Investigating Issues of Age and Work-Related Stress as they relate to Supporting Health and Social Care Workers through Online Work-Stress Management Interventions

Presented by Mr Cathal Ryan B.A. (Hons), MSc.

A thesis submitted in partial fulfilment of the requirements of

SETU Waterford for the degree of Doctor of Philosophy

Department of Nursing and Health Care

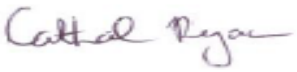
SETU Waterford

Supervisors: Professor John S.G. Wells & Dr Michael Bergin

Submitted to SETU Waterford: April 2023

Declaration

I, Cathal Ryan, declare that this thesis is submitted in partial fulfilment of the requirements of the degree in Doctor of Philosophy (PhD) and is entirely my own work except where otherwise accredited. It has not at any time, either whole or in part, been submitted for any other educational award.

Signed:  Candidate

Cathal Ryan

Abstract

Background

Previous research on stress in the workplace often fails to take account of age as a variable, particularly in the context of health and social care practice. Utilising an established online work-stress management programme as a case example, this study investigated issues of age and work-related stress as they relate to supporting health and social care workers through online stress management interventions.

Methods

Mixed methods research comprising two studies were conducted. Study One employed quantitative survey methods, in line with the JDC(S) model (Johnson and Hall 1988), to investigate the role of age in the contribution of workplace characteristics to stress among a specific cohort of health and social care workers (nurses and intellectual disability care workers). Study Two used qualitative unstructured individual interviews with people from the target group undertaking an existing online work-stress management programme to explore experiences of the programme delivery and content.

Findings

Study One found that nurses and intellectual disability care workers experience poorer physical health as they age. However, age did not influence stress perception or how workplace psychosocial characteristics contributed to the experience of stress among these groups. The interactive effects of the JDC and JDC(S) models were not supported.

Study Two found that issues relating to online delivery, disengagement, support and additional commitments affected most who undertook the programme. Differential experiences among participants appeared to be due to factors related to experience, leadership, and responsibility in the workplace, rather than age. Participants had varying personal preferences for how online work stress management programmes should be designed and delivered.

Implications for online work-stress management interventions

There was little evidence that age should form a factor in the design and development of online work-stress management interventions for health and social care workers. A number of findings relevant to the further development of online interventions and the DELAROSE programme were generated. The dual-focused nature of the programme should remain in place, though this may depend on the position of the target user in the workplace. The support from those who deliver the programme should be consistent and structured. Online stress management programmes that aim to support health and social care workers should focus on their physical well-being and target each of the workplace psychosocial characteristics of psychological job demands, decision latitude and social support.

Acknowledgements

To those who completed surveys and took part in the interviews for this study, I would like to express my heartfelt thanks. Your willingness to share your time and views with me is greatly appreciated. I am very grateful also to the management teams of the service providers who granted me access to conduct this study. A special thanks too to all of the gatekeepers in those services and the clinical placement co-ordinators, particularly Gillian Sexton from the NFVB and Deirdre Chapman from SETU, who championed this research.

To my supervisors, Professor John Wells and Dr Michael Bergin, I express my sincere gratitude for your expertise throughout. Your consistent support, encouragement, review of my work and advice is greatly appreciated.

I would like to thank Dr Warren Roche, Dr Sameh Elwady and Dr Martina Gooney for their communications and expertise relating to the methodology and processes of data analysis in this study.

I would like to thank all my colleagues in SETU Waterford their ongoing support and encouragement during the course of this study. Finally, this research journey would not have been possible without the support and encouragement of my family and partner. Thank you for your support and for creating a platform for me to pursue this work.

Contents

List of Boxes

List of Tables

List of Figures

Acronyms

ROSE Reducing Occupational Stress in Employment

DELAROSE Delivering e-Learning Accreditation to Reduce Occupational Stress in Employment

ECTS European Credit Transfer and Accumulation System

HSE Health Service Executive

NFVB National Federation of Voluntary Bodies

RCT Randomised Controlled Trial

CBT Cognitive Behaviour Therapy

JDC Job Demand-Control

JDC(S) Job Demand-Control-Support

JCQ Job Content Questionnaire

SF-12/SF-26 Health Status Survey Short-Form (12 and 36 item versions)

PCS12 Physical Health Component Score (from SF-12)

MCS12 Mental Health Component Scores (from SF-12)

SPSS Statistical Package for the Social Sciences

Glossary

Ageing Health and Social Care Worker

Defined for the purposes of this research as an individual engaged in the provision of health and social care who is aged over 45 years.

Intellectual Disability Care Worker

This refers to any professional who provides direct care and support to persons with an intellectual disability. Intellectual disability care in Ireland is typically delivered in community, residential and day care facilities. Though such services are considered to form part of the social care sector in Ireland, not all of those engaged in such work may regard themselves as a social care worker or are likely to meet the criteria set by CORU to be considered a social care practitioner (see social care worker below). Registered nurses in intellectual disability are included as a type of intellectual disability care worker in this research.

Registered Nurse

Registered nurses provide professional care to people of all ages, groups and communities in a range of settings. They are governed as a profession in Ireland by the Nurses and Midwives Act 2011, and must adhere to standards issued by the Nursing and Midwifery Board of Ireland (NMBI). These standards include successful completion of an approved nursing education programme and demonstrating competency in the practice of nursing.

Registered Nurses in Intellectual Disability

Intellectual disability nurses are a speciality field of registered nursing who provide care to persons with an intellectual disability. They are a key profession in the provision of health and social care supports for people with intellectual disabilities.

Social Care Worker

Social Care Workers are professional practitioners engaged in the practice of social care work. In Ireland, social care work comprises the care, protection, psychosocial support and advocacy delivered in partnership with vulnerable individuals and groups who experience marginalisation, disadvantage or special needs. The provision of care and support to persons with an intellectual disability is part of the social care sector in Ireland.

Social care workers are not yet a professionally regulated workforce in Ireland. CORU, the multi-profession health regulator, established a registration board in April 2015 to prepare for the statutory registration of those seeking to operate under the legally protected term of ‘social care practitioner’. However, this is not likely to come into effect until at least 2025.

Chapter One

INTRODUCTION

1.0 Introduction

The health and social care workforces of many countries are ageing. This is important as ageing workers may be particularly vulnerable to the challenges of health and social care practice (Buchan and Catton 2020), or experience stressors not encountered by those in other cohorts of the workforce (Denton, Evans and Xu 2020). They may also require tailored supports and initiatives to protect their psychosocial well-being (Nagarajan *et al.* 2019). These issues informed the focus of this research on age and supporting health and social care workers in the management of their work-related stress through online programmes.

The purpose of this opening chapter is to outline the personal and professional factors that led me to pursue this doctoral work, discuss the background issues to this research, and outline the research question, aim, and objectives. The chapter commences with an overview of the catalyst for this research (Section 1.1). This is followed by a discussion of the issues and trends which formed the background to this research (Section 1.2), leading into the presentation of the research question, aim and objectives (Section 1.3). Three factors that were central to the process of investigation in this research (namely the population of interest, concept of interest, and the use of theory) are then discussed. The chapter concludes with an overview of each of the chapters that comprise this thesis (Section 1.4), and the publications arising from this work (Section 1.5).

1.1 Catalyst for this research

A number of personal and professional experiences influenced my decision to undertake this doctoral work. First, my interest in the field of work-related stress and related psychosocial interventions has been ongoing since I took my Master's degree in Health Psychology at NUI Galway. This followed my completion of a B.A. in Psychology at Maynooth University.

Through both programmes I was exposed to leading national and international researchers in the area of stress, coping and intervention design, and who sparked my interest in explore these topics further. My academic grounding in the discipline of psychology instilled within me an awareness of the value of empiricism and the

generation of knowledge in a systematic manner in order to understand and solve problems. I developed an enthusiasm for the conduct and dissemination of research. This encouraged me to pursue professional work as an early career researcher.

Thus, I sought and secured the position of principal research assistant to the DELAROSE project (Delivering eLearning Accreditation to Reduce Occupational Stress in Employment) at WIT, an EU-funded project that led to the development of an online learning programme in stress management for health and social care workers (known also as DELAROSE). Working on this project gave me an opportunity to engage in a meaningful way with persons who were experiencing work-related stress and committed to creating less stress inducing working environments. I also began working with researchers and service providers from different clinical and academic backgrounds to my own.

These experiences raised my awareness of the national contextual challenges encountered by those who provide professional care and support to vulnerable people in Ireland. A particular question to arise for me in this regard was how supportive interventions delivered through online platforms could be tailored to meet the needs and preferences of health and social care workers as they aged. Recognising the importance of such workers and need to support them in their work-related stress management was significant in my decision to pursue this doctoral study.

1.2 The background to this research

The following sections summarise the key trends and issues which informed the focus of this research. These include the issue of work-related stress in health and social care work, online work-stress management interventions (including the ROSE and DELAROSE programmes), and the trend towards an ageing health and social care workforce. Each are now addressed in turn.

1.2.1 Work-related stress in health and social care work

Stressful occupational environments, characterised by intense work demands, long hours and poor managerial and peer support, are a recognised issue in many countries. The American Psychological Association's Work and Well-being Survey (American Psychological Association, 2021), found that 71% of

workers in the United States feel tense or stressed every day at work, while Gallup's State of the Global Workforce Report (2022) indicated that 44% of employees internationally reported feeling stressed for a lot of the previous day to being surveyed.

In an Irish content, a 2019 report by the Economic and Social Research Institute (ESRI) found that 38% of employees experienced negative reactions to stress in the workplace. Those working over 40 hours-a-week or facing tight deadlines, emotional demands, or bullying reported considerably greater stress levels. This is despite the fact that the economic costs of work-related stress, arising from issues such as absenteeism and presentism, can be substantial (Matrix 2013, Hassard *et al.* 2018). Significantly, only 40% of Irish employers are identified as having policies in place to manage stress in the workplace (ESRI 2020), even though national and European legislation such as the EU Health and Safety Directive (89/391/EEC) and the Health and Welfare at Work Act (2005) dictate that employers have a duty of care to protect the psychosocial well-being of their staff.

One sectoral group who make a vital societal contribution and who are often exposed to stressful working environments are health and social care workers (Clegg 2001, Johnston *et al.* 2013, Wells 2011). Such workers are often required to cope with occupational challenges that include heavy workloads, shift work, and the emotional impact of caring for sick patients or vulnerable clients (Happell *et al*. 2013, Wells and White 2014). This was particularly the case during the Covid-19 pandemic (Galbraith *et al.* 2020), when such workers were among the occupational groups at highest risk of COVID-19 morbidity and mortality (Hodgson *et al*. 2020). They were also exposed to risks and challenges not generally experienced by other sectoral groups, including a shortage of personal protective equipment (PPE), physical deprivation, bereavement, and psychological injury.

It is unsurprising that in many studies of such workers, high rates of depression, distress, anxiety and insomnia were reported (e.g. McMahon *et al.* 2020, Ornell *et al.* 2020, Sheehan *et al.* 2022). Within an Irish context, issues such as inadequate salaries, increased working hours and understaffing have continued

to impact greatly on health and social care workers and contributed to high levels of stress, burnout and staff attrition (Lambert and Mahon 2021).

1.2.2 ROSE, DELAROSE and online stress management interventions

Challenging working environments and national contexts place added importance on the design and delivery of effective interventions to support health and social care workers in the management of their work-related stress (Heath and Sommerfield 2020, Hussein 2017, Vinkers *et al.* 2020). It is this issue which formed the basis of two previous EU funded projects, ROSE and DELAROSE. These resulted in the development of two online programmes, both known also as ROSE and DELAROSE, which deliver person-centred psychosocial interventions to support health and social care workers in the management of their work-related stress.

The first of these (ROSE - 'Reducing Occupational Stress in Employment') commenced in 2009 when a consortium of nine partners from five European countries led by Waterford Institute of Technology (WIT) secured funding from the EU to develop an online intervention to support health and social care workers in managing their work-related stress. Drawing upon three strands of research conducted by the project team, which included reviews of the literature, a survey of the stressors impacting upon rehabilitative and vocational support workers, and focus groups held in five European countries (Wells, Denny and Cunningham 2011), the ROSE online programme was developed.

An online design was employed so that the programme could be provided with free access for all within this significant and variegated sectoral group. Two main sections to the programme were created (see Table 1 below). One of these was individual-focused and suitable for all levels of staff. The other was aimed at managers and focused on creating less-stressful working environments. Both sections comprised a multi-component intervention with four short training units:

Table 1. ROSE Programme Content

Section One	Section Two
• Introduction to Stress • Learning Ways of Coping with Stress (including Time Management and Problem-Solving Skills) • Changing Your Thinking (Cognitive-behavioural exercises plus techniques for combatting procrastination and perfectionism) • Learning to Relax.	• The Organisation and Stress • Leadership and Motivation • Risk Assessment • Managing Change

ROSE was adapted as part of a doctoral student project in the United States of America and used by a small sample of new graduate nurses during their first year of employment in a large regional health system (Nimmo *et al.* 2014). It was found that the programme did indeed help decrease stress levels in new graduate nurses. Significantly, these nurses specified that they would like some formal recognition of their learning in relation to ROSE. This would incentivise them to engage with the programme and indicate to their employers that they had acquired a skill set and knowledge base in relation to their professional practice.

It was this finding in particular which formed the basis for a further application to the EU for funding to establish ROSE as an accredited online learning programme for health and social care workers. The result was the DELAROSE project, which brought WIT into a collaborative partnership with seven other partners to develop an online learning programme called the 'Certificate in the Management of Work-Related Stress'. The Certificate was delivered in English, German and Italian as a 20 ECTS credit EQF Level 5 programme.

This programme (referred to as DELAROSE henceforth) is delivered from the School of Health Sciences in SETU Waterford (formally WIT). Following the original conceptualisation of ROSE, it is divided into two modules, each comprising individual units of learning. The first module provides learners with relevant skills and knowledge for personal stress management. The second

module is manager-focused and aims to provide learners with the skills and knowledge to create a less stressful working environment (see Appendix A for programme curriculum documentation). The programme is delivered entirely asynchronously, meaning that learners progress at their own pace and submit their assessments as and when they complete them. I was responsible for the delivery of the programme as part of my commitments under the WIT PhD Scholarship programme.

1.2.2.1 Online work-stress management interventions

ROSE and DELAROSE are reflective of a broader trend within the work-stress management literature in recent years as it relates to the proliferation of interventions delivered through online modalities (Carolan, Harris and Cavanagh 2017, Holman, Johnson and O'Connor 2018). The purported benefits of online modalities for such interventions include fewer constraints with regard to time and location, the potential to access a larger target group, and the protection of anonymity, thereby reducing possible stigma with regard to seeking help for stress (Lehr *et al.* 2016, Wantland *et al.* 2004).

For these reasons, online modalities have been increasingly employed by public health bodies, service providers and representative organisations to deliver open-access psychosocial supports and resources to healthcare staff. Examples include the 'Stress Control' online programme provided by the Health Service Executive in Ireland (https://bit.ly/3lH0Cva) and the mental health toolkit for nurses provided by the 'C3 Collaborating for Health' (https://www.c3health.org/) organisation in the UK. This toolkit contains advice and resources across a range of domains including stress, nutrition, sleep, finance, housing and relationships.

The benefits of online delivery have been much evidenced during the Covid-19 pandemic (Blake *et al.* 2020), during which a range of website and smartphone delivered Covid-19 information and stress management support were developed (e.g. Golden *et al.* 2021, Fiol-DeRoque *et al.* 2021, DeTore *et al.* 2021). A popular example includes the University of North Carolina's 'Heroes Health' app to help support the mental health of first responders and healthcare workers during COVID-19 (https://heroeshealth.unc.edu/).

An increasing number of studies support the efficacy of online interventions for helping workers manage their stress (Pfaffinger *et al.* 2022). Meta-analytic reviews of this literature report that such interventions on average produce small to moderate improvements in perceived stress and other stress-related outcomes (such as depression and anxiety) when delivered to workers (Carolan, Harris and Cavanagh 2017, Stratton *et al.* 2017, 2021, Phillips, Gordeev and Schreyögg 2019). These online interventions are typically mobile or website-delivered, person-centred, target the individual and draw upon cognitive-behavioural, mindfulness and/or relaxation-based techniques.

Nonetheless, caution must be exercised when making judgements about the likely efficacy of specific interventions (such as DELAROSE) with particular target audiences, such as health and social care workers. This is because individual interventions can vary markedly from each other in terms of their content, depth, modality of delivery and target audience. A further challenge with the use of online modalities as a means of supporting workers in managing stress is their susceptibility to low adherence. For example, Carolan, Harris and Cavanagh (2017) identified that, on average, fewer than half of participants (45%) completed interventions in full (though this ranged from 3% to 95% across the included studies).

Low adherence is a noted issue with online interventions generally (Kelders *et al.* 2012). This is problematic as adherence has been found to be an important determinant of the effectiveness of online interventions (Wantland *et al.* 2004). Interestingly, Carolan, Harris and Cavanagh suggest that increased accessibility and anonymity, commonly purported to be benefits of online modalities, may actually be less advantageous in a workplace setting due to a lack of structure or monitoring. This may negatively affect uptake and engagement, particularly amongst stressed occupational cohorts with limited free time.

1.2.3 The ageing Irish population and labour force

One issue which may impact upon both the psychological well-being of the health and social care workforce and the use of online modalities to support them is the fact that a significant proportion of this workforce are ageing. Within an Irish context, for example, approximately 65% of all public health service

staff are aged over 40 years, with just 21% aged under 35 years[1]. In contrast the most recent research indicates that 31.6% of those employed in the general population are aged under 35 years (Solas, 2019).

This trend is especially evident among Ireland's nursing workforce. The most recently published data from the Health Service Executive (HSE) indicates that nearly 60% of all nurses in Ireland are aged over 45 years and more than 30% are aged over 50 (Health Service Executive 2017). This appears to be reflective of a broader international phenomenon, as 24% of nurses employed by the National Health Service (NHS) in the United Kingdom are aged between 40 and 50, with a further 34.2% aged 50 years and older (Nursing and Midwifery Council 2022). In the United States of America, the trend towards an ageing nursing workforce has been identified since 2000 (Buerhaus, Staiger and Auerbach 2000), where it is estimated that at least 50% of registered nurses are aged over 50 years (Smiley *et al.* 2021)

An ageing staff profile may be observed within other occupational groups of the Irish health service. For example, 61.2% of those who provide patient and client care services (i.e. non-nursing and medical staff) are aged over 45 years (Health Service Executive 2017). Though less pronounced among medical and dental staff (35.2% of whom are aged over 45 years), a significant proportion of general practitioners (60%) and medical consultants (71%) are aged 45 years and older (Health Service Executive 2021).

The extent of the trend towards an ageing workforce among social care workers in Ireland is more difficult to determine. This is due primarily to the complex and fragmented nature of the sector here (see Section 1.3 for a more detailed discussion on this issue), meaning that demographic data relating to those involved in social care provision is not available to the same extent as it is for the healthcare workforce. Nonetheless, the most recent data from the HSE does indicate that 30.9% of staff in its health and social care category (that is, those responsible for supporting older persons and person with a disability to live independently) are aged over 45 years (Health Service Executive 2017).

[1] Des Williams, Health Service Executive. Personal Communication, 2018.

It is worth noting that the Irish population and labour force is also ageing. The proportion of the population aged over 60 is projected to increase from 15.3% in 2006 to 23% by 2026 (Central Statistics Office 2017a). With regard to the Irish labour force, those aged 55 and older now comprise a substantial proportion (almost 20%), a share that has grown in the last ten years (Privalko, Russel and Maitre 2019). Combined with the data as it relates to the healthcare workforce in Ireland, it is probable that the social care workforce is ageing also.

The ageing of the health and social care workforce is an important issue as there is evidence that workers become more susceptible to the negative impacts of chronic stress as they age (Cohen 2005). This may place them at greater risk of negative physical and mental health outcomes (Graham, Christian and Kiecolt-Glaser 2006). It is also possible that ageing workers in these sectors are more vulnerable to certain types of workplace stressors, or encounter workplace challenges that are specific to them and not experienced by those in other areas of the workforce (Denton, Evans and Xu 2020, Hatch *et al.* 2018).

Whether health and social care workers require stress management supports tailored to their age is uncertain. Resources to support ageing workers specifically in the management of their work-related stress are sparse, and while an increasing body of research favours the efficacy of online work-stress management interventions, whether these can or should be adapted to meet the needs and preferences of health and social care workers according to their age is unclear. Given the trend towards an ageing health and social care workforce, and what is currently know about the inherently stressful nature of such work generally, the investigation of these issues is warranted and forms the primary focus of this research.

1.3 The research question, aim and objectives

This research sought to answer the following question: How can ageing health and social care workers be supported in the management of their work-related stress through online stress management interventions? The formulation of this research question was based on an analysis of the aforementioned issues as they relate to stress in health and social care work, the trend towards an ageing health and social care workforce, and the delivery of online work-related stress management interventions. In line with this, the

aim of this research was to explore and analyse the requirements of health and social care workers in managing their work-related stress as these relate to issues of age and online work-stress management interventions, utilising the specific case example of the DELAROSE programme to explore broader issues of need, engagement and adherence.

In order to meet this aim, the following research objectives were formed (see Box 1 below). These objectives were informed by a number of issues relevant to the research question at hand. For example, is was unknown whether the perceived stress of health and social care workers changes as they age, or whether ageing workers in these sectors experience occupational stressors that are unique to them or to which they become more vulnerable. This is important as existing online work-stress management interventions such as DELAROSE may be limited in their ability to support these groups within their work settings. Examination of what was already known about the nature of the challenges and work-related stressors encountered by such workers as they age was required (Objective One).

This research drew upon an existing online work-stress management intervention (DELAROSE) as a case example through which the objectives, aim and research question were addressed. There was a need to analyse DELAROSE in the context of what was already known about online work-stress management interventions. This would enable strengths or weaknesses of the programme, particularly with regard to its utility in meeting the needs of workers as they age, to be identified. In order to facilitate such analysis, it was necessary to review the quantitative and qualitative literature as it related to online work-stress management interventions (Objective Two). This included examination of the evidence relating to the efficacy of online work-stress management interventions, in addition to determining what is known about how workers experience such interventions. These are phenomena which may vary according to age, and it was important that findings of this research as they relate to the DELAROSE programme could be analysed in the context of the existing literature.

Box 1. Objectives of this research

Objectives of this research

1) Analyse the literature as it relates to the experience of work-related stress among ageing health and social care workers;

2) Review the literature in relation to online work-related stress management interventions, with a specific focus and reflection on evaluative studies of online interventions that are similar in nature to DELAROSE;

3) Gather and analyse data relating to age-related differences in the contribution of workplace characteristics to the psychological and physical manifestations of work-related stress among a sample of health and social care workers in the South-East of Ireland **(Study One);**

4) Investigate the experience of a sample of registered learners in undertaking the current DELAROSE online learning programme **(Study Two);**

5) Based on Objectives One to Four above, evaluate and adapt the current DELAROSE online learning programme in work-related stress management to meet the needs and preferences of ageing health and social care workers;

6) Discuss and make recommendations on the implementation of online work-related stress management interventions to support ageing health and social care workers.

The PRIMA-EF guidance resource on the *European Framework for Psychosocial Risk Management* (Leka, Cox and Zwetsloot 2008) identifies the need for work-stress interventions to be theory-informed and evidence-based. Theory-informed design is important as it explains the mechanism of an intervention and facilitates the selection of component techniques (Michie *et al*. 2008) Collecting empirical data within a theoretical framework enables a more accurate understanding of the factors that contribute to stress in a specific occupational group (such as ageing health and social care workers) and helps to identify constructs that are appropriate targets for intervention (Wingood and DiClemente 2000).

This is important in the context of the DELAROSE programme as it is dual-focused in nature. This means that it targets both individual and organisational stressors, delivering personal stress management support in addition to tools to manage sources of stress as they arise at a workplace level. While this may represent a strength of the programme (as contemporary perspectives of work-related stress acknowledge that it arises from a combination of individual and organisational factors, e.g. Siegrist and Li 2016), the extent to which DELAROSE is theory-informed is unclear (see Section 1.3.3 of this chapter for analysis and discussion of this issue). In addition, the impact of age on how workplace characteristics, as hypothesised within existing work-stress theories, contribute to stress-related outcomes and should therefore inform intervention content was unknown.

For these reasons, a theory-informed investigation of age-related differences in the contribution of workplace characteristics to the experience of stress among health and social care workers was conducted (Objective Four). The purpose of such investigation was to determine the relationship between age, psychosocial characteristics of the workplace, and the stress and well-being outcomes of a sample of health and social care workers. This is to determine whether and how age should inform theory-based stress management interventions for health and social care workers.

It is possible that health and social care workers may vary in terms of what they require from online work-stress management interventions, or how their design and delivery can be tailored to meet their needs and preferences. To address this issue, the experience of undertaking the DELAROSE online stress management programme was investigated (Objective Four). This included an examination of age-related differences in participants' experiences of the programme, as well as consideration as to the utility of the programme, what should change, and what should stay the same.

Finally, there was a need to identify the broader implications of the findings of this research as they relate to the issue of age and supporting health and social care workers in the management of their work-related stress. These were to inform recommendations as to the development and implementation of online work-stress management interventions for ageing health and social care workers (Objective Six). The further development of DELAROSE programme to meet the needs and preferences of ageing health and social care workers was also considered as part of this (Objective Five).

Before proceeding to address these objectives, it is necessary to discuss and define a number of factors that were central to process of investigation in this research. Namely, these are the population of interest, the concept of interest, and use of theory in this research. Each are now addressed in turn.

1.3.1 The population of interest for this research: Nurses and intellectual disability care workers in Ireland

It is estimated that almost 250,000 persons were employed in the health care sector in Ireland in 2016 (Central Statistics Office 2017b). The public health service is managed by the Health Service Executive and accounts for almost two-thirds of all those employed in this sector. Nursing staff comprised the main occupational category, representing over 30% of all employees (Health Service Executive 2022). Management, administration and general support staff comprised nearly 24%; followed by other patient/child care (21.5%), allied health and social care professionals (13%), and medical staff (9%).

Social care workers in Ireland are responsible for the provision of professional care to vulnerable and sometimes marginalised populations. They provide practical, social and emotional support to people in need (Glasby 2017). Recipients of social care range from older adults to young people; families; people with mental health problems, intellectual or physical disabilities; people with alcohol/drug dependency and the homeless (Lalor and Share 2013). Within an Irish context, social care workers are employed in a range of settings including residential, community and domiciliary care. Most services are publically funded but delivered by a mix of public and independent (i.e. private and voluntary) organisations (Mulkeen 2016).

The variegated nature of health and social care work in Ireland meant that in order for meaningful investigations to be conducted as part of this research, it was necessary to focus on specific occupational groupings within this sector. Specifically, it was decided to focus on nurses and those who provide professional care and support to persons with an intellectual disability. This was for three key reasons.

First, the ROSE and DELAROSE projects were focused on supporting workers in the vocational and rehabilitative disability care sector to manage their work-related stress. Such workers comprise a significant component of social care provision in Ireland. Psychiatric nurses were also included as part of the target group, owing to similar nature of their work. Indeed, it is worth noting that intellectual disability nursing has been an established field of clinical practice in Ireland for several decades. This means that nurses and social care workers often work together in intellectual disability care settings.

Second, this research was supported and networked by the National Federation of Voluntary Bodies (NFVB), a representative organisation for services for persons with intellectual disabilities in Ireland. The NFVB were also key partners within the ROSE and DELAROSE projects and provided support to access this sectoral group for research purposes.

Third, nursing staff are the largest cohort of the health care workforce in Ireland, accounting for approximately one-third of its total public health service workforce (Health Service Executive 2022). The issue of an ageing health and social care workforce is one that has been most prominently identified among nursing staff. Furthermore, as the ROSE and DELAROSE project teams were led by staff from the Department of Nursing and Health Care in WIT, and as this doctoral research was to be conducted from this Department also, including registered nurses as a population of interest was justified.

Nurses in Ireland are governed as a profession by the Nurses and Midwives Act (2011). They must adhere to standards issued by Nursing and Midwifery Board of Ireland (NMBI). There were 81,431 registrants with NMBI in 2022 (Nursing and Midwifery Board of Ireland 2022). Nurses are regulated according to four fields of speciality. These are general, psychiatric, children's, and intellectual disability nursing.

Nurses are categorised operationally by the Health Service Executive (HSE) into a number of staff groupings. These include Nurse Managers; Nurse Specialists; Staff Nurses; Public Health Nurses, and Nursing Students. Outside of the HSE, there are 19 private hospitals in Ireland and 437 private or voluntary residential care services, though data relating to the exact number of nurses (or

indeed staff) employed in these services is not available. About fifty nurses also work directly for Túsla, the Child and Family Agency.

Though services for people with intellectual disabilities comprise a significant proportion of social care provision in Ireland (Mulkeen 2016), the term 'intellectual disability care worker' does not refer to a cohesive, professionally regulated group in the same way as the term nurse. Social care workers are not yet a professionally regulated workforce in Ireland, and those who deliver social care to persons with an intellectual disability may do so under a range of job titles, depending on their professional background. This includes intellectual disability nurses, who are a speciality field of registered nursing and a key profession in the provision of health and social care supports to people with intellectual disabilities in Ireland. As such, while nurses and intellectual disability care workers are defined as the population of interest for this research, the term intellectual disability care worker is taken to include both nurses and other care and support workers operating within intellectual disability care services in Ireland.

Over 90% of the direct care services for people with an intellectual disability are delivered by independent non-profit organisations (Mulkeen 2016). The National Federation of Voluntary Service represents over 57 voluntary/non-statutory agencies who provide services to people with intellectual disability and autism in Ireland, on the basis of service arrangements with the HSE. Their members comprise a range of residential and day care services and account for at least two-thirds of Ireland's direct service provision to people with an intellectual disability.

1.3.2 The concept of interest – age and the ageing worker

Of much importance for this research was defining the concept of interest as it relates to age and health and social care work. This was challenging as despite much interest in ageing workforces internationally (e.g. Blackham 2017, Gahan *et al.* 2017), there is a lack of agreement among researchers and policy makers as to what exactly constitutes an ageing worker (McCarthy *et al.* 2014). Few have attempted to provide an explicit definition (Cleveland and Hanscom 2017).

Most common is for researchers to employ chronological age markers to define their concept of interest when examining age-related differences in the workplace (Rupp *et al.* 2005). Policymakers and legislators typically rely on chronological markers to define issues related to age and work. An example of this is the Age Discrimination in Employment Act in the United States, which forbids age discrimination against people who are aged 40 years or older.

However, other conceptualisations of age in the workplace have been employed (Schalk *et al.* 2010, Sterns and Doverspike 1989). Functional approaches, for example, recognise that workers go through various biological changes as they age, which may affect their health status, physical capacity and cognitive performance. Similarly, lifespan perspectives focus on the process of ageing across the whole life cycle (Kooij 2015). For health and social care workers, these may include changes in their financial situation or providing eldercare to their own families.

Psychosocial conceptualisations comprise social and self-perceptions of age in the workplace. This includes the concept of subjective age, which can refer to how old a worker feels or the age cohort with which they identify (Urick 2017). Finally, age can also refer to a worker's career stage and level of experience. This recognises that workers spend increasing amounts of time in their jobs as they age. As a result, they accumulate increased levels of skills and expertise (Benner 1984).

For this research, it was decided that a chronological definition of age would be employed as the concept of interest and to guide analysis of the data and findings. This decision was informed by the fact that the trend towards an ageing nursing workforce, which contributing to formulating the research question, was evidenced by chronological age data from numerous national and international nursing workforces reported. That is, a growing number and proportion of nurses in Ireland and elsewhere are aged in their forties, fifties and sixties (Health Service Executive 2017, Nursing and Midwifery Council 2022).

Specifically, it was aged 45 years and older that was taken as the definition of the ageing health and social care worker in this research. This age criterion was

justified based on workforce data that shows that 53% of nurses in the Irish public health service are aged between 20 and 45 years, with 47% aged between 45 and 65 years plus (Health Service Executive 2017). This indicates that nurses aged over 45 years are likely past the mid-point and into the latter stages of their career.

Framing an upper chronological age limit was also important for articulating the nature of age in the workplace. This helps to distinguish between age in a general sense and what constitutes an ageing worker. While the State retirement age in Ireland in 2022 (in terms of accessing a state pension) is 66 years, a statutory mandatory age for retirement only applies to certain public sector occupations, such as An Garda Síochaná. Instead, retirement ages are generally provided for in contracts of employment, company policies or by way of practice.

Nurses and intellectual disability care workers can choose to work beyond 66 years but may retire earlier depending on their area of employment, collective bargaining agreements and pension accruals. Though the exact average age of retirement for nurses and intellectual disability care workers in Ireland is not known, fewer than 0.5% of Irish public sector nurses are aged over 65 years, while only 5.1% are aged between 60 and 65 years (Health Service Executive 2017). This suggests that most nurses leave or have left the workforce by the time that they reach their late fifties of early sixties.

This is further supportive of the use of 45 years plus to define the ageing health and social care worker here, as it indicates that workers have moved into the latter stages of their career. In any event, participants for this research were recruited without distinction as to their age. Rather, chronological age markers of 45 years and older were employed (where relevant) to inform investigations of age-related differences in the data.

1.3.3 Work-related stress, burnout and the use of theory in this research

Definitions of stress have traditionally derived from three broad conceptualisations (Cox and Griffiths 1995, see Table 2 below). Much of the early stress research was grounded in what is known as the *physiological*

approach, which focused on the range of biological responses that may occur in an individual when faced with a stressor (Mark and Smith 2008). For example, seminal research by Selye (1950) articulated the stress experience as a process of physiological adaptation, postulating what he termed a general adaptation syndrome. According to Selye, the stress process progressed in three stages from alarm to resistance to physiological exhaustion.

A modern articulation of complexity of the biological response to stress is Ganster and Rosen's (2013) Allostatic Load Model of the Stress Process. This model focuses on the development of allostatis, a process of adjustment for an individual's bodily systems when faced with challenges. It proposes that continued overstimulation leads to dysregulation, and then to poor tertiary health outcomes (Guidi *et al.* 2021). Empirical evidence identifies allostatic load as a dynamic and potentially modifiable risk factor for poor health outcomes and mortality (Parker *et al.* 2022).

Table 2. Conceptualisations of Stress

Approach	Conceptualisation of Stress
Physiological	Stress as a biological response that occurs within the individual
Stimulus	Stress as a characteristic or stressor in the environment that places a strain on the individual
Psychological	Stress as a dynamic relationship between the stimulus and the individual, who is an active agent in the appraisal of their environment and mitigation of stress

Stress has also been conceptualised as characteristic of the environment that imposes a demand or pressure on the individual (Dewe, O'Driscoll and Cooper 2012). This is referred to as the *stimulus* approach. Several prominent theoretical models of work-related stress, which are discussed in the following section, draw primarily on this approach. They describe how characteristics such as excessive demands, inadequate resources or poor social support can contribute to stress-related outcomes for workers (Giga *et al.* 2003).

The third conceptualisation of stress is *psychological* in nature and explores the dynamic relationship between these stimulus and physiological approaches. The origin of this approach lies in the work of Lazarus, who defined stress as 'a relationship between the person and the environment that is appraised as personally significant and as taxing or exceeding resources for coping' (Lazarus 1966). This definition, which frames the individual as an active agent in the appraisal of their environment and mitigation of stress, was the foundation of the psychological conceptualisation of the stress process, and indeed most contemporary perspectives of stress and coping (Mark and Smith 2008).

Despite the differences in these approaches to conceptualising stress, a seminal review of the literature (Cox 1993) identified that there was consensus among researchers that stress is a psychological state with cognitive, emotional and physiological components that arises through a sequence of events experienced by an individual. These events include the presence and appraisal of demands as a threat to one's well-being, which is likely to require the use of personal resources beyond a normal range of functioning. This precipitates the generation of a coping response (Cooper, Dewe and O'Driscoll 2001).

Cox's 1993 review was commissioned by the Health and Safety Executive in the United Kingdom. Informed by his findings, they formally defined work-related stress as 'the adverse reaction people have to excessive pressures or other types of demand placed on them at work' (Health and Safety Executive 2001). This is significant as it acknowledges that stress exists as a psychological state rather than an illness (though it can lead to mental and physical illness when prolonged and excessive). It also distinguishes the experience of work-related stress from simply the presence of demands or workload, in that a state of stress develops when a worker perceives that they are unable to cope with the demands being placed on them. It is this definition that informs the investigation of issues of work-related stress and its management in this research.

It is worth noting that in some cases a positive reaction to stress, known as eustress, may be observed (Cummings and Cooper 1998). Bienertova-Vasku, Lenart and Scheringer (2020) define eustress as a positive psychological response to a stressor, as indicated by the presence of positive psychological

states. Research interest in eustress originated in the aforementioned work of Hans Selye (1950), who identified that not all stress reactions are equivalent, and that differences in responses may be the outcome of individual differences in perception and physiology. Contemporary work on eustress primarily conceptualises it as an *optimal* level of stress (Perrotta 2021), whereby stress that it can be beneficial to performance up and until an optimum level is reached, after which performance will decline (Cohen 2011). Learning to react to stressors with positive emotions such as gratitude, hope and goodwill is likely to maximise eustress.

Supportive of this concept of an optimal level of stress is empirical research that suggests that the stress experience can bring beneficial outcomes. For example, activation of the hypothalamic-pituitary-adrenal (HPA) axis has been shown to provide an organism with a boost in energy and blood flow in challenging situations (McEwen, 2007). Stress has been found to predict enhanced performance in meaningful, demanding situations (Moore *et al.* 2015, Vine *et al.* 2015), while in others it can facilitate learning (Salehi *et al.* 2010) and psychological growth (Merrill *et al.* 2016). Stress has also been associated with increased social bonding, connection to meaning (Park *et al.* 2012, Vine *et al.* 2013) and prosocial behaviours (Bartz *et al.* 2011). There are contexts, therefore, where optimal levels of stress can have an adaptive influence.

1.3.3.1 Burnout

Connected to the concept of work-related stress is burnout (Toker and Melamed 2017). Burnout may be defined as a state of physical, emotional and mental exhaustion that results from chronically demanding workplace situations (Schaufeli and Greenglass 2001). Maslach (1976) was among the first to reference burnout in the scientific literature, defining it as a gradual process of fatigue, cynicism and reduced commitment among healthcare professionals. This was refined by Maslach and Jackson (1981) to a psychological syndrome characterised by emotional exhaustion, depersonalisation and a reduced sense of efficacy, and later extended to persons in all occupations (Schaufeli, Lieter and Maslach 2009). Exhaustion (i.e. feeling depleted of one's emotional resources) is considered the core component of burnout, and has been shown to precede cynicism and lack of professional efficacy (Taris *et al.* 2005).

This conceptualisation of burnout as a syndrome characterised by feelings of emotional exhaustion and cynicism arising from exposure to chronic stress distinguishes it from the concept of work-related stress. There is much research evidence to suggest that burnout warrants attention in its own right due to its impact on workers (Schaufeli and Buunk 2003). Health and social care workers are especially susceptible to burnout owing to the psychologically and emotionally demanding nature of their work (Klopper *et al.* 2012, Yoon and Sok 2016). A recent meta-analysis of studies with nurses found that they experienced high levels of burnout, with prevalence rates of high emotional exhaustion, high cynicism and low professional efficacy 31%, 24% and 38% respectively (Molina-Praena *et al.* 2018). For nurses in mental health care settings, burnout prevalence has been estimated to be between 21% and 67% (Morse *et al.* 2012). As noted in Section 1.2, the Covid-19 pandemic placed considerable psychological strain on health and social care workers, and numerous studies have evidenced the impact of burnout on such workers, including nurses and intellectual disability care workers globally (McMahon *et al.* 2020, Nishimura *et al*. 2021, Ornell *et al.* 2020).

Burnout is as a key risk factor for attrition in the health and social care workforce (Boamah and Laschinger 2015, Sadovich 2005). Attrition and nursing staff shortages are increasingly common problems globally (Nantsupawat *et al.* 2016). It is estimated that the attrition rate for nurses is between 25% and 30%, and that stress and burnout are significant factors in their intention to resign from their positions (Geuens *et al.* 2021, Li *et al.* 2021, MacKusick and Minick 2010, Oyeleye *et al*. 2013). The risk of burnout and its impact on attrition is not limited to healthcare settings, but also social care. This includes those who work with persons with an intellectual disability (Thompson and Rose 2011, Nistor and Chilin 2013, Stevens *et al.* 2021).

1.3.3.2 Theoretical models of work-related stress

A number of theoretical models of work-related stress have been proposed and tested empirically. Broadly speaking, these models stress can be categorised as transactional or interactional in nature (Althaus, Kop and Grosjean 2013). Transactional models of stress adopt the view that stress is the product of a cognitive process of appraisal which links the individual to their working

environment. Typically, these models describe perceived discrepancies between the individual and their workplace that may result in the development of a state of psychological stress. In contrast, interactional models of work-related stress focus on characteristics of the working environment (such as demands or role conflict) that may be stress-inducing.

Transactional models of work-related stress

Of the transactional models, it is the Lazarus and Folkman (1984) Model of Stress and Coping that is most influential as it relates to informing research on work-related stress and indeed stress in general. The model proposes that a stressful psychological state will emerge should an individual perceive that the demands placed on them outweigh their perceived ability to cope. Thus, any aspect of the work environment can be stress-inducing if it is perceived as such by the appraising individual.

Another significant transactional model is Hobfoll's (1989) Conservation of Resources (COR) theory, which posits that a stressful response occurs when an individual perceives an actual or threatened loss of resources, or a lack of gain following the investment of resources. Similarly, Siegrest's (1996) model of Effort-Reward Imbalance posits that a perceived imbalance in social reciprocity can result in worker stress. That is, a perceived failure on behalf of the employer to reward the efforts of worker appropriately can produce a stress response.

There is much empirical support for the principles of each of these models. Each provides a unique perspective on occupational stress and has proven utility in predicting physical health and psychosomatic complaints among workers (e.g. Hobfoll and Freedy 2018, Siegrist and Li 2016, van Vegchel *et al.* 2002), though the complexity of Lazarus and Folkman model has made it more challenging to test empirically (Mark and Smith 2008).

In terms of informing the design of work-stress interventions, however, it is the Lazarus and Folkman model which appears to be more widely used. This includes a range of stress management programmes delivered in-person and online (e.g. Ansley *et al.* 2021, Imamura *et al.* 2021, Heber *et al.* 2016), with promising evidence for their efficacy to date. The popularity of the model in

this regard is most likely due to the fact that it aligns closely with the form and focus of most existing work stress management programmes (Kröll, Doebler and Nüesch 2017). These typically seek to help workers re-appraise their working environments and improve their coping skills when faced with acute stressful events. Typically, this is through the use of cognitive-behavioural, relaxation, problem-solving, mindfulness and similar therapeutic approaches (Bhui *et al.* 2012, Richardson and Rothstein, 2008). In contrast, other transactional models such as Conservation of Resources or Effort-Reward Imbalance lack investigation in terms of work-stress intervention design and delivery (Hobfoll *et al.* 2017; Limm *et al.* 2011, Siegrist and Li 2016).

Interactional models of work-related stress

Foremost of the interactional models in terms of shaping work-related stress research and intervention design is Karasek's (1979) Job Demand Control Model (JDC). This model proposes that stress is the product of an interaction between the demands placed on the individual and the level of control (i.e. decision authority and skill discretion) they have in the meeting those demands. This was later expanded to become the Job Demand Control Support (JDCS) model (Johnson and Hall 1988). Support at work, in terms of social and emotional trust or practical assistance provided by co-workers and supervisors, can facilitate active coping and moderate the negative impact of a straining environment. However, individuals who experience high demands paired with low control and poor support are at increased risk of work-related psychological distress.

Empirical research informed by the JDC(S) model has made a major contribution to explaining the role of work conditions in the development of stress outcomes in a range of occupational cohorts (see van der Doef and Maes 1999, and Hassaur *et al.* 2010 for meta-analytic reviews of this research). The model has been drawn upon successfully to inform the design of several organisational stress management interventions, particularly those based on job crafting and re-design (Holman, Johnson and O'Connor 2018).

This distinguishes the JDC(S) from other prominent interactional models, such as Person-Environment Fit (Caplan 1987) or the NIOSH model (Hurrell and

McLaney 1988). Indeed, while other models such as these have been employed to examine the contribution of workplace characteristics to stress, findings to date are generally unsupportive of the utility of either model in this regard (e.g. van Vianen 2018).

Newer interactional models have emerged that try to build upon existing interactional frameworks. Foremost of these is the Job Demands-Resources (JD-R) Model (Demerouti *et al.* 2001), which is similar to the JDC(S) model in its focuses on the role of job resources as a buffer against demands in the workplace (Llorens *et al.* 2006, Bakker, Demerouti and Euwema 2005). However, the JD-R is not a model of work-related stress per se. Rather, its focus is on explaining outcomes related to worker engagement and burnout. As such, it is the Job Demand-Control-Support model which is the most empirically robust interactional model available in terms of explaining work-related stress.

1.3.3.3 The use of work-stress theory in this research

Two theoretical models of stress were utilised to inform this research. Namely these were the Lazarus and Folkman (1984) Transactional Model of Stress and Coping and the Job Demand-Control Support Model (Johnson and Hall 1988). Both models were employed to frame efforts to understand the experience and management of work-related stress among participants in this research and to inform an investigation of age-related differences in the contribution of workplace characteristics to the experience of stress among health and social care workers.

These particular models were chosen as they are the foremost transactional and interactional models of stress employed in the work-stress literature. They are supported by robust empirical evidence and have been employed successfully to inform the development of work-stress management interventions (Holman, Johnson and O'Connor 2018). Indeed, the Lazarus and Folkman model was employed to inform the content of the ROSE and DELAROSE programmes.

The value of using both a transactional and interactional model lies in their relative strengths with regard to explaining the development of stress and designing stress management interventions (Hobfoll *et al.* 2018). For example,

transactional models are particularly suited to informing the design of interventions that focus on the individual (Mark and Smith 2008). By conceptualising stress as an individual cognitive phenomenon rooted in subjective processes of appraisal and coping, they account for the fact individuals can vary in their stress response when exposed to similar situations, or even to the same situation but at a different time (Folkman 2011).

The use of cognitive-behavioural, relaxation and mindfulness-based techniques are consistent with the Lazarus and Folkman model. Indeed, these are widely employed in the work-stress management literature (Bhui *et al.* 2012). Several online stress management programmes have also drawn upon this transactional perspective to inform the focus and form of their intervention (Ebert *et al.* 2015, Heber *et al.* 2016).

Nonetheless, the use of a transactional model alone could risk conceptualising the experience of work-related stress as entirely subjective and imply that responsibility for the management of stress rests entirely on the individual. This is significant as the experience of work-related stress is known to arise from both personal factors and environmental workplace characteristics (Härenstam 2008).

Most empirical research of work-related stress focuses on environmental stressors, drawing upon interactional models such as the JDC(S) model in an attempt to identify workplace characteristics that lead to stress outcomes. Using both a transactional and interactional model acknowledges the complexity of the experience of work-related stress, accounting for the role of subjective perceptions, coping, and organisational characteristics (Althaus, Kop and Grosjean 2013).

1.4 Chapter overviews

Chapter Two – Work-related stress, age, and nurses and intellectual disability care workers

Chapter Two presents an analysis of what is currently known about the relationship between age and the experience of stress and well-being among nurses and intellectual disability care workers. This was informed by two separate scoping reviews of the

literature relating to these occupational cohorts. The conduct and findings of these reviews (both updated to 2023) are presented. This is followed by a discussion of the findings as they relate to the issue of age and supporting nurses and intellectual disability care workers in the management of their work-related stress through online programmes.

Chapter Three - DELAROSE and the management of work-related stress through online programmes

Chapter Three presents a review of evaluative studies of online work-stress management interventions and a reflection on the DELAROSE programme in the context of what is known about similar interventions. This was achieved by updating an existing systematic review and meta-analysis of the literature as it related to online work-stress management in interventions (Phillips, Gordeev and Schreyögg 2019) to January 2023. Separately, a scoping review of the qualitative literature pertaining to workers' experiences of online stress management interventions was also conducted. Interventions similar to DELAROSE that were included in each of these reviews are identified and analysed.

Chapter Four - Research methodology and design

Chapter Four presents the methodology and design approaches employed in this research. Mixed method approaches comprising two separate studies were conducted. These utilised quantitative cross-sectional survey design (Study One) and qualitative individual interviews (Study Two). The findings of both studies were combined and analysed to identify their broader implications as they relate to age and the needs and preferences of health and social care workers for online work-stress management interventions.

Chapter Five – Findings Study One

Chapter Five details the findings of Study One of this research, which comprised a survey of nurses and intellectual disability care workers in the South-East of Ireland. The purpose of this survey was to gather and analyse data relating to the relationship between age and contribution of workplace psychosocial characteristics to the manifestations of work-related stress among these samples. Findings are discussed with

reference to their implications for the development of online work-stress management interventions to support health and social care workers.

Chapter Six – Findings Study Two

Chapter Six presents the findings of Study Two, which comprised an investigation of the experience of undertaking the DELAROSE online learning programme. Individual interviews were conducted with a sample of learners who had registered to complete the programme, and a thematic analysis of the data was conducted and presented. This includes a further examination of the findings with reference to age-related differences in participants' experiences. The usefulness of the programme in terms of participants' stress management, in addition to aspects of the programme that should change or remain the same are also considered.

Chapter Seven – Combined findings of Study One and Two

Chapter Seven comprises an analysis of the combined findings of Study One and Two of this research as they relate to issues of age, health and social care work and the management of work-related stress through online interventions. Drawing upon this analysis and referenced to the existing literature, recommendations as to the development and implementation of online work-stress management interventions to meet the requirements of health and social care workers are articulated. The further development of the DELAROSE online stress management programme is also considered as part of this.

Chapter Eight – Discussion and conclusion

Chapter Eight outlines a final discussion of the findings and processes of this research. The chapter commences with an overview of the findings of this research, highlighting new knowledge, findings that are confirmatory in nature, and what remains to be explored. The strengths and limitations of this research study are considered, followed by areas for potential research arising from the findings. The chapter concludes with a personal reflection on the research process and final conclusions.

1.5 List of publications arising from this research

This section details the published peer reviewed papers arising from this research to date[2]. Copies of these papers are included in Appendix J of this thesis. Conference papers and workshops that were delivered nationally are also noted.

Ryan, C., Bergin, M., & Wells, J. S. (2023). Workers' experiences of online work-stress management interventions: A review of the qualitative literature. *International Journal of Stress Management (under review).*

Ryan, C., Jones, A., Bergin, M., & Wells, J.S. Occupational e-mental health interventions: An updated systematic review and meta-analysis *(manuscript in preparation).*

Ryan, C., Bergin, M., & Wells, J. S. (2021). Work-related stress and well-being of direct care workers in intellectual disability services: A scoping review of the literature. *International Journal of Developmental Disabilities, 67*(1), 1-22.

Ryan, C., Bergin, M., White, M., & Wells, J.S.G. (2018). Ageing in the nursing workforce: A global challenge experienced within an Irish context. *International Nursing Review,* 00 1-8.

Ryan, C., Bergin, M., & Wells, J. S. (2018). Theoretical perspectives of adherence to web-based interventions: A scoping review. *International Journal of Behavioral Medicine*, 1-13.

Ryan, C., Bergin, M., & Wells, J. S. (2017). Valuable yet vulnerable—a review of the challenges encountered by older nurses in the workplace. *International Journal of Nursing Studies, 72*, 42-52.

Ryan, C., Bergin, M., Chalder, T., & Wells, J. S. (2017). Web-based interventions for the management of stress in the workplace: focus, form, and efficacy. *Journal of Occupational Health*, *59* (3), 215-236.

Conference Presentations:

[2] With each of the publications arising from this research I served as the lead author. I formulated the research question, conducted the literature searches, analysed the data and prepared the manuscript. My co-authors assisted with the study selection process (where indicated), provided comments on earlier drafts of each paper and guided me in preparing the manuscripts for publication.

Ryan, C. (2017). *'Web-Based Interventions for the Prevention and Management of Stress in the Workplace: Format, Focus and Efficacy'* Waterford Institute of Technology Research Day.

Ryan, C., Bergin, M. & Wells, J.S.G. (2017) *'A Review of the Challenges Facing Older Nurses in the Workplace'* 36th Annual International Nursing & Midwifery Conference (2017) Royal College of Surgeons, Ireland (RCSI).

Ryan, C. (2017*) 'The SuRE Project: Sustaining Resilience in Employment'* Psychology, Health and Medicine Conference (2017) Royal College of Surgeons, Ireland (RCSI).

Ryan, C., Bergin, M. & Wells, J.S.G. (2017) *'Web-Based Interventions for Work-Related Stress and Strain: A Scoping Review'*. 17th Healthcare Interdisciplinary Research Conference, Trinity College Dublin.

1.6 Conclusion

This opening chapter described the personal and professional factors that led me to pursue this doctoral work. The background issues that informed the focus of this research were discussed, leading in an outline of the research question, aim, and objectives. The population and concept of interest, in addition to the use of theory in this research were also detailed, followed by an overview of each of the chapters that comprise this thesis and the details of publications arising from this research.

Chapter Two

WORK-RELATED STRESS, AGE, AND NURSES AND INTELLECTUAL DISABILITY CARE WORKERS

2.0 Introduction

Chapter Two presents an analysis of what is currently known about the relationship between age and experience of work-related stress among nurses and intellectual disability care workers. This was informed by two separate scoping reviews of the literature relating to these occupational cohorts. The background to this work is discussed in Section 2.1, while the scoping review process is introduced in Section 2.2. The conduct and findings of the two reviews are then presented (Sections 2.3 and 2.4). These were initially conducted in 2016 and 2018 respectively, before being updated in January 2023. The chapter concludes with a discussion of the significant findings of both of these reviews as they relate to issues of age and supporting nurses and intellectual disability care workers in the management of their work-related stress through online interventions (Section 2.5).

2.1. Background

It is possible that nurses and intellectual disability care workers encounter different workplace challenges or become more vulnerable to certain types of stressors as they age (Buchan and Catton 2020, Denton, Evans and Xu 2020). This is important as existing online stress management interventions such as DELAROSE may not address the age-related workplace challenges and stressors experienced by such workers. This could limit their utility to support this sectoral group in the management of their work-related stress. For this reason, the literature as it related to the experience of stress among ageing nurses and intellectual disability care workers was searched and analysed.

Two separate scoping reviews of the literature were conducted. The first review focused on the challenges encountered by ageing nurses in the workplace. The conduct and findings of this review, which was first conducted in 2016 and then updated in 2023, is presented in Section 2.3.

It was intended that the second review in this chapter would adopt a similar approach by reviewing the experiences of ageing intellectual disability care workers. However, initial searches of the literature revealed that research of this nature has not yet been published. This is most likely because of a lack of workforce data globally as it relates to those engaged in this sector, meaning that a trend or otherwise towards an ageing intellectual disability care workforce has not been identified. As a result, the issue of age has not formed a topic of investigation as it relates to the work-related stress and well-being of this occupational group. For this reason, a review of the literature relating to the experience of work-related stress among intellectual disability care workers generally was conducted. The conduct and findings of this review, which was first undertaken in 2018 and then updated in 2023, is presented in Section 2.4.

2.2 Scoping reviews

Scoping reviews are utilised for a range of purposes. Most commonly it is to explore the breadth of research in a field, followed by determining the value of undertaking a full systematic review, summarising and disseminating research findings, and identifying gaps in the literature (Pham *et al.* 2014). For this research, scoping reviews were undertaken as in each case the objective centred on mapping and analysing the literature in a structured and systematic manner (Chapter One, Section 1.2). I also sought appraise the robustness of the available evidence through validated quality analysis tools and identify gaps in the literature that may have implications for this research. Scoping reviews are particularly suited to meeting these requirements (Aromataris and Pearson 2014, Daudt, van Mossel and Scott 2013).

Furthermore, with both reviews the extent and nature of the published research was unclear. Scoping reviews are useful when it is uncertain what questions can be posed and addressed by a review of literature (Levac *et al.* 2010). The conduct of both reviews in this chapter followed a five-stage process articulated by Arksey and O'Malley (2005), later revised by Levac *et al.* (2010) and Colquhoun *et al*. (2014), as follows:

Stage 1 Identifying the Research Question

Scoping reviews typically seek to answer a broad research question through a specified scope of inquiry. The process of identifying the research question tends to be iterative and develop throughout the review process. Review questions are often redefined and

literature search strategies amended as the author becomes more familiar with the literature.

This was the case here as it related to investigating issues of age and the experience of work-related stress among intellectual disability care workers. Initially, it was intended to focus solely on the experience of ageing workers in this sector. However, it was soon determined that specific research of this nature had not yet been conducted. The review question was then revised to an investigation of the experience of work-related stress among those who provide professional care and support to persons with an intellectual disability.

Stage 2 Identifying Relevant Studies

Scoping reviews, in contrast to systematic reviews which tend to be more stringent in study selection and narrower in their focus, often attempt to identify all of the literature in a particular area. Though a large volume of research may be eligible for inclusion at a preliminary stage, this is common with scoping reviews and ensures that the research question is addressed as accurately as possible. Systematic search strategies were employed with both reviews in this chapter and are presented in Sections 2.3 and 2.4. These demonstrate that the processes followed were transparent, that the results are reliable, and that the conclusions drawn are robust and credible.

Stage 3 Study Selection

The use of systematic search strategies, combined with a broad research question and little restriction of study methodology or design, meant that with each review a large number of studies were screened for potential inclusion. The process of study selection was aided by the use of pre-defined inclusion and exclusion criteria. These criteria are detailed in Sections 2.3. and 2.4 respectively. In line with the iterative nature of developing the research question, in some cases these criteria changed as I became more familiar with the literature. As a result, the number and nature of the studies eligible for inclusion also changed.

Stage 4 Charting the Data

With each review, I employed a descriptive-analytical approach (informed by Levac *et al.* 2010) to charting the literature. This comprised extracting key information from each study, such as participants, design and findings, and then developing a practical

(sometimes numerical) overview of the included research. The nature and extent of the information extracted from each study varied between the two reviews.

Stage 5 Collating, Summarising, Analysing and Reporting the Results

This was the final and most extensive stage of each scoping review. With both reviews presented in this chapter, I conducted a thematic analysis of the findings of the included studies. This took the form of a narrative review of the literature. Themes were generated by identifying and analysing patterns across the findings of the included research. Generating this thematic analysis was a challenging process as in some cases a balance between breadth and depth had to be struck. In other cases, the literature was complex and inconsistent in its findings.

Though Arksey and O'Malley (2005) posited that scoping reviews should not seek to assess the methodological quality of the included research, Levac and colleagues (2010) argued that quality assessment can make a valuable contribution to the findings of a scoping review without undermining its remit. With both of the reviews in this chapter, the reporting of the thematic analysis was informed by quality assessments of the included literature. Findings from studies that were deemed to be most methodologically robust were prioritised.

To facilitate this, a structured quality assessment of each study, informed by the Mixed Methods Appraisal Tool (MMAT; Pluye *et al.* 2011), was conducted as part of both reviews. The MMAT outlines four criteria for assessing the quality of quantitative and qualitative research studies, with scores ranging from 25% for one criterion met to 100% for all criteria met. Mixed methods studies were assessed using both the qualitative and quantitative components of the tool.

2.3 Work-related stress among ageing nurses

A scoping review of the published literature was undertaken using a framework described by Arksey and O'Malley (2005). A systematic search of the electronic databases Medline, CINAHL, PsycINFO, Science Direct and Google Scholar, from January 2000 to June 2016 (later updated to January 2023) was undertaken. Keywords including "older nurse" or "ageing nurse" were searched (see Box Two for details of search terms employed).

The following inclusion criteria were applied:

1) Studies which described challenges reported by older or ageing nurses in their practice;

2) Published in English between the years 2000 and 2016 (later extended to 2016 to 2023);

3) Studies that included older or ageing nurses providing direct patient care, and

4) Studies which utilised qualitative, quantitative or mixed methods study designs.

Papers were excluded if they focused solely on the retention of nurses, retirement issues, return to practice strategies, or included nurse managers or human resource managers only. Discussion and review papers, papers published in a language other than English, or papers published before the year 2000 were also excluded. In relation to the term 'challenges', this was taken to mean the work-related stressors experienced by nurses as they age, in addition to any difficulties or issues they encountered in managing such stressors.

Box 2: Search terms used for reviews of the literature relating to ageing nurses

Search Terms
The following terms were used to search the Medline, CINAHL, PsycINFO and Science Direct databases (title/abstract):
(Older OR Old OR Age OR Ageing OR Aging) (Nurse OR Nurses OR Nursing) (Challenge OR Stress OR Well-being OR Health OR Strain)
Separately, Google Scholar was used the following terms (title only):
(Older OR Old OR Age OR Ageing OR Aging) (Nurse OR Nurses OR Nursing)

In Chapter One (Section 1.3.2) the concept of interest for this research was defined as chronological age, with 45 years and older employed to define the ageing health and social care worker. However, chronological age limits were not applied as part of inclusion or exclusion criteria here. This was because I was interested in examining how issues of age and ageing were defined and addressed in this literature and what this

might imply for the purposes of online stress management (this is explored in the discussion section of this chapter).

In addition, I was aware of a lack of consensus among researchers and policy-makers as it relates to the ageing worker more generally. An obvious chronological age cut-off for when a nurse becomes 'older' or 'ageing' was not apparent from existing national and international workforce data. For this reason, I did not employ chronological age markers as part of the inclusion criteria, and instead searched the literature using variations of the terms 'older' and 'ageing'.

2.3.1 Results

The initial literature search returned a total of 5,997 papers from all databases. From these, the abstracts of 292 papers were further screened for relevance to the review and 115 full-texts were read and checked against the inclusion criteria. The reference lists of these studies were also searched for additional relevant papers. A total of 20 papers were deemed suitable for inclusion following this process.

An update of this literature search was conducted in January 2023. This search utilised the same databases and terms as the initial literature search, though with the dates of June 2016 to June 2023 applied. This updated search returned a total of 5,068 papers, from which, following the removal of duplicates and title and abstract screening, seven further papers of relevance were identified. The reference list of one scoping review that was found as part of this process was also searched, though no additional papers were identified. In both instances, I independently searched, screened and selected the studies to include in the review according to the inclusion and exclusion criteria. If there was any uncertainty concerning the inclusion of a study, this was discussed with my supervisors and a decision was agreed.

Data relating to the study authors, country, sample characteristics and key findings were extracted from each of the 27 included papers and charted (see Appendix B). Most studies were qualitative (n = 17), though five quantitative studies were also identified, including one study which combined a physical exam with survey methods. Five mixed-methods studies were also included.

The Mixed Method Appraisal Tool (MMAT) version 2011 (Pluye *et al.* 2011) was used to assess the quality of the included studies. The tool outlines four criteria for assessing the quality of quantitative, qualitative and mixed methods studies, with scores ranging from 25% for one criterion met to 100% for all criteria met. Of the 27 studies reviewed here, seven fulfilled all four criteria; sixteen fulfilled three criteria and four fulfilled two criteria (these scores are noted in the tables in Appendix B).

With reference to these assessments, much of the qualitative investigation was deemed to be of good or very good methodological quality (i.e. 14 of the 17 qualitative studies fulfilled three or four criteria). The use of specific designs and the selection of participants were generally clear and relevant to the research question at hand. Many also gave appropriate consideration to the context in which the data was collected, though few researchers acknowledged how their findings related to their own personal influences or their interactions with participants. All five mixed-methods studies were deemed to be of good methodological quality, each fulfilling three of four criteria. Equally, four of the five quantitative studies were deemed to be good or very good in quality (one study fulfilling three criteria and one study fulfilling four).

A thematic analysis of the findings of the 20 studies included in the original review resulted in the generation of three primary themes. Namely these were *Nursing and the Ageing Body*, *Recognition and Support of the Older Nurse*, and *Mid-life Demands.* Analysis of the seven studies identified through the updated search strategy indicated that their findings were consistent with these themes. As such, they were incorporated into the thematic analysis which is now presented.

Figure 1. Flow chart of studies identified in original review (June 2016)

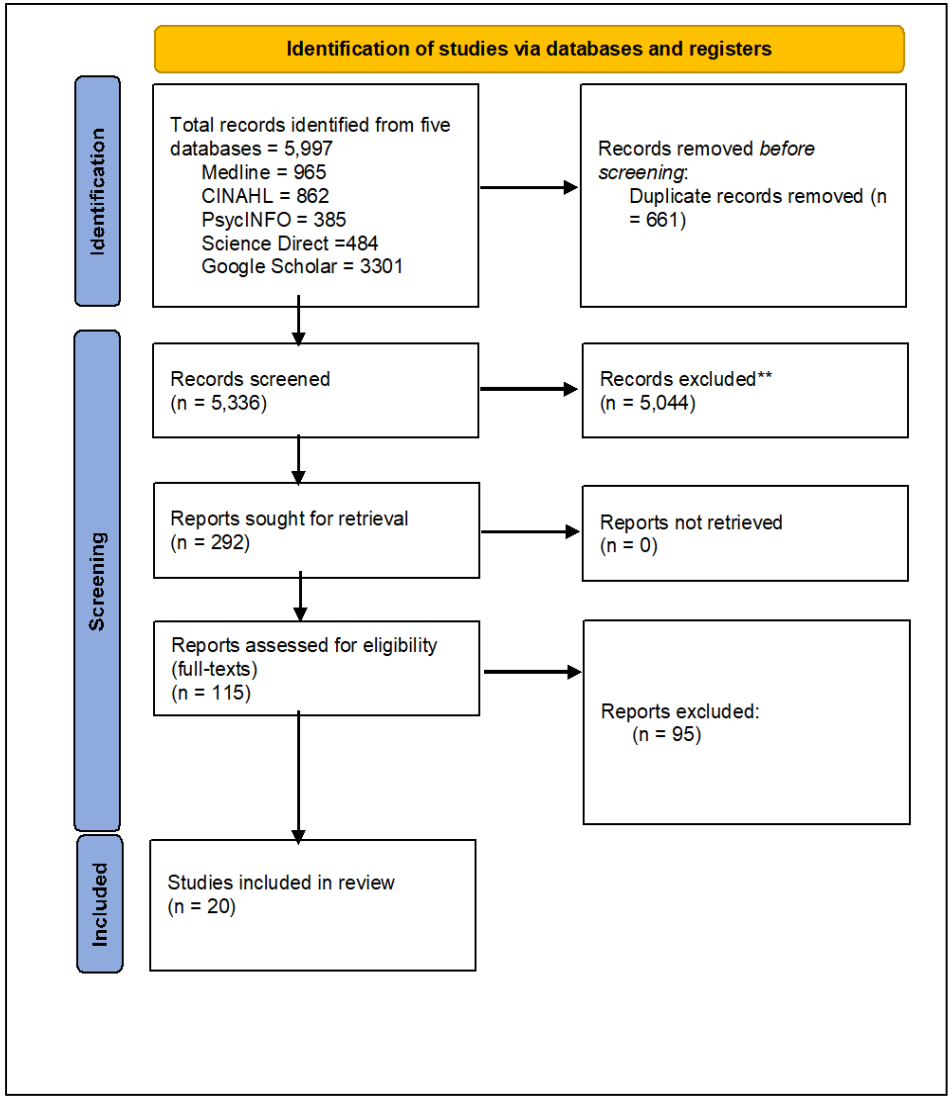
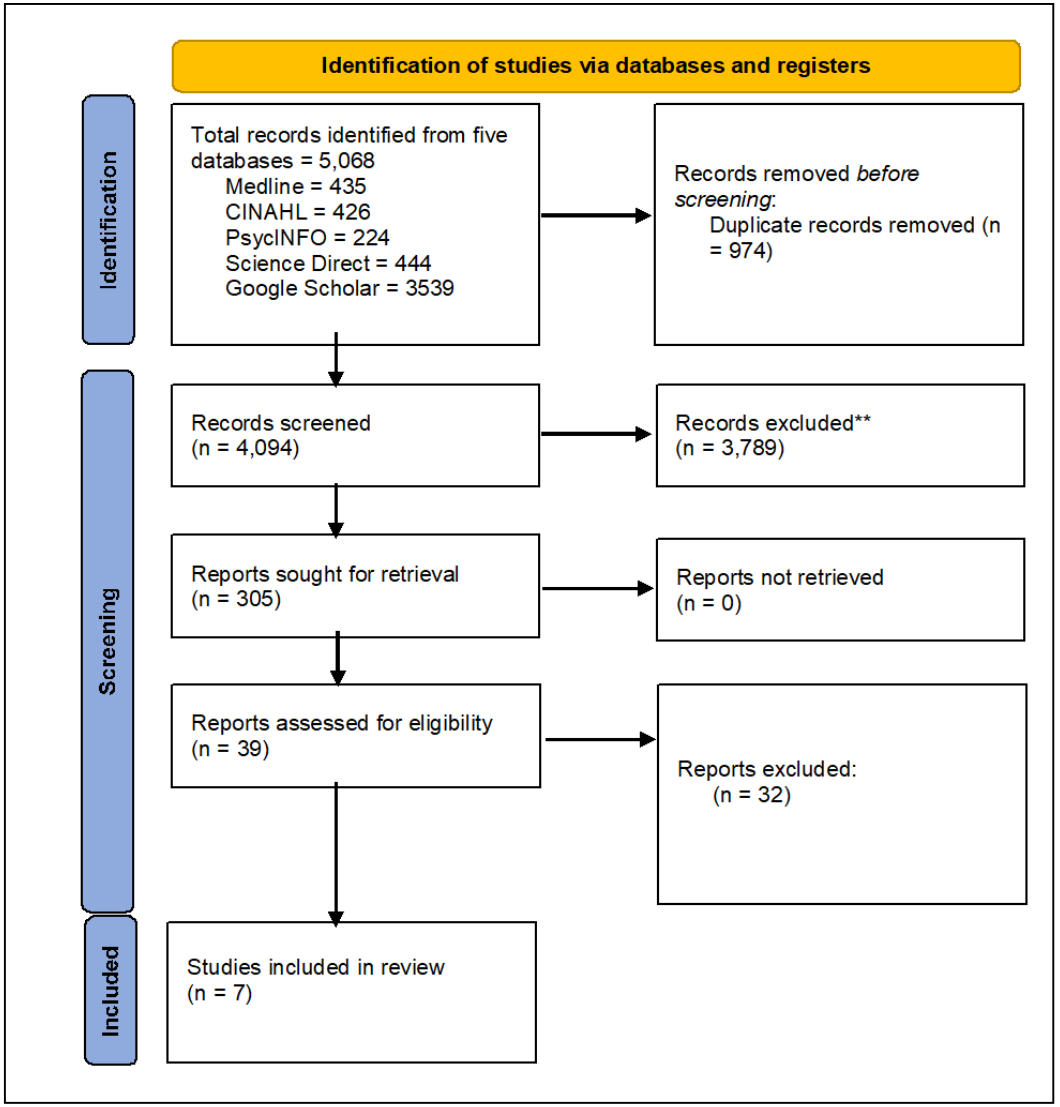


Figure 2. Flow chart of studies identified in updated review (Jan 2023)



2.3.1.1 Nursing and the Ageing Body

Physical Demands of Nursing

Coping with age-related physical declines and fatigue appear to be one of the key challenges ageing nurses faced in their practice (Clendon and Walker 2016). This assertion is evidenced by the findings of a number of rigorous qualitative investigations. For example, interviews conducted with 80 Australian nurses and allied health professionals aged over 50 revealed how they experienced declines in their vision and hearing, reduced strength and flexibility, persistent mental fatigue and sleep issues as they aged (Fragar and Depczynski 2011). These declines affected their ability to cope with the physical demands of providing patient care such as administering medications, patient handling and spending long periods of time standing, walking or sitting.

Difficulties arising from reduced stamina and tiredness in the workplace were identified as a significant issue in another good quality qualitative study of Australian nurses aged between 40 and 60 years (Gabrielle, Jackson and Mannix 2008), who likened the physical ageing process to a series of losses, with each loss signalling a decline in physical ability. Another qualitative study with 10 New Zealand nurses aged over 60 (Squire 2008) found that they struggled with sensory declines and an increased need for recovery from work as they aged.

These natural declines in stamina and strength can make coping with the physical demands of nursing more challenging (Ang *et al.* 2017, Fackler *et al.* 2019, Phillips and Miltner 2015). For example, Spiva, Hart and McVay (2011) identified a sense of stress and frustration arising from the fast pace of work, physical care demands and a lack of energy as a theme of their interviews with 18 nurses aged between 55 and 67 in the United States. Shift work can also present challenges relating to long periods at work, working several days consecutively and the requirement of being 'on-call' (Dall'Ora *et al.* 2015). The findings of number of well-conducted qualitative investigations indicate that shift work becomes more difficult for nurses to cope with as they age (Letvak, 2003a, Mion *et al.* 2006, Spiva *et al.* 2011), that it negatively affects their sleep, need for recovery, mental performance (Durosaiye, Hadjri and Liyanage 2016), and encourages mistakes in their practice (Clendon and Walker 2015).

Cognitive Declines

In addition to physical declines, qualitative research with ageing nurses has identified challenges in relation to changes in their cognitive functioning, manifested primarily through declines in memory and recall, attention and reaction time. Focus group research with 84 National Health Service nurses aged over 50 in the United Kingdom (Andrews, Manthorpe and Watson 2005) identified mental 'slowing up' as a significant source of stress for this group which affected their employment-related decision-making. Although cognitive declines may be more easily accommodated than physical declines or injuries, nurses have reported that several aspects of their duties such as keeping pace with paper-work and e-mails, administering medications, interpreting patient results and analysing statistical information, have been affected as they aged (Fragar and Depczynski 2011).

Indeed, mixed-methods research by Ang *et al*. (2017) with nurses aged over 50 found that while the participants in their study faced significant challenges with technological advancement, working with computers and reading labels. The changing nature of nursing as it relates to skill development, upgrading expertise, coping with technological advances and changes at procedural (e.g. assuming new duties) or organisational levels (e.g. system restructuring) are also significant in this regard (Ward-Smith *et al.* 2007, Spiva *et al.* 2011).

Nursing Through Pain and Injury

Perhaps the strongest evidence as it relates to the challenges encountered by ageing nurses concerns the prevalence and impact of nursing through pain and injury. These can significantly impair the ability of nurses to fulfil their caring duties as they age, and appear to comprise a prominent occupational stressor for this cohort (Sousa-Ribeiro Lindfors and Knudsen 2022). This is evidenced by the findings of several good quality cross-sectional surveys, in conjunction with the results of a number of rigorous focus group investigations (e.g. Cameron *et al.* 2008, Friedrich *et al*. 2011, Letvak 2005).

For example, a survey of 3,273 nurses aged over 50 in New Zealand (Clendon and Walker 2013a) determined that over one-third reported moderate pain or discomfort; with levels of pain and discomfort increasing with age and highest

in those aged between 61-70 years. The risk of experiencing a musculoskeletal disorder or injury at work appears to increase as nurses age (Heiden *et al.* 2013). In the United States, Letvak, Ruhm and Gupta's (2013) survey of 1,171 nurses found that older nurses had a higher prevalence of health problems, in addition to a greater average body mass index, and higher average productivity losses and pain levels than their younger colleagues.

The debilitating effects of working through pain and ill-health were identified through a focus group study with nurses aged over 50 with a history of musculoskeletal pain and/or depression (Letvak 2009). Participants in that study alluded to struggling with pain and physical exhaustion on a daily basis and that their practice had slowed in response to these struggles. They also expressed concerns about the safety implications for patient care as a result of reduced reaction time and struggling with sustaining concentration when tired.

2.3.1.2 Recognition and support of the ageing nurse

The positive attributes of being an ageing nurse were referred to in several studies. These include a sense of empowerment through maturity and an increased confidence in abilities and knowledge (Gabrielle *et al.* 2008, Spiva *et al.* 2011). Nursing offers meaningful quality work which brings autonomy, enjoyment, a sense of contribution, intellectual stimulation and diversity to nurses as they age (Squire 2008). Combined with a structured and supportive working environment, nurses have asserted that their expertise can compensate for age-related declines (Letvak 2009). Indeed, Letvak's (2003b) focus group research with female staff nurses aged 55 – 62 years found that these nurses perceived that they had developed skill sets that younger nurses may not have and that patients appreciated receiving care from them as they were perceived to be competent and experienced.

However, there is also evidence from several well-conducted qualitative studies that ageing nurses can perceive a lack of recognition of their value from colleagues, and that their positive attributes are frequently ignored or underplayed (e.g. Andrews *et al*. 2005, Mion *et al.* 2006). Generational differences can emerge within the nursing workplace (Kupperschmidt 2006), and interpersonal friction arising from differences in attitude and work ethic

have also been described (Helass *et al.* 2022, Letvak 2003a). For example, younger nurses tend to be perceived as less committed to their work (i.e. less willing to endure challenging working conditions) and more career or financially focused than their older colleagues (Camerino *et al*. 2006; Letvak 2003b). Nurses can also be subject to positive or negative age-based stereotyping and bullying (Longo, 2013). Some ageing nurses have reported that they can be perceived as less capable because they have not progressed beyond staff nurse level (Durosaiye *et al*. 2016).

Positive interpersonal communication and supportive relationships in the workplace appear to be valued highly by nurses as they age (Sousa-Ribeiro Lindfors and Knudsen 2022, Fitzgerald 2007). Indeed, Letvak (2003b) found that the staff nurses aged 55 - 62 who participated in her focus group research had mostly positive relationships with their managers and were satisfied with the level of support they received. Nevertheless, they have reported difficulties with regard to the levels of administrative and organisational support offered to them (Gabrielle *et al.* 2008 Letvak 2009, Mion *et al.* 2006). Ageing nurses also appear to place a strong value on feedback though may be more sensitive to criticism of their practice (Fragar and Depczynski 2011).

The failure of colleagues to recognise and account for the fact that nurses can experience specific challenges in the conduct of their duties as they age (e.g. coping with pain and tiredness) can be a source of frustration and discontent (Rigby and O'Connor 2012). Clendon and Walker's (2015) qualitative exploration of the perceptions of flexible working with nurses and nurse practitioners aged over 50 identified a sense of frustration arising from participants' interactions with their organisation. The nurses in this study related how they had been committed and loyal to both their colleagues and workplace throughout their career, and were required to be flexible in their own work practices. However, they did not receive similar flexibility or accommodation of their needs from their organisation in return. Similarly, survey research by Topa, Guglielmi and Depolo (2016) with 255 nurses aged over 45 in Spanish hospitals found that perceptions of organisational justice and effort/reward imbalance had a significant influence on health complaints and creating healthy work environments for these nurses.

2.3.1.3 Mid-life demands

Difficulties intrinsic to mid-life can place a strain on nurses as they age (Phillips and Miltner 2015). As with the previous theme, this is primarily supported by the findings of qualitative research. For example, Gabrielle et al. (2008) found through focus group research with nurses aged 40 to 60 years that such nurses can struggle to manage demands outside of the workplace and, in particular, the issue of balancing work-life commitments. The concept of the 'neglected-self' was an issue raised by nurses in this study. They reported pressure to adopt a selfless attitude and ignore their own health and recovery needs in order to keep pace with demands arising from both home life and their workplace.

Mid-life often marks the onset of several health-related challenges such as weight gain, chronic illness and insomnia (Letvak 2005), as well as the physical and cognitive declines discussed previously. Coping with the emotional acceptance of ageing can prove psychologically taxing. Fragar and Depczynski (2011) described how nurses can find it difficult to balance work and family commitments and stay engaged and positive at work as they aged. Nurses in this study also alluded to the challenge of emotionally accepting that they were ageing, particularly as they were providing care for older adults and as such were confronted with issues of ageing and mortality.

Ageing nurses have reported assuming additional carer roles outside of the workplace, for example, caring for ageing parents (eldercare) or caring for their own families (Andrews *et al.* 2005, Mion *et al.* 2006). The requirement of shift work can also be problematic in this context as it generates issues with regard to a lack of time through working irregular hours and limited flexibility with regard to starting and finishing work (Clendon and Walker 2015, Fragar and Depczynski 2011). Financial issues can also contribute to poorer mental health, as evidenced by survey research conducted by Lewko, Misiak and Sierżantowicz (2019) with 523 nurses aged over 40 years old in Poland.

Gender issues are a factor for consideration here (Squire 2008). Nursing workforces are predominantly female (Rajacich *et al.* 2013) and women aged 45 to 54 years are consistently found to have higher levels of work-related stress, anxiety and depression when compared to other cohorts (Health and

Safety Executive 2016). Female nurses can also be susceptible to hormone changes arising from the menopause (Fitzgerald 2007), which in turn can produce symptoms such as sleep disturbance and fatigue. Women also tend to assume responsibility for many additional domestic duties within the home, and ageing female nurses allude to struggling with a lack of energy for completing such tasks, particularly ones which involve physical components (Gabrielle *et al.* 2008).

2.3.2 Summary of findings as they relate to stress and ageing nurses

One of the key purposes of a scoping review is to determine the extent of the existing research (if any) as it relates to a specific topic of investigation. This scoping review of the literature identified twenty-seven published studies into the stressors and challenges experienced by ageing nurses in the workplace. This reflects the fact that an ageing nursing workforce has been an identified trend in several countries for at least two decades now, contributing to a clear interest in understanding the workplace experiences of nurses as they age (Denton, Evans and Xu 2021). That such a body of work has been conducted is important as it means that useful and credible conclusions about the experiences of such workers can be drawn.

Perhaps the most significant finding in the context of this study is the absence of evidence that age plays a role in stress perception among nurses. There is no empirical evidence to date to suggest that chronological age is reliably correlated with the perception of stress among this cohort. One exception to this is arguably the impact of age-related physical and cognitive declines on nurses. Ageing nurses do appear to be negatively affected by declines in their stamina and physical abilities, while injury and pain are sources of stress for ageing nurses. There are also some age-related external stressors, such as a lack of recognition and support in the workplace, and mid-life challenges such as child and eldercare responsibility. These are discussed in further detail in Sections 2.5.2 and 2.5.3 of this chapter.

Almost all of the extant investigation to date as it relates to ageing nurses is qualitative in nature. This is to be expected given the nature of the topic of investigation in terms of understanding and exploring the challenges

encountered by a specific cohort in the workplace. Qualitative methods are particularly suited to this purpose owing to their potential to generate rich, contextual insight into the experiences of a specific population of interest (Creswell 2005, Ritchie and Lewis 2016).

With regard to methodological quality, much of the literature was judged to be good or very good in quality based on MMAT assessments (see Appendix B). For example, the finding that nurses can struggle with physical and cognitive age-related declines, in addition to pain and injury, is supported by methodologically rigorous qualitative and quantitative research. That mid-life pressures, such as competing personal and professional demands, and a lack of recognition and support constitute sources of stress for nurses as they age is evidenced by good quality qualitative research.

The methodological quality of this literature is important as it means that there can be confidence in the credibility and trustworthiness of the findings (Nowell *et al.* 2017). Nonetheless, the dominance of qualitative methods within this literature does limit the conclusions that may be drawn from it. For example, the extent to which qualitative findings apply to a wider population of interest can be challenging to estimate (Clarke and Braun 2020). This is evidently the case with the findings as they relate to mid-life demands and recognition/support of the ageing nurse, as they are almost all drawn from qualitative (albeit good quality) investigations. As such, it is difficult to judge the prevalence and impact of these stressors among ageing nurses more generally. The implications of this and the findings of this scoping review for this research more generally are discussed in further detail in Section 2.5 of this chapter.

2.4 Work-related stress among intellectual disability care workers

As noted in the opening section of this chapter, the initial aim of this second review would examine the challenges encountered by ageing intellectual disability care workers. However, searches of the literature based on the search terms employed for the first review indicated that research of this particular nature has not yet been published. As a result, a scoping review of the literature as it relates to the experience

of work-related stress among those who provide professional care and support to persons with an intellectual disability was conducted. It is the conduct and findings of this review that is reported here.

Systematic literature searches of the Academic Search Complete, CINAHL, PsycINFO, Medline and Web of Science electronic databases, from 1st January 1990 to 1st February 2018, were conducted (this was later extended to January 2023, see Section 2.4.1). Variations of the following search terms were combined to identify papers for review: 'Burnout;' 'Well-being;' 'Stress;' 'Learning disability;' 'Intellectual disability;' 'Intellectual development disorder;' 'Mental retardation;' 'Care staff;' 'Carer;' and 'Support worker' (see Box 3 for details of exact search terms employed). The following inclusion criteria were applied:

1) Participants were working in services for people with intellectual disabilities, including residential, hospital, secure institutional, community, and day care services;
2) The majority of participants were working with persons with an intellectual disability;
3) Participants were recruited from working populations and over 18 years of age;
4) Papers were published in English.

Studies which included staff working in secure and community services for people with intellectual disabilities, and studies which examined more than one client group (e.g., intellectual disability and brain injury) were included only if the majority of participants were working with persons with intellectual disabilities. As burnout, a psychological syndrome which develops in response to prolonged exposure to stress, was found to be a commonly investigated outcome in this population, studies which examined the experience of burnout were also included. Review papers, meta-analyses, or meta-syntheses; papers not published in English and studies where participants were not recruited from working populations or not working with persons with intellectual disabilities were excluded.

Box 3: Search terms used for reviews of the literature relating to intellectual disability care workers

Search Terms
The following terms were used to search the Academic Search Complete, Medline, CINAHL, PsycINFO and Web of Science databases (title/abstract):
(challenge OR Stress OR well-being OR health OR strain OR burnout OR stress) AND (learning disability OR intellectual disability OR developmental OR retardation) AND (staff OR care OR carer OR support OR work OR worker OR occupation)

2.4.1 Results

The initial search output returned 11,388 papers. Following title and abstract screening 9,611 papers were removed due to not meeting inclusion criteria or duplication. The full texts of the remaining papers were retrieved and screened, through which 1,177 papers were excluded for not meeting critical. This left a total of 60 papers for inclusion in the review.

Seven previous reviews, each of which addressed specific aspects of this literature, were identified as part of the search process. Hastings (2002) reviewed the literature as it related to the relationship between stress and exposure to challenging behaviour; White, Edwards and Townsend-White (2006) considered recent trends in the literature, while Skirrow and Hatton (2007) reviewed the literature as it related to burnout among care workers of adults with an intellectual disability. Dislet, Hatton and Digan (2009) discussed six studies related to perceived inequality in the working relationships of intellectual disability care workers. Devereaux, Hastings and Noone (2009) reviewed the application of theories of work-related stress within intellectual disability research, while Thompson and Rose (2011) reviewed the impact of organisational climate upon burnout among those who work with persons with intellectual disability. Finally, Rose (2011) reviewed the literature with regard to staff psychological factors and their relationship to client outcomes in residential care. A search of the reference lists of each of these reviews, in

addition to the reference lists of all identified primary studies, was also conducted. In total, 22 additional papers that met inclusion criteria were identified through this process.

An update of this literature search was conducted in January 2023. This search utilised the same databases and search terms as the initial literature search, though with the dates of February 2018 to January 2023 applied. This updated search returned a total of 6,136 papers, from which, following the removal of duplicates and title and abstract screening, 17 further papers of relevance were identified (see Figures 3 and 4 for PRISMA flow chart). As with the other review in this chapter, I independently searched, screened and selected the studies to include in the review according to the inclusion and exclusion criteria. If there was any uncertainty concerning the inclusion of a study, this was discussed with my supervisors and a decision was agreed.

The final review included a total of 99 papers, describing 100 studies. Data relating to the authors, participants, methodology, design, and key findings from each study were charted (see Appendix C). The majority of studies collected quantitative data utilising cross-sectional (n = 83) or longitudinal survey designs (n = 4). A further eight studies were mixed-methods in nature (i.e. quantitative survey data combined with qualitative data obtained from interviews, observation, speech samples or open-ended questions). Finally, five studies were solely qualitative, reporting on the findings of individual interviews or focus groups.

Figure 3. Flow chart of studies identified in original review (Feb 2018)

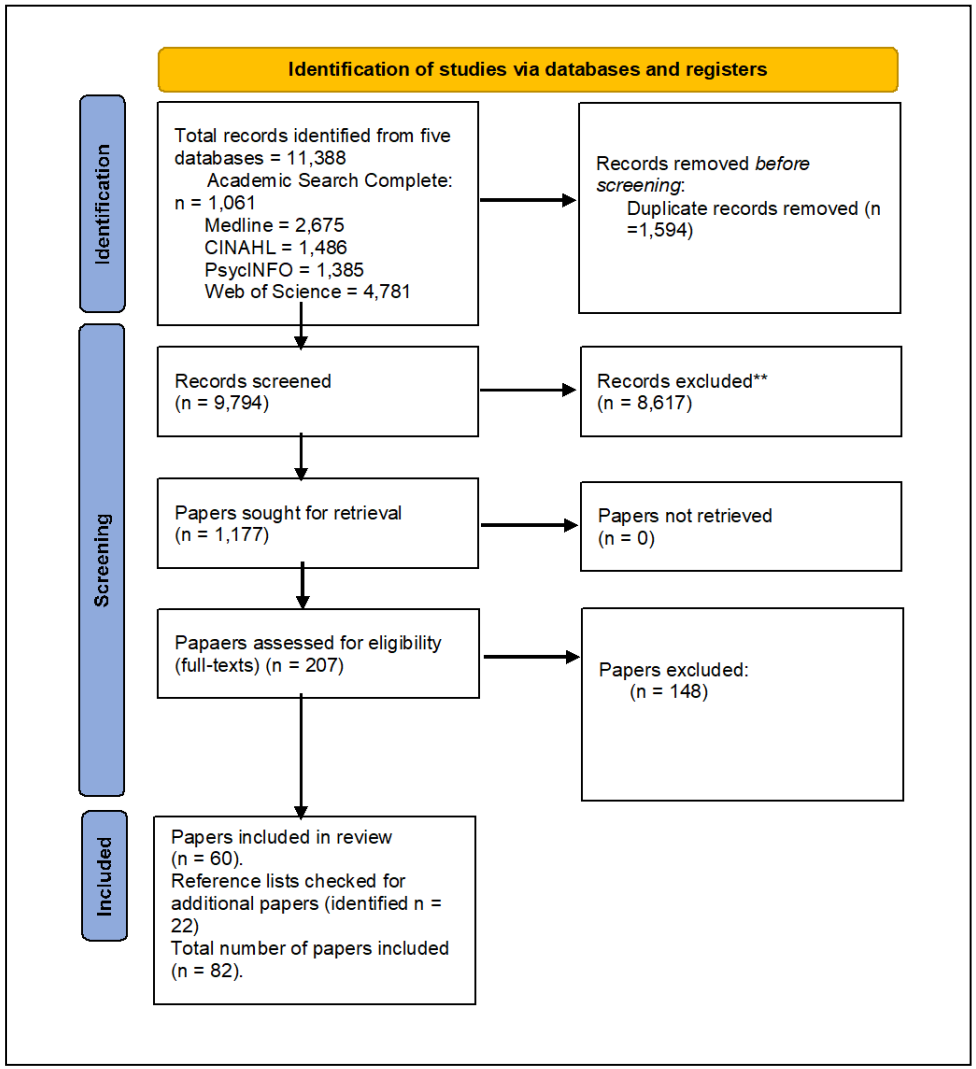
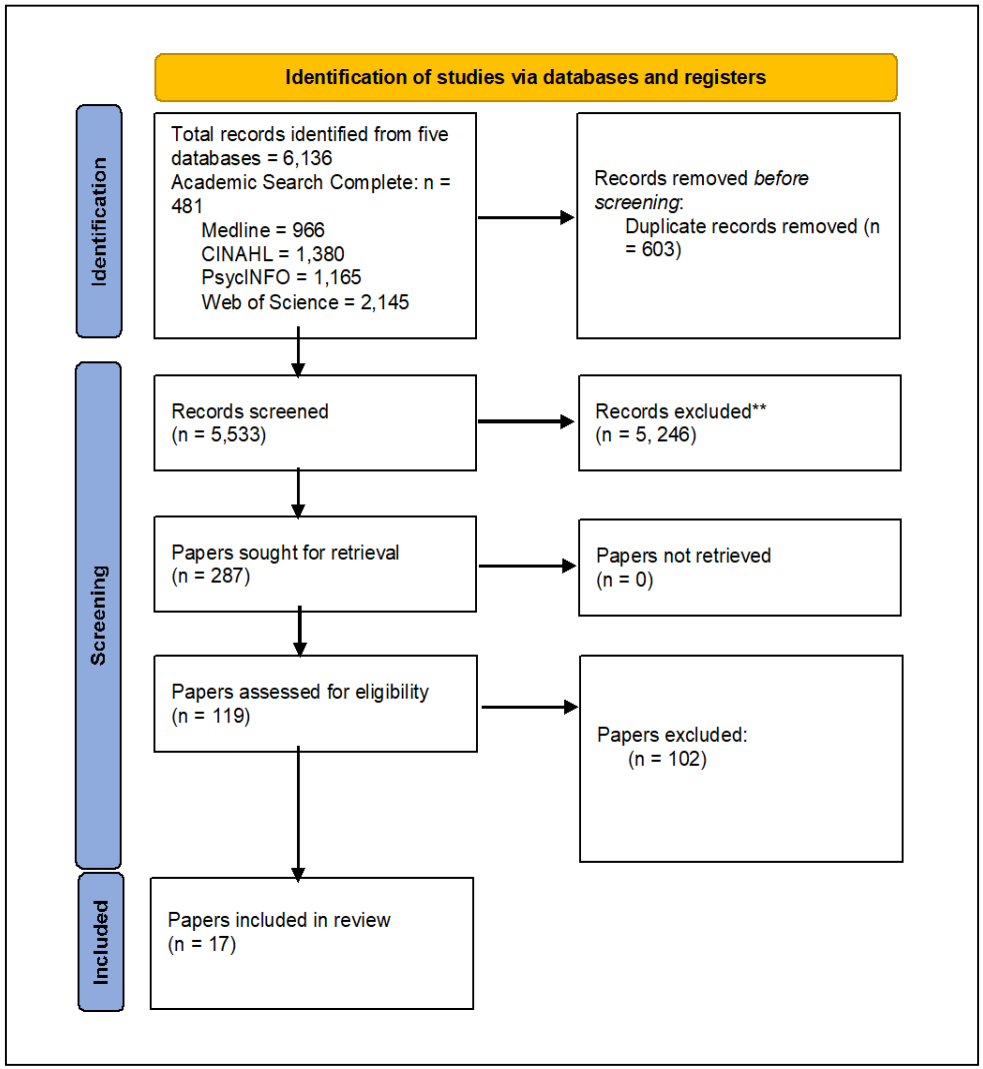


Figure 4. Flow chart of studies identified in updated review (Jan 2023)



Again, the Mixed Method Appraisal Tool (MMAT; Pluye *et al*. 2011) was used to assess the quality of the included studies. Of the 100 studies reviewed here, the majority fulfilled at least three of the quality assessment criteria, with eight fulfilling all four criteria; fifty-six fulfilling three criteria and the remaining thirty-six fulfilling two criteria (the score for each study is noted in the tables in Appendix C).

Much of this research was cross-sectional and survey-based (83/100 studies). These studies varied in methodological quality. On a positive note, many recruited large samples, and the inclusion and exclusion criteria tended to be clearly stated and justified. Though almost all relied on convenience sampling procedures, which means that their sample may have lacked representativeness, participants were recruited from a range of care settings, reflecting the fact that intellectual disability services are delivered in residential, community, domiciliary and day care settings.

Where these studies typically lacked methodological rigour was in the domain of response rates, which were often in the region of 40%. Indeed, several did not report or were unable to calculate response rates due to the nature of recruitment employed. Better quality studies reported power analyses, for example, in order to justify their sample size or inform their recruitment.

The range of survey tools employed across these studies are too numerous to discuss here individually, though they are charted for each study in Appendix C. Almost all of the tools employed in the quantitative surveys were psychometrically robust and appropriate for the research question at hand. Reflecting the prevalence and impact of burnout among intellectual disability care workers, the Maslach Burnout Inventory (Maslach, Jackson and Leiter 1997) was by far the most commonly assessed psychological outcomes in this literature (used in 47 studies). Considerable empirical evidence supports the validity and reliability of this measure of burnout. Other measures of burnout included the Copenhagen Burnout Inventory (Kristensen *et al.* 2005) and Pines' Burnout Scale (Maslach-Pines 2005), though these were used sparingly in contrast (in three studies and one study respectively). Stress and stress-related outcome measures included the Perceived Stress Scale (Cohen, Kamarck and

Mermelstein 1983), the General Health Questionnaire (Goldberg 1978), the DASS (Lovibond and Lovibond 1995), the Beck Depression Inventory (Beck, Steer and Brown 1987), and the CES-D (Radloff 1977), each of which are widely employed and supported psychometrically across the psychological literature.

The psychosocial working environments of intellectual disability care workers were assessed using tools such as the Job Content Questionnaire (Karasek et al. 1988), the Staff Stressor Questionnaire (Hatton *et al.* 1999); the Nordic Safety Climate Questionnaire (Kines *et al.* 2011) and the Occupational Stress Inventory (Osipow and Spokane 1998). Perceptions of challenging behaviour, which formed one of the primary themes of the literature review (see Section 2.4.1.1) were assessed through measures such the Challenging Behaviour Attributions Scale (Hastings 1997), Emotional Responses to Challenging Behaviour (Mitchell and Hastings 2011), the Aberrant Behaviour Checklist (Newton and Sturmey 1988), and the Checklist of Challenging Behaviour (Harris, Humphreys and Thompson 1994). The use of these measures adds credibility and trustworthiness to the findings of these studies, owing to that fact that they are standardised, valid and reliable psychological tools.

Five studies collected qualitative data alone. Each of these were deemed to be of good methodological quality (see Appendix C), and provided useful and credible insight into the contextual experience of stress among intellectual disability care workers. The methodological quality of the eight mixed-methods research, however, was more varied. Four of these studies collected both quantitative survey and qualitative interview data, while two combined survey data with participant observation. One collected quantitative and qualitative data in a survey format, and one combined a recorded speech sample with a survey.

These mixed-methods studies ranged from fair to good in methodological quality. Where they varied was primarily in domain of sample sizes, which were very small in some cases, and in responses rates, which were sometimes low or else not reported. Similar to much of the research in this review, all relied on

convenience sampling procedures, which means that their sample may have lacked representativeness.

With regard to the qualitative components of these mixed-methods studies, most justified their use of particular approaches for collecting and analysing data. These were appropriate for the research question at hand. Many also gave consideration to the context in which the data was collected, though few researchers addressed the issue of reflexivity in terms of how their findings related to their own personal influences or their interactions with participants.

Thematic analysis of the findings of all studies included in this review resulted in the generation of five primary themes. Namely, these primary themes were *Challenging Behaviour; Organisational Factors; Reciprocity; Coping and Stress,* and *The Impact of the Covid-19 Pandemic.* One of these themes, *Organisational Factors,* comprised two sub-themes of *Role Issues* and *Workplace Psychosocial Characteristics*. Each of these are now discussed in turn.

2.4.1.1 Challenging behaviour

Much research has investigated the relationship between exposure to challenging behaviour and the experience of stress among those who work in the intellectual disability care sector. There are two distinct strands to this literature.

First, there is good evidence from a range of studies (including several well-conducted cross-sectional studies with large sample sizes) that exposure to challenging behaviour, including violence and aggression, is correlated with increased levels of stress (Gingi 2012, Hatton *et al.* 1995), anxiety (Jenkins, Rose and Lovell 1997), depression and fatigue (Womack *et al.* 2021), and burnout (Klaver *et al.* 2021, Hensel 2012, Lundstom *et al.* 2007, Kile 2014, Chung and Harding 2009, McMahon *et al.* 2020) among staff in intellectual disability services. A causal link between exposure to challenging behaviour (including verbal aggression and hostile aggression) is evidenced by the longitudinal work of Freeman (1994) and Nevill *et al.* (2020). Qualitative (Judd Dorosenko and Breen 2017, Rackza 2005) and mixed methods (Koritas *et al.*

2010) investigations also provide evidence of the impact of challenging behaviour as a stressor for this occupational this cohort.

One exception to this is a cross-sectional survey of 186 intellectual disability care workers by Flynn *et al.* (2018), which found little association between exposure to aggressive challenging behaviour and staff burnout. This lack of correlation was attributed to a clustering effect. That is, the impact of challenging behaviour on staff well-being was moderated by the environment in which they worked.

Indeed, the second strand to this research has focused on the factors that may moderate the relationship between exposure to challenging behaviour and staff stress. These include, for example, management issues (Chung, Corbett and Cumella 1996, Chung and Corbett 1998), personality traits (Chung and Harding 2009) and a lack of procedure for dealing with such behaviour as it arises (Robertson *et al.* 2005).

The strongest evidence in this regard relates to the relationship between negative staff reactions to challenging behaviour, such as depressive and angry responses, and staff well-being outcomes, such as emotional exhaustion and depersonalisation (Mitchell and Hastings 2001, Rose *et al.* 2004). Indeed, there is robust evidence that exposure to challenging behaviour is also associated with increased 'fear of assault', which may exacerbate the negative effects of exposure to violence in the workplace (Mills and Rose 2011, Rose and Cleary 2007, Rose *et al.* 2013). This is a finding that is also supported by good quality qualitative research (Howard and Hegarty 2003).

Two smaller studies provide some evidence for the moderating role of self-efficacy on the relationship between challenging behaviour and burnout. Howard, Rose and Levenson (2008) found that while staff in medium-secure services were exposed to more violence than those in community services, they reported less burnout and fear of violence and higher self-efficacy for managing difficult behaviour. Similarly, Shead, Scott and Rose (2016) identified that emotional exhaustion and depersonalisation were greater in staff exposed to violent behaviour who had lower self-efficacy for managing such behaviour. However, these findings are contradicted by a larger study (Klaver *et al.* 2021)

of 1,271 intellectual disability care workers which identified that while self-efficacy, supervisor social support, resilience and extraversion were each correlated with burnout symptoms, none of these variables moderated the association between exposure to challenging behaviour and burnout.

Evidence is similarly mixed on the extent to which staff perceptions of the cause and controllability of challenging behaviours may influence their negative emotional outcomes (Dagnan, Trower and Smith 1998). In line with Weiner's (1988) model of helping behaviour, Bailey *et al.* (2006) identified that internal, stable and controllable attributions of challenging behaviour (including self-injury) were correlated with negative emotional responses among intellectual disability care workers. Another study by Rose and Rose (2005) also found that an attribution of challenging behaviour as stable was associated with increased negative emotion. However, Weiner's model was actually quite poorly supported in that and another earlier study (Wanless and Jahoda 2002).

2.4.1.2 Organisational factors

The contribution of organisational factors, such as role ambiguity, conflict, and a lack of resources, to the experience of work-related stress and burnout among intellectual disability care workers has been much investigated. This literature can be categorised into two sub-themes. Namely, these are role issues in workplace, and the contribution of workplace psychosocial characteristics to stress-related outcomes.

Role Issues

Role issues such as ambiguity and conflict appear to comprise significant sources of work-related stress for intellectual disability care workers. This assertion is supported by the findings of several methodologically robust cross-sectional studies, including a study by Hatton *et al.* (1999) with a sample of 450 intellectual disability care workers, and a number of smaller studies (e.g. Dyer and Quine 1998, Harries *et al.* 2015). Both role conflict and role ambiguity have also been found to predict burnout outcomes among such workers in a number of good quality cross-sectional studies (e.g. Gil-Monte and Piero 1998, Vassos and Nankervis 2012, Vassos *et al.* 2013, Finkelstein *et al.* 2018).

Intellectual disability care staff who report satisfaction with the quality of supervision provided to them have also reported experiencing higher levels of role clarity and job satisfaction and lower levels of intended turnover and emotional exhaustion (Mascha 2007). The importance of role clarity is also highlighted by Moriarty's (2019) study, which found that keyworkers (i.e. staff members responsible for meeting the needs of individual service users) who were clear about what was expected of them were more satisfied with their role and more likely to perceive key-working was beneficial to them.

Indeed, there is evidence from a high quality study of 422 intellectual disability care workers that role clarity and social support can help prevent 'mobbing' (i.e. interpersonal aggression between workers), while role ambiguity may encourage it (Figueiredo-Ferraz *et al.* 2012). Mobbing was also found to predict negative employee health outcomes and intended absenteeism. The long-term negative impact of mobbing on depressive symptoms was also evidenced through a longitudinal follow-up to this study with 372 workers (Figueiredo-Ferraz & Gil-Monte 2012).

Workplace Psychosocial Characteristics

Research drawing on established work-stress theories such as the Job Demand-Control-Support (Johnson and Hall 1988) and the Job Demand-Resources (Demerouti *et al.* 2001) model has examined how the psychosocial characteristics of a workplace contribute to stress and burnout among intellectual disability care workers. In keeping with the central hypotheses of these models, there is robust evidence that excessive workplace demands and overload is correlated with stress and burnout among this cohort (Elliot and Rose 1997, Rose 1999, Harries *et al.* 2015).

A high-quality cross-sectional study by (Gray-Stanley and Muramatsu 2011) with 323 intellectual disability care workers found that overload and lack of participation in work decisions predicted higher emotional exhaustion and decreased personal accomplishment. This is consistent with the findings of Dyer and Quine (1998), Rose Ahuja and Jones (2006) and also Corrigan (1993), whose survey of 322 intellectual disability care workers in developmental and state hospitals identified a lack of administrative control as a prominent source

of stress. Survey research by Kowalski *et al.* (2010) found that greater latitude in decision making was correlated with reduced emotional exhaustion in their sample of 175 care workers.

Support from supervisors and colleagues can also exert a meaningful impact on the stress and burnout experienced by direct care staff in the intellectual disability sector (Harris and Rose 2002, Howard, Rose and Levenson 2008). Perhaps the strongest evidence for this derives from a national study of 3,774 intellectual disability care workers in Japan (Ito 1999), which identified lower burnout among staff who felt that they could consult supervisors about work or personal problems compared to those who felt they could not. Robust evidence for the relationship between low social support and job strain is provided by Hatton *et al.* (1999) in their study of 450 intellectual disability care. Several well conducted smaller studies have also indicated that support from colleagues is correlated with stress (e.g. Hatton and Emerson 1993, Leyin and Wakerly 2007), while there is good quality evidence from two studies (Lahana *et al.* 2017, Robertson *et al.* 2005) that a lack of resources and social support are associated with staff stress in this sector.

Analysis of data from a large cross-sectional survey of 1,243 intellectual disability care workers in Taiwan (Lin *et al.* 2009, Lee *et al.* 2009) found that high effort and low reward at work correlated with perceived stress and job strain. High demands and low levels of perceived job support and control were each correlated with high effort/low reward circumstances among this sample.

Few studies have examined whether interactions between these workplace characteristics interact to influence stress-related outcomes among intellectual disability care workers. Among those that have, Devereux *et al.* (2009) found that social support at work moderated the relationship between workplace demands and personal accomplishment, while Gray-Stanley and Muramatsu (2011) found that low social support was predictive of increased burnout in their sample when workload was high. Vassos *et al. (*2017) found that a combination of a high workload, low control, and low colleague support predicted higher burnout and lower engagement among intellectual disability care workers. Thus, there is some preliminary evidence from good quality cross-sectional

survey that social support and control may moderate the relationship between workplace demands and burnout among intellectual disability care workers.

2.4.1.3 Reciprocity

There is evidence from a small number of good quality studies, including some longitudinal research, that inequity in social relationships in the workplace (i.e. a discrepancy in the interpersonal support/effort desired and received) is a sources of stress for intellectual disability care staff (Disley, Hatton and Dagnan 2009). Early work by van Yperen (1996), for example, identified that perceived inequity in the relationship with their organisation and clients was correlated with emotional exhaustion and reduced personal accomplishment among a sample 98 nurses working with person with an intellectual disability.

Further evidence for the relationship between inequity and staff burnout in intellectual disability care services is provided by a longitudinal study of 245 workers conducted by van Dierendonck *et al.* (1996, 2001). It is also supported by two more recent studies (Thomas and Rose 2010, Rose *et al.* 2010), both cross-sectional and of good methodological quality. Indeed, survey research by Kile (2014) with 222 intellectual disability care workers found that emotional exhaustion was correlated with a lack of reciprocity across clients, colleagues and their organisation, while inequity within the organisation predicted all three aspects of burnout.

2.4.1.4 Coping and stress

There is evidence that the coping styles of intellectual disability care workers (e.g. whether they employ problem-solving, emotion-focused or wishful thinking strategies in the face of stress) are correlated with their stress and well-being outcomes (Smithson-Sims 1996, Mitchell and Hastings 2001, Mascha 2006). The strongest evidence in this regard relates to ‘wishful thinking’, a coping style characterised by a focus on what may be pleasing to imagine rather than rationality or available evidence. A good quality longitudinal study of disability support workers over a 22-month period (Devereux *et al.* 2009) found that the relationship between job demands and emotional exhaustion was partially mediated by ‘wishful thinking’, while practical coping was correlated

with personal accomplishment. Though neither wishful thinking nor practical coping were predictive of emotional exhaustion over time, the effect of demands on emotional exhaustion was reduced by the use of wishful thinking.

The relationship between the use of wishful thinking and increased stress/poorer psychological well-being among intellectual disability care workers is further evidenced by some well-conducted cross-sectional studies (e.g. Hatton *et al.* 1995, Rose, David and Jones 2003). In addition, Kile (2014), in a study of 222 direct care workers engaged with clients displaying challenging behaviour, reported that emotion-focused coping was related to increased emotional exhaustion and depersonalisation and reduced personal accomplishment. Problem-focused and relationship-focused coping strategies were both associated with increased personal accomplishment, suggest that the use of appropriate coping strategies has an impact on the burnout of intellectual disability care workers.

Certain personality traits may play a role in the experience of stress and burnout in this sector (Chung and Harding 2009, Suls and Martin 2005). Current findings are consistent with the broader literature in this domain. For example, Rose, David and Jones (2003) found that higher neuroticism and lower extraversion were related to poorer psychological well-being among intellectual disability care workers. Lundstrom *et al.* (2007) found that the personality dimensions of harm avoidance and self-directedness (traits associated with pessimism, worrying, shyness, fatigue, irresponsibility and a lack of impulsive control) were related to burnout, tedium, emotional exhaustion, and depersonalisation among those working with people with an intellectual disability.

2.4.1.5 Covid-19 and its impact on intellectual disability care workers.

The final theme related to the impact of the Covid-19 pandemic on the stress and well-being of intellectual disability care workers. This topic of investigation formed the focus of most of the recent research in this field. For example, Embregts Tournier and Frielink (2021) reported on the emotional and cognitive impact of the pandemic on workers, arising from issues such as fear of infection, feeling overwhelmed with emotions, and the need for perseverance and

problem-solving coping. They took the novel approach of collecting audio-recorded messages from eleven intellectual disability care workers at the beginning of the pandemic. It was also noted how pandemic impacted practically and professionally on their work, contributing to issues such as lack of time for care, navigating preventative measures, and struggling to maintain connected with colleagues. Similar themes were generated by Sheerin *et al.* (2022), who conducted semi-structured interviews with 13 intellectual disability care workers. Findings emphasised the challenges of the working environment during Covid-19, in addition to fear of infection, general anxiety, isolation, and guilt. The need for organisational, managerial, counselling and peer support were also highlighted in this study.

The psychosocial consequences of the pandemic were also evidenced through the quantitative literature. A survey of 285 Irish intellectual disability care workers (McMahon *et al.* 2020) during the pandemic identified moderate levels of personal and work-related burnout and mild levels of anxiety and depression. Sheppard-Jones *et al.* (2022) highlighted the effect of the pandemic on the stress and resilience of intellectual disability care workers, finding that perceived stress was strongly correlated with quality of life and resilience, though not with years of DSP experience. Finally, Sheehan *et al.* (2021) revealed different concerns between in-patient and community staff across NHS and non-NHS services in their survey of 648 intellectual disability care workers in the UK. Issues around infection risk and mitigation were more important to those working in the NHS and in-patient settings, while community staff were more likely to express concern about the practicalities of a rapid shift to remote working and engaging patients remotely.

2.4.2 Summary of findings relating to intellectual disability care workers

A complex and varied literature as it relates to work-related stress and burnout has emerged from the field of intellectual disability care work over the past two decades. This includes sizable bodies of research relating to the impacts of challenging behaviour and psychosocial organisational factors. Bodies of investigation pertaining to the coping styles of intellectual disability care workers and the effects of inequality in their relationships with their clients and

their colleagues have also been conducted, though the volume of this research is considerably smaller compared to the first two themes in this review.

The methodological quality of this literature is more varied than that as it relates to ageing nurses in the workplace. There is, however, good-quality evidence that exposure to challenging behaviour can be a key source of stress for those who provide care and support to persons with an intellectual disability. This is demonstrated by a number of well-conducted cross-sectional and longitudinal surveys, which utilised validated measures and which drew upon large sample sizes. Contextual insight into the negative effect of challenging behaviour on the well-being of intellectual disability care workers is provided by qualitative work, while there is also good quality evidence that the impact of challenging behaviour is moderated by negative staff reactions. Existing research is inconclusive, however, on the influence of self-efficacy and staff attributions on the relationship between challenging behaviour and well-being in this cohort.

Psychosocial organisational factors, such as a lack of role clarity, are reliably correlated with stress and burnout outcomes among intellectual disability care workers. The central hypotheses of the Job Demand-Control and Job Demand-Resource models, in terms of the contribution of demands, resources and social support to the well-being of intellectual disability care workers, are well-evidenced in this occupational cohort. This is indicated by the findings of survey-based research, much of which is of good methodological quality. This is due to that fact that it is theory-informed and draws upon validated psychosocial measures. In several cases, large sample sizes and high response rates were achieved. While there is some evidence that social support and control moderate the relationship between workload and burnout among intellectual disability care workers, investigation is sparse to date.

The volume of research as it pertains to the two other themes in this review (i.e. coping styles and reciprocity) is noticeably smaller compared to those relating to challenging behaviour and organisational factors. Nonetheless, there is some good quality evidence that the coping styles of intellectual disability care workers, and in particular wishful thinking, is associated with their stress and burnout outcomes. A number of cross-sectional and longitudinal studies

evidence the negative effect of the workplace inequity on intellectual disability care workers.

The findings of this review are subject to a similar limitation as the first review in this chapter, in terms of the dominance of one particular methodology (Section 2.3.3). In this case, quantitative cross-sectional survey research was the leading approach. There are recognised limitations to such research, as quantitative cross-sectional studies can only examine relationships between variables at a specific point in time and cannot provide an indication of the causal direction of such relationships (Haslam and McGarty 2008). The reliance on these methods is probably reflective of the nature of research question for this review, which was focused on work-related stress among intellectual disability care workers generally. As a result, a different type of literature was identified and analysed compared to the first review in this chapter, which was more specific and focused on a particular cohort within an occupational grouping (i.e. ageing nurses in the workplace).

2.4.2.1 Age, intellectual disability care work, and stress

Due to a lack of investigation, it is unclear from this literature whether intellectual disability care workers encounter different types of stressors or manage stressors differently as they age. Few studies specifically examined the impact of age on the experiences of intellectual disability care workers. Exceptions were Sheppard-Jones *et al.* (2022) who found that perceived stress was not correlated with not with years of experience; Kowalski (2010) who reported that workers aged between 30-39 years experienced higher levels of burnout compared to younger staff, and Hatton (1998) who found that older age was correlated with higher levels of work stress.

Ultimately, research as it relates to issues of age, stress, and intellectual disability care work is sparse and extant findings are inconsistent. As a result, the studies reviewed here must be taken as the best available evidence as it relates to the experience of work-related stress among intellectual disability care workers, ageing or otherwise. Though there is little indication that age and stress perception are correlated among intellectual disability care workers, this is a

topic of investigation that is underexplored. The implications of this are discussed in more detail in the next section.

2.5 Discussion

In the following section the significant findings of both of these reviews as the relate to the population of interest and the management of their work-related stress are discussed and analysed. This is presented across four sub-sections. There are: an overlap in population; age and stress perception; defining the ageing nurse and intellectual disability care worker, and implications for the development of online work-stress management interventions.

2.5.1 Overlap in population

A potential overlap in the populations of interest across both reviews was considered. It was found that approximately one-fifth of the studies (21 of the 100) with intellectual disability care workers indicated that nursing staff were included in their sample. The remaining studies did not specify whether nurses were sampled, while two (Courderc *et al.* 2021, Smithson-Sims 1996) specifically excluded nurses from their recruitment procedures. Among the studies which did include nursing staff, these typically comprised between 10-25% of the sample, while three studies recruited nursing staff only (Shead, Scott and Rose 2016, Lundstom *et al.* 2007a, 2007b).

While ageing nurses in the studies in the first review were recruited from a range of care settings (including hospitals, community care services, care homes and hospices), it does not appear that any were recruited from services for persons with an intellectual disability. This means that it is not possible to draw conclusions relating to issues of age and intellectual disability care work from the literature relating to ageing nurses.

2.5.2 Age and stress perception

There is a lack of evidence to suggest that age plays a role in stress perception among nurses or intellectual disability care workers. That is, being older is not necessarily a source of stress for either occupational cohort. Chronological age does not appear to have an impact on how nurses or intellectual disability care

workers perceive stress, nor does it appear that their work is more stressful, or that they become less capable of managing stress as they age. This is an important finding as it relates to this research, which is focused on examining issues of age and supporting health and social care workers in the management of their work-related stress through online interventions.

The one exception to this relates to theme of physical and cognitive declines among ageing nurses (Section 2.3.1). Nurses do appear to be affected by age-related declines in their physical and cognitive abilities, which has an impact on their health and well-being. The experience of injury and pain is a prominent source of stress for ageing nurses, and worthy of consideration in terms of supporting this occupational cohort.

In addition, there are certain age-related stressors experienced by nurses that should be taken into account when seeking to support the well-being of this group. These include a lack of recognition and support for nurses, generational tensions, and mid-life challenges in terms of competing professional and personal life demands (see Section 2.3.1). The implication of this in terms of online work-stress management interventions is discussed in greater detail in Section 2.5.3.

While there has been some investigation of the relationship between age and stress among intellectual disability care workers, this research is sparse and the findings are inconclusive. Only three studies reported findings relating to age (Section 4.4.1.2). While there is little indication that age and stress perception are correlated among intellectual disability care workers, this is primarily because of a lack of investigation of this issue.

A gap in both bodies of literature that is relevant to the overall aim of this research relates to the lack of investigation of the relationship between age and workplace characteristics in the experience of stress among nurses and intellectual disability care workers. Only one study conducted with ageing nurses offered a theory-informed understanding of how workplace characteristics contribute to stress among this group (Letvak 2005). Conversely, while much of the literature as it relates to stress and intellectual disability care

work is informed by relevant work-stress theory, no study considered the extent to which age influenced the contribution of workplace characteristics to age.

Such investigation could prove useful in terms of informing the design of online stress management interventions to support health and social care workers. As noted in Chapter One (Section 1.3.3) theory-informed design is important as it explains the mechanism of an intervention and facilitates the selection and refinement of component techniques (Michie *et al.* 2008). This reinforces the value of Objective Three of this research as it relates to understanding of the role of age in the contribution of workplace characteristics to the experience of stress among health and social care workers.

2.5.3 Defining the ageing nurse and intellectual disability care worker

The age range of the participants in the studies in the first review of this chapter (Section 2.3) was examined. This was to determine how the concept of age was defined in occupational stress research with nurses and intellectual disability care workers. In this way, the extent to which the findings of this research can be referenced to existing literature can be judged.

It was found that few studies actually offered a definition of the ageing nurse or were guided by specific criteria in their recruitment. Most simply stated the lower age point of the recruited participants. This varied between 40 and 60 years, though several studies did not specify the age range of recruited participants (see Appendix B). Eleven of the 27 studies recruited from a lower age limit of 50 years. Three used over 55 years, while three studies used over 45 years. One used over 46 years, another two used 40 years, while one used over 60 years.

These would suggest that those examining the issue of occupational challenges and stress among ageing nurses generally consider a nurse to become ‘older’ or ‘ageing’ once they are aged in the 40s or 50s. Based on this and the analysis of the data relating to the Irish health service workforce in Chapter One (Section 1.3) it would appear that the decision to use of 45 years as the lower chronological age point for defining the ageing health and social care worker in this research is justified.

2.5.4 Implications for the development of online work-stress management interventions

The finding that mid-life demands can place a strain on nurses could have implications for the development and delivery of online stress management interventions for this sectoral group. For example, nurses can struggle to balance a range of personal and professional commitments, such as caring for elderly parents and for their own families (Andrews *et al.* 2005, Mion *et al.* 2006, Phillips and Miltner 2015), while shift work can generate issues with regard to a lack of time through working irregular hours and limited flexibility (Clendon and Walker 2015, Fragar and Depczynski 2011). It is possible therefore that nurses will struggle to allocate time and energy to undertaking online work-stress management interventions. The design of such interventions may need to be tailored to account for this. The exploration of these issues as it relates to the experience of undertaking the DELAROSE programme as part of this research may provide valuable insight into the development of online interventions to support the target group.

One commonality between both bodies of literature reviewed here was that they indicate that the experience of stress for ageing nurses and for intellectual disability care workers arises from a combination of personal and organisational factors (Armstrong-Stassen and Ursel 2009, Cohen 2006, Graham *et al.* 2014). Organisational stressors were particularly notable across both reviews. Among ageing nurses, for example, bullying, generational differences, administrative issues and a lack of positive communication from management and colleagues were identified as sources of stress and frustration. Among intellectual disability care workers, organisational issues such as role conflict, ambiguity, demands and support were prominent in the literature.

That personal and organisational stressors contribute to the experience of stress in these groups is consistent with contemporary perspectives of stress in the workplace, as discussed in Chapter One (Section 1.3). This has an implication for the development of online work-stress management interventions for health and social care workers, ageing or otherwise. This is because it suggests that

both individual- and organisational-focused strategies are needed to support such workers in the management of their work-related stress.

This is illustrated by the relationship between age and the physical well-being of nurses. The finding that nurses experience physical and cognitive age-related declines implies that they would benefit from tailored personal interventions to help them maintain their physical well-being. These declines can make such workers more vulnerable to the negative effects of shift work and physically exerting working environments. The most effective actions to mitigate these stressors are likely organisational in nature, such as the implementation by management of tailored strategies and initiatives by managers at a workplace level.

This highlights the importance focusing on organisational stress management in addition to personal initiatives. It also indicates the value of using the DELAROSE programme, which is dual-focused in nature, as a case example in this research. The perceptions of health and social care workers as it relates to age and workplace stress management may provide useful insights in this regard (Study Two, Chapter Six). It also indicates the value of investigating the relationship between age and workplace characteristics in terms of their contribution to stress among health and social care workers (Study One, Chapter Five).

2.5 Conclusion

This chapter presented an analysis of what is currently known about the relationship between age and experience of work-related stress among nurses and intellectual disability care workers. This was informed by the findings of two separate scoping reviews of the literature.

It was found that a body of research as it relates to the experiences of ageing nurses in the workplace has been conducted and published. Thematic analysis of this literature indicated that the key contextual stressors experienced by such nurses related to physical and cognitive declines, a lack of support and recognition, and mid-life pressures and challenges.

Few studies have examined the impact of age on the experiences of intellectual disability care workers. As a result, it is unclear whether intellectual disability care workers encounter different types of stressors or manage stressors differently as they age. Analysis of the literature as is it relates to experiences of work-related stress among intellectual disability care workers must be taken as the best available as it relates to ageing workers in this sectoral group. Key themes within this literature related to challenging behaviour, reciprocity, organisational issues, coping styles, and the impact of Covid-19.

With regard to issues of age and the development of online work-stress management interventions to support health and social care workers, perhaps the most significant findings from this chapter is that there is a lack of evidence that age plays a role in stress perception among nurses or intellectual disability care workers. That is, being older is not necessarily a source of stress for either of occupational cohort. Chronological age does not appear to have an impact on how nurses or intellectual disability care workers perceive stress, nor does it appear that their work is more stressful, or that they become less capable of managing stress as they age. However, online work-stress management interventions may need to focus on certain personal and organisational interventions sources of stress in these sectoral groups. There is a lack of theory-informed investigation as it relates to age, workplace psychosocial characteristics and the stress and well-being outcomes of nurses and intellectual disability care workers. A settled definition of the ageing worker as it applies to these occupational cohorts is also absent.

In this way, the first objective of this research, which involved analysing the literature as it relates to the experience of work-related stress among ageing nurses and intellectual disability care workers, was met. The following chapter (Chapter Three) addresses the second objective by reviewing the literature in relation to online work-stress management interventions. This includes a specific focus and reflection on evaluative studies of online interventions that are similar in nature to the DELAROSE programme.

Chapter Three

DELAROSE AND THE MANAGEMENT OF WORK-RELATED STRESS THROUGH ONLINE INTERVENTIONS

3.0 Introduction

The purpose of this chapter is to provide a review of the literature as it relates to evaluative studies of online work-stress management interventions and to reflect on the DELAROSE programme within the context of similar online interventions. This was achieved in two parts.

First, the published literature relating to evaluative studies of online work-stress management interventions was reviewed. The background to this work is presented in Section 3.1. This is followed by the conduct and findings of two reviews of the literature relating to online work-stress management interventions. The first of these was a systematic review and meta-analysis of quantitative evaluations of online work-stress management interventions (Section 3.2). This was an update of an existing systematic review and meta-analysis of the literature (Phillips Gordeev and Schreyögg 2019). It focused on identifying relevant evaluative studies published between April 2018 and January 2023 for the purpose of determining the efficacy of such interventions.

The second was a scoping review of qualitative evaluations of workers' experiences of online stress management interventions (Section 3.3). The conduct of this review followed the Arksey and O'Malley (2005) five-stage framework (Chapter Two, Section 2.1). The purpose of this review was to determine what is known about the positive and negative aspects of online work-stress management interventions, as well as the factors associated with their uptake and usage.

The second part of this chapter comprises a reflection on the DELAROSE programme in the context of similar online work-stress management interventions (Section 3.4). This was guided by an analysis of the DELAROSE programme as a stress management intervention (Section 3.4.1). Online work-stress management interventions similar to DELAROSE were identified from the body of studies included in the reviews of the literature in Sections 3.2 and 3.3. A reflection on the DELAROSE programme in the context of comparable programmes across a number of domains is presented. These domains include overall form and focus, programmes similar to Module One of

DELAROSE, the issue of adherence, programmes delivered to health and social care workers, and issues of age and online work-stress management (Section 3.4.2).

3.1 Background

A considerable number of evaluative studies of worker-directed stress management interventions have been published (Holman, Johnson and O'Connor 2018). The most comprehensive meta-review of this literature (Bhui *et al.* 2012) synthesised the findings of 23 previous systematic reviews and 499 primary research studies of interventions for managing stress at work. This review focused specifically on anxiety, depression and absenteeism as outcomes, and found that meta-analytic and narrative reviews have consistently reported that interventions focused on and delivered to individual workers produce positive benefits at that level.

Though the authors cautioned against drawing conclusive comparisons with regard to the benefits of different intervention techniques (due to considerable heterogeneity across the trialled interventions), the findings were consistent with earlier meta-analytic review work in this area (e.g. van der Klink *et al.* 2001, LaMontagne *et al.* 2007, Richardson and Rothstein 2008). These previous reviews determined that interventions based on cognitive-behavioural, multimodal and relaxation-based techniques tended to be most effective, and were associated with significant improvements (medium to large average effects sizes) in outcomes such as stress, anxiety, quality of work, coping skills, and physiological responses among workers.

Few organisational interventions (initiatives that involve making direct changes to the working environment) were identified and included in these reviews. Those that were tended to be ineffective in improving worker outcomes at the individual and organisational level, apart from productivity. However, Holman, Johnson and O'Connor (2018) noted an increased focus on organisational stress management initiatives and that more individual studies supportive of the efficacy of such approaches have been published.

3.1.1 Online work-stress management interventions

As noted in Chapter One (Section 1.2.2) a key trend within the work-stress management literature is the proliferation of interventions delivered via online modalities. Such interventions are typically website or smartphone delivered, target individual workers, focus on personal stress management and provide

cognitive-behavioural, mindfulness and/or relaxation-based therapeutic content (Stratton *et al.* 2022).

Existing systematic reviews and meta-analyses (e.g. Carolan Harris and Cavanagh 2017, Stratton *et al.* 2017, Phillips Gordeev and Schreyögg 2019) are consistent in their support for the efficacy of online stress management interventions delivered to workers. For example, a pooled meta-analysis conducted by Carolan *et al.* (2017) indicated significant post-intervention reductions (with small average effect sizes) in workers' levels of stress, depression, and psychological distress. Similarly, Stratton *et al.* (2017) reported significant post-intervention changes with small average effect sizes for workers' mental health (i.e. symptoms of stress, depression, and anxiety). The most recently published systematic review of this literature (Phillips, Gordeev and Schreyögg 2019) determined that the interventions they analysed were associated with moderate average changes in stress, burnout and mental well-being among workers. Average effect sizes were small across interventions which assessed changes in depression and anxiety.

The extant literature indicates that online stress management interventions delivered to workers typically produce small to moderate improvements in symptoms of stress, anxiety, depression, burnout, and psychological well-being. However, because systematic reviews only report average effects across outcomes, caution is required when drawing conclusions about the likely efficacy of individual interventions (such as DELAROSE) with specific occupational cohorts (such health and social care workers) or demographics (e.g. ageing workers). Though online work-stress management interventions share a common modality of delivery (online) and target audience (workers), they can vary greatly on features such as content, duration, guidance, and the occupational cohort they target (Stratton *et al.* 2022).

In recognition of this, a key purpose of this chapter is to reflect on the DELAROSE programme within the context of what is known about similar online work-stress management interventions. To achieve this, it was necessary to determine what online work-related stress management interventions have already been developed and delivered, and which of these are similar to

DELAROSE. As outlined in Section 3.1, two reviews of the literature as they relate to evaluative studies of online work-stress management interventions were conducted (in this case, evaluative is taken to refer to quantitative and qualitative assessments of the efficacy and experience of such interventions).

An existing systematic review and meta-analysis of quantitative evaluations of online work-stress management interventions (Phillips, Gordeev and Schreyögg 2019) was analysed and updated for this purpose. The conduct and findings of this review are presented in the following section (Section 3.2).

This is complemented by a scoping review of the qualitative literature as it relates to online work-stress management interventions (Section 3.3). Undertaking this review was important as qualitative evaluations can provide unique insight into the positive and negative aspects of online work-stress management interventions, as well as the factors that associated with their uptake and usage. Reviewing both quantitative and qualitative evaluations of online work-stress management also facilitated a more complete reflection on the DELAROSE programme in the context of what is known about similar interventions (Sections 3.4).

3.2 An updated systematic review and meta-analysis of the literature

An updated systematic review is a new edition of a published systematic review with changes that can include new data, methods or analyses to the previous edition (Garner *et al.* 2016). As existing reviews only provide a snapshot of knowledge at the time of their conduct, newly identified studies may change the conclusion of a review. If they have not been included, this can undermine the validity of the review, and potentially important findings that could guide future research or practice may be missed. Updating existing reviews also tends to more efficient and make a more relevant contribution to the literature than conducting a completely new review.

Following consultation with an external researcher experienced in conducting systematic reviews, and in line with guidance provided by international review registers such as PROSPERO, it was determined that updating the most recent systematic review of the online work-stress management intervention literature (Phillips Gordeev and Schreyögg 2019) was both necessary and the most appropriate course of action to take. The advantage of updating this particular review was the breadth of its scope, as it

examined evaluative studies of work-stress management interventions across a range of outcomes. In addition, it was published in a high-impact journal related to occupational health and deemed to be of high methodological quality, based on an evaluation using the AMSTAR measurement tool (Shea 2007). However, as this review only includes studies published before April 2018, and is the most recently published review of this literature, it was necessary that an update of the review was conducted.

An updated systematic review and meta-analysis of the literature as it relates to online psychological interventions focused on work-stress management and/or a stress-related outcome that were published between April 2018 and July 2021 (later updated to January 2023) was therefore conducted. A protocol for this updated review was formulated based upon the background, aim, inclusion criteria and methods of the Phillips, Gordeev and Schreyögg (2019) review. This protocol was submitted to the PROSPERO network prior to commencement and can be viewed in Appendix D. It was informed by the PRISMA framework (Page *et al.* 2020) as it relates to the reporting of systematic reviews. The conduct of this review followed the PRISMA framework, and the completed checklist can also be viewed in Appendix D.

For robustness, two additional reviewers, both of whom had previous experience with conducting and publishing systematic reviews, were recruited to assist with the conduct of the updated review. One of these reviewers contributed to the process of study screening and selection, while the other was a statistician experienced in conducting meta-analyses. This statistician assisted with the meta-analyses calculations and advised on the appropriate reporting of the findings.

3.2.1 Methods

Updated reviews ask a similar question with regard to the participants, interventions and outcomes, and so employ comparable search strategies and inclusion criteria to an existing review. These may be modified in the light of developments within the topic area such as new interventions or approaches. In this instance, search strategies were refined, taking into account slight changes in the question and inclusion criteria.

3.2.1.1 Inclusion criteria, searching, screening

One of the challenges with the charting and analysing the literature as it relates to online work-stress management interventions is the diversity of terminology employed by researchers in this field. Carolan Harris and Cavanagh (2017), for example, analysed digital mental health interventions for enhancing employee psychological well-being, while Phillips Gordeev and Schreyögg (2019) used the term occupational e-mental health to indicate the scope of their review. They defined this as the use of information and communication technologies in the field of mental health. Though they did not provide a definition of information and communication technologies, they did note that e-mental health interventions delivered through ICT were offered on online platforms accessible via personal computers, tablets, or smartphones.

Despite differences in terms, common to each study and review in this field is the focus on interventions which are delivered online and to workers, and which assess changes in stress or stress-related outcomes, such as anxiety, depression, burnout or well-being. As such, though the term occupational e-mental health intervention was utilised in the protocol for this updated review, reflecting a slight change in inclusion criteria and for consistency with the rest of this thesis, the term online work-stress management intervention is used in the remainder of this chapter.

Studies were only included in the existing review (Phillips, Gordeev and Schreyögg 2019) if they reported on a randomised controlled trial evaluating the efficacy of an ICT-based intervention on any mental health condition in an employee population for any occupation. However, instead of assessing any mental health condition (such as insomnia or alcohol consumption) this updated review focused solely on outcomes related to stress. That is, studies had to report on outcomes related to symptoms of stress, psychological well-being, or a reduction in the presence of work-related stressors. As symptoms of anxiety, depression and burnout are related to the experience of stress in the workplace, interventions which reported changes in these measures were also included in this updated review. This is consistent with the existing review, which examined changes in stress, anxiety, depression, well-being and burnout.

The following inclusion criteria were applied to the updated review:

(1) Used a randomised controlled design;

(2) Aimed at employed participants aged 18 years or over (full-time/part-time employed and self-employed working individuals only to be included);

(3) Evaluated a psychological intervention focused on work-stress management (improving psychological well-being/symptoms of stress/reducing the presence of work-related stressors) and/or a stress-related outcome measure;

(4) Delivered online via the Internet, mobile technology (e.g. smartphone application), e-mail or a computer programme;

(5) Published in English.

Review papers, meta-analyses or meta-syntheses, qualitative investigations, interventions not delivered via an online modality, papers not published in English, and studies in which participants were not recruited from a working population were excluded. Interventions aimed at workers with a clinical psychiatric or mental health diagnosis, or if the participants exclusively comprised those on extended sick leave were also excluded.

Only randomised controlled trials were eligible for inclusion in the updated review. This was because randomised controlled trials provide the strongest evidence as they relate to the efficacy of interventions. This was in keeping with the inclusion criteria applied in the existing review.

For the meta-analysis, a distinction was made between inactive and active control group studies, following recommendations made in the Cochrane Handbook (2022). This handbook states that estimates of intervention efficacy depend on a comparison between an experimental condition and a comparable counterfactual condition. Inactive control groups, such as a wait-list control or treatment as usual, estimate absolute effects, while active control groups estimate relative effects (i.e. showing that one form of treatment is more effective than another).

In keeping with the existing review (Phillips, Gordeev and Schreyögg 2019), only absolute treatment effects were calculated here. As such, the inclusion of

studies for the meta-analysis part of this review was limited to randomised controlled trials with an inactive control. Randomised controlled trials that were excluded from the meta-analysis were charted in Table 24 in Appendix D and included a narrative summary of the literature (Section 3.2.2.2).

In several cases the studies included in the meta-analysis comprised multiple independent intervention groups. In order to avoid a unit-of-analysis error, groups were combined to create a single pair-wise comparison. This is the recommended approach as per Chapter Seven of the Cochrane Handbook. To this end, any studies with multiple experimental intervention groups were combined into a single group. Relevant control groups were also combined into a single control group. Means and standard deviations were calculated using the method and formula described in Chapter Seven of the Cochrane Handbook.

Only studies that employed validated measures of stress-related outcomes that were relevant to this review were included in the meta-analysis. Studies that used outcomes that did not meet this criterion were excluded. Studies were also excluded from the meta-analysis if they did not report sufficient data to calculate pre-post effect sizes per condition or if the study authors did not respond to a request for the data.

To identify relevant papers, the following electronic databases were searched:

- Academic Search Complete;
- PsycINFO;
- CINAHL;
- MEDLINE;
- Cochrane Library;
- PubMed;
- WHO International Trials Registry;
- PROSPERO;
- International Prospective Register of Systematic Reviews;
- Web of Science.

Search dates of April 2018 (the end date of the existing review) to July 2021 were applied initially. A second search extending from July 2021 to January

2023 was conducted later. Keywords including stress, strain, well-being, web-based, online, computerised, occupation, worker and employee were searched (see Box 4 for full details of the search terms employed). The final set of search terms were generated from existing reviews of online work-stress management interventions and by identifying potential synonyms for these terms.

Box 4. Search Terms Employed

(Stress OR strain OR distress OR mental OR depression OR anxiety OR well-being OR burnout OR disorder OR resilience OR psychological OR ill-health) AND

(Internet OR web OR web-based OR online OR computerized OR computerised OR computer OR e-health OR app OR digital OR mobile OR application OR m-health OR smartphone) AND

(occupation OR worker or working OR workplace or "at work" or workforce or work-related OR employee or occupational OR "employee assistance" OR intervention or worksite)

The screening process was conducted by another reviewer and I independently. Discussions occurred with a third reviewer on two occasions to resolve disagreements over the inclusion of specific studies. A PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) flow chart was compiled to summarise the study selection process (see Figure 5).

3.2.1.2 Data extraction process

Descriptive information relating to the authors, year, participants, intervention, design, measures, theoretical underpinning and results was extracted from each included study and charted in Tables 24 and 25 (see Appendix D). For assessing intervention effectiveness *p* values and effect sizes were also extracted and are reported in this table.

3.2.1.3 Statistical analysis

For each study, between-group effect sizes were calculated for each outcome. As studies with small sample sizes were included, Hedges' g was used to measure effect size at both primary study and meta-analysis levels. To assess different sample sizes and pre-test values, an effect size based on the mean pre-post change in the treatment group minus the mean pre-post change in the

control group, divided by the pooled pre-test standard deviation, was determined.

Effect sizes of 0.2 to 0.5 were considered small, sizes of 0.5 to 0.8 were considered medium, and effect sizes of 0.8 and over were considered large (the magnitude of an effect size was interpreted using Cohen's classification). A *p* value of < 0.05 was considered statistically significant. Positive effect sizes with a 95% confidence interval (95% CI) excluding zero indicated that the treatment condition was superior to the control.

Random-effects models that accounted for differences in the treatment effects from heterogeneous studies were employed to analyse the data. Separate meta-analyses were conducted for each stress-related outcome. These were: stress; depression; anxiety; mindfulness; well-being, and burnout. For each meta-analysis, mean effect sizes (Hedges' *g*), heterogeneity estimates (Q statistic) and the percentage of total variation across studies due to heterogeneity (I^2) were computed.

The degree of heterogeneity was assessed using a statistical significance level of $p < 0.05$ as follows: 0 - 40% might not be important; 30 - 60% may be moderate heterogeneity; 50 - 90% may be substantial, and 75 - 100% may be considerable. An I^2 percentage of 25% was considered low, 50% as moderate, and 75% as high.

It was intended that moderator analysis would be conducted to compare differences in efficacy across intervention types (e.g. CBT versus mindfulness) and between guided and unguided interventions. However, as an insufficient number of studies in each group were identified for statistically meaningful investigation of that nature, moderator analysis was not conducted. Publication bias was assessed for each model through examination of funnel plots and Egger's regression tests (where more than ten studies were included in a model, as it is not applicable otherwise). The trim and fill method was used to identify studies responsible for asymmetry. These are detailed in Appendix D.

3.2.1.4 Risk of bias

The risk of bias of the included trials was evaluated using the latest version of the Cochrane Collaboration Risk of Bias 2 tool (Higgins *et al.* 2021). This tool

was used to assess risk of bias across seven domains. These were: sequence generation; allocation concealment; blinding of participants; personnel and outcome assessors; incomplete outcome data; selective outcome reporting, and other issues.

3.2.1.5 Categorisation

Included work-stress management interventions were categorised using a matrix of prevention level and target strategies outlined by De Jonge and Dollard (2002). This matrix builds on a previous framework outlined by DeFrank and Cooper (1987), which postulates three types of target strategies and their associated outcomes (see Table 3).

Individual-level interventions target the user directly and typically include techniques such as relaxation, meditation, and cognitive restructuring to alter irrational or dysfunctional patterns of thinking. Their impacts tend to be assessed through physiological or psychological measures, such as mood states, subjective stress, blood pressure or sleep disturbance.

Organisational level interventions focus on altering aspects of the workplace that may be stress inducing (Giga, Noblet and Cooper 2003). Most commonly, they aim to modify workplace characteristics such as job discretion, shift scheduling or workload, and tend to affect entire workforces. Outcomes are typically organisational in nature (e.g. absenteeism, turnover, presentism, recruitment or productivity).

Finally, interventions at the level of the individual/organisational interface target stressors that arise through the interaction between the worker and their workplace. As such, they focus on psychosocial stressors such as role conflict, job insecurity or a lack of social support (DeFrank and Cooper 1987). Their impact may be individual or organisational in nature.

Work-stress management interventions can also be categorised according to their level of prevention. Primary prevention focuses on preventing the occurrence or causes of stress in the workplace, while secondary prevention focuses on managing stress symptoms or worker reactions to stress through, for example, cognitive-behavioural exercises, relaxation, conflict management, or

communication. Tertiary prevention is therapeutic in nature and focuses on treating illness or burnout as a result of exposure to stress (Bhui *et al*. 2012).

It should be noted that there may be a degree of overlap across these varying target strategies and prevention levels, and that in practice there is not always a clear distinction between them. Nevertheless, the matrix was a useful classification system to articulate the form and focus of the work-related stress management interventions included in this review.

Table 3: Work-Stress Management Interventions: Target Strategies and Prevention Level

Target Strategy	Primary Prevention	Secondary Prevention	Tertiary Prevention
Organisational	Changes in Job Content, Career Development	Conflict Management, Communication and Decision-making Interventions	Rehabilitation
Individual/Organisation Interface	Time Management, Interpersonal Skills, Work/Life Balance	Social Support, Career Planning and Development	Rehabilitation, Support Groups.
Individual	Pre-employment Screening and Examination, Psychoeducation.	Cognitive-behavioural, Relaxation or Mindfulness-based Interventions.	Rehabilitation, Employee Assistance, Psychotherapy, Sick Leave.

3.2.2 Results

The search strategy as described (including the update to January 2023) returned a total of 14,601 hits from all databases (see Figure 5). These were downloaded and exported to EndNote. Following the removal of 3,116 duplicates, the titles

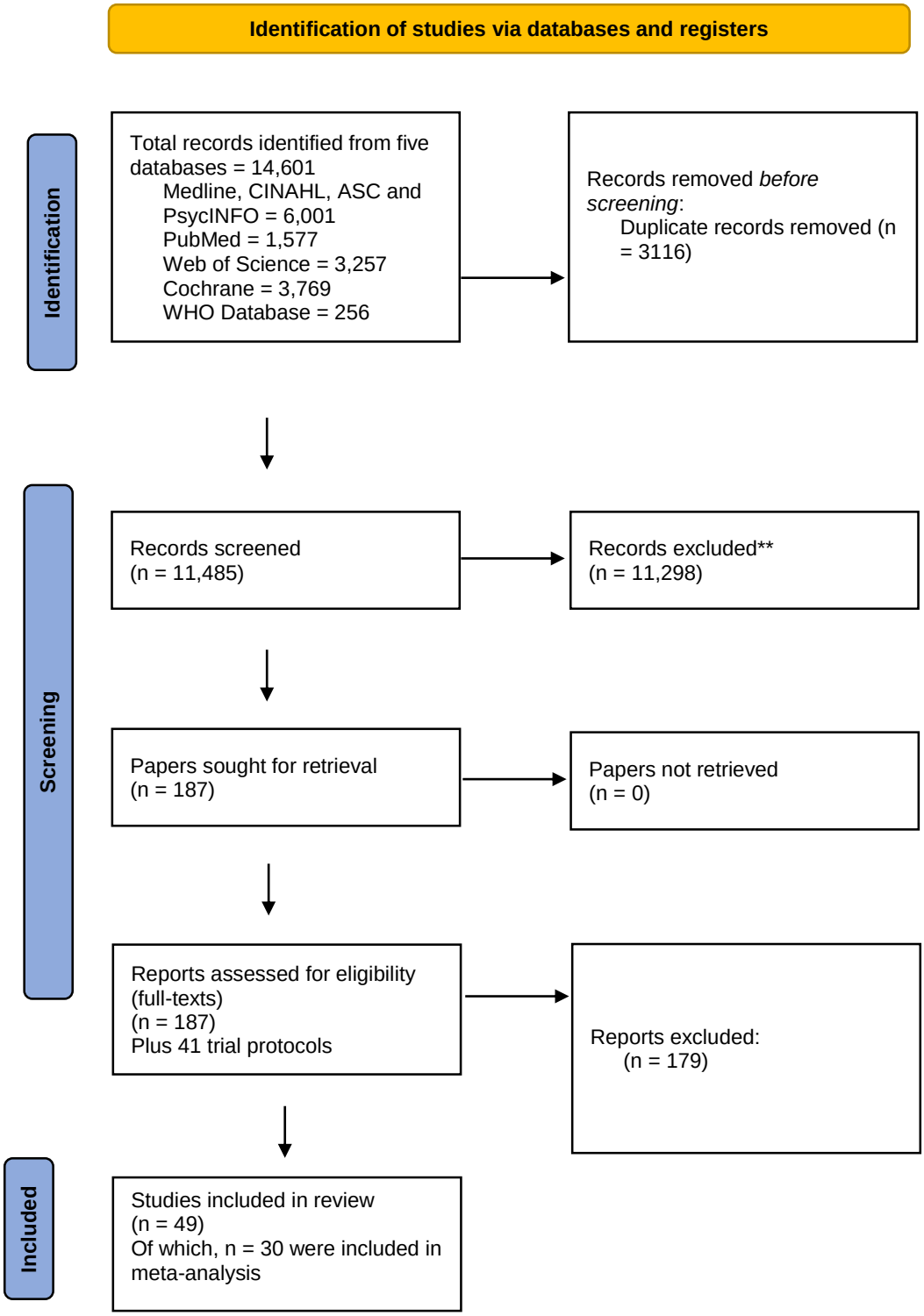
and abstracts of 11,485 papers were screened for possible inclusion. From these, the full-texts of 187 papers were checked, in addition to 41 trial protocols (which were checked for updates) by another reviewer and I independently. Following this further screening, a total of 49 studies were deemed eligible for inclusion in this updated review (see Table 23 and Table 24, Appendix D). From these, data from 30 studies were extracted and included in the meta-analysis part of this review (see Section 3.2.2.2. and Table 23 Appendix D).

3.2.2.1 Study/participant characteristics

Descriptive information relating to authors, year, participants, intervention, design, theoretical underpinning and results from each of the 49 studies included in this review is presented in Table 23 and Table 24 in Appendix D. The occupational profile of the participants varied. Most common were interventions delivered to health and social care workers (*n* = 13, including five delivered to nurses), followed by university staff and students, or a mix of professions (*n* = 4 each). The remainder were delivered to teachers, office/company employees, managers, firefighters, legal professionals, and police workers.

All of the interventions included in this updated review were individual-focused in target strategy, apart from one. This was a training programme for managers to help them understand and support the mental health needs of their staff (Gayed *et al*. 2019).

Figure 5: Updated Systematic Review of Online Work-Stress Management Interventions (PRISMA Flow Chart)



With regard to therapeutic content, interventions comprising solely or primarily of mindfulness techniques were most common (n = 11), followed by those based on cognitive-behavioural approaches (n = 10). Three interventions were informed by positive psychology, three were coping/resource-based and two were primarily focused on meditation. Only one intervention referenced the Covid-19 pandemic. This was a smartphone application that combined psychoeducation with cognitive-behavioural and mindfulness exercises for healthcare workers (Fiol-DeRoque *et al.* 2021). The remaining interventions comprised ACT, psychoeducation, or self-regulation exercises, respectively (see Table 23 and Table 24, Appendix D).

Just four interventions were theory-informed. Each of these referenced the Lazarus and Folkman (1984) Transactional Model of Stress and Coping. No other studies indicated that a stress-specific theoretical model was employed to inform the form or focus of their trialled interventions.

3.2.2.2 Meta-analysis

Of the 49 studies included in this updated systematic review, 30 were eligible for meta-analysis. Twelve studies were excluded from the meta-analysis as they did not utilise an inactive control group, while four did not assess changes in a stress-related outcome that was relevant to this review. Three studies did not provide sufficient data to be included in the meta-analysis, and the authors did the respond to requests for further information (see Table 24 in Appendix D). This left a total of 30 studies for inclusion in the meta-analyses part of this review.

The methodological quality of each study included in the meta-analysis was evaluated using the Cochrane Risk of Bias tool (Higgins *et al.* 2021). Ten studies were determined to be of high risk of bias in one of these domains only, while nine were determined to be of high risk of bias in two. However, 14 studies were deemed to be of unclear risk of bias in at least one other domain. The assessment results for each domain with each individual study are presented in Table 23 in Appendix D.

All participants in each study were randomly allocated to either an intervention or control condition as per the inclusion criteria. Nineteen studies indicated that the process of participant allocation was adequately concealed, though for elevn it was unclear whether this was the case. Only five were deemed to have achieved a low risk of performance bias by blinding participants to their condition. Blinding participants to their condition in a trial of a psychological intervention is recognised as very difficult (Juul *et al.* 2021).

The risk of detection bias was deemed to be low for each study on the basis that all participants were randomised and that intervention and control group participants completed the exact same measures at the same time points. The risk of incomplete outcome data was high for eleven studies which reported an attrition rate of greater than 20%. The risk of selective reporting was unclear for eighteen studies, as only twelve registered their trial and/or published a study protocol. In terms of other issues, a salient risk of bias related to the fact that each study used self-report measures as the primary method to assess the efficacy of their intervention. This is likely to have introduced a significant risk of bias.

In line with the Cochrane guidance as it related to an overall risk of bias judgement for a trial, each study included here was judged to be of high risk of bias, due to the fact that all were deemed to be high risk in at least one domain. To this end, the results as they relate to each study included in the updated review must be interpreted with a degree of caution:

Effects on Stress: A pooled analysis of nineteen studies (19 effect sizes, n = 1502) demonstrated a large effect size on reducing stress (g = - 0.91; 95% CI - 1.41; -0.40, $p < 0.01$. The level of heterogeneity was high ($I^2 = 94\%$).

Effects on Depression: A pooled analysis of thirteen studies (13 effect sizes, n = 1288) demonstrated a moderate effect on reducing depression (g = - 0.581; 95% CI – 1.02; - 0.14, $p = 0.01$. The level of heterogeneity was high ($I^2 = 95\%$).

Effects on Anxiety: A pooled analysis of eight studies (eight effect sizes, n = 1973) demonstrated a small non-significant effect on reducing anxiety (g = 0.255; 95% CI - 0.3204; 0.835, $p = 0.394$. The level of heterogeneity was high ($I^2 = 83\%$).

Effects on Mindfulness: A pooled analysis of eight studies (eight effect sizes, n = 1504) demonstrated a small effect size on improving mindfulness (g = 0.498; 95% CI 0.1272; 0.8704, *p* = 0.0156. The level of heterogeneity was moderate (I^2 = 87.6%).

Effects on Well-being: A pooled analysis of eight studies (eight effect sizes, n = 1728 demonstrated a small effect size on improving well-being (g = 0.4142; 95% CI .0116; 0.8167, *p* = 0.0452. The level of heterogeneity was high (I^2 = 77.6%).

Effects on Burnout: A pooled analysis of eleven studies (eleven effect sizes, n = 2218) demonstrated a small effect size on reducing burnout (g = - 0.365; 95% CI - 0.6317; - 0.0986, *p* = 0.0122. The level of heterogeneity was high (I^2 = 90%).

3.2.3 Summary of systematic review and meta-analysis findings

The findings of this updated systematic review and meta-analysis are broadly consistent with previous reviews of this literature (e.g. Carolan, Harris and Cavanagh 2017, Phillips Gordeev and Schreyögg 2019). This updated review found that online work-stress management interventions are, on average, associated with small to moderate improvements for workers on outcomes of depression, burnout, mindfulness and psychological well-being. A large average effect size was identified for studies which assessed changes in stress. The effect size for anxiety was small but non-significant, possibly due to the limited number of studies included and a high degree of heterogeneity.

With regard to form and focus, it would appear that online mindfulness-based interventions for workers have become increasingly popular in recent years. Four such interventions were included in the Phillips, Gordeev and Schreyögg (2019) systematic review, with a further eleven included in the updated review here. Smartphone-delivered interventions also appear to have increased in popularity, as six such interventions were included in the existing review, compared to nine in this updated review. Interestingly, all of the interventions delivered via smartphone application utilised mindfulness approaches, either solely or combined with positive psychology, behavioural activation, CBT, or ACT.

The scarcity of theory-informed interventions in this updated review is consistent with existing literature as it relates to online work-stress management interventions. For example, just five of the interventions included in the Phillips, Gordeev and Schreyögg (2019) systematic review were informed by a theoretical model. Two of these were referenced to Social Cognitive Theory and the Trans-theoretical Model, while three were referenced to the Lazarus and Folkman Model of Stress and Coping. Online work-stress management interventions which draw upon a stress-specific theoretical model still remain the exception rather than the norm (Kröll, Doebler and Nüesch 2017). This is surprising considering the multitude of work-stress models which currently exist, many of which are well-validated and have been employed in occupational stress research for several decades now (Siegrist 2017).

A novel development in the literature was the publication of an online intervention with an organisational focus (Gayed *et al.* 2019). This targeted the interface between the user and their working environment, by providing managers with the skills and knowledge to deliver psychological support to their co-workers. Though it was not associated with positive changes in stress-related outcomes for workers, it may represent a first step in the development of online interventions that incorporate this target strategy. The implication of this as it relates to the DELAROSE programme is explored in Section 3.4.

Though the findings of this updated review confirm existing knowledge about the efficacy of online stress management interventions delivered to workers, caution is still required when drawing conclusions about the likely efficacy of individual interventions (such as DELAROSE) with specific groups (e.g. ageing health and social care workers). It is clear from this and previous reviews that online work-stress management interventions can vary greatly on features such as content, duration, guidance, and target audience (see Tables 24, 25 and 26 in Appendix D). For these reasons, a reflection on the DELAROSE programme in the context of what is known about similar online work-stress management interventions is presented in Section 3.4 of this chapter. This reflection also drew upon the findings of a review of the literature as it relates to qualitative evaluations of online work-stress management interventions, the conduct and outcome of which is now presented.

3.3. A scoping review of the qualitative literature

In addition to updating an existing systematic review and meta-analysis, a scoping review of the literature as it relates to qualitative evaluations of workers' experiences of online stress management interventions was conducted. This was important for several reasons. First, estimates of intervention efficacy (as determined through the systematic review and meta-analysis in the first part of this chapter) provide limited insight into the positive and negative aspects of online work-stress management interventions, or the factors associated with their uptake and usage. Indeed, adherence to online interventions is often low (Carolan, Harris and Cavanagh 2017), and it is possible that the context of the workplace may impact on how interventions such as DELAROSE are received, especially by workers who are time poor or have difficulty accessing in-person supports.

Second, reviewing the literature as it relates to both quantitative and qualitative evaluations of online work-stress management interventions facilitates a more complete reflection on the DELAROSE programme in the context of what is known about similar interventions available globally. Third, the findings of this review provide an important frame of reference for the findings of the qualitative evaluation of DELAROSE as part of objective three (Study Two) of this research (see Chapter One, Section 1.3.3).

For these reasons, a scoping review of the literature as it relates to qualitative evaluations of online work-stress management interventions was undertaken. This review sought to answer the question: 'What is known from the qualitative literature about workers' experiences of undertaking online stress management interventions?' The conduct and findings of this review, which was informed by the Arksey and O'Malley (2005) framework (see Chapter Two, Section 2.1) are now presented.

3.3.1 Methods

A systematic literature search using the electronic databases Medline, CINAHL, PsycINFO and Academic Search Complete databases from January 2000 to January 2023 was undertaken. The search terms employed were the same as those used for the systematic review of the literature in Section 3.2.

The following inclusion criteria were applied:

1) Studies which explored the experience of undertaking a psychological intervention focused on work-stress management and/or a stress-related

outcome; the intervention must have been delivered via the Internet, mobile technology (e.g. smartphone application), e-mail or a computer programme;

2) Studies that included employed participants aged 18 years or over (full-time/part-time employed and self-employed working individuals) only;
3) Studies that were published in English between the years 2000 and 2022;
4) Studies which utilised qualitative designs or collected qualitative data (including mixed methods studies).

The review was limited to studies which employed qualitative methods to explore workers' experiences of undertaking online work-stress management interventions. This was defined as the collection and analysis of non-numerical data obtained by methods such as observation, interviews, focus groups, documents and case studies. Review papers, meta-analyses or meta-syntheses, interventions not delivered via an online modality, papers not published in English, and studies in which participants were not recruited from a working population were excluded. Interventions aimed exclusively at workers with a clinical psychiatric or mental health diagnosis, or if the participants exclusively comprised those on extended sick leave, were also excluded.

Experience was taken to refer to workers' perceptions of the positive and negative aspects of an intervention, such as reported usefulness in managing their work-related stress, and factors that may have impacted upon their engagement with the intervention. These included, but were not limited to, the acceptability of the intervention, adherence to the intervention, or the facilitators and barriers to using the intervention.

3.3.2 Results

The initial literature search returned a total of 4,053 papers from all databases. Following the removal of 864 duplicates, the title and abstracts of 3,189 papers were screened for relevance to the review. This left 173 full-texts to be read and checked against the inclusion criteria. The reference lists of these studies were also searched for additional relevant papers. One paper was identified this way. A total of 14 papers were deemed suitable for inclusion (see Figure 6 for a flow chart of study selection process).

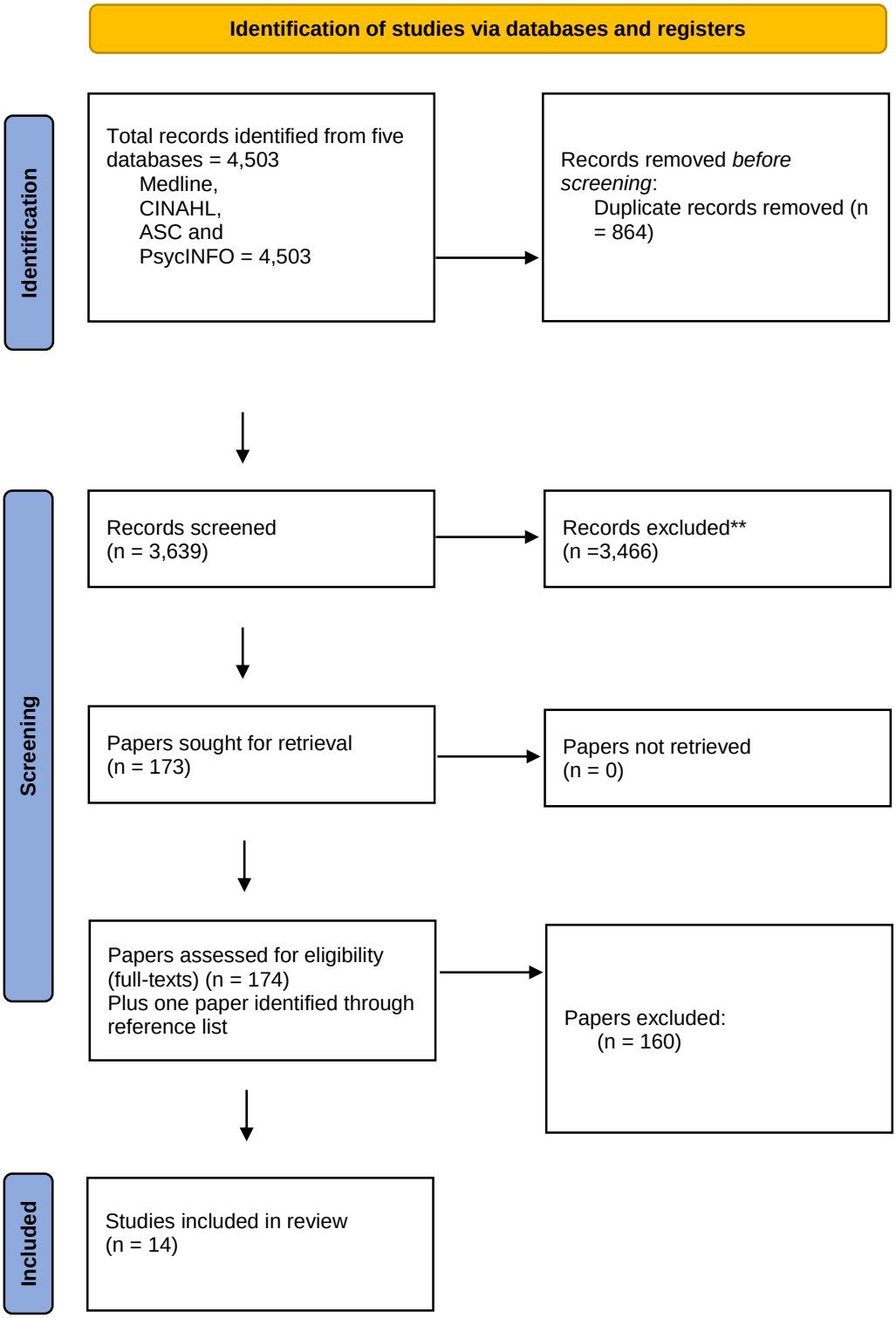
Data relating to the study authors, country, sample characteristics and key findings were extracted from each of the 14 included papers and charted (see Table 28, Appendix D). The number of participants ranged from 4 to 70 (mean = 27.1 participants per study). Five studies recruited health and social care personnel as participants, while three recruited participants from a range of occupations. Two studies each were conducted with university staff and workers in the Information and Communication Technology (ICT) sector, one study recruited apprentice workers, and one agriculturists.

Each of the interventions were person-centred and individual-focused in nature, though their therapeutic content varied (see Table 27, Appendix D). Five employed a combination of different approaches, such as cognitive behaviour therapy (CBT), problem-solving therapy (PST), positive psychology and mindfulness; two were solely mindfulness-based, while two comprised a range of lifestyle interventions. One intervention comprised solely of internet CBT, another was based on positive psychology, and one was based on Acceptance and Commitment Therapy. The remaining interventions were an anxiety and stress training programme for Covid-19 and a smartphone app that included psychoeducation and access to a vocational rehabilitative assistant.

Seven studies collected qualitative data only, while the other seven collected both quantitative and qualitative data. Of these, five studies collected data through both written questionnaires and interviews, while the remaining two were questionnaire-based, utilising multiple-choice or validated 'Likert'-scale measures, in addition to open-ended questions with a 'free-text' response.

Nine studies collected their qualitative data using individual semi-structured interviews or focus-groups. Three studies analysed responses obtained from open-ended survey questions, while two analysed data from individual interviews or a focus group combined with responses to written open-ended survey questions.

Figure 6: Review of Qualitative Literature Re: Online Work-Stress Management Interventions (PRISMA Flow Chart)



3.3.2.1 Quality assessment

The qualitative component of the Mixed Method Appraisal Tool (MMAT) version 2011 (Pace *et al*., 2011; Pluye *et al*. 2009; 2011) was used to assess the methodological quality of the included research. Of the 14 studies reviewed here, 12 fulfilled three out of the four criteria, indicating that they achieved a high standard of methodological quality (see Table 27, Appendix D). Each of these studies were guided by a clear aim and research question, while their use of specific designs and the selection of participants was relevant to the research question at hand. Each study described a process for analysing qualitative data that was robust and appropriate. Consideration was given to the strengths and limitations of the research and the context in which the data were collected (particularly in the case of studies that collected data during the Covid-19 pandemic). Where these studies were deemed to lack rigour was in the absence of researcher reflexivity, in terms of discussion of the influence of the researchers on their interpretation of the data.

Of the remaining two studies, one fulfilled two out of the four criteria and one fulfilled just one criterion. These studies failed to indicate how the qualitative data was analysed, nor did they provide a clear link between the reported findings and the data itself. There was also a lack of reflexivity and discussion of the context in which the data was obtained. In keeping with established processes for conducting scoping reviews, these studies were not excluded from this review (Levac, Colquhoun and O'Brien 2010).

3.3.2.2 Thematic analysis

Thematic analysis of the findings of these studies generated four themes. Namely, these were the positive features of online work-stress management interventions; barriers to online work-stress management; the benefits of online work-stress management, and improving work-stress interventions. Each theme is now discussed in turn.

The Positive Features of Online Work-Stress Management Interventions

Online work-stress interventions have been praised for being easy to use and navigate (Asplund *et al*. 2019, Murraiskangas *et al*. 2016). Workers appreciate online interventions that are personalised and have an attractive appearance and

feel (Deady *et al*. 2020, De Korte *et al*. 2018, Freund *et al*. 2022). User-friendly technology, flexibility and accessibility appear to be important in terms of fostering worker engagement with these interventions (Blake *et al*. 2021, Deady *et al*. 2020, de Korte *et al*. 2018, Freund *et al*. 2022).

Combined with the positives of a practical design is applied utility. The skills and knowledge provided by online work-stress management interventions are valued when they translate readily into the workplace (Murraiskangas *et al*. 2016) and help workers to embed changes in their normal routines (de Korte *et al*. 2018, Xu *et al*. 2021). Workers have also indicated that a meaningful depth of information as it relates to work-related stress is important to them. This includes guidance towards extraneous supports and resources that can be accessed in the future, as required (Ravalier *et al*. 2020). Indeed, several of those who undertook an online mindfulness programme delivered by Murraiskangas *et al.* (2016) stated that they would continue to use it beyond the study period as a toolkit for personal well-being.

Nonetheless, what has been described as a positive feature of an online work-stress intervention by some workers has been perceived as a negative by others. For example, Blake *et al*. (2021) found that workers need such interventions to strike a balance between a sufficient depth of content and overwhelming them with their extensiveness (i.e. providing an unmanageable volume of material in a single programme). Others (e.g. Eccles *et al.* 2021) reported that workers expressed concerns about privacy particularly as it relates to managers accessing data or being aware of employees using online work-stress supports (de Korte *et al*. 2018, Heyen *et al*. 2021). The provision of a Vocational Rehabilitative Assistant was met with scepticism by some workers in Ravalier *et al*.'s (2020) study, as they were concerned about privacy, anonymity and data protection. In contrast, Freund *et al.* (2022) found that having a positive relationship with an expert e-coach who provided personalised guidance and expertise was an important driver of workers' acceptance of and satisfaction with their online stress management intervention.

Some features of online work-stress management have been perceived as both positive and negative. Carolan and de Visser (2018), for example, found that

workers experienced the flexibility and anonymity provided by online modalities to be both a facilitator of and barrier to intervention completion. Similarly, Murraiskangas *et al*. (2016) reported that workers regarded being able to engage with an intervention at one's own pace as both a benefit of online delivery and a potential challenge to completing the intervention.

Barriers to Online Work-Stress Management

Workers have described a number of barriers to engaging in online stress management interventions. On a personal level, a lack of time and excessive stress (arising from extensive workplace demands, for example) have formed barriers to undertaking or completing these interventions (Carolan and de Visser, 2018, Eccles *et al*. 2021, Muuraiskangas *et al*. 2016, Xu *et al*. 2021). Prioritising online stress management in the face of other demands, such as family responsibilities, long hours or undertaking additional training can be a challenge for workers.

In terms of barriers related to the interventions themselves, the provision of content that is overly extensive or too demanding for workers can negatively affect engagement (Asplund *et al.* 2019, Eklund *et al*. 2018). As noted in the previous theme, what may comprise a meaningful depth of content for some workers may serve to overwhelm others. The format of such content has also been identified as a potential barrier, in that providing much text can be off-putting (Eccles *et al*. 2021, Freund *et al*. 2021). Functionality issues are also a barrier to intervention use, as workers have expressed dissatisfaction with intervention designs that are unclear, frustrating, or make is difficult to navigate to desired content (Eklund *et al*. 2018, Murraiskangas *et al*. 2016). Systems that do not operate smoothly or that drain heavily on smartphone battery life have been linked to drop-out (de Korte *et al*. 2018).

The Benefits of Online Work-Stress Management

Workers described positive impacts on mental health, including better stress and anxiety management, psychological relief, and improved concentration as a result of undertaking online work-stress management (Asplund *et al*. 2019, Deady *et al*. 2020, Muuraiskangas *et al.* 2016, Xu *et al*. 2021). However, the efficacy of such interventions, in terms of whether workers feel less stressed,

for example, has formed only a minor aspect of qualitative investigations to date. This is most likely because the question of efficacy as it relates to several of these interventions has already been addressed as part of separate quantitative investigations, either through randomised controlled trials (e.g. Eklund *et al*. 2018, Xu *et al*. 2021) or cohort studies (e.g. Blake *et al*. 2021, Heyen *et al*. 2021).

Rather, qualitative investigations of online work-stress management have tended to take a broader focus and explore workers' perceptions of how they benefited from these interventions. For example, some workers reported benefits related to raising awareness of psychological wellbeing and providing new insights into and knowledge of workplace stress management (Asplund *et al*. 2019, Eklund *et al*. 2018). Practical advice on protecting psychological well-being, particularly within the context of the Covid-19 pandemic, was especially helpful for some workers (Blake *et al*. 2021, Parker *et al*. 2022). This encompassed both personal well-being and the ability to direct colleagues to support. With others, the benefits of online work-stress management centred on support for behaviour change, building a social connection within their organisation (Asplund *et al*. 2019, Parker *et al*. 2022) or helping them to increase their emotional control, compassion and self-awareness (de Korte *et al*. 2018, Parker *et al*. 2022, Osman *et al*. 2021).

Improving Online Work-Stress Management Interventions

The final theme generated from the findings of these qualitative investigations relates to workers' perceptions of how online work-stress management interventions can be improved. For example, some workers have indicated a need for reminders or group sessions in order to help sustain engagement with the intervention (Deady *et al*. 2020, Eklund *et al*. 2018, Muuraiskangas *et al*. 2016). Others have indicated a need for access to coaching support or longer term follow-up to mitigate against a lack of support when an intervention ends (Asplund *et al*. 2019).

Most proposed improvements related directly to the barriers that workers encountered while undertaking an online work-stress intervention. These included the provision of interactive features and the segmentation of textual

content with audio and video clips (Blake *et al*. 2021, Asplund *et al*. 2019). Shorter interventions, perhaps covering fewer topic areas in greater depth, could also help avoid overwhelming workers who are experiencing much stress or are unable to engage with a large amount of content (Blake *et al*. 2021). These could help to make interventions more engaging. Managing concerns relating to privacy may also be beneficial (Heyen *et al*. 2021). Assuring workers of the confidentiality of their data or that their use of an intervention will not be made known to colleagues or management may be helpful in this regard.

3.3.3 Summary of findings from the qualitative scoping review

Fourteen studies met the inclusion criteria for this scoping review of qualitative evaluations of online work-stress management interventions. Apart from one (Muuraiskangas *et al.* 2016), all were published between 2018 and 2022, indicating that research interest in how workers experience online stress management is relatively new and growing quickly. Four interventions were developed specifically to support workers manage the stress created by the Covid-19 pandemic (Blake *et al.* 2021, Heyen *et al.* 2021, Osman, Hamid and Singaram 2022, Parker *et al.* 2022). This highlights the value of online modalities in terms of accessibility and convenience. All were received positively and were valued by workers for improving their understanding of stress and protecting their psychological well-being.

Much of the literature (12/14 studies) was good or very good in methodological quality (based on MMAT assessments). This means that there can be meaningful confidence in the trustworthiness of these findings. The use of qualitative methods in a rigorous manner enabled rich, contextual and credible insight into the experiences of undertaking online work-stress management interventions to be generated.

As indicated in Sections 3.1 and 3.2 of this chapter, online work-stress management interventions vary across a range of features, including the therapeutic content they provide. This is reflected in the interventions included in this review. Nonetheless, it appears that workers' experiences of online stress management interventions do not vary widely according to content, particularly as it relates to issues of facilitators, barriers or the benefits of such interventions.

This meant that it was possible to generate meaningful patterns across the findings of the studies included in this review.

There are some notable differences between workers' experiences and what is known about the experiences of the general population in engaging with online stress management interventions (e.g. Bendelin *et al.* 2011, 2020, Berg *et al.* 2020, Darvell *et al.* 2015, Rozenthal *et al*. 2015). Perhaps most significant is the issue of time. Several studies included in this review reported that workers struggled to make time to undertake online stress management. This is understandable given that those seeking online work-stress management interventions are likely to be experiencing a high level of workplace demands. Linked to this is the fact that some workers experienced the interventions as overly extensive in nature, providing an excessive amount of content which they felt was unmanageable. This contributed to additional pressure on these workers.

A further difference is that of confidentiality. This is a factor in which the context of the workplace appears to have an influence, as workers have reported a need for reassurance that their use of online stress management interventions is private and that their data cannot be obtained by management or colleagues. The issues of time management, excessive content and the need for confidentiality are particularly pressing for workers as it relates to online stress management interventions. The impact of these issues as they may relate to DELAROSE are discussed in Section 3.4.2.2.

The workers recruited in these studies were either health and social care professionals, university staff, ICT workers or from a range of predominantly office-based professions. While it is positive to note the consistency of findings across populations, it is possible that the workers' experiences could vary across occupational sectors (e.g. workers in blue-collar roles may differ to those in office-based managerial positions). Demographic differences such as age could also have an impact. These have not been examined to date. Investigation of differences according to age in the experience of undertaking the DELAROSE programme, which forms the focus of Study Two (objective four) of this research, addresses this gap in the literature.

3.4 DELAROSE and online work-stress management interventions

The following section presents a reflection on the DELAROSE programme in the context of similar online work-stress management interventions. An examination of the DELAROSE programme as a stress management intervention was performed in order to guide this process. Informed by the reviews of the quantitative and qualitative literature relating online work-stress management interventions (Sections 3.2 and 3.3), interventions of comparable focus, content, modality and target audience to DELAROSE are considered in terms of the evidence for their efficacy and how they have been received by workers. Potential strengths and weaknesses of the DELAROSE programme are deliberated.

3.4.1 Examining DELAROSE as a work-stress management intervention

Work-stress management interventions can be categorised across a range of domains, including content, modality of delivery, population of interest, prevention level, and target strategy. This is important as any reflection on the DELAROSE programme in the context of similar interventions developed and evaluated elsewhere first requires a clear understanding of the nature of the programme as an online work-stress management intervention.

In line with de Jonge and Dollard's (2002) adapted matrix of target strategies and prevention levels, DELAROSE can be categorised as a multi-module and multi-component programme that targets both the individual and interface between the individual and their organisation (see Table 4). Though DELAROSE is a person-centred programme (i.e. completed by an individual user), it contains content relevant to both the individual and the relationship between the individual and their working environment.

For example, Module One contains psychoeducational, cognitive-behavioural and relaxation-based content, with the aim of providing learners with the skills and knowledge to manage their own personal levels of stress. Module Two, in contrast, aims to provide learners with the skills and knowledge to create a less stressful working environment, through content focused on organisational policies, ergonomics, and risk assessment. DELAROSE cannot be considered an organisational intervention as it does not directly influence or change the

workplace itself (although potential outcomes of the programme may include changes to the structure or nature of the working environment, to the benefit of persons beyond the target user). While the content in Module Two of the programme is organisationally focused, in reality it targets the relationship between the individual learner and their working environment, rather than directly changing the organisation itself.

DELAROSE is not an online clinical psychological programme. Though persons experiencing psychological distress may enrol in the programme and benefit from it, it is not the aim of the programme to provide therapeutic interventions (either self-help interventions or online therapy) to treat distress, burnout or mental illness. Furthermore, while the programme introduces learners to cognitive-behavioural and problem-solving approaches, it does not deliver online Cognitive Behaviour Therapy. Consistent with the focus of ROSE and DELAROSE, the aim is to provide learners with the skills and knowledge to manage their personal stress and contribute to creating a less stressful working environment.

While DELAROSE is targeted towards health and social care workers, the extent to which the programme content is actually tailored to these sectoral groups is unclear. As discussed in Chapter One, the ROSE project team utilised an evidence-based approach, drawing upon a review of the stress management literature and the conduct of focus group and survey approaches, to ensure that the programme targets specific stressor issues as experienced by these groups. However, aside from the addition of a Unit of Learning on Challenging Behaviour to the DELAROSE programme, much of the content is generic in nature and could be used by a wide range of workers.

Table 4. Analysis of the DELAROSE Programme as a Work-Stress Management Intervention

Delivery:	Delivered as an accredited online learning programme via dedicated webpage through Institute website. Exact timeframe for completion is unspecified, but up to two academic semesters afforded to learners to complete programme.
Support/Guidance:	Asynchronous delivery, support from tutor available as required.

Structure:	Two modules, equally weighted (10 ECTS credits each) but with different theoretical underpinning, aims, target strategies and content.	
	Module One: Person-Centred Management of Work-Related Stress	***Module Two: Environment-Centred Management of Work-Related Stress***
Theoretical Underpinning:	Lazarus and Folkman's Model of Stress and Coping. Draws on principles of cognitive-behaviour therapy.	Psychoeducational in nature, theoretical basis unspecified.
Aim:	Provide learners with skills and knowledge to cope with and manage personal levels of work-related stress	Provide learners with skills and knowledge to contribute to a less stressful working environment
Target Strategy:	Individual-focused	Individual/Organisation Interface-focused
Content:	Multi-component: Psychoeducation (Introduction to Stress), Well-being (Sleep/Nutrition), Cognitive Therapy, Relaxation and Mindfulness, Giving Feedback, Physical Activity.	Multi-component: Psychoeducational in nature, Risk Assessment, Organisation and Stress, Leadership & Motivation, Ergonomics, Managing Change, Policies.

The ROSE programme was referenced to a model of stress to explain the mechanism of the intervention, which is the exception rather than the norm in the stress management literature. The Lazarus and Folkman (1984) Transactional Model of Stress was chosen for this purpose as it gives weight to subjective perceptions and recognises the importance of enhancing coping behaviours as a method of reducing perceived stress. This made it particularly useful for ROSE as it does not treat all people as if they were alike, instead allowing for the individual's own perspective of their workplace (Lazarus 1991).

The principles of cognitive-behavioural approaches and the importance of enhancing coping behaviours as a method of reducing perceived stress are

consistent with this theoretical framework and are employed in the design of the ROSE and DELAROSE programmes. However, while it is clear how the model was employed in Module One of DELAROSE (Person-Centred Management), there is no indication from the project literature or the intervention itself whether or how a work-stress theoretical model was employed in the design of the second module, which is management-focused and targets the interface between the user and their working environment.

3.4.2 Reflection on the DELAROSE online stress management programme

Phillips, Gordeev and Schreyögg (2019) included 50 randomised controlled trials in their systematic review of the online work-stress management intervention literature. Examination of these 50 trials indicated that 39 assessed changes in stress and/or a stress-related outcome (including anxiety, depression, psychological well-being and burnout) following delivery of an online intervention. Data relating to all 39 of these trials (plus two papers that reported one-year follow-up data), were extracted and charted in Appendix D (the remaining eleven studies assessed changes in alcohol intake, mindfulness or insomnia only). Interventions of comparable focus, content, modality and target audience to the DELAROSE programme were identified from this body of 39 trials, the 49 trials included in the updated systematic review reported in Section 3.2, and the 14 studies included in the qualitative review of the literature included in Section 3.3. A reflection on DELAROSE in the context of these interventions is now presented.

3.4.2.1 Programmes comparable to DELAROSE in overall form and focus

DELAROSE is a multi-module and multi-component stress management programme, which combines psychoeducational, cognitive-behavioural, relaxation-based and management-specific content. It is delivered over a number of weeks via a website and targets both the individual and the interface between the individual and their organisation. Initial examination of the studies charted in Appendix D indicated that no evaluative studies of online work-stress management interventions of this specific nature currently exist.

This was because, with the exception of Gayed *et al.* (2019), all identified interventions were purely individual-focused in terms of their target strategy. This highlights that DELAROSE is relatively unique as an online stress management intervention. Incorporating a dual individual and organisational focus is arguably a strength of the DELAROSE programme, as it supports workers in managing stressors as they arise at a personal and workplace level. This is important given that work-related stress is postulated to arise from a combination of personal and organisational factors (Althaus, Kop and Grosjean 2013). This was reflected in the findings of the reviews of the literature presented in Chapter Two as they related to the experience of ageing nurses and intellectual disability care workers.

Only one online work-stress management intervention that targets the workplace has been evaluated by randomised controlled trial to date (Gayed *et al*. 2019). There was little evidence for the efficacy of this intervention in reducing worker stress. It is unclear, therefore, whether the organisational content employed in DELAROSE is likely to be useful in supporting workers to contribute to a less-stressful working environment. This is an issue reflected in the 'in-person' work-stress management literature also, as few organisational-focused interventions have been trialled, and the evidence for their efficacy to date is limited, according to a number of reviews (e.g. LaMontagne *et al.* 2007, Bhui *et al.* 2012, Holman, Johnson and O'Connor 2018).

3.4.2.2 Programmes comparable to Module One of DELAROSE

Online work-stress management interventions can vary considerably in terms of their length, modality and content. This heterogeneity means that only a relatively small number of evaluative studies of online work-stress management interventions similar in nature to Module One of DELAROSE (i.e. Person-Centred Management of Work-related Stress) were identified.

Most similar perhaps are the 'Get.On Stress' and 'Get.On Recovery' interventions, which are psychoeducational in nature and informed by the Lazarus and Folkman (1984) Transactional Model of Stress and Coping. These comprise a number of individual modules of cognitive-behavioural, relaxation

and problem-solving-based content for workers, and are delivered via a dedicated website as well as in combined website and mobile formats. They have been evaluated through several high quality randomised control trials and are associated with significant medium to large reductions in worker stress post-intervention (Ebert *et al.* 2014, 2016, 2022, Heber *et al.* 2016, Nixon *et al.* 2022, Thiart *et al.* 2015).

There are two key strengths to these specific interventions that are of relevance to DELAROSE. First, they are theory-informed and draw upon evidence-based approaches, a characteristic shared with Module One of the DELAROSE programme. Research on in-person work stress management interventions suggests that those with fewer components and more sessions are superior. Indeed, van der Klink *et al.* (2001) suggest that at least six sessions are required for work-related stress management interventions to be effective. That Module One of DELAROSE is also theory-informed and draws upon a number of evidenced-based components such as cognitive-behavioural and relaxation-based exercises is a strength of the programme.

Second, these interventions are delivered in a guided format. Guided work-stress interventions appear to be more effective than those that are unguided (Carolan, Harris and Cavanagh 2017). Researchers also used mobile components to introduce training content into daily life. These features likely enhanced the efficacy of these interventions. Considerable efforts were also taken to increase adherence through methods that are generally considered to be effective, including human support, interactive exercises, tailoring, and reminders via mobile phone. As a result, a relatively high level of adherence was achieved during these trials. This could indicate a limitation of the DELAROSE programme in that it is entirely asynchronous and the support provided to learners is not specifically focused on sustaining adherence or engagement.

Other multi-module individual-focused interventions similar in nature to Module One of DELAROSE have been developed and delivered. These were all delivered via a website over a 5 to 12-week period and comprised cognitive-behavioural techniques combined with other therapeutic approaches such as

relaxation, mindfulness, coping skills and time management (Andersson *et al.* 2022, Ansley *et al.* 2021, Billings *et al.* 2008, Carolan *et al.* 2017, Eklund *et al.* 2021, Hasson *et al.* 2005, Persson *et al.* 2018). Each of these programmes were associated with significant improvements in worker stress and psychological well-being post-intervention. However, these trials were of a lower methodological quality than the aforementioned Get.On Stress and Get.On Recovery interventions, meaning that caution should be exercised when interpreting these findings.

A suggestion raised by the authors of several studies was that the beneficial effects of some online stress management interventions may be long-term in nature. The veracity of this claim in relation to DELAROSE is difficult to assess. This is because only one study has examined the longer-term effects (i.e. beyond six months) of an online work-stress management intervention that is similar to DELAROSE. This was a six-week problem-solving, cognitive therapy and psychoeducational programme (Geraedts *et al.* 2014a) that was found to produce small significant improvements in anxiety and emotional exhaustion post-intervention. However, there were no significant differences between the intervention and control group at one-year follow-up (Geraedts *et al.* 2014b). Unfortunately, a poor response rate and much missing data was a significant issue with this study, and likely contributed to this lack of a positive effect at follow-up. At this stage, the potential long-term effects of an intervention such as DELAROSE cannot be predicted with any certainty.

Four interventions of similar modality and content to Module One of DELAROSE have been evaluated using qualitative methods (Asplund *et al.* 2019, Carolan and de Visser 2018, Eccles *et al.* 2022, Eklund *et al.* 2018). Participants were workers recruited from a range of occupational settings. These interventions were praised for their flexibility, convenience and user-friendly interface, and criticised in cases where they lacked functionality or their design caused frustration. Therapeutic content relevant to a work-based context was highly valued by participants, as was material that was engaging and interactive (e.g. text combined with video/audio content and discussion with others). Participants needed reminders to stay focused on these interventions and to help ensure that they remained engaged with them.

These findings suggest that there several strengths to the DELAROSE programme in its current format. For example, it is delivered online using Moodle software, which is designed to be learner-centred and user-friendly. It is can also be accessed through both desktop and mobile modalities. A further strength of DELAROSE is that learners have access to lecturer support and guidance as required. This is likely to be valuable in sustaining learner engagement (as evidenced by the findings as they relate to the aforementioned Get.On Stress interventions). While the learning content of DELAROSE is tailored to the workplace, it is not specific to health and social care workers, which could be a limitation should such workers perceive it to be too generic for them.

Consistent with the findings of the thematic analysis of the qualitative literature presented in Section 3.3, two key issues for workers undertaking these interventions were a lack of time and privacy. That many workers had limited free time to engage in these interventions is likely to be a significant challenge with the DELAROSE programme given that it is a 20 ECTS learning programme undertaken over a period of several months. With regard to privacy, workers expressed a need for confidentiality and assurance that their workplace colleagues or managers could not access their contributions or know that they were undertaking these interventions. The may reflect a strength of the DELAROSE programme, in that enrolment in the programme is private. Other learners cannot see who else is enrolled in the programme, unless they choose to participate in open discussion forums.

3.4.2.3 Adherence to online stress management interventions

An issue of much relevance to DELAROSE is that online work-stress management interventions are susceptible to low levels of adherence (i.e. users failing to complete these an intervention in full). Indeed, a low completion rate was a defining characteristic of a small number of studies of online work-stress interventions comparable to DELAROSE which reported unfavourable outcomes. For example, Ketelaar *et al.* (2013) and Bolier *et al.* (2014) trialled an online intervention for nurses and allied health professionals in which participants completed and received feedback on a health surveillance module.

They were then offered a range of tailored online interventions (which targeted psychological well-being, depressive and panic symptoms, work-related stress, and problem drinking). There was little evidence to support the efficacy of these interventions, due primarily to low user engagement and high attrition.

Likewise, Abbott *et al.* (2009) found that their ten-week resilience skills intervention produced no significant differences versus controls post-intervention on scores of distress, quality of life, happiness or work performance. This was attributed to the fact that the study had a small sample size and high attrition. These were also issues with Umanodan *et al*.'s (2014) seven-week intervention based on behavioural, communication and cognitive techniques. This was found to have no effect on measures of work performance, job satisfaction, social support, problem-solving, avoidance or suppression.

The implication of this is that it is likely that the DELAROSE programme will be susceptible to low levels of adherence. The programme literature does not specify any components that are designed to sustain the engagement of users and ensure that they complete the programme in full. This could prove to be a significant limitation of the programme.

Much evidence already points to the value of support in fostering adherence to online interventions (Titov *et al.* 2013, Furmarl *et al.* 2009, Alfonsson *et al.* 2016). Indeed, the Get.On Stress and Get.On Recovery interventions, which are similar in nature to DELAROSE, drew upon the principles of human support and a model known as Supportive Accountability (Mohr Cuijpers and Lehman 2011) to inform their delivery and encourage adherence. This was achieved with great success.

The use of an appropriate model of adherence to inform the design and delivery of DELAROSE could make a valuable contribution to sustaining the engagement of learners with the programme. The model is highly congruent to the form and focus of the DELAROSE programme. DELAROSE is a purely online programme that is delivered asynchronously, with tutor support provided as required. This type of human support is central to the Supportive Accountability model. Incorporated this model into the design and delivery of

the DELAROSE programme could be important in ensuring that learners complete the programme in full and benefit from the content on offer.

3.4.2.4 Online stress management and health and social care workers

ROSE and DELAROSE were developed with a specific target audience in mind, namely those involved in vocational and rehabilitative disability care work. Indeed, this study employs the programme as a case example to examine the requirements of ageing health and social care workers in their work-stress management. As such, it is worth reflecting upon the DELAROSE programme in the context of online work-stress management interventions developed for or delivered to health and social care workers. Phillips, Gordeev and Schreyögg (2019) identified two interventions that were delivered to this sectoral group (Bolier *et al.* 2014, Ketelaar *et al.* 2014). Both were trialled with a sample of nurses and allied health professionals. Support for the efficacy of these interventions was minimal, though Bolier *et al.* did report a significant increase in positive mental health three and six-months post-intervention compared to controls.

A number of evaluative studies of online work-stress management interventions delivered to health and social care professionals were included in the updated systematic review (Section 3.2). Again, the issue of heterogeneity, particularly in terms of content and modality, makes it challenging to reflect upon the DELAROSE programme in the context of these interventions. For example, one of these was an eight-week website-delivered positive psychology intervention. This was found to produce no significant differences on stress outcomes with a sample of nursing home staff (Kloos *et al.* 2019). Two other interventions were delivered to hospital staff using smartphone applications and associated with positive improvements in user stress-related outcomes. One of these was mindfulness-based (Coelhoso *et al.* 2019); the other was based on music, breathing, yoga and meditation (Hwang and Jo 2019). Imamura *et al.* (2021, 2022) trialled internet CBT and multi-module stress management interventions with large samples of nurses (n = 951 and n = 1200, respectively). Findings were mixed overall, with one intervention resulting in significant small reductions in psychological distress post-intervention (Imamura et al. 2022).

However, of two interventions trialled in another study (Imamura *et al.* 2021 one had no significant effect on symptoms of depression, while a second had a small significant effect post-intervention but not at follow-up.

Other interventions trialled with health and social care workers include Smoktunowicz *et al.*'s (2021) resource-based intervention delivered to medical professionals, Otared's (2021) online ACT sessions and Gollwitzer *et al.*'s (2018) mental contrasting/implementation intentions intervention trialled with a sample of nurses. All of these were associated with positive outcomes for users on stress-related outcomes, though are quite different in form to DELAROSE (and indeed most other online work-stress management interventions).

While these studies indicate that online work-stress management interventions can result in reduced stress and enhanced well-being among various groups of healthcare workers, all are different in nature to DELAROSE. Furthermore, all were determined to be of high risk of bias. It was notable also that no evaluative studies (quantitative or qualitative) of online supports delivered to those involved in social care provision (such as those engaged in supporting persons with an intellectual disability) were identified. This reflects the lack of support made available to social care workers during the Covid-19 pandemic (see Section 1.4). This is despite the fact that the pandemic has contributed to a significant crisis in the delivery of social care services, with workers in these services were among the occupational groups at highest risk of COVID-19 mortality (Hodgson *et al*., 2020). As such, the assertion that Module One of DELAROSE will be of benefit to health and social care workers is based on the evidence pertaining to similar online interventions delivered either to other occupational cohorts or in an in-person format.

This reflects a limitation of the literature rather than of interventions of the form and focus of DELAROSE. It is also mirrored in the qualitative literature. For example, four studies (Blake *et al.* 2021, Heyen *et al.* 2021, Osman, Hamid and Singaram 2021, Xu *et al.* 2021) reported on qualitative evaluations of online work-stress management interventions delivered to health and social care workers (specifically, first responders, emergency department staff, and health care trainees). Three of these were designed to provide support during the

Covid-19 pandemic. Each delivered content that was quite different to DELAROSE (with two comprising mindfulness, one based on leadership and positive psychology, and the other based on building resilience to stress and anxiety).

Findings were consistent with other qualitative studies, suggesting that the needs and preferences of health and social care workers may not differ to other occupational cohorts when it comes to the design and delivery of online interventions. With regard to DELAROSE, the key issues would appear to be the need for content to be personalised and attractive, the technology user-friendly, and the skills and knowledge provided practical and readily translated into the workplace. The engagement of health and social care workers with online interventions may be dependent on their ability to overcome a lack of time and to prioritise online stress management in the face of other demands, such as family responsibilities.

3.4.2.5 Age and online work-stress management

On a final note, only one randomised controlled trial of an intervention focused on a specific age cohort of workers has been published to date. This was a website-delivered intervention trialled by Cook *et al.* (2015) which targeted a range of health behaviours in IT workers aged over 50. No positive improvement on any stress-related outcome post-intervention was reported. No other study reviewed here considered age-related differences in the effectiveness of or user engagement with their interventions. This is similarly the case with the qualitative literature as it relates to online stress management interventions. As noted in Section 3.3.1.3, the influence of demographic differences such as age or gender on workers' experiences of stress management online interventions has not be explored to date.

This is unsurprising given that online modalities are a relatively new development in the work-stress management intervention literature. However, it is plausible that different age cohorts may vary in their acceptance and use of online platforms to support them in their management of their work-related stress. Though the DELAROSE programme was not designed with a specific

age cohort in mind, consideration of age-related differences in how the programme meets the needs and preferences of workers is worthy of investigation and provides significant justification for Objective Four of this research.

3.5 Conclusion

This chapter addressed objective three of this research as it related to providing a review of evaluative studies of online work stress management interventions and a reflection on the DELAROSE programme in the context of similar interventions developed and delivered elsewhere. A number of findings arising from work are relevant to the focus of this research as it relates to issues of age, health and social care work, and online work-stress management interventions.

First, DELAROSE appears to be relatively unique as an online work-stress management intervention as a result of its focus on both personal and organisational work-stress management. Almost all online work-stress management interventions evaluated to date (quantitatively or qualitatively) are individual-focused. Meta-analytic findings of this chapter confirm existing knowledge as it relates to the individually-focused online work-stress management interventions. In addition, a number of online interventions similar in content and modality to Module One of DELAROSE (which is individual-focused) have been evaluated through randomised controlled trials and are associated with significant improvements in worker stress-related outcomes. The multi-component format of this module, which draws upon theory-informed and evidence-based content, represents a strength of the programme. However, a lack of evidence for the efficacy of online interventions that encompass an organisational focus means that the utility of Module Two of DELAROSE, which is itself organisationally-focused, is unclear at present.

Second, low levels of adherence (in terms of users completing an intervention in full) appear to be a significant issue with many online work-stress management interventions. A weakness of the DELAROSE programme may be the asynchronous nature of its delivery, which could contribute to low adherence and undermine the value of the programme. The use of a theoretical model of support to inform the delivery of DELAROSE could help to ensure that learners complete the programme content in full.

This is an issue to explored as part of Study Two of this research (qualitative evaluation of the DELAROSE programme).

Third, there is evidence that online work-stress management interventions are associated with significant improvements in stress-related outcomes for healthcare workers. Only one programme trialled to date with this sectoral group is somewhat comparable in nature to the DELAROSE programme. The experience of undertaking similar interventions to DELAROSE has been evaluated through qualitative methods, though these studies have tended to focus on issues of engagement and facilitators and barriers, rather than utility. Thus, the likely value of DELAROSE in supporting health and social care workers in the management of their work-related stress can only be surmised from similar interventions delivered to other occupational cohorts or in in-person formats.

In addition, only one intervention from across the quantitative and qualitative literature that focused on a specific age cohort of the workforce was identified. Age-related differences in the extent to which the DELAROSE programme meets the needs and preferences of health and social care workers is worthy of investigation and forms the focus of Objective Four (Study Two) of this research.

Chapter Four

RESEARCH METHODOLOGY AND DESIGN

4.0 Introduction

Chapter Four presents the methodology and design approaches employed in this research. Specifically, mixed methods research comprising two separate studies was conducted. These studies utilised quantitative cross-sectional survey design (Study One) and qualitative individual interviews (Study Two). The findings of both studies were combined and analysed to identify their broader implications as they relate to issues of age and meeting the needs and preferences of health and social care workers through online stress management interventions (Chapter Seven).

The research methodology is introduced in Section 4.1. This includes a discussion of the decisions which informed the selection of the methodological approach and the paradigm for this research. This leads into an overview of the research design and processes of data collection and analysis, which are outlined in Section 4.2. These include survey design approaches (Section 4.2.1); statistical analysis (Section 4.2.2); individual unstructured interviews (Section 4.2.3), and thematic analysis (Section 4.2.4). The chapter concludes with a summary of the methodology and design of this research (Section 4.3), linking into Chapters Five and Six in which the results of Studies One and Two are presented.

4.1 Research methodology

A mixed methods approach was employed to address the aim of this research as it related to exploring and analysing issues of age and the requirements of health and social care workers in managing their work-related stress, utilising the case example of an existing online programme (see Chapter One, Section 1.4). Mixed methods research lies within the continuum between quantitative and qualitative research and adopts elements of both approaches (Todd *et al.* 2004). It is considered to be an expansive and creative alternative to these two traditions (Doyle *et al.* 2009), drawing upon different approaches to realise research objectives. For example, with quantitative research the process of inquiry is often deductive in nature and involves the examination of relationships between quantifiable variables through the procedures of statistical analysis. In contrast, qualitative research is typically inductive with the aim of building

themes and generating narrative interpretation through the analysis of textual data (King, Horrocks and Brooks 2018).

A mixed methods approach was selected for this research as the aim and objectives suggested both quantitative and qualitative data collection methods would be needed if they were to be achieved (see Box 5 for an overview of the objectives of this research). For example, Objective Three involved gathering data to examine the relationship between age and the contribution of workplace characteristics to the manifestations of stress among a sample of health and social care workers. A quantitative approach was deemed most appropriate to meet this objective as it involved testing hypotheses within a theoretical framework. Important also was that the variables to be analysed needed to be precisely defined and assessed. Quantitative methods are particularly suited to these requirements (Creswell 2003).

Separately, Objective Four comprised an investigation of the experience of undertaking the DELAROSE online stress management programme, which was employed as a case example to explore broader issues of need, engagement and adherence. A qualitative approach was determined to be most appropriate for this investigation as the aim was to generate rich, contextual insight into the experience of undertaking the programme. In this way, unique aspects of the experiences of individual participants could be captured and issues not previously considered could be identified. The depth and detail of qualitative data could also allow for differences among participants (such as age differentials) to be identified and explored.

There is no one accepted way of conducting mixed methods research (Connelly 2009). Decisions relating to research design and analysis are influenced by a range of factors including the population of interest, the aims and objectives of the research, and the funding available (Creswell 2003). The mixing of quantitative and qualitative approaches in this research was pragmatic in nature and informed by the 'toolkit' approach, as espoused by Ritchie and Lewis (2003). That is, I selected the methods, design and data collection procedures that I deemed most suited to addressing the research aim and objectives.

Box 5. Objectives of this research

Objectives of this research

1) Analyse the literature as it relates to the experience of work-related stress among ageing health and social care workers;

2) Review the literature in relation to online work-related stress management interventions, with a specific focus and reflection on evaluative studies of online interventions that are similar in nature to DELAROSE;

3) Gather and analyse data relating to age-related differences in the contribution of workplace characteristics to the psychological and physical manifestations of work-related stress among a sample of health and social care workers in the South-East of Ireland **(Study One);**

4) Investigate the experience of a sample of registered learners in undertaking the current DELAROSE online learning programme **(Study Two);**

5) Based on Objectives One to Four above, evaluate and adapt the current DELAROSE online learning programme in work-related stress management to meet the needs and preferences of ageing health and social care workers;

6) Discuss and make recommendations on the implementation of online work-related stress management interventions to support ageing health and social care workers.

Appealing also was that this pragmatic 'toolkit' approach views quantitative and qualitative methods not as competing but as complementary to each other (Shook and Margolis 2008). This acknowledges that while each approach has certain limitations and that they are unlikely to be mixed perfectly, their relative strengths can be utilised to provide a wholesome analysis of the phenomena under investigation (Creswell and Plano Clark 2011).

4.2 The research design and process of inquiry

The following section outlines the design for this research and the strategy by which this design was implemented. It is worth at this point clarifying the terminology employed here. 'Methodology' is taken to refer to the overarching research approach, which in this case comprises the 'mixing' of quantitative and qualitative methods

(Silverman 2010). 'Design' is used to describe the specific quantitative and qualitative approaches used to meet the aim and objectives of the research (Creswell 2003). The design here is organised into two studies, each comprising separate processes of data collection and analysis.

Study One comprised a survey of specific samples of health and social care workers in the South-East of Ireland (counties Waterford, Wexford, Kilkenny, Carlow and South Tipperary). Namely, these were nurses and intellectual disability care workers employed by the Health Service Executive or by an organisation affiliated to the National Federation of Voluntary Bodies (Section 4.2.1.1). Data relating to age and contribution of workplace psychosocial characteristics to the psychological and physical manifestations of work-related stress in this population were gathered and analysed (Section 4.2.1.8). Objective Three of the research (see Box 5) was met through Study One.

Study Two comprised a qualitative investigation of the experience of a sample of registered learners in undertaking the DELAROSE programme (delivered as the 'Certificate in Work-Related Stress'). Persons who enrolled in this certificate with Waterford Institute of Technology and who had received their final results were the population of interest (Section 4.2.3.1). Initially it was intended that a semi-structured interview format, following a schedule of questions, would be employed for this purpose. Instead, however, the experiences of those who had undertaken the programme were elicited through unstructured 'conversational-style' interviews (see Section 4.4.2). Data were analysed with reference to age-related differences in these experiences. Objective Four of this research (see Box 5) was met through Study Two.

Both Study One and Study Two were implemented simultaneously. Following their completion, the key findings of both studies were combined and analysed to identify their broader implications as they relate to issues of age and the needs and preferences of health and social care workers for online stress management interventions (Chapter Seven, Section 7.1). Referenced to the existing literature, these findings were drawn upon to inform a series of recommendations as they relate to the development and implementation of online interventions to support health and social care workers in the management of their work-related stress (Chapter Seven, Section 7.2). Thus, the quantitative findings of Study One and the qualitative findings of Study Two were

combined and referenced to findings of Chapters Two and Three (Objectives One and Two) to meet Objectives Five and Six of this research (see Box 5). In the following sub-sections, the design approaches for this research and processes by which they were implemented are described.

4.2.1 Study One: Quantitative survey design

Study One (Objective Three) of this research focused on gathering and analysing data relating to age and the contribution of workplace psychosocial characteristics to the experience of stress among a sample of health and social care workers in the South-East of Ireland. This was addressed through a survey design approach. The following sub-sections provide an account of the design and delivery of this survey. This includes the population of interest (Section 4.2.1.1); ethical approval (Section 4.2.1.2); the management of informed consent and confidentiality (Section 4.2.1.3); convenience and representative sampling (Section 4.2.1.4); the modality of delivery (Section 4.2.1.5), and the survey instrument, which includes an overview of the selection of instruments with reference to validity and reliability (Section 4.2.1.6) The process of recruitment is outlined in Section 4.2.1.7, while a description of the final sample and its relationship to the wider population of interest is discussed in Section 4.2.1.8.

4.2.1.1 Population of interest

Nurses and intellectual disability care workers in the South-East of Ireland (counties Waterford, Wexford, Kilkenny, Carlow and South Tipperary) employed by the HSE or by an organisation affiliated to the NFVB comprised the population of interest for this survey. As noted in Chapter One (Section 1.3.1), there was a degree of overlap between these two groups. This is because intellectual disability nursing has formed a specific division of nursing practice in Ireland for several decades, meaning that nurses are employed in intellectual disability care settings.

Registered nurses account for approximately one-third of the total public health service workforce in Ireland (Health Service Executive 2022) and are categorised operationally by the Health Service Executive (HSE) into a number of staff groupings. These include Nurse Managers, Nurse Specialists, Staff

Nurses, Public Health Nurses, and Nursing Students. Nurses in Ireland operate in range of public and private care settings, including hospitals, mental health services, residential care services for older persons and persons with a disability, and primary care. About fifty nurses also work directly for Túsla, the Child and Family Agency. Nurses are regulated by the Nursing and Midwifery Board of Ireland (NMBI) according to four fields of speciality. These are general, psychiatric, children's, and intellectual disability nursing.

Intellectual disability care workers form one of the largest cohorts of the social care workforce in Ireland. Such workers are responsible for the provision of professional care and support to persons with an intellectual disability (Lalor and Share 2013). Intellectual disability care workers in Ireland are employed in a range of settings including residential, day and domiciliary care services. These services operate within a mixed economy of service provision, whereby most are publically funded but delivered through a mix of the public and independent sector; indeed, over 90% of the direct care services for people with an intellectual disability are delivered by independent non-profit organisations (Mulkeen 2016).

As discussed in Chapter One (Section 1.3.1), those who deliver social care to persons with an intellectual disability do so under a range of job titles, depending on their professional background. This includes intellectual disability nurses, a speciality field of registered nursing in Ireland. As such, the term intellectual disability care worker is taken here to include both nurses and other care and support workers operating within intellectual disability care services in Ireland. Unfortunately, the variegated nature of the social care workforce in Ireland means that limited data are collected and published relating to the number of staff in the sector and their demographic breakdown. Nonetheless, a description of the final sample for Study One and its relationship to what is known about the wider population of nurses and intellectual disability care workers in Ireland is presented in sub-section 4.2.1.8.

4.2.1.2 Ethical approval

Ethical approval for this survey was sought and granted from the WIT Ethics Committee in March 2017. Following this, I applied for ethical approval from

the Regional Ethics Committee (HSE South-East) and the National Federation of Voluntary Bodies (NFVB). These were both granted, following desk review, in September and October 2017 respectively (see Appendix E).

4.2.1.3 Informed consent and confidentiality

In order to protect participant anonymity, personal contact details were not collected and a participant reference system was not put in place. Participants were informed that they could not withdraw their data once they submitted their survey responses, and that completing the survey or responding to any number of survey items meant that they were giving consent to take part in the study and for their data to be used. This was stated on an information sheet that was disseminated with the paper form of the survey and at the beginning on the online survey (see Appendix F).

Data collected via the survey was pseudo-anonymised by replacing certain data characteristics with a value which did not allow the participant to be directly identified. This approach, however, only provided limited protection for participants as it still made identification using indirect means possible. Certain demographic information was also collected in order to guide the research. For participants who completed the survey online there was a potential for electronically identifying information to be detached from the responses (for example, IP addresses). As such, the survey could not be considered completely anonymous.

4.2.1.4 Convenience and representative sampling

There are several different sampling strategies that researchers can draw upon to recruit participants. Probability (random) sampling is the most robust way to minimise sampling bias (i.e. the expectation in advance that a sample will not be completely representative of the larger population, because they are only an approximation of the population from which it is drawn). This is because the sample is chosen in a random manner from a larger population, meaning that every member of the population has an equal chance of being selected (Haslam and McGarty 2008).

In contrast, non-probability sampling involves recruiting from a population using a non-random method. There are several types of non-probability

sampling. Stratification is when the larger population is divided into strata of a homogeneous nature (e.g. age or gender). An equal number of group members are then selected from each stratum. Systematic sampling is when participants are chosen from a random starting point. Selection then proceeds at fixed, periodic intervals.

Cluster sampling is similar to stratified sampling in that each participant is placed into a subgroup based on a particular characteristic. An entire subgroup then forms the final sample. Snowball sampling is a technique for samples that are rare or difficult to find. Existing participants refer others, thus creating a snowball effect. Finally, convenience sampling involves recruiting participants solely on the basis that they are eligible and accessible to the researcher.

Though non-probability sampling approaches are more likely to result in sampling bias, they can be faster, simpler and less expensive ways of obtaining data compared to random sampling. In addition, they do not require a complete survey frame, which was one of the key difficulties to overcome in terms of recruiting participants for Study One. Few services collected demographic data relating to their employees, while the NFVB were also unable to provide such information. As a result, convenience sampling was determined to be the only feasible approach to take with this survey. A comparison between the final sample recruited for Study One and what is known about the demographic characteristics of the nursing and intellectual disability care workforce in Ireland is presented in Section 4.2.1.8.

The use of convenience sampling to recruit participants for Study One was facilitated through a 'gatekeeper' approach, whereby clinical placement co-ordinators (i.e. staff members who guide and coordinate student nurses on placement) in WIT and the HSE, in addition to other staff members within these services, served as gatekeepers by agreeing to support this research and by disseminating the survey to potential participants within their services. This was facilitated by the NFVB, who permitted me to contact their affiliated members within the South-East region, and the HSE, who permitted me to contact relevant services in this region.

An additional consideration when conducting survey research is how to achieve a representative sample. A representative sample is one that accurately represents the characteristics of the larger population of interest (Creswell 2005). Examples of such characteristics include sex, age, education level, and socioeconomic status.

Achieving a representative sample is important as it helps to ensure that the data gathered and interpretations drawn accurately reflect the views or behaviours of the broader population. The findings drawn from a non-representative sample may not represent those that would be obtained from the entire population. Though all forms of sampling have some degree of sampling bias, the aim when sampling is to reduce this bias to a near negligible level.

Several actions were taken to limit bias within the final sample for Study One. First, the population of interest was clearly defined (see Chapter One, Section 1.3, and Chapter Four, Section 4.2.1.1), as were the various care settings in which these sectoral groups operate (Chapter One, 1.3.2). The use of the HSE and the NFVB as sectoral-level gatekeepers helped to limit the impact of population and sample frame error, by facilitating the recruitment of participants from across a range of services (such as general hospitals and community intellectual disability care services) in the South-East region (see Section 4.2.1.7 for an overview of the recruitment procedures). Non-response error, which occurs when researchers are unable to contact potential respondents (or when certain respondents refuse to respond), was limited through the use of gatekeepers from representative organisations such as the NFVB and from within individual services. As discussed in Section 4.2.1.5, mixed-mode surveying was employed to encourage participation and reach as many of the population as possible.

Increasing the sample size closer to the actual population also decreases the potential for deviations from that population. Achieving an optimal sample size to ensure a robust degree of confidence for making an inference is also important. In this case, power calculations (see Section 4.2.2) were conducted and reported.

4.2.1.5 The modality of survey delivery

The greater the number of responses from participants, the more useful survey results are (Todd *et al.* 2014). If one type of survey modality can generate more responses from participants, there is a greater likelihood that sampling biases, will be minimised (Dillman 2000).

Previous research has found that mixed mode surveys can have a positive impact on response rates (Archer 2003, Cobanoglu Warde and Moreo 2001, Kiernan *et al*. 2005, Shannon *et al.* 2002, de Leeuw 2005). There is evidence that different types of people may prefer to respond to different survey modalities. For example, younger participants tend to respond to online surveys at greater rates than older individuals (McCabe 2004, Smyth *et al*. 2010). Response rates to solely online surveys tend to be relatively low (Manfreda *et al.* 2008). However, research has indicated that providing choice to participants can increase response rates because individuals can select their preferred mode (e.g. Dillman West and Clark 1994, Diment and Garrett-Jones 2007, Shih and Fan 2007).

Mixed mode surveys can also help reduce coverage error (i.e. when only a portion of a population is invited to participate as opposed to the whole population). This was a factor of consideration for Study One due to the diversity of workplaces and care settings to be surveyed. It was likely that a meaningful proportion of workers in the sector would not have access to a work email or, if they did, regularly access that email. Utilising more than one modality may have helped to mitigate this particular challenge.

For these reasons, the survey was delivered using a mixed-mode approach (i.e. both online and paper-based formats). The survey was piloted informally with a small number of colleagues prior to commencing the recruitment process. This was to identify and correct any issues that may have affected the data collection process. No such issues were identified and the survey was delivered with the instruments as outlined in the following section (Section 4.2.1.6)

4.2.1.6 The survey instrument

The survey instrument employed in this research was designed to gather demographic information, assess psychological and physical manifestations of stress, and measure a number of workplace psychosocial characteristics. Stress was assessed using the Perceived Stress Scale (Cohen Kamarck and Mermelstein 1983), while physical and mental health were assessed using SF-12 health survey (Ware, Kasinski and Keller 1996). Workplace characteristics were assessed using the Job Content Questionnaire (Karasek *et al.* 1988). A full description of each of these measures, including their reliability and validity, is now presented. The final survey that was used in this study is included in Appendix F.

Demographic Measures

Though no personal contact details were collected, certain demographic data were obtained in order to guide the research. These data included age; gender; relationship status; highest level of educational attainment obtained; county of residence; job role and title, and the number of years working in the health and social care sector.

Perceived Stress Scale (Short Form 10-Item)

The ten-item Perceived Stress Scale (PSS-10) was used to assess stress in the survey. This scale was developed by Cohen, Kamarck and Mermelstein (1983), and is perhaps the most commonly employed psychometric assessment of perceived stress (Karam *et al.* 2012). It is designed to evaluate the extent to which one finds their life unpredictable, uncontrollable or overloaded. The scale includes a number of items relating to current levels of experienced stress, meaning that scores are not biased by event content or the recall of past life experiences. The shorter ten item scale, employed here, is one of three standardised versions of the Perceived Stress Scale. Items were scored and summed to give a score between 0 and 40, with higher scores indicating greater perceived stress.

The use of this scale for Study One was attractive for a number of reasons. For example, it has been used in previous studies with nurses (Rushton *et al.* 2015,

Purcell, Kutash and Cobb 2011, Judtkins *et al.* 2006, Sauer and McCoy 2018) and intellectual disability care workers (Harris and Rose 2002), and has proven acceptability with these cohorts. In addition, as the questions in the scale are general and not specific to any one occupational group, it could be administered to all potential participants without adjustment.

The reliability and validity of the Perceived Stress Scale is evidenced by a considerable body of empirical research. Initially developed as a fourteen item scale (PSS-14; Cohen *et al.* 1983), using exploratory factor analysis with data from a representative sample of 2,387 U.S. adults, Cohen and Williamson (1988) identified four poorly performing items and dropped them to give rise to the PSS-10. They determined that the PSS-10 demonstrated acceptable convergent validity and reliability (0.78), and so recommended that this is the version that should be used in research.

The most comprehensive review of empirical examinations of the psychometric properties of the Perceived Stress Scale (Lee 2012) to date examined the findings of 19 studies. The internal consistency, factorial validity, and predictive validity of the PSS were reported as satisfactory, though it was noted that evaluations of the test-retest reliability and criterion validity of the scale were sparse. The psychometric properties of the 10-item PSS were determined to be superior to those of the 14-item and 4-item versions of the scale.

More recently, Taylor (2015) conducted a psychometric analysis of the PSS-10 using data from a sample of 1,236 adults in the United States. Findings were supportive of the reliability of the scale and indicated that inferences made using PSS-10 scores are valid. Confirmatory factor analysis further supported the presence of the two-factor model (perceived stress and perceived control), consistent with Lazarus's theory of transactional stress (1966). The internal consistency of the Perceived Stress Scale in Study One of this research was robust (0.85), as indicated by Cronbach's alpha statistic (see Section 4.2.2).

Short-Form Health Survey (12-Item)

Physical and psychological well-being were assessed in Study One using the 12-Item Short Form Health Survey (SF-12), the development of which arose

from the Medical Outcomes Study (MOS), a multi-year study of patients with chronic conditions (Ware Kosinski and Keller 1994, Ware *et al.* 1995). It is one of the most commonly employed assessments of physical and mental health-related functioning in research surveys (Vilagut e*t al.* 2013, Roelen *et al.* 2018). A 36 item (SF-36) survey was employed in the Medical Outcomes Study, from which the shorter 12 item survey was developed (Ware, Kosinski and Keller 1996).

The 12 item survey assesses the same eight health domains as the SF-36 and is more suited to use in research. As with the Perceived Stress Scale, the survey is generic and not specific to any population grouping, making it suitable to be administered to all participants in Study One. Items are combined and scored to provide an indication of overall health-related quality of life, with two subscales (Physical and Mental Health Composite Scores) providing an insight into the respondent's mental and physical well-being. Version One of the SF-12 was employed in this study, which differs slightly from Version Two in terms of wording and scoring of certain items. This version is non-proprietary, which made it attractive for use here.

To calculate the Physical (PCS12) and Mental Health (MCS12) Well-being composite scores, test items were scored and transformed using an algorithm to norm-based scores with a mean of 50 and a standard deviation of 10. PCS12 and MCS12 scores range from 0 to 100, with a higher score indicating better health. An online score calculator (https://www.orthotoolkit.com/sf-12/) was used for this purpose.

The limitation of using this standardised score calculator was that the internal consistency of the SF-12 could not be determined. However, there is ample support for the internal consistency of the SF-12 from studies of the general population (Lim and Fisher 1999, Resnick and Parker 2001, Hayes *et al*. 2017), and samples of workers with back pain (Luo *et al.* 2003, n = 2,520) and musculoskeletal disorder (Bultmann *et al.* 2007, n = 632). The test-retest reliability of the SF-12 has been shown to be robust (Ware *et al.* 1996, Salyers *et al.* 2000, Resnick and Parker 2001). Tests of the reliability of the SF-12 administered two weeks apart reported that it was satisfactory in United States

(McHorney 2003) and United Kingdom (Brazier and Roberts 2004) populations (PCS $r = 0.86$ and MCS $r = 0.77$; PCS $r = 0.89$ and MCS $r = 0.76$; respectively).

The two-factor structure of the SF-12 (Physical and Mental Health Scores) has been confirmed using factor analysis in population-based studies (Kontodimopoulos *et al.* 2007, Montazeri *et al.* 2009). The criterion validity of the SF-12 is primarily evidenced by how well it reproduces the PCS and MCS scores of the SF-36. In this regard, SF-12 PCS and MCS scores were found to correlate 0.95 and 0.96 with SF-36 PCS and MCS scores, respectively (Ware *et al.* 1996). These findings have been replicated in surveys of the general populations of nine European countries (Denmark, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, and the UK; Gandek *et al.* 1998), with very high correlations between SF-12 PCS and SF-36 PCS scores ($r = 0.94 – 0.96$) and SF-12 MCS and SF-36 MCS scores ($r = 0.94 – 0.97$).

The convergent and discriminant validity of the SF-12 is supported by the fact that comparable scales and dimensions are typically well-correlated (Busija *et al.* 2011). PCS scores typically correlate strongly with mobility, usual activities, and pain discomfort, and weakly with anxiety/depression, while the converse has been observed for MCS scores (Sanderson and Andrews 2002, Kontodimopoulos *et al.* 2007). Hayes *et al.* (2017), based on data from a sample of 15,716 patients with non-cancerous pain, reported that the PCS12 was strongly correlated with perceived health ($r = 0.52$) and weakly correlated with perceived mental health ($r = 0.25$). The MCS12 was moderately correlated with perceived mental health ($r = 0.42$) and perceived health ($r = 0.33$).

The Job Content Questionnaire

Workplace psychosocial characteristics were assessed using the Job Content Questionnaire (JCQ), which is the most widely used self-administered tool to assess psychosocial aspects of the working environment (Karasek and Theorell 1990, Karasek *et al.* 1998). The questionnaire is based on Karasek's (1979) Job Demand-Control (JDC) theoretical model and includes a range of sub-scales. As the JCQ measures workplace characteristics in a general manner, it is applicable to all types of jobs and could be used here without adjustment.

For this survey, five sub-scales from the JCQ were employed. These five scales assessed the workplace characteristics of Psychological Job Demands; Decision Latitude; Social Support; Physical Exertion, and Job Insecurity. The first three of these were chosen as they are the core psychosocial characteristics postulated to contribute to the development of 'job strain' and employee well-being outcomes, according to the Job Demand-Control-Support Model (Johnson and Hall 1988). Items relating to Physical Exertion and Job Insecurity were also included as they were deemed to be relevant to this population of interest. This was informed by the findings of the reviews of the literature in Chapter Two which highlighted the potentially precarious and physically demanding nature of nursing and intellectual disability care work (Chapter Two, Section 2.3 and 2.4).

Eight items relating to Psychological Job Demands were included, while nine items assessed Decision Latitude (this comprised two sub-scales of *skill discretion* and *decision autonomy*). Social Support was assessed by eight items (comprising two four-item subscales relating to *supervisor support* and *co-worker support*). Five items relating to Physical Exertion and Physical Isometric Load were also included in the survey, though ultimately Physical Exertion was analysed using one item, in line with the recommended format of the survey. Job Insecurity was assessed by four items.

Though additional items and sub-scales were available for use as part of the JCQ, I decided not to include any more as they were not particularly relevant to this population of interest and would have contributed to an excessively long survey. Each item was scored on a scale from 1 to 4, with total scale scores calculated for each workplace characteristic.

Considerable empirical evidence indicates that the psychometric properties of these scales are robust. A compilation of six studies in four different countries (Canada, the United States, the Netherlands and Japan) conducted by Karasek *et al.* (1998), supported the reliability of the JCQ scales. Numerous other studies have indicated the psychometric value of the JCQ scales across different occupations and languages. For example, the internal consistency and dimensional structure of the Psychological Job Demands, Decision Latitude and

Social Support scales was supported in large samples of Belgian (Pelfrene *et al.* 2001, *n* = 21,419) and French (Niedhammer *et al.* 2001, *n* = 11,471) workers. Similar results have been obtained with Japanese (Kawakami and Fujigaki 1996; Kawakami *et al.* 1995), Finish (Santavirta 2003), Dutch (Storms *et al.* 2001), Swedish (Sanne *et al.* 2005); Malay (Edimansyah *et al.* 2005); Korean (Eum e*t al.* 2007), Portuguese (Vilas-Boas *et al.* 2017), and Chinese (Li *et al.* 2004) versions of the JCQ.

The psychometric properties of the scale have been evidenced in samples of nurses and other health care workers. Aguir, Más and Flores (2001), for example, reported good internal consistency and test-retest reliability of the JCQ in sample of 330 Spanish hospital nursing staff. Sale and Kerr (2002) found that the psychological job demands and decisions latitude scales demonstrated acceptable internal consistency and discriminatory validity with a sample of 484 Canadian hospital employees, while Griep *et al.* (2009) reported satisfactory internal consistency and factorial validity of the Demand-Control-Support scales among 1,509 nursing personnel at two Brazilian hospitals.

While the fit indices and dimensional structure of the measures are generally confirmed (Choi *et al*. 2009, Fransson *et al.* 2012, Jabali *et al.* 2013), low internal consistency has been observed in some studies (Kawakami *et al.* 1995; Phakthongsuk and Apakupakul 2008). Others have indicated inconsistent factor loading (Gomez-Ortiz 2011), particularly relating to the decision latitude scale. Specifically, two separate factors in that scale (skill discretion and decision authority) have been found (Chien *et al.* 2011, Karasek *et al.* 1998). In this research good internal consistency was observed across the JCQ scales (Psychological Job Demands $r = 0.76$; Decision Latitude $r = 0.75$; Social Support $r = 0.81$), with the sub-scales of skill discretion and decision authority closely correlated (see Section 4.2.2).

Finally, an extensive literature supports the predictive validity of the JCQ for different indicators, including cardiovascular outcomes, job satisfaction, perceived stress, anxiety, depression and psychological well-being (Karasek *et al*. 1998). Studies of the JCQ with nurses support its predictive validity with regard to mental health (Amick *et al.* 1998, Shen *et al.* 2005); burnout (Bakker,

Le Blanc and Schaufeli 2005, Bourbonnais *et al.* 1998, 1999; Aguir, Más and Flores (2001); job satisfaction (Tholdy Doncevic *et al.* 1998), and emotional distress (Fillon *et al.* 2007). Reviews of the JDC literature more generally (de Jonge and Kompier 1997, van der Doef and Maes 1999, de Lange *et al.* 2003 Hausser *et al.* 2010) have each concluded that there is strong empirical support for the main effects of demands and control. That is, high job demands generally predict strain and related symptoms, while high levels of control have the potential to mitigate these negative outcomes, irrespective of demands. Indeed, Hausser *et al.* (2010) noted that support for additive effects of demands, control, and social support on general psychological well-being is almost always found if the sample size is sufficient.

The survey instrument for Study One also contained three open-ended questions which invited participants to make comments in relation to stress in the workplace and their use of psychosocial supports. However, this section was left uncompleted by the majority of participants, thus precluding any meaningful analysis from being conducted.

4.2.1.7 Recruitment procedures

The recruitment process focused on three different types of care setting (i.e. intellectual disability care services, hospitals, and mental health care services) related to the population of interest (nurses and intellectual disability care workers). First, care and support staff (including nurses) working in intellectual disability care services across the South-East of Ireland that were affiliated to the NFVB were recruited. This process started in November 2017.

Initially, five services were approached, three of whom consented to participate in the survey. Between November 2017 and January 2018 I meet with placement co-ordinators in these services and explained the purpose and focus of the survey. I provided them with the online link to the survey to be sent to potential participants and about twenty to thirty paper copies of the survey, depending on the size of the service and the recommendation of the gatekeeper. I returned after two weeks to retrieve completed paper surveys. In one case completed paper surveys were posted back to me after three weeks.

Recruitment was paused between February and May 2018 as I was appointed to a full-time employment position in WIT (I subsequently resigned from the WIT PhD Scholarship programme in June 2018). I resumed recruiting participants from intellectual disability care services in May 2018. These remaining services were recruited through cold-calling or emailing and requesting to speak with a member of staff who might be able to assist with the conduct of this research.

Eleven services were contacted in this way, five of whom consented to participate. In each case a staff member served as a gatekeeper for participant recruitment. I provided this person with the online link to the survey and around twenty to thirty paper copies of the survey, depending on the size of the service and what was feasible for the gatekeeper to disseminate (see Table 5 below for an overview). The link was emailed to staff and I returned after two weeks to retrieve any completed surveys. In two cases completed paper surveys were posted back to me after a number of weeks. The recruitment of participants from intellectual disability care services was completed by September 2018.

Approximately 360 surveys were disseminated to potential participants in these services, which comprised five day services, one residential service and two mixed (day and residential) services. One hundred and twelve survey responses were obtained, of which 75 were online and 37 were paper-based, and giving an estimated response rate of about 31%. As the survey did not collect personally identifiable information, the response rates for specific services cannot be determined.

Table 5. Profile of Intellectual Disability Care Services

Service	Service Type	Approx. number of eligible care staff	Number of surveys disseminated
Service A	Day and Residential	100	30 paper; 50 emailed.
Service B	Day only	80	20 paper; 40 emailed.
Service C	Residential only	15	15 paper surveys only
Service D	Day only (Special School)	30	20 paper, 30 emailed.
Service E	Day Only	15	15 paper surveys only
Service F	Day Only	30	20 paper surveys only

Service G	Day Only	40	20 paper, 20 emailed.
Service H	Day and Residential	100	30 paper, 50 emailed.

Second, I focused on recruiting a sample of registered nurses from hospital settings in the South-East region. Three public hospitals and two private hospitals in the region were approached in order to recruit a sample of registered nurses. This took place between October and December 2018. Two general hospitals and one private hospital consented to participate (see Table Two below).

A similar process was followed with each hospital. I met or spoke with a staff member and explained that I was seeking to recruit nursing staff to participate in a survey. If they agreed to serve as a gatekeeper, I provided them with the online link to the survey and about forty to fifty paper copies, depending on their recommendation. The gatekeepers emailed the online link or disseminated papers surveys to nursing staff in their hospital (this included staff nurses, nurse specialists and nurse managers). In each case completed paper surveys were posted back to me after about three weeks.

Approximately 305 surveys were disseminated to nursing staff in these hospitals. Responses were obtained from 119 participants, giving an estimated response rate of about 38%. Of these, 48 responses were online and 71 were paper-based (see Table 6).

Table 6. Profile of Hospitals Surveyed

Service	Service Type	Approx. number of eligible staff	Number of surveys disseminated
Hospital A	Private	Registered Nursing Staff – 80	40 paper; 40 emailed
Hospital B	Public	400	50 paper; 75 emailed
Hospital C	Public	740	50 paper; 50 emailed

Third, a sample of registered nurses from mental health care services in the region were recruited. This process proved challenging due to ongoing industrial action in this sector. However, I did make contact with a clinical

placement co-ordinator in the South-East Mental Health area, who disseminated paper copies of the survey and the online link to nursing staff working in the Department of Psychiatry in a hospital in the region in January and February 2019. In addition to this, nursing staff working in a community mental health care service were recruited in April 2019 through a staff member in WIT with a connection to this service. I provided them with 40 paper copies of the survey. Completed surveys were returned to me directly in May 2019.

Approximately 180 surveys were disseminated to potential participants in these services (see Table 7 below). Seventy-four responses were obtained, giving an estimated response rate of 46%. Of these, 51 were paper-based and 23 were online.

Table 7. Profile of Mental Health Care Services Surveyed

Service	Approx. number of eligible staff	Surveys disseminated
Department of Psychiatry in a General Hospital	100 psychiatric nurses.	50 paper, 70 emailed.
Community Mental Health Service	Approximately 50 direct care staff.	40 paper (all paper).

The last response to the survey was received in June 2019. I downloaded the final excel files of the survey data in August 2019. In total, 305 survey responses were obtained through this process of recruitment. A full breakdown of the number of responses obtained from each of the three types of care setting is detailed in Chapter Five.

4.2.1.8 Description of the final sample and its relationship to the population

In total, 305 survey responses were obtained. Ten were excluded due to incomplete data, leaving a final survey sample for analysis of n = 295. The age profile of participants ranged from 21 – 65 years, with a mean age of 43.91 and standard deviation of 9.96. The final sample comprised 68 males and 227 females.

The sample mostly comprised nursing staff (71.5%), including registered general, intellectual disability and psychiatric nurses (these in turn included

staff nurses, clinical specialists, advanced practitioners and nurse managers). The remainder comprised social care, support or project workers in intellectual disability care services (26.7%), or care/support workers in a mental health care setting (1.8%). Overall, 28.8% of the sample indicated that they held some form of managerial position.

In order to assess the representativeness of this sample, its relationship to the broader nursing workforce is considered here. This is possible due to the publication of workforce census data for the nursing workforce in Ireland. However, little information about those who work in intellectual disability care services is available. A similar assessment of the representativeness of the sample of intellectual disability care workers (non-nurse qualified) recruited in Study One unfortunately cannot be made.

Overall, 229 nurses were included in the final sample. These comprised staff nurses, advanced nurse practitioners and nurse managers across the three areas of practice (intellectual disability care services, hospitals and mental health services). Nurses comprised 71.5% of the final sample.

As a whole, the nurses included in this sample are comparable in age to the broader nursing workforce in Ireland. In this study, their ages ranged from 21 to 65 years, with a mean of 45.1 years and standard deviation of 9.2 years. By comparison, the most recent HSE workforce data reports (Health Service Executive 2022) indicate that nurses in the public healthcare system in Ireland range from 20 to 65 years in age, with the mean age between 40 and 44 years.

With regard to a gender breakdown, there were relatively more male nurses in this sample than is in the HSE public healthcare workforce. Overall, 22.8% of the nurses in this sample were male (73.2% female). This compares to just 10% in the total nursing workforce. This may be attributed to the relatively higher proportion of nurses in mental health care settings who participated in this study, compared to the number of such nurses in the total nursing workforce. There was a slightly higher proportion of males in the sample of nurses recruited from mental health services (31.25%), compared to the overall mental health care workforce (i.e. 25% of psychiatric nurses in Ireland are male).

Within the public health service workforce, HSE data indicates that 13% of nurses are employed in mental health care services (Health Service Executive 2022). Just under 9% of NMBI registrations are psychiatric nurses (Nursing and Midwifery Board of Ireland 2022). There are no HSE reports on the number of nurses working in intellectual disability care services, though about 5% of those on the NMBI register hold a registration as an intellectual disability care nurse. In contrast, HSE public healthcare workforce data indicates that 60.5% of nurses work in hospital settings (Health Service Executive 2022), while NMBI reports that 62% of those on their register hold a general nursing registration.

In summary, the final sample for this survey is broadly similar in age profile to wider HSE nursing workforce. However, it contains relatively fewer nurses in general hospital (public and private) settings compared to the wider nursing workforce (50% versus 61% approximately). In addition, the sample contains relatively more nurses in mental health (30%) and intellectual disability (20%) services compared to the total nursing workforce. These differences in care setting may explain the slight disparity in gender breakdown in this sample compared to wider HSE nursing workforce. These differences are to be expected given the use of convenience sampling approaches, which are unlikely to have produced a fully representative sample. While the actions taken to reduce bias (Section 4.2.1.4) and the similarity between this sample and the wider population of interest suggest that there can be confidence in the survey findings, caution must be exercised when drawing conclusions about this population based on the findings of Study One (see Chapter Eight, Section 8.3 for further discussion on this limitation).

4.2.2 Statistical analysis

Manifestations of work-related stress were assessed through the SF-12 and the Perceived Stress Scale. This meant that three measures of well-being could be calculated for each participant; namely Physical Well-being (PCS12), Mental Well-being (MCS12) and Perceived Stress. For each participant a score for each of the five workplace psychosocial characteristics (referred to as job content variables henceforth) of Psychological Job Demands, Decision Latitude, Social Support, Job Insecurity and Physical Exertion was also calculated.

The process of descriptive analysis is presented in Section 4.2.2.1. This includes reference to the internal reliability and normality distribution of each measure, where relevant. Correlational and hierarchical regression analysis is discussed in Section 4.2.2.2. Power calculations and the appropriateness of the achieved sample size for the statistical analysis that was conducted are outlined in Section 4.2.2.3.

4.2.2.1 Descriptive analysis

Descriptive analysis was conducted in order to describe the sample and data under investigation. First, the internal reliability of the four calculated measures (Perceived Stress, Psychological Job Demands, Decision Latitude, Social Support) were assessed using the Cronbach's Alpha statistic (see Table 8). The internal reliability of each of these scales was found to be robust.

Table 8. Internal Reliability of Perceived Stress and Job Content Measures

	Cronbach's Alpha
Perceived Stress	0.85
Psychological Job Demands	0.76
Decision Latitude	0.75
Social Support	0.81

Descriptive analysis was conducted for the three well-being measures (i.e. Physical Health Component Score (PCS12), Mental Health Component Score (MCS12) and Perceived Stress) and five job content measures (i.e. Psychological Job Demands, Decision Latitude, Social Support, Job Insecurity and Physical Exertion). Higher scores on PCS12 and MCS12 scores indicated better Physical and Mental Well-being, while higher scores in Perceived Stress indicated greater stress. Similarly, higher scores on the five content variables indicated greater levels of those characteristics in the workplace (e.g. higher scores of Psychological Job Demands indicated a more psychologically demanding workplace). The extent to which the scores for each measure were normally distributed was assessed using the Kolmogorov-Smirnov statistic (see Table 9).

Table 9. Normality of Age, Well-being Outcome and Job Content Measures

	Kolmogorov-Smirnov sig.
Age	0.049
Years Working in Sector	< 0.001
PCS12	< 0.001
MCS12	< 0.001
Perceived Stress	0.200
Psychological Job Demands	< 0.001
Decision Latitude	< 0.001
Social Support	< 0.001
Physical Exertion	< 0.001
Job Insecurity	< 0.001

4.2.2.2 Correlational and hierarchical regression analysis

The relationships between age, the three well-being outcome measures, and the five job content variables were examined using correlational analysis. This focused on testing the main effects of the JDC(S) model as they related to age and participants' physical and psychological well-being. Correlational analysis was particularly suited to the non-experimental and cross-sectional nature of this research. Variables were not deliberately manipulated or controlled, but rather assessed as they occurred naturally.

The use of correlational analysis is underpinned by a range of assumptions (Pallant 2020). For example, it is only suited to examining linear relationships between variables. Outliers can affect the correlation co-efficient, particularly for smaller samples, and should be removed from the data-set. Other assumptions include levels of measurement; related pairs (i.e. each participant must provide a pair of values); independence of observations; and assumptions relating to the distribution of scores for each measure (i.e. normality, linearity and homoscedasticity). Owing to the ordinal nature of the data under investigation, and the fact that the assumption of normality was clearly violated (as per the Kolmogorov-Smirnov statistical results – Table 9) a non-parametric test (Spearman's Rank Order correlation - rho) was used instead of the parametric alternative (i.e. Pearson's product correlation).

The final part of the analysis focused on investigating age-related differences in the extent to which workplace psychosocial characteristics contributed to psychological and physical well-being outcomes in this sample. Hierarchical Multiple Regression was employed for this purpose. This type of analysis is based on correlation. Variables are entered into a model in steps or 'blocks' according to an order specified by the researcher. Each variable is assessed in terms of what it adds to the prediction of a dependent variables, after the previous variables have been controlled for. This is assessed via R^2 (variance explained) and R^2 change (change in R^2 when adding another block of predictors). Thus, it provides information about the model as a whole (i.e. each measure combined) and the relative contribution of each variable that makes up the model.

Hierarchical Multiple Regression was used to investigate the relative contribution of demographic and psychosocial workplace characteristics to the three well-being outcome measures (i.e. Perceived Stress, Mental Well-being and Physical Well-being). Interaction terms were calculated to assist with this process. For example, a 'Job Strain' interaction term was calculated by multiplying Psychological Job Demands and Decision Latitude and tested by adding this new predictor variable to the model. To determine whether age affected this interaction, an additional term was created by multiplying this newly created Job Strain variable by Age. Three separate hierarchical regression models were run, with Perceived Stress, Mental Well-being and Physical Well-being employed as dependent variables. Two dummy variables based on care setting (and with intellectual disability care services employed as the reference) were also created and included in the model.

Regression analysis is underpinned by a number of assumptions. An adequate sample size is perhaps most important. Different authors provide different guidelines regarding a sufficient sample size for multiple regression. Tabachnick and Fidell (2007), for example, provide the formula of $N > 50 + 8m$, where m is the number of predictor variables. The sample size for Study One met this requirement.

Multiple regression is also sensitive to violations of multi-collinearity and singularity, which relate to the relationships between the independent variables. Independent variables should not be highly correlated with each other, nor should they comprise a combination of other independent variables. In each case here, variables were centred prior to calculating interactions in order to reduce the potential for mulicollinearity, while the Tolerance output produced by SPSS (which indicates how much of the variability of a particular independent variable is not explained by other independent variables) was also inspected. The presence of outliers must also be considered and managed, and it is typically recommended that extreme scores be removed from the data set (Pallant 2020). In this case, I checked for outliers by inspecting the Mahalanobis distances that were produced by running the regression analyses.

Important also is the distribution of scores. Residual scatterplots generated from the multiple regression procedure were checked for normality, linearity and homoscedasticity. This was to ensure that the residuals (i.e. the difference between a score obtained and the predicted dependent variables scores) were normally distributed, that there was a straight-line relationship between them, and that the variance of the residuals about the dependent variable scores was the same for all predicted scores (Pallant 2020).

4.2.2.3 Power calculations and the sample size

Sample size calculations based on power analysis were conducted to determine whether the study was adequately powered and whether an appropriate sample size was achieved. For this study, a power of 80% was assumed, meaning there would be at least an 80% probability of detecting a statistically significant finding if one did exist. A 5% level of significance was assumed for all analysis. Power analysis software G*Power 3.1 was used for this sample size determination, with a conservative effect size, as defined by Cohen (1988), considered.

For the correlational analysis, a weak-to-moderate correlation, with $r = 0.2$, was assumed. As a result, a sample size of $n = 194$ was required in order to achieve the required power and confidence level for this study. Hierarchical linear regression was also carried out as part of this study, with variables such as

Perceived Stress and Physical Health employed as dependant variables. A sample size calculation was carried out based upon the maximum number of independent variables available for these hierarchical models (i.e. 13 independent variables). Given the high level of variability expected within the results, a conservative estimate of effect size of F = 0.1 was considered. In order to achieve an 80% power with these parameters, a sample size of n = 190 was required.

Based upon the calculations outlined above, a sample size greater than n = 194 was needed in order to achieve at least 80% power for this study. After comparison with similar studies in the field (e.g. Donnelly 2014, McTiernan and McDonald 2014, Lernihan and Sweeney 2021), the achieved sample size appears sufficient. While n = 194 provided an adequate sample size, this was considered the minimum sample size required for this study in order to ensure the statistical validity of any conclusions drawn. As a result, the final sample size of n = 295 recruited participants ensured a greater power for this study.

4.2.3 Study Two: Individual interviews

Study Two (Objective Four) focused on investigating the experience of a sample of registered learners in undertaking the DELAROSE online learning programme. This was addressed through the conduct of individual interviews with registered learners who had enrolled in this programme (delivered as the 'Certificate in Work-Related Stress') with WIT and received their final results.

The following sub-sections outline the population of interest for this study, followed by the methods employed in the design and conduct of these interviews, including ethical approval, informed consent and recruitment (including data collection dates). A description of the conduct of the interviews with reference to rigour, credibility, transferability, trustworthiness and the ethical considerations of interviewing is also outlined.

4.2.3.1 Population of interest

Persons who had enrolled in the online 'Certificate in Work-Related Stress' (known as DELAROSE) in the School of Health Sciences, Waterford Institute

of Technology and received their final results served as the population of interest for Study Two. This included learners in Ireland and international learners. As a pre-requisite, all learners enrolled in the Certificate were employed and were proficient in the English language.

4.2.3.2 Ethical approval

Ethical approval for Study Two was sought and granted from the WIT Ethics Committee in March 2018 (see Appendix E).

4.2.3.3 Recruitment

Convenience sampling was employed to recruit participants for Study Two. Participants were contacted by email with an invitation to participate in a research interview. An information sheet was included with the email. This invitation was sent only when the learner had received their final results for the programme.

Participants who indicated willingness to take part in this research then received the informed consent form by email or post, which was then signed and returned (see Appendix H). They were then contacted to schedule an interview. In total, 12 participants took part in individual interviews as part of this research. A profile of these participants in terms of their age and occupation is detailed in Chapter Six (Section 6.1). This included three learners who did not complete the programme in full. The first interview took place in October 2018. The final interview was conducted in February 2020.

4.2.3.4 Informed consent and confidentiality

Written informed consent was obtained from all participants prior to participation. Participants were informed that they could withdraw their data if they so choose (up until the point of data analysis), that taking part in the research was entirely up to them, and that they could withdraw at any time without giving a reason. As certain participant contact details and demographic information were collected, this study was not anonymous. Individual participant data was associated with an anonymous ID and was identifiable using this unique ID number. Analysis was conducted using pseudo-

anonymised data. This approach, however, only provided limited protection for participants as they could still be identified using indirect means.

My role as a researcher conducting a study and as a lecturer with responsibility for delivering the DELAROSE online learning programme presented an ethical consideration to address in terms of minimising pressure to consent and ensuring that participants felt comfortable enough to engage with me honestly and openly. That I initially fulfilled a formal lecturer role with each participant could have placed me in a position of power and exerted some pressure on them to consent and perhaps feel that they should deliver a certain viewpoint. However, each participant had received their final results before participation. The invitation to participate placed them under no obligation to engage with me and they could choose not to opt in.

4.2.3.5 Telephone interviewing

The choice of conducting an interview through telephone or online via skype was offered to each participant. As participants were recruited on the basis of their engagement with an online learning programme, with some based nationally and some internationally, in-person interviewing would not have been feasible. A choice of modality was offered as learners enrolled on the programme typically had a preference for engaging with support either online or through telephone. It also provided participants with some control over the research process and could have helped foster a more equal relationship (Rappaport and Stewart 1997).

Though some researchers have suggested that telephone interviewing can be limit the ability of the researcher to achieve depth (Sturges and Hanrahan 2004), others have espoused the practical benefits of these modalities (Barriball *et al.* 1996, Novick 2008). These benefits include savings in consumables, travel and time, the ability to reach geographically dispersed participants, and interviewer safety (Sturges and Hanrahan 2004). They may also help participants to feel relaxed and able to disclose sensitive information (Irvine 2011).

Ultimately, each participant chose for their interview to be conducted by telephone. Dates and times of interviews were agreed and all participants were

informed again of the purpose of the research and offered the opportunity to ask questions before or during the interviews. They were also informed that they could withdraw from the interview at any stage and decline to answer any question if they chose not to.

4.2.3.6 The interview process

Interviews are a widely used tool to access people's experience, attitudes, and feelings of reality. Based on their level of structure and flexibility, interviews can be divided into three categories. These are structured, semi-structured, and unstructured (Fontana and Frey 2005).

The interviews conducted with each participant were unstructured and conversational in style[3]. It was not intended that the interviews would be conducted in this manner. A semi-structured interview schedule of questions based on the research objective at hand had been prepared (see Appendix I), and the interviews should have adhered to this format.

However, over the course of each interview, I deviated from the question schedule and my interviewing became conversational in nature. It was not an explicit decision to conduct the interviews in this way. Rather this happened unintentionally over the process of each interview. This was partially due to my inexperience as an interviewer trying to establish depth and a rapport with participants over the telephone. The questions I asked followed on from participants' responses and statements, or were based on the topics covered in the semi-structured interview schedule. As a result, my questioning of each participant was conversational in nature and was steered by the semi-structured schedule of questions, rather than adhering to it strictly. Extracts from two of these interviews can be seen in Appendix I.

To an extent, the conduct of these interviews in a flexible and iterative manner could be considered a strength as it may have enabled participants to discuss

[3] It was highlighted by my PhD examiners that, based on examination of extracts from these interviews, I had not followed the semi-structured question schedule correctly. The interviews were unstructured and conversational in nature. It was not a conscious decision to deviate from the question schedule during each interview. Rather my lack of adherence to the specific questions detailed in this schedule occurred as part of interview process while trying to establish rapport with participants and explore topics in more depth. The interviews were incorrectly presented as semi-structured in the original thesis for examination

topics that would not have been raised had a more structured process been adhered to. The conversational-style could have worked as a positive in terms of understanding participant contributions.

The results of an NVivo12 coding query (see Table 10, Section 4.2.4.1) provide a degree of reassurance to the reader that certain interview topics were discussed with each participant (albeit in a different way to what was originally intended). The coding query was used to create a numerical chart of the final analysis in terms of the number of references that were coded across each theme and sub-theme across each participant.

While the interviews were steered by the topic guide, which provided some consistency in the foci of the interviews across participants, it cannot be guaranteed that every aspect of the topic guide was discussed with each participant. The use of an unstructured approach does have implications for the interpretation of data and findings from Study Two. It could have contributed to bias in both my questioning and in my analysis through selective coding (that may have led to some data being viewed as more reliable and others being ignored). Following the semi-structured interview process as initially intended for Study Two may have contributed to greater consistency in this aspect of the research (Lincoln and Guba 1985).

The unstructured format may limit the ability of readers to examine the research process and judge the dependability and confirmability of the findings (Tobin and Begley 2004), particularly as it relates to comparing differences in what was reported across participants. This is significant given the use of thematic analysis approaches in Study Two (Section 4.2.4), as the use of unstructured interviews places limitations on the extent to which thematic analysis can be harnessed to determine differences according to age across the data. While thematic approaches were usefully applied in order to generate a robust and coherent interpretation of the data, the relative strengths of the different themes generated from the data and the differences between participants are challenging to ascertain using these approaches. The interpretation of the data in Study Two must be considered in the context of this limitation.

4.2.3.7 Rigour and trustworthiness

A trustworthy study is one that is credible and consistent. Trustworthiness depends on how the research process has been carried out and how closely the findings represent the experiences of the participants (Clayton and Thorne 2000). Lincoln and Guba (1985) refined the concept of trustworthiness by introducing the criteria of credibility, transferability, dependability, and confirmability to parallel the quantitative criteria of validity and reliability. These criteria are widely accepted to demonstrate trustworthiness in qualitative research (Nowell *et al.* 2017).

Credibility

Credibility is defined as the extent to which data and data analysis are believable and trustworthy (Tobin and Begley 2004). Deviating from the intended semi-structured interview schedule may limit the credibility of the interview process and the findings of this study. In response, however, it is possible that the conversational flow of each interview may have helped to build rapport with each participant and create a generative environment. For example, the particular questions I asked depended on the participants' answers. This flexibility may have protected against uniform responses and helped to capture a real sense of each participant's experience.

My prior experience with each participant as a lecturer delivering meant that I had developed an understanding of their particular situations and experiences as they related to work-stress management. This may have helped to build their trust and confidence in me. It may also have helped with generating insightful findings and a credible account of participants' experiences.

Finally, the credibility of these findings may have been enhanced through a focus on what is known as negative case analysis (Lincoln and Guba 1985). For example, the experiences of participants who did not complete the programme in full were analysed to ensure that their experiences were not ignored. Similarly, analysis of the data and the final report was continuously refined to ensure that an accurate and credible account was provided, particularly as it relates to similarities and differences between participants according to age.

Transferability

Transferability is a recognised challenge in qualitative research (Ritchie and Lewis 2003). The processes I employed here in terms of small sample sizes and non-standard interviewing may have limited the transferability of the findings to similar contexts. However, this is justified on the basis that I sought to generate rich, contextual information relating to the experiences of a specific target population.

Nonetheless, Ritchie and Lewis (2003) do suggest that judgements about transferability can be made based on the accuracy with which the phenomena have been captured and interpreted in the study sample. This was managed by providing a full description of the sample and processes of data collection and analysis so that comparisons can be made with those in similar circumstances. Analyses and findings are presented as working hypotheses related to a particular context.

Dependability

Dependability refers the consistency of the findings under similar circumstances. A limitation of unstructured interviews is that they can lack consistency. Each unstructured interview conducted as part of this study was different because it was influenced by my relationship with the participants. The duration of the interviews varied while the conversational style that I employed with participants influenced the questions I asked of them. Nonetheless, a level of consistency in the interview processes was achieved by ensuring that the questions I asked of the participants were congruent with the research objective and that appropriate procedures and participants for data collection were employed. Dependability is also supported by providing a credible final report and by detailing an accurate account of the research process, data and analysis.

Confirmability

Confirmability is the degree to which the research findings can be confirmed by others. This is established when the participant's perspectives have been clearly and accurately presented, and are recognised by others. To accomplish this, any claims that are made are supported by the data. My analysis was scrutinised by

my PhD supervisors, while NVivo 12 allowed me to track and review the coding process so that I could ensure that my interpretations were informed by the data. The findings are related to previous research and existing work-stress theory.

4.2.4 Thematic analysis

All interviews were transcribed personally and the transcript data was imported into NVivo 12 for analysis. The transcribed interview data were analysed thematically following a six-step protocol described by Braun and Clarke (2006). Thematic analysis is a widely used method for identifying, analysing and reporting patterns (themes) across a data set (Braun and Clarke 2006, 2015). It can be used to address most types of qualitative research questions and data (such as interviews and investigations of participant experiences, as was the case here).

Traditionally seen as a poorly 'branded' method (in that it lacked the named status of other methods such as narrative analysis and grounded theory), much work to demarcate the nature, theory and conduct of thematic analysis has been conducted in recent years (Braun and Clarke 2016). As a result, detailed guidance as to the process of thematic analysis is now available and the value of this method for qualitative research is increasingly recognised.

I chose to employ inductive thematic analysis here as it is suited for use with small samples and data sets. It can also be used to analyse data collected as part of a broader study to generate results that are accessible and transferable to different contexts. I was attracted to this type of type of analysis as it is primarily data driven, whereby data is coded and interpreted independent of a researcher's preconceptions or a pre-existing coding frame (Terry *et al.* 2017).

Another factor of consideration was that I already had some experience with the nature and process of thematic analysis through the conduct of the reviews of the literature in Chapters Two and Three. Scoping review frameworks, following a process described by Arksey and O'Malley (2005), were used to inform the conduct of these reviews. These followed a descriptive-analytic approach which included a narrative thematic analysis. As part of this process I developed an appreciation of the nature of conducting critical thematic analysis.

Consistent with the assertions of Braun and Clarke (2015), I recognised that my review work was more than neutrally charting and describing existing research, but also included my interpretation of the literature. That is, I had to make a series of considered decisions relating to which studies to select, what findings to focus on, and which trends I perceived to be most relevant to my research question and final report. This prior experience with a thematic analytic approach contributed to my decision to utilise inductive thematic analysis in my examination of the data here.

As a novice researcher with limited experience in qualitative research methods, inductive thematic analysis was appealing as it is purported to be less complex than other analytical approaches and quicker to learn and do (Braun and Clarke 2016). I was also enticed by the flexibility that inductive thematic analysis appeared to offer. Thematic analysis is theoretically 'free', with themes derived from the dataset itself. As such I could employ it here to provide a rich and detailed interpretative account of the data independent of theory and epistemology (Joffe 2012). Inductive thematic analysis was suited to the pragmatic assumptions which underpinned the methodology and particular research question that informed Study Two.

4.2.4.1 The process of analysis and NVivo 12

My analysis of the qualitative dataset was facilitated by NVivo 12 software. I found NVivo to be particularly advantageous as a single location storage system through which material could be accessed easily and where data from multiple participants could be handled, considered and coded. Thus, I used it as a tool to help me to organise and co-ordinate my analysis of the data and to report from it, rather than as a tool to analyse the data itself. My analysis of the data was guided by the six-step process articulated by Braun and Clarke, which I now describe.

Step 1: Become Familiar with the Data

Before importing the interview texts into NVivo 12, I became familiar with the data by reading and re-reading the transcribed data and noting initial ideas. This is known as precoding and involved noting some sections of text which were of

interest without assigning any codes. Once all data was imported it was at this point that the process of analysis with NVivo began.

Step 2: Generate Initial Codes

Following this, I took my initial steps in the process of formally coding the data. This was essentially an analytic process of categorising data. My first attempts at which are best described as 'provisional coding', i.e. preliminary efforts to classify the data by associating it with particular concepts, categories or ideas. With NVivo 12, this involved the creation of nodes, to which collections of related material called references were coded (see Figure 7 and Appendix I for examples of references coded under particular nodes).

Specifically, my process of provisional coding involved the generation of a set of 'free nodes', which are stand-along nodes with no clear connection to other nodes (i.e. they did not fit easily into a hierarchical structure). Eighteen free nodes were created through the initial provisional coding process. Subsequent stages of coding then involved an on-going analysis of these free nodes. For example, I began regularly renaming and merging codes. This happened when I noticed that I had created two similar nodes and needed to merge the contents of both into one node, or if I felt that the title I had originally given a node did not accurately reflect the content of the references coded to it.

I converted free nodes into parent and child nodes by 'dragging and dropping' nodes into each other as appropriate. 'Parent' and 'child' nodes are a hierarchical structure of nodes, which move from a general category at the top to more specific categories. These nodes were categorised and compared, and it is from these that the core structure of my thematic analysis was generated.

Step 3: Search for Themes

Several cycles of coding were required to explore and identify salient features of the data. Once I was satisfied with my final database of free 'parent and child' nodes, I began to analyse them for initial patterns and group them into loose categories, from which sets of themes were generated. As with process of provisional coding, I regarded these themes as temporary in nature. I modified or amalgamated them I began to produce thematic analytic reports. As I was

working with a relatively small data set, there was much overlap between the coding stage and this stage of identifying preliminary themes.

Step 4: Reviewing Themes

I reviewed, modified and further developed the preliminary themes that were identified in Step 3. This involved reading the data associated with each theme I had generated and considering whether the data really did support them. Following this, I began to consider how each theme fit within the context of the entire data set. In cases where themes appeared to overlap, I questioned whether they existed as separate themes or whether they needed to be revised and amalgamated. Sub-themes within the data were also explored and reviewed further.

Figure 7. Screenshot of NVivo 12 during Coding Process

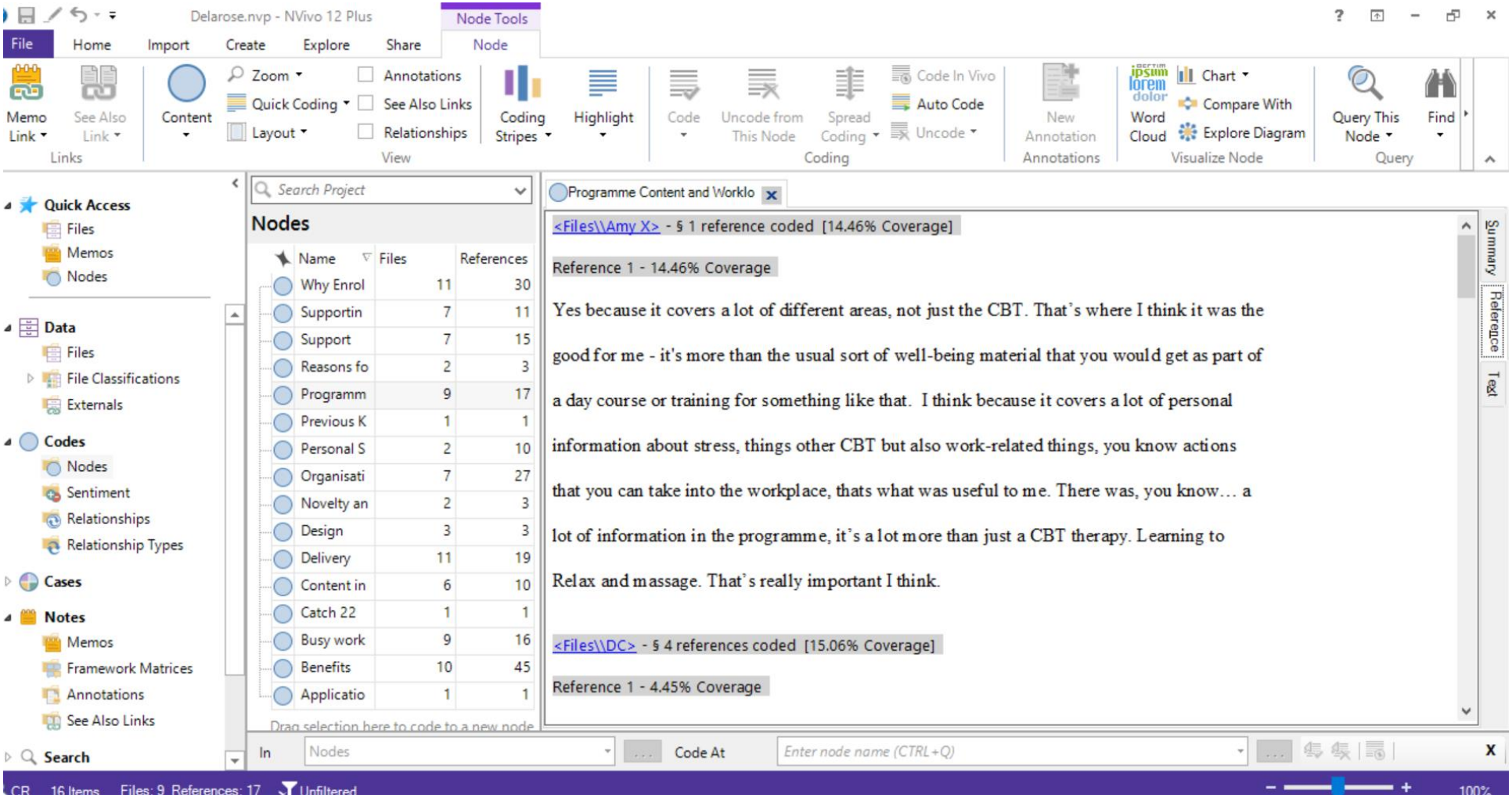


Table 10. Numerical Chart of Sources and References in relation to Coding Framework

	Sources	References
Benefiting From The Programme	12	80
Novelty and Relevance	11	21
Reasons for Enrolling	12	23
Supporting Others	6	7
Personal Stress Management	12	29
Facilitators and Barriers	12	144
Barriers	12	70
Work-life Balance	8	12
Programme Specific Issues	11	23
Content and Workload	9	11
Online Delivery	12	24
Facilitators	12	74
Application to Practice	11	19
Design	7	20
Tutor Support	9	21
Online Delivery	12	14
Enhancing the Experience	12	62
Content in Alternative Modalities	7	19
Interaction with Other Users	5	20
Structured Support	9	23

Step 5: Defining Themes

This step centred on a refinement of the themes with the intention of identifying 'the essence of what each theme is about' (Braun and Clarke 2006, pg.92). Sub-themes were categorised and analysed in terms of how they interacted and related to the main themes and with each other.

Step 6: Writing-up

Themes were compared, reviewed and refined in order to form the final thematic results presented in Chapter Six. Direct quotations of participants that best

illustrated each of these themes were selected and included in these results. Only participants' gender and age were included with each quote to maintain their anonymity.

In terms of the process of analysis itself, I found 'memoing' to be a very useful aid and relied much on it to help me throughout. These took the form of hand-written self-notes to track my thinking and interpretation as I progressed through each step of the analysis. I also took notes during and after interviews. Initially, these notes and memos consisted of just a few lines, but as the research and my analysis progressed, they became more comprehensive and in-depth. They helped to form early drafts of the thematic analysis and resolve issues that affected my making sense of the data. Two examples of memos are presented below.

Memo following interview with Participant (Female Staff Nurse Aged 44)

Work-life balance was a major challenge – experienced nurse with young children, managing demands of young family, balancing act with complex working environment. Passion for job came through. Real aim was based around need and desire to support others. Lot of stress in own right, desire to help others and support colleagues. Loyalty to profession and colleagues was evident. Time is prioritised – not just online but to prioritise anything extra. Expecting too much with this type of programme.

Memo following interview with Participant (Male, Manager in I.D. Care Service, Aged 55)

Personal stress management was not such a major priority for this participant. Much of the conversation was about the workplace, mostly led the participant. Was able to engage in the full course – possible link here to working more regular hours (not shift worker?). Facing higher level pressures around stress at work – looking for technical expertise in this area. Might be worth bringing in Health and Safety (legislation expert maybe?)

As I was interested in examining the potential impact of age on participants' experiences, I engaged in further rounds of analysis following production of the final thematic report. These subsequent rounds of analysis focused on examining variations in the experiences of different learners. Where differences across learners were noted, I queried whether age may have had an influence. The findings of this analysis are reported separately to primary narrative analysis in Chapter Six.

4.3 Conclusion

This mixed methods research comprised two studies based on survey and qualitative interview design approaches. The selection of a mixed methodology was rooted in the aims and objectives of this study. Specifically, Study One comprised a survey of health and social care workers in the South-East of Ireland in order to gather and analyse data relating to age-related differences in the contribution of workplace psychosocial characteristics to the psychological and physical manifestations of work-related stress among this population. The results of this are presented in Chapter Five. Study Two focused on investigating the experience of undertaking the DELAROSE online stress management programme. This was addressed through the conduct of individual unstructured interviews. The results of this study are presented in Chapter Six.

Chapter Five

FINDINGS – STUDY ONE

5.0 Introduction

Chapter Five presents the findings of Study One of this research, which comprised a survey of nurses and intellectual disability care workers in the South-East of Ireland. The purpose of this survey was to gather and analyse data relating to the contribution of age and workplace psychosocial characteristics to the manifestations of work-related stress among this cohort.

The findings of Study One are presented here in three parts. First, the sample and data under investigation are described (Section 5.1). Second, the results of correlational analyses of the relationships between age, well-being outcomes and job content variables are outlined (Section 5.2). Third, the results of three separate Hierarchical Multiple Regression models examining the contribution of age and workplace psychosocial characteristics to the experience of psychological and physical well-being in this sample are presented (Section 5.3).

The chapter concludes with a discussion of these findings in terms of age, stress and the main and interactive effects of the JDC(S) model; age-related differences in physical well-being outcomes, and previous research in this field (Section 5.4). The implications of these findings as they relate to issues of age and the development of online work-stress management interventions to support health and social care workers are considered.

5.1 Description of sample and data under investigation

In total, 305 survey responses were obtained, of which 174 were online and 131 were paper-based. One hundred and twelve survey responses were obtained from nurses and other care staff in eight intellectual disability care services in the region. This included five day services, one residential service and two mixed services. Responses were also obtained from 119 nursing staff in two general public hospitals and one private hospital in the region. Finally, one Department of Psychiatry in a regional hospital and one community mental health service were sampled. Seventy-four survey responses were collected from nursing staff and mental health care workers in these two settings.

Ten surveys were excluded due to incomplete data, leaving a final survey sample for analysis of n = 295. The age profile of participants ranged from 21 – 65 years, with a mean age of 43.91 and standard deviation of 9.96 (see Table 11).

Table 11. Sample by Age and Years Working in Sector

	Mean (SD)	Median	Min	Max
Age	43.91 (9.96)	44.00	21	65
Years Working in Sector	17.59 (10.48)	19.00	1	45

The final sample comprised 68 males and 227 females. Most participants (59.6%) were married; 12.6% were living with a partner; 20% were single and 7.8% were divorced, separated or widowed. The number of years working in the health and social care sector ranged from 1 – 45 years, with a mean of 17.59 and standard deviation of 10.48 (see Table 12). An undergraduate degree was the highest level of educational attainment for 42.2% of the sample, while 31.2% held a postgraduate qualification and 26.6% were educated to certificate or diploma level (this included the Leaving Certificate for three participants).

Table 12. Sample by Gender, Educational Attainment, Relationship Status and Role

	N	%
Gender		
Male	68	23.1%
Female	227	76.9%
Educational Attainment		
Diploma/Certificate (incl. LC)	71	24.1%
Undergraduate	117	39.6%
Postgraduate	107	36.3%
Relationship Status		
Married	176	59.6%
Divorced/Separated/Widowed	23	7.8%
Single	59	20%
Living with Partner	37	12.6%
Role		
Managerial	85	28.8%

Non-managerial	210	71.2%

Participants were asked to state their current occupation/area of work and then to state their current role/job title. This information was used to categorise participants according to their own description of their job. The sample mostly comprised nursing staff (71.5%), including registered general, intellectual disability and psychiatric nurses (these in turn included staff nurses, clinical specialists, advanced practitioners and nurse managers). The remainder comprised social care, support or project workers in intellectual disability care services (26.7%), or care/support workers in a mental health care setting (1.8%). 28.8% of the final sample indicated that they held some form of managerial position.

Descriptive analysis was conducted for the three well-being measures (i.e. Physical Health Component Score (PCS12), Mental Health Component Score (MCS12) and Perceived Stress) and five job content measures (i.e. Psychological Job Demands, Decision Latitude, Social Support, Job Insecurity and Physical Exertion). Higher scores on PCS12 and MCS12 scores indicated better Physical and Mental Well-being, while higher scores in Perceived Stress indicated greater stress (see Table 13). Similarly, higher scores on the five content variables indicated greater levels of those characteristics in the workplace (e.g. higher scores of Psychological Job Demands indicated a more psychologically demanding workplace).

Table 13. Well-being Outcome and Job Content Measures Descriptive Statistics

	Mean (SD)	Median	Min	Max
PCS12	50.58 (8.12)	53.69	18.36	53.69
MCS12	47.36 (10.06)	49.85	17.68	67.37
Perceived Stress	14.59 (6.68)	15.00	0	37
Psychological Job Demands	33.28 (6.37)	32.00	18	48
Decision Latitude	61.93 (14.50)	64.00	24	94
Social Support	23.65 (3.68)	24.00	11	32
Physical Exertion	2.58 (0.86)	2.00	1	4
Job Insecurity	4.57 (1.87)	4.00	3	16

5.2 Associations between well-being outcome measures and job content variables

Bivariate correlations were conducted to investigate the relationships between the job content variables of Psychological Job Demands, Decision Latitude, Social Support, Job Insecurity and Physical Exertion, and the three well-being outcome measures of Perceived Stress, Physical Health (PCS12) and Mental Health (MCS12) scores (in addition to age and years working in the health and social care sector).

As discussed in Chapter Four (Section 4.2.2.1), the choice of statistical test for the correlational analysis was determined by the nature of the data under analysis. As the assumption of normality was clearly violated (as per results of Kolmogorov-Smirnov statistical results, see Table 9, Chapter Four) and the data was ordinal in nature, a non-parametric test (Spearman's Rank Order correlation - rho) was used instead of the parametric alternative (i.e. Pearson's product correlation).

The following statistically significant correlations were identified (see Table 14). Age and the number of years working in the health and social care sector were significantly correlated with Physical Exertion (r_s = -0.187, $p < 0.001$, and r_s = -0.247, $p < 0.001$, respectively). PCS12 scores were significantly correlated with MCS12 scores (r_s = -0.150, $p = 0.010$), while MCS12 scores and Perceived Stress were significantly correlated (r_s = -0.519, $p < 0.001$). MCS12 scores also were significantly correlated with the three job content variables of Psychological Job Demands (r_s = -0.195, $p < 0.001$), Decision Latitude (r_s = 0.133, $p < 0.001$) and Social Support (r_s = 0.165, $p < 0.001$). Finally, Perceived Stress was significantly correlated with the job content variables of Psychological Job Demands (r_s = -0.240, $p < 0.001$), Decision Latitude (r = -0.173, $p = .003$) Social Support (r_s = -0.237, $p < 0.001$) and Physical Exertion (r_s = 0.124, $p = 0.033$).

In order to determine whether these correlations varied according to age, partial correlational analyses were conducted. PCS12 scores were no longer significantly correlated with MCS12 scores when controlling for age (r_s = -0.098, $p = 0.094$). MCS12 scores remained significantly correlated with the three job content variables of Psychological Job Demands, Decision Latitude and Social Support (r_s = -0.539, $p < 0.001$; r_s = -0.202, $p < 0.001$; r_s = 0.216, $p < 0.001$, respectively). Perceived Stress remained significantly correlated with Psychological Job Demands (r_s = 0.224, $p <$

0.001), Decision Latitude (r_s= -0.162, p = 0.005) and Social Support (r_s =-0.238, p < 0.001). However, when controlling for age, Perceived Stress was no longer significant correlated with Physical Exertion (r_s = 0.100, p = 0.088).

Table 14. Correlation Matrix[a] between Age, Job Content Variables and Well-being Outcome Measures

	Variables	1	2	3	4	5	6	7	8	9	10
	Predictors										
1	Age	.									
2	Years Working in Sector	**0.680****	.								
3	Psyc. Job Demands	-0.031	-0.056	.							
4	Decision Latitude	0.049	0.149	-0.034	.						
5	Social Support	-0.153	0.004	**-0.216***	**0.270****	.					
6	Physical Exertion	**-0.187***	**0.247****	**0.449****	-0.018	-0.070	.				
7	Job Insecurity	0.089	-0.003	-0.037	0.108	-0.080	-0.109	.			
	Outcomes										
8	PCS12	**-0.153***	**-0.154***	-0.039	-0.058	-0.007	-0.056	**-0.137***	.		
9	MCS12	-0.053	-0.005	**-0.195****	**0.133***	**0.165****	-0.059	-0.016	**-0.150****	.	
10	Perceived Stress	-0.095	-0.055	**0.240****	**-0.173****	**-0.237****	**0.124***	-0.002	0.006	**-0.519****	.

[a] *Using Spearman's Rho*

** represents statistically significant predictors with p < 0.05*

*** represents statistically significant predictors with p < 0.01*

5.3 Hierarchical multiple regression analysis

Hierarchical multiple regression analysis was employed to test the interactive effects of the JDC(S) model as they related to predicting physical and psychological well-being outcomes in this sample. Age-related differences in these interactions were also investigated. Three separate Hierarchical Multiple Regression models were conducted. Perceived Stress, Mental Health (MCS12) and Physical Health (PCS12) scores were employed as the dependent variables, respectively.

With regard to Perceived Stress and Mental Health, the demographic variables of Age, Gender and Care Setting were entered into the model in Block One. Two dummy variables based on care setting (and with intellectual disability care services employed as the reference) were created for this purpose. Following this, the three job content variables of Psychological Job Demands, Decision Latitude and Social Support were entered in Block Two. In Block Three, two 'two-way' interaction terms between Psychological Job Demands and Decision Latitude, and Psychological Job Demands and Social Support were entered. Two 'three-way' interaction terms of Psychological Job Demands, Decision Latitude and Age; and Psychological Job Demands, Social Support and Age, were also entered in this block. Finally, a three-way interaction term of Psychological Job Demands, Decision Latitude and Social Support was entered in Block Four (see Table 15).

In the first model, Perceived Stress scores were employed as the dependent variable. Block One explained 3.7% of the variance in Perceived Stress scores, which was statistically significant ($p = 0.027$). Block Two explained 13.5% of the variance in Perceived Stress scores, with an R^2 increase of 0.098, which was statistically significant ($p < 0.001$). This block was also statistically significant ($p < 0.001$). Block Three explained an additional 2.5% of the variance in Perceived Stress scores. This change was not statistically significant ($p = 0.076$), though the block itself was ($p < 0.001$). Block Four explained an additional 0.2% of the variance in Perceived Stress scores; again this change was not statistically significant.

The overall model (Block Four) explained just 16.3% of the variance in Perceived Stress scores, which was significant ($F (12, 282) = 4.573$, $p < 0.001$). Psychological Job Demands made a statistically significant unique contribution to predicting Perceived

Stress scores in the final block ($\beta = 0.248$, $p < 0.001$). Psychological Job Demands were also statistically significant in Blocks One, Two and Three. No other variable made a statistically significant unique contribution to predicting Perceived Stress scores in the final model.

In the second model, MCS12 scores were employed as the dependent variable. Block One explained 3.9% of the variance in MCS12 scores, which was statistically significant ($p = 0.021$). Block Two explained 13.4% of the variance in MCS12 scores, with an R^2 change of .112, which was statistically significant ($p < 0.001$). Block Two was statistically significant overall in the prediction of MCS12 scores ($p < 0.001$). Block Three explained an additional 1.2% of the variance in MCS12 scores. This change was not statistically significant ($p = 0.433$), though the block itself remained statistically significant ($p < 0.001$). Block Four explained an additional 0.8% of the variance in MCS12 scores, which was not significant ($p = 0.103$).

Table 15. Perceived Stress and MCS12 Hierarchical Regression Models

	Perceived Stress				MCS12			
	R^2	*p*	ΔR^2	β	R^2	*p*	ΔR^2	β
Block One	**0.037***	**0.027**	**0.037***		**0.039***	**0.021**	**0.039***	
Age				**-0.117***				-0.017
Gender				0.069				-0.091
Care Setting (Gen)				**-0.140***				0.127
Care Setting (Psyc)				0.015				-0.090
Block Two	**0.135***	**0.000**	**0.098***		**0.134***	**0.000**	**0.095***	
Age				-0.107				-0.033
Gender				0.064				-0.092
Care Setting (Gen)				**-0.127***				-0.105
Care Setting (Psyc)				**1.483***				**-0.322***
Psyc. Job Demands				**0.226***				**-0.221***
Decision Latitude				-0.178				**0.310***
Social Support				-0.115				0.046
Block Three	**0.161***	**0.000**	0.025		**0.145***	**0.000**	0.012	
Age				-0.107				-0.060
Gender				0.070				-0.098
Care Setting (Gen)				-0.014				-0.087
Care Setting (Psyc)				0.183				**0.303***
Psyc. Job Demands				**0.235***				**-0.224***
Decision Latitude				-0.199				**0.288***
Social Support				-0.087				0.055
Psyc. Job Demands x Decision Latitude				0.012				-0.152
Psyc. Job Demands x Decision Latitude x Age				0.100				0.180
Psyc. Job Demands x Social Support				0.121				-0.535
Psyc. Job Demands x Social Support x Age				-0.280				-0.532
Block Four	**0.163***	**0.000**	0.002		**0.153***	**0.000**	0.008	
Age				-0.101				-0.049
Gender				0.069				-0.099
Care Setting (Gen)				-0.013				-0.085
Care Setting (Psyc)				0.187				**0.297***
Psyc. Job Demands				**0.248***				**-0.199***
Decision Latitude				-0.211				**0.263***
Social Support				0.095				0.040
Psyc. Job Demands x Decision Latitude				0.025				-0.128

Psyc. Job Demands x Decision Latitude x Age	0.080	0.148
Psyc. Job Demands x Social Support	0.029	0.354
Psyc. Job Demands x Social Support x Age	-0.183	-0.341
Psyc. Job Demands x Decision Latitude x Social Support	-0.054	-0.105

**** represents statistically significant at p < .05***

R^2 statistic (coefficient of determination) refers to the percentage of variance in the outcome variable that is explained by the block of predictor variables.

ΔR^2 statistic refers to the additional variance in the outcome variable explained by the block of predictor variables, when the effects of the previous block (s) are controlled for. Beta Coefficients (β) refer to the degree of change in the outcome variable for every 1-unit of change in the predictor variable. A *t*-test assesses whether the beta coefficient is significantly different from zero.

The overall model (Block Four) explained just 15.3% of the variance in MCS12 scores. This was statistically significant (F (12, 282) = 4.245, $p < 0.001$). Psychological Job Demands (β = -0.199, $p = 0.002$) and Decision Latitude (β = 0.263, p = 0.022) each made a statistically significant unique contribution to MCS12 scores in the final model (see Table 15), as well as in Blocks One, Two and Three.

In the third and final Hierarchical Multiple Regression model, Physical Health (PCS12) scores were employed as the dependent variable. Again, the demographic variables Age, Gender and Care Setting were entered into the model in Block One. Two dummy variables based on care setting (and with intellectual disability care services employed as the reference) were created for this purpose. This was followed by the three job content variables of Physical Exertion, Decision Latitude and Social Support in Block Two. In Block Three, three 'two-way' interactions between Physical Exertion and Decision Latitude, Physical Exertion and Social Support, and Physical Exertion and Age were entered. Two 'three-way' interactions of Physical Exertion, Decision Latitude and Age, and Physical Exertion, Social Support and Age were also calculated and entered in this block.

Block One explained 5.9% of the variance in PCS12 scores, which was statistically significant ($p = 0.001$). Block Two explained an additional 4.3% of the variance in PCS12 scores; this change was statistically significant ($p = 0.004$), as was the block

itself was significant (p = 0.011). Block Three explained an additional 1.6% of the variance in PCS12 scores. This change was not statistically significant (p = 0.263). The overall model (Block Three) explained just 11.8% of the variance in PCS12 scores, which was significant (F 11, 283) = 3.458, $p < 0.001$). Age (β = -0.202) and Physical Exertion (β = -0.197) each made a statistically significant unique contribution to explaining PCS12 scores in each of the blocks in which they were entered (see Table 16).

Table 16. PCS12 Hierarchical Regression Model

	PCS12			
	R^2	p	ΔR^2	β
Block One	**0.059***	**0.001**	**0.059***	
Age				**-0.178***
Gender				-0.096
Care Setting (Gen)				-0.119
Care Setting (Psyc)				-0.036
Block Two	**0.056***	**0.011**	0.016	
Age				**-0.200***
Gender				-0.069
Care Setting (Gen)				**-0.355***
Care Setting (Psyc)				0.110
Physical Exertion				**-0.193***
Decision Latitude				**-0.240***
Social Support				0.059
Block Three	**0.118***	**0.000**	0.016	
Age				**-0.202***
Gender				-0.087
Care Setting (Gen)				**-0.349***
Care Setting (Psyc)				0.086
Physical Exertion				**-0.197***
Decision Latitude				-0.211
Social Support				0.039
Physical Exertion x Decision Latitude				-0.481
Physical Exertion x Social Support				-0.450
Physical Exertion x Decision Latitude x Age				0.142

Physical Exertion x Social Support x Age	0.173

**** represents statistically significant at p < 0.05***

R^2 statistic (coefficient of determination) refers to the percentage of variance in the outcome variable that is explained by the block of predictor variables.

ΔR^2 statistic refers to the additional variance in the outcome variable explained by the block of predictor variables, when the effects of the previous block (s) are controlled for.

Beta Coefficients (β) refer to the degree of change in the outcome variable for every 1-unit of change in the predictor variable. A *t*-test assesses whether the beta coefficient is significantly different from zero.

5.4 Discussion

In the following section the findings of Study One are discussed across a number of domains. First, the findings in relation to age, stress, and the main and interactive effects of the JDC and JDC(S) models are considered and referenced to the existing literature (Sections 5.4.1 and 5.4.2). This includes a discussion on the lack of evidence for age-related differences in both of these effects and their relationship to previous investigations of these models. This is followed by a discussion of the findings as they relate to age, physical exertion and physical health (Section 5.4.3). The implications of these findings as they relate to issues of age and the development of online work-stress management interventions are then considered (Section 5.4.4).

5.4.1 Age, stress and the main effects of the JDC and JDC(S) models

A key finding in the context of this research as it relates to issues of age and supporting health and social care workers in the management of their work-related stress was that perceived stress was negatively correlated with both age and the number of years spent working in the health and social care sector (Section 5.2). Hierarchical regression analysis indicated that age did not make a significant unique contribution to predicting Perceived Stress or Mental Health scores (Section 5.3).

These findings are consistent with the conclusions drawn in Chapter Two (Section 2.4) from analyses of the literature pertaining to the experiences of ageing nurses and intellectual disability care workers. It was determined that

there was a lack of evidence that age plays a role in stress perception among nurses or intellectual disability care workers. That is, being older does not appear to constitute a source of stress for either occupational cohort (albeit it was noted that research examining this issue among intellectual disability care workers was limited). Chronological age does not seem to have an impact on how nurses or intellectual disability care workers perceive stress, nor is it that their work is more stressful, or that they become less capable of managing stress as they age (Chapter Two, Section 2.4.2). Taken with the findings of Study One, these suggest that a focus on age in developing tailored supports for health and social care is not justified on stress perception alone.

Nonetheless, Study One took a broader focus than solely exploring the relationship between age and stress perception. Data related to age-related differences in the contribution of workplace characteristics to the psychological and physical manifestations of work-related stress were analysed. Studies which examine age-related differences in the contribution of workplace psychosocial characteristics to stress outcomes are rare (Zacher and Schmitt 2016). In most previous investigations of the JDC and JDC(S) models with nurses and intellectual disability care workers, for example, age was not included as a variable within regression or odds ratio analyses (Amick *et al.* 1998, Laschinger *et al.* 2001, Hansen *et al.* 2009). Notable exceptions include Jansen *et al.* (1998), Hochwalder *et al.* (2007), and van den Berg *et al.* (2008), who each found age to be a significant unique predictor of burnout outcomes in their studies with nurses. However, these studies did not consider whether age influenced the contribution of workplace characteristics to such outcomes.

Only one study has examined this issue among health and social care workers. Yaldiz, Truxillo and Cadiz (2020) found that job autonomy was more strongly predictive of engagement and emotional exhaustion in older nurses compared to their younger colleagues. However, it is difficult to draw a comparison from that research to the findings of Study One as it assessed differences in engagement and burnout, rather than stress or mental well-being.

The findings of Study One support the main effects of the Job Demand-Control model (Section 5.2). These did not vary according to age. Psychological Job

Demands remained significantly correlated with Perceived Stress and Mental Health scores while controlling for age. No significant interactions between Psychological Job Demands and age were observed in either hierarchical regression model with Perceived Stress or Mental Health scores employed as the dependent variables (Section 5.3). Based on these findings, age does not appear to influence the relationship between psychological demands in the workplace and the experience of stress or mental well-being among nurses and intellectual disability care workers.

Decision Latitude and Social Support were both significantly correlated with Perceived Stress and Mental Health scores. Decision Latitude made a significant unique contribution to predicting Perceived Stress and Mental Health scores in each hierarchical regression model (Section 5.3). However, Social Support did not make a significant unique contribution to either of these outcomes.

None of these relationships varied according to age. Both Decision Latitude and Social Support remained significantly correlated with Perceived Stress and Mental Health scores when controlling for age (Section 5.2). No significant interactions between these variables and age were observed in either hierarchical regression model with Perceived Stress or Mental Health scores employed as dependent variables (Section 5.3). Age does not appear to influence the relationship between decision latitude or social support in the workplace and the experience of stress or mental well-being among nurses and intellectual disability care workers.

These findings are consistent with previous investigations of the JDC and JDC(S) models (van der Doef, Maes and Diekstra 2000, Hausser *et al*. 2010, Gonzalez-Mule, Kim and Ryu 2020). A review by Pisanti *et al.* (2012) of studies with nurses reported robust support for the additive effects of the JDC and JDC(S) models. Support for the main effects of these models among intellectual disability care workers also appears to be quite robust, evidenced through a number of individual studies as reviewed in Chapter Two (e.g. Rose 1993, Clayton *et al.* 2008, Kowalski *et al.* 2010, Judd, Dorosenko and Breen 2017).

The findings here support the main effects of these theoretical models, and provide no evidence that they vary according to age.

5.4.2 The interactive effects of the JDC and JDC(S) models

The (iso) strain and buffer hypotheses of the JDC(S) model suggest that Decision Latitude and Social Support are of value as a buffer against increased Psychological Job Demands in the workplace. No evidence for this was found in Study One, based on hierarchical regression analysis with Perceived Stress and Mental Health employed as dependent variables. Psychological Job Demands made a significant contribution to stress and mental well-being outcomes among this sample of nurses and intellectual disability care workers. This was not affected by their age or the levels of Decision Latitude or Social Support they reported.

The lack of evidence for an interaction between job demands and control in Study One is consistent with previous investigations of the JDC and JDC(S) models. Hausser *et al.* (2010), for example, determined that only about a third of 'tests' of this interaction reviewed in their meta-analysis provided at least partial support for an interaction between job demands and control. Evidence for a full three-way interaction of demands, control, and social support was even more sparse. This was confirmed in the findings of meta-analysis by Gonzalez-Mule, Kim and Ryu (2020), which identified that support for strain or buffer effects is generally weak and inconsistent.

The lack of support for the interactive effects of the model is also reflected in studies with samples of nurses. Pisanti *et al*.'s (2012) review of this literature noted that the strain and iso-strain hypothesis were supported in fewer than one-third of studies. Just one study in that review supported the moderating effect of control on job demands, and while the combined moderating effect of control and social support on job demands was tested four times, a significant three-way interaction effect was not found.

Investigations of the interactive effects of the JDC and JDC(S) models among intellectual disability care workers are rarer and tend to focus on outcomes related to engagement and burnout, rather than stress (Chapter Two, Section

2.2). For example, Howard, Rose and Levenson (2008) found that staff support moderated the relationship between exposure to violence and burnout, while Devereux *et al.* (2009) reported that social support at work moderated the relationship between workplace demands and personal accomplishment.

Only one study to date has investigated the iso-strain and buffer effects of the model with intellectual disability care workers. Vassos *et al.* (2017) found that the combination of a high workload, low control and low colleague support was predictive of higher burnout and lower engagement in a sample of such workers. It should be borne in mind, however, that Vassos *et al.* assessed burnout outcomes only, whereas outcomes related to perceived stress and mental well-being in were examined in Study One. That an outcome measure of burnout was not included is discussed as a limitation of this research in Chapter Eight (Section 8.2).

5.4.3 Age, physical exertion and physical health

The sole domain in which age did appear to exert an influence was in the relationship between Physical Exertion and Physical Health. Age was significantly and negatively correlated with both Physical Health and Physical Exertion (Section 5.2). Age and Physical Exertion were significant unique predictors of Physical Health scores in each block of a hierarchical regression model (Section 5.3)

That workers reported poorer physical health with increased age is consistent with the conclusions drawn in Chapter Two (Section 2.2) relating to the experiences of ageing nurses in the workplace. Nurses do appear to be affected by declines in their physical and cognitive abilities as they age, which has an impact on their health and well-being. The experience of injury and pain is a source of stress for ageing nurses, and, coupled with declines in their physical and cognitive stamina and needing more time to recover between shifts, constitutes a challenge for this cohort (Chapter Two, Section 2.2).

This is supported by quantitative research relating to the physical health of nurses and other healthcare workers more generally. For example, De Cieri *et al.* (2019) identified age as a significant unique predictor of physical health in a

sample of Australian nurses and healthcare workers, while Zaghini *et al.* (2020) reported that age was predictive of physical health among Italian nurses and doctors.

The relationship between age and the physical well-being of intellectual disability care workers (including intellectual disability care nurses) does not appear to have been examined to date (Chapter Two, Section 2.4.4). The findings here suggest that the relationship between age and poorer physical well-being are equally applicable to this sectoral group.

Previous research indicates that nurses can become more vulnerable to the physically exerting nature of care work as they age (Fronteira and Ferrinho 2011, Heiden *et al*. 2013, Perry *et al.* 2017). In Study One, it was found that while younger workers experienced greater stress and more physically exerting jobs, it was ageing workers who experienced poorer physical health (Section 5.2). This suggests that health and social care workers may become more vulnerable to physically exerting care work as they age, even if their specific roles are less physically exerting than those undertaken by younger workers.

The extent to which the contribution of workplace characteristics to physical well-being outcomes among nurses or intellectual disability care workers varies according to age has not been examined to date (Chapter Two, Section 2.4.4). In Study One, no significant interactions between age and any job content variable were identified. Neither decision latitude nor social support made a unique contribution to predicting physical health scores, nor did they influence the relationship between physical exertion and social support (Section 5.3).

Age and Physical Exertion were the only variables to make a statistically significant unique contribution to Physical Health outcomes through hierarchical regression analysis. The JDC and JDC(S) models were not particularly useful in predicting physical well-being in this study, which does contrast with some recent investigations. For example, Magnavita *et al.* (2017) found that job demands, control and decision latitude predicted physical health among nurses and doctors in an oncology/haematology unit, while Sarafis *et al.* (2016) found that workload and problems with peers and supervisors predicted physical health among Greek nurses.

5.4.4 The implications of these findings for this research

The key findings from Study One are that age and stress perception are not correlated among nurses and intellectual disability care workers, and that the main effects of the JDC(S) model were supported regardless of age. As such, a specific focus on age in efforts to support nurses and intellectual disability care workers in the management of their work-related stress does not appear to be required.

The findings suggest that online work-stress management interventions for these occupational cohorts should target each of the workplace characteristics of psychological job demands, decision latitude and social support. In contradiction to the interactive hypotheses of the JDC and JDC(S) models, it is not justified to focus on increasing social support or decision latitude for nurses and intellectual disability care workers with the intention of mitigating the stressful effects of psychological job demands. Again, a focus on age in this regard is not warranted based on the findings of this study.

As these are psychosocial characteristics that manifest at an environmental or systemic level of the workplace, their mitigation through online work-stress management interventions may require actions that are organisation-focused. Such interventions should provide those who possess the requisite power to make meaningful changes in their working environments to lessen the psychological job demands or enhance the levels of decision latitude or social support experienced by nurses and intellectual disability care workers. Practical examples of the ways in which these workplace characteristics could be targeted through an online stress management intervention include risk assessments or the implementation of participatory design approaches. These and other initiatives are discussed in more detail in Chapter Seven (Section 7.2).

In only one domain of this study were clear age-related differences found. This was in the relationship between age, physical exertion and physical health. The findings in this regard suggest that nurses and intellectual disability care workers should be provided with tailored interventions to maintain their physical well-being and limit the negative effects of physically exerting care work as they age. Consistent with the findings of the review of the literature in

Chapter Two (Section 2.2.1), this may also include techniques to help them manage the effects of shift work and improve their recovery from work.

Alterations to physically strenuous working environments may be needed to support nurses and intellectual disability care workers as they age. This is because physical exertion is a characteristic of the working environment. As such, its effective management may require intervention at that level. In terms of online stress management, this may involve targeting managerial staff who possess the requisite power to make meaningful changes in the working environment. This would most likely involve providing them with the skills and knowledge to create less physically exerting environments or support workers to manage the effects of physically strenuous work.

On a final note, the findings of this study should be interpreted within the context of certain limitations relating to the process of investigation. The data were drawn from a self-selected convenience sample from one region in Ireland, while the predictive value of most of the variables examined in this study was limited. To an extent, this highlights the complex and subjective nature of perceived stress and mental well-being as psychological states based on cognitive perceptions. It is also indicative of the difficulty in garnering a complete understanding of the many factors (demographic and organisational) that can contribute to explaining such outcomes, as well as limitations in the specific measures employed here (such as their lack of tailoring to health and social care occupational settings). These limitations are discussed in greater detail in Chapter Eight (Section 8.2).

5.5 Conclusion

The chapter presented the findings of Study One, which involved gathering and analysing data related to age and the contribution of workplace characteristics to the manifestations of work-related stress among a sample of nurses and intellectual disability care workers. This was achieved through a survey of a sample of such workers in the South-East of Ireland. In this way, Objective Three of this research was met.

It was found that the main (additive) effects of the JDC and JDC(S) models were supported and do not appear to vary according to age. There was limited support for the (iso) strain and buffer effects. Again this did not vary according to age. There was

evidence that nurses and intellectual disability care workers may experience poorer physical health as they age, and may become more vulnerable to the negative effects of physical exerting care work. These findings are consistent with previous investigations of the JDC and JDC(S) models across a number of occupational groups, including several studies with nurses and intellectual disability care workers. The implications of these findings as they relate to issues of age and the development of online stress management interventions to support health and social care workers are discussed in Chapter Seven.

Chapter Six

FINDINGS - STUDY TWO

6.0 Introduction

Chapter Six presents the findings of Study Two, which comprised a qualitative investigation of the experience of undertaking the DELAROSE online learning programme. Individual interviews following an unstructured 'conversational' style were conducted with a sample of learners who had registered to complete the programme. A thematic analysis of the data was conducted, the findings of which are presented in Section 6.1. Included as part of this is a focus on the extent to which these findings varied according to age (Section 6.1.4). In Section 6.2, the implications of these findings with reference to the usefulness of the DELAROSE programme in terms of participants' stress management are discussed. Aspects of the programme that should change or remain the same are also examined. The chapter concludes with a brief reflection on the limitations of these findings arising from the interview process (Section 6.3).

6.1 Findings

A profile of those who participated in the interviews is presented in Table 17. Participants were sampled from learners who had registered for the DELAROSE programme. Fifteen learners, all of whom had enrolled in the programme and whose final results had been approved and ratified, were invited to participate in an individual interview via telephone or skype relating to their experience of undertaking the programme. Twelve (n = 12) consented to participate, of whom nine were female and three were male. This gender imbalance reflects the profile of those who enrolled to undertake the programme and the wider health and social care workforce, which is predominantly female. Each interview was conducted via telephone as per participant preference. Interviews were audio-recorded, transcribed and analysed.

Table 17. Profile of Participants in Study Two

	Job Title	Age	Gender
P1.	RG Nurse (Staff)	27	Female
P2.	Manager ID Service	51	Male
P3.	R. Nurse Manager	47	Female
P4.	Midwife	46	Female
P5.	Social Care Worker (ID Service)	48	Male
P6.	Manager ID service	42	Male
P7.	Doctor	58	Female
P8.	RG Nurse (Staff)	38	Female
P9.	RG Nurse (Staff)	54	Female
P10.	Social Care Worker (Psychiatric Service)	34	Female
P11.	Social Care Worker	43	Female
P12.	Occupational Health Practitioner	55	Female

As can be seen from the profile presented in Table 17, the participants recruited for these interviews included nurses and intellectual disability care workers, as well as other workers from the wider health and social care workforce. Four participants were registered nurses (one Nurse Manager and three staff nurses), three were social care workers (one of whom worked in a psychiatric service), two were managers in intellectual disability care services, one was a midwife, one was a doctor while one was in an occupational health role within the health service.

Recruitment of participants for Study Two was not stratified according to age; rather it was a convenience sample of those who had undertaken the DELAROSE programme as registered learners with WIT and who agreed to participate in an interview. Participants ranged in age from 27 to 58 years, with a mean age of 45.25 years. Some had not completed the programme fully (n = 3, all female) but had completed at least one of the two modules.

Three overarching themes were generated through the process of thematic analysis. These were '*Benefiting from the Programme'*; '*Facilitators and Barriers'* and '*Enhancing the Experience'*. Each of these comprised a number of sub-themes. The

following sections (Sections 6.1.1 – 6.1.3) present the findings as they relate to each theme and sub-theme in turn.

As outlined in Chapter Four (Section 4.2.4), I engaged in further rounds of analysis following production of the initial thematic report. This additional analysis was focused on identifying differences in the experiences of participants, and whether these differences varied according to age. The findings of this analysis are presented in Section 6.1.4.

6.1.1 Benefiting from the programme

An understanding of how participants benefited from undertaking the programme was a more complex process than simply considering whether they felt 'less stressed' during or after completion. Participants alluded to a range of ways in which they benefited from undertaking the programme. These benefits appeared to derive from the development of new skills and knowledge in relation to the management of work-related stress, though they manifested in a number of different ways.

This included changes in managing stress, which are analysed across two sub-themes, namely *changes in personal stress management* and *supporting others and organisational stress management.* A further two sub-themes relevant to how participants did or did not benefit from the programme were also identified. These were the *reasons participants enrolled in the programme*, and *the novelty/relevance of the content*.

6.1.1.1 Changes in personal stress management

Participants commented that their ability to manage stress at an individual level improved through undertaking the programme and that they were continuing to benefit following completion. This improvement was attributed to the development of new knowledge and skills as they related to personal stress management. These translated into positive benefits for participants in two principal domains.

First, participants described their efforts and success in reducing their negative physical and psychological manifestations of stress. Units of Learning focused on changing their thinking, learning how to relax, workplace well-being and mindfulness-based stress reduction were particularly highly regarded:

'For me I suppose the biggest difference it made personally was around the physical side of it and my own well-being. I knew previously that I wasn't getting enough sleep…. So what I learned through the sleep hygiene aspect really just helped me re-focus on that and work towards something better' (P5, M)

'The mindfulness and relaxation piece was my favourite part of it. Overall I'd say that was one that helped me the most and actually noticeably helped me to feel less stressed…It helped I think with minimising the amount of time that I feel stressed, and helps me to appreciate each small moment as it happens'(P5, M).

Second, participants described how the programme enabled them to develop some skills to mitigate sources of stress in their workplace. This differed from efforts to alter their physical and emotional responses to stress. Rather it related to expertise and abilities that participants developed in order to identify and alleviate key stressors in their working environment that were a persistent source of concern and difficulty to them:

'I still use the Activity Map, just to keep a written record of how I spend my time on the normal working days. In the course I found out quite quickly that there was one activity I definitely over-spent time on: Documentation and administrative work' (P10, F)

An interesting aspect of the discussion in terms of personal stress management was how the programme helped some participants to reduce their uncertainty and concern about work-related stress. This related to the fact that they now had access to trustworthy, evidence-based knowledge to inform their interactions with co-workers, as well as some skills to support those in distress and advocate where necessary. This gave them confidence in their ability to manage stress in their workplace to at least some degree.

This appeared to be related to the level of experience or workplace responsibility held by the participant. That is, for those who were more experienced and/or held leadership or managerial-level roles in their workplace, a perceived lack of confidence and competency in supporting others or managing stressful working environments manifested as a personal stressor. A particular value of this programme was that it could alleviate a lack of

confidence to some degree by increasing their knowledge and skills in managing work-related stress:

'I've more confidence now when team members verbalise their fears and concerns regarding changes, things like concerns about the impact of new changes on the day to day completion of their job and what, if any, positives and negatives they foresee the change bringing about. I'm happy to have team members verbalise what, if any, fears they have regarding the impact on them personally, fears around routine, security, possibly working with new people and the unknown' (P2, M).

A feeling expressed by some participants was that it would take time for their newly developed skills and knowledge to translate into tangible differences in their workplace and their personal working practices. Participants alluded to how the programme provided them with access to a comprehensive portfolio of information which could be drawn upon as a resource in the future. Several indicated that they were seeking specific resources that they could retain after the programme:

'Leadership is one area I think might just stand to me in the future. I'm not in that kind of a role at the moment but a learned a lot from that module about managing other people… What makes a good leader in the workplace and the skills you need to be one and work effectively to get the best out of others' (P10, F)

6.1.1.2 Supporting others and organisational stress management

Some participants described how they had gained practical skills and knowledge in terms of coping with stress that could be shared with colleagues. This enabled them to support their co-workers by directing them to evidenced-based information and talking to them about what they were doing to manage their stress.

It was great to approach it in a structured way and more evidenced based way. You can google things obviously and sure there are plenty of videos and articles about stress, but I wanted something more concrete and bigger picture, so that I could say to others 'look this is what I've learned, this is what I'm doing, it

might help you'…. Yes, definitely and I've shared a lot of that stuff with my colleagues as well (P3, F).

Participants alluded to some positive benefits at a broader workplace level. For example, through developing their own knowledge in relation to work-related stress, they were able to help their colleagues, even in small ways, by directing them to useful resources and being able to talk to them about what they were doing to manage their stress. Thus, participants were enabled to improve their understanding of the nature and effects of work-related stress generally. They were supported to manage stress in a manner that encompassed more than just personal stress reduction and relief.

The salience of these benefits for participants also appeared to be influenced by their position in the workplace. That is, for those who were more experienced and/or held positions of leadership or management, being able to support others was of particular value. They were also more likely to be in a position where they could contribute to a less stressful working environment:

'That was a great help to me because my job is stressful and it just gave me some direct help with buffering against that, and a much clearer understanding of what I'm up against. I think that's why I started with the second module (Environment-Centred Management) - *the models and frameworks, like the Ten Category, and the Five- point model, and the legislation too. it was great to get that grounding and have that language then when it comes to understanding stress in the workplace and how the organisation adds to It' (P12, F)*

6.1.1.3 Reasons for enrolling

Participants gave different reasons for enrolling on the programme. For some, their primary motivation for enrolling centred on personal stress management and specific stressor relief, and they viewed the programme as potentially therapeutic or 'stress-relieving' in nature. This caused a difficulty for some, as, despite benefiting from newly gained knowledge and skills in this domain, they also found the programme to be more extensive and 'academic' in nature than anticipated. This is discussed in more detail in another theme '*Facilitators and Barriers'*.

Again, there were differences among participants related to the occupational role they held. For those who were more experienced and/or held a managerial role, a key reason for enrolling tended to be to support others. This seemed to stem from a desire to tackle stress in their workplaces, or gain formal recognition of their ability to manage work-related stress. Among less experienced workers, personal stress management was more prominent in these discussions.

Others noted that their personal levels of work-related stress were perhaps not excessive before or during the programme but they enrolled more for reasons of prevention and to gain new skills and knowledge in a field that was interesting and relevant to them.

'Both, for me and my nurses, it's just such a busy working environment and very stressful. The stress is really bad, it's very difficult with pressures from doctors. We're just constantly under pressure, so it was about me but also because I'm in charge of a team of nurses. Stress just isn't supported' (P3, F)

'I did it for me personally and eh, as for my role. Well, I was having ongoing work-related issues and they were causing me long-term stress. So I was looking for help with that…. I am a safety advisor. I am answering a query from a line manager in relation to his duty to manage a particular risk (P12, F)

One participant described how they intended to use the programme to help them support both themselves and the people who use their service:

'I'm working with people who are very vulnerable and have huge stress in their own lives also. So much of our stress comes from the people we look after but then I think that's forgotten that stress is everywhere and affects everyone, and they had lots of stress in their lives too. I needed some stress management personally to look after myself but stress affects the people who use our service also. It's almost forgotten about. I needed information and just some guidance so I could at least understand what is going on with them' (P11, F).

6.1.1.4 Novelty/Relevance

While completing an accredited learning programme is evidence of skills and competencies acquired, it was important to consider whether this actually

reflected the attainment of knowledge that was new and relevant to participants. Many participants were familiar with at least some aspects of the programme content. The techniques themselves, such as learning to relax, giving feedback, assertiveness or mindfulness were not new. However, approaching them in a structured format and with practical examples referenced to theory and research was what made the programme novel and beneficial to them.

The fact that the programme built on previously attained knowledge was welcomed. Some learners even considered themselves already knowledgeable in the field but still enjoyed the programme and developed new perspectives from their completion. In line with this, several articulated a benefit of the programme in that it provided them with a platform and opportunity to reflect on their personal situation.

'It depends…a lot of the information in the first module, I would have known already and I think most medical professionals would be familiar with a lot of concepts covered in it. But it was useful and I did pick up a few kind of tips from it. From my point of view, the second module was a lot more useful to me, a lot of the frameworks and theories I wouldn't have come across before' (P6, M)

Participants indicated that the learning content of the programme was relevant to them both personally and professionally, that it was comprehensive, and that it struck an appropriate balance between theoretical knowledge and practical skills-based exercises. Though the programme content was relatively generic, the assignments (portfolio activities) required participants to apply the knowledge and skills they had gained in their personal efforts to manage stress in their workplace. This was highlighted as valuable in ensuring that the content was sensitive to their needs and that they could apply it directly.

'One thing I liked was that all the activities were really practical and applied – all the assignments were about work, not just about theory and documents and writing essays. You weren't doing assignments just for the sake of it, they were more like activities or exercises that were affecting you directly' (P10, F).

Nonetheless, several did state that while they developed skills and knowledge in managing stress, they were working within exceptionally stressful environments. As an online stress management programme completed by one

individual, DELAROSE could not address these issues. Rather, it could only help them cope with the effects of the stressors they encountered. This was noted as a limitation not just of this programme but of stress management initiatives generally, as well as a criticism of the broader organisational and sectoral challenges they faced.

'I'm thinking of the time management exercises, it's a big source of stress for nurses and it's not that we have poor time management skills, it's that so much work is expected in this very limited time frame. Like, on night duty there can be a quiet period and you can be just waiting for the morning jobs…. Then during all this hectic time, they might decide to send up an admission. To get all these jobs completed in that time frame, no matter how efficiently you work, you know, you're just under huge pressure' (P1, F).

The environment-centred content lacked relevance to some participants. This was because they did not hold an occupational position which enabled them to make workplace changes. This was more prominent among (though not limited to) less experienced participants, who perceived this content to be more applicable to those who held more senior or managerial positions. While it did not affect their ability to complete the programme, there were few immediate benefits to them in learning how issues outside of their role or beyond their control could be addressed.

'There are practical things I can't do much about - there's not enough car parking. Now look they might seem small but it creates a lot of hassle and ill-feeling here…That's not a criticism of your course, more I suppose an acknowledgement that it can only ever go so far in a sector like this one (P2, M)

6.1.2 Facilitators and barriers

A number of characteristics of the programme were highlighted for their role in encouraging or discouraging engagement. These related primarily to the design and delivery of the programme, rather than the actual content, and are presented across the following sub-themes: *online asynchronous delivery*, *support and feedback, interface design*, and *excessive workload.* Each of these are analysed in the following sections.

6.1.2.1 Online asynchronous delivery

Valued by participants was the flexibility and convenience of the programme, afforded by the online and asynchronous nature of its delivery. The fact that there were few time and location restrictions to completing programme content was of value to them. This served to minimise many of the constraints typically encountered when undertaking additional work-related learning or training. For example, most participants referred to a range of competing personal and work commitments which they had to manage in addition to undertaking the programme. The modality of delivery was helpful in ensuring that they could ultimately complete it.

'Yeah and it was a good time for me as I was off work, and I could actually go at it without being compromised in any way from doing that. It's a really nice benefit from the way the course is set up. That flexibility is big thing for me, I need it in anything I take on' (P8, F).

For most this was the first wholly online programme for which they had registered. A lack of experience in online learning did not appear to be a factor of consideration either for participants in choosing to undertake this programme. Few appeared to have intentionally sought an online learning programme; rather, the programme was discovered co-incidentally and was attractive for its subject matter and the knowledge and skills it purported to offer. Online delivery was an additional bonus which, combined with fortuitous timing on behalf of learners, made it feasible for them to undertake the programme.

'I hadn't done anything online before, but the title of it really grabbed me, you know 'work-related stress'. I think whenever you see a title like that your interest is going to be piqued. I'm exposed to a lot of stress in my job, especially… I thought it might be interesting and a handy way of doing it online' (P9, F).

However, online asynchronous delivery was also identified as a barrier to programme completion. This was partly because it contributed to feelings of a lack of urgency and obligation. Participants described a difficulty getting into a regular flow of work, meaning that they tended to complete the programme in

a piecemeal manner. This was not necessarily due to a lack of motivation or dissatisfaction with the content offered. Instead, participants were simply unable to prioritise and commit to a programme of this extent.

Some participants spoke of struggling to meet additional demands such as family responsibilities, other training obligations and occupational pressures. Because the programme was online and completed in their own time and of their own volition, it tended to be of a lesser priority compared to these other demands. This was a challenge faced by most participants. For the three participants who did not complete DELAROSE in full, long hours, shift work, and child or eldercare responsibilities were key contributing factors.

... I suppose the days that I do work, my long days really are long, and my days that I'm off, I find that I'm juggling kind of housework, day to days chores, and looking after my child, and I suppose I'm at an age now where she, I can't just sit here down now in front of the tv and I do my thing, she wants to be at the computer with me, whatever I'm doing, and I don't like leaving her do that either you I suppose, nobody…you know you want to read with her, colour with her…play with her in other ways, and you know I suppose I feel guilty when I'm working, when I'm not around that em, the days that I am around I want to give her my 100% attention (P8, F).

6.1.2.2 Interface design

Accessing the programme was reported to be straightforward, with the Moodle interface attractive, intuitive and easy to navigate. While some participants had prior experience with Moodle, the virtual leaning network through which the programme was delivered, most did not. This did not seem to negatively affect their ability to access and engage with the programme.

In terms of the learning content itself, participants described it as clear and concise and that it conveyed key concepts simply and effectively. There was a good flow between the different Units of Learning within the two individual modules of the programme and there was a logical rationale to how the Units were presented.

Yes, it was fine, I'm used to Moodle so it was grand and accessible from that point of view. I think there was an issue with Powerpoint with one of the subjects at one stage, it was missing or the link was down or something, but it pretty easy to contact you and get it fixed (P3, F)

6.1.2.3 Support and feedback

The provision of personalised feedback on assignment submissions was valued by participants. Appreciation was expressed that this feedback addressed issues they raised. New information beyond the standard programme content and relevant to the individual learner was provided as they completed the programme. Satisfaction was expressed that support was readily available when required and that issues relating to accessing content or understanding assessment activities were quickly resolved.

'The emails and the follow ups were really handy, really relevant to what I wanted to read about and have – I've a bank of stuff now that I draw on, and tip into when I need it. All there for me. It was good too, cos I just done whatever unit it was and then I had the follow-up with you so I could keep going, but I also had that info so it meant a bit more' (P6, M)

6.1.2.4 Extensive content and workload

Some participants described how programme completion required considerably more work and time than they anticipated. The programme in its current format was felt to be more akin to a traditional academic programme and not what they had expected from one that was online and part-time. There was no recommended time frame and participants were free to complete and submit assignments as they wished (though they were advised that the structure of the normal academic calendar still applied). Many required, or at least utilised, the full academic year to complete the programme in its entirety. This felt excessive and beyond what they anticipated such a programme would comprise or what they were looking for.

'I changed role right after signing up and I'm effectively working six days a week. At first I did some bits of work but found I needed to set aside a couple of hours to really get into it, read the material, look things up and do the activities.

Between work, tiredness and other responsibilities and just needing time off, I found that really tough to do' (P4, F).

Others acknowledged that as an accredited online learning programme carried out mostly independently, self-motivation was required. In order for it to be useful and for them to derive benefit from it, they needed to commit time and effort to ensure they could complete the programme within a reasonable timeframe. This was viewed as part of being an adult learner and a normal part of completing such programmes, regardless of how entertaining or engaging they may be.

'No, eh there was nothing I didn't really like about it. Apart from I suppose the effort it takes the complete a learning programme. But every adult learner probably complains about that! I knew it was 20 credits but I suppose there was more to it than I realised. But that's the nature of it too, all adult learning is like that, you have to put in the time. Even after doing the work, the eh… work on procrastinating, I was still procrastinating. It's just the way these things are I think! (P7, F).

6.1.3 Enhancing the experience: needing something more

Participants discussed aspects of the programme which they felt should be changed or specific actions that could have been taken to enhance their experience. Interpreted from these was an underlying sentiment that while the programme in its current format was broadly satisfactory, more could be done to make it more manageable and engaging. These aspects related to delivering *learning content in different modalities*, *interaction between learners*, and *the tutor-learner relationship.*

6.1.3.1 Learning content in different modalities

Some participants expressed a desire for more of the programme content to be presented in different modalities such as videos and podcasts, rather than a primary reliance on written text for conveying information. It was felt that this would have been more compatible with their own preferences for consuming information. It may have also stimulated and maintained engagement with the programme.

'I … just found it very textual and content heavy early on. I liked the first unit and the appearance of the course, especially that video, the one about stress and it goes through the different parts of the body. I liked the podcasts and workbooks that you sent me on as well. I think I'm a very visual learner, I like colour and I need to see things in graphs and pictures, neat and, ah, easy on the eye. Or it just suits me better I think. The ten or twelve pages of text, you know, they just felt dense to me and harder to work through' (P11, F)

Others, however, expressed a preference to read text and were quite satisfied with the PDF support material, PowerPoint slides and audio downloads. This appeared to relate to the personal preferences of some learners. Several indicated that they were seeking specific resources that they could retain after the programme ended and draw upon in the future.

'I liked the combination of the file and the slide, it broke it up (the content) a bit for me. I wouldn't be too bothered now by videos and audio and things like that, it's a course at the end of day so I was more focused on that side of it. Yeah, like at the end of the day it's about the content, you can jazz it up in lots of different ways but still, you know, you have to do the work, do the learning, get through the content and take it in. If it was more videos and clips and thing, I don't know, I'd probably be spending more time watching things over again and having to write out notes and all that' (P6, M).

6.1.3.2 Interaction with others

Some participants stated that it might have been helpful to build interaction with other learners into the programme as this may have made it more engaging. They may also have benefitted from sharing their experience of managing work-related stress with others. Suggestions included moderated forums, question and answer sessions, interactive quizzes that provide automatic feedback, small group discussions and occasional synchronous classes. However, others stated that they appreciated working independently, and that some portfolio activities did not have to be shared with the tutor.

'I think I would have liked more online stuff, things like videos maybe. A Q and A session would have been good as well. You kind of do the course on your own

I suppose, that's probably just the way that's set up. But maybe if I could interact with others or there was some kind of online lecture that I could log into every now and again, I would have liked that I think. Even just to share your thoughts with others and see what other people are doing' (P5, M).

6.1.3.3 The tutor-learner relationship

While there was a general satisfaction with the nature of the support and feedback provided, this was also identified as an area of programme that could be improved. Some expressed a preference for more regular communication, such as reminders, check-ins and opportunities to discuss the learning content. Others indicated that they would have liked an agreed timeline for completing and submitting assignments. These may have helped them stay engaged with the programme and complete it in a timely manner.

'I suppose, if you could touch base…I suppose that's what I would have liked, or I would imagine, if you could base at the start, maybe a class to kind of advise on, and put a timetable in place. Anyway I know that you did speak to me about a timetable and all that, at the start, and a kind of framework, have a kind of sit down maybe at the beginning. A structure there maybe, a more formal structure, even a kind of two hour meet or a class to get it going' (P8, F).

Various modalities of support were also discussed. Email support and telephone calls with the tutor were preferred over other means of support such as skype communication or video calling, which were generally regarded as more complex and unnecessary. Emails were seen as less intrusive and more suited to the busy working schedule that most participants followed. Overall, it seemed that a mix of professional support for technical aspects of the programme and motivational support to encourage continued engagement with the learning content was favoured.

'I think as well I preferred text support rather than have to arrange a call. It was much easier for me just to email and then catch up with you later on. That kind of support suited me fine' (P8, F).

6.1.4 Age-related differences in participants' experiences

As noted in Section 6.1. and discussed in Chapter Four (Section 4.2.4), following production of the thematic findings (Sections 6.1 to 6.3), further analysis was conducted to determine the extent to which these findings varied according to age. This was necessary to address the central research question of this thesis (Chapter One, Section 1.3) as it related to issues of age and supporting health and social care workers in the management of their work-related stress through online interventions.

Ultimately, there was little indication of an influence of chronological age on participants' experience of the programme. All participants appeared to gain at least some skills and knowledge in personal stress management and derive some benefits from this (Section 6.1.1.1). These included changes in their ability to manage physical and psychological manifestations of stress, as well as mitigating certain sources of stress in their working environment. These benefits did not seem to vary to according to age.

There were differences among participants in the benefits they derived from the programme, particularly with regard to issues of confidence and uncertainty (Section 6.1.1.1). These differences appeared to be due to the influence of experience or responsibility in the workplace, rather than chronological age itself. That is, among participants who were more experienced and/or held positions of management or leadership in their workplace, a lack of confidence and knowledge in managing stressful working environments manifested as a personal stressor. Though this was related to age, in that those who were more experienced and/or held managerial-level roles tended to be older, these differences were more related to participants' position in the workplace rather than their chronological age per se.

Undertaking the programme appeared to comprise an active coping strategy for such participants as it helped them reduce their uncertainty and concern around work-related stress (Section 6.1.1.2). This related to the fact that they now had access to trusted material to inform their interactions with co-workers. Alleviating a perceived lack of confidence by increasing their knowledge and

skills in managing stress was a benefit of the programme that seemed to be particularly associated with those with more experience and responsibility.

Related to this was the reported value of gaining skills and knowledge that would enable participants to support their colleagues and manage stress at a workplace level (Section 6.1.1.2). This appeared to vary among participants, not because of their chronological age, but because of their position in the workplace. Among those holding senior or managerial level roles, managing stress at a workplace level was a pressing issue. They were also more likely to hold positions in the workplace where they could take action at that level. Though these workers tended to be older, it was not their age but rather their experience and the positions of leadership or responsibility they held that contributed to this.

These differentials were in turn linked to differences in participants' motivation to undertake the programme (Section 6.1.1.3). Being more experienced and/or holding a position of management or leadership appeared to contribute to feelings of an obligation or responsibility to support their colleagues in managing stress. As such, a primary reason for enrolling for such workers centred on gaining skills to support others or learning how to manage stress in the workplace. Some also sought to gain formal recognition of their ability to manage work-related stress. Among those who were less experienced (and who tended to be younger), a desire to improve their personal stress management seemed to be more prominent (Section 6.1.1.3).

Though most researchers employ chronological age markers to define their concept of interest when examining age-related differences in the workplace (indeed, this is the conceptualisation employed in this research), as discussed in Chapter One (Section 1.3), occupational position can be associated with the influence of age in a work-related context (Schalk *et al.* 2010, Sterns and Doverspike 1989). In this way, age is an indicator of a worker's career stage and level of experience (Rupp *et al.* 2005). This recognises that as workers spend more time in their jobs as they age, they accumulate increased experience and responsibility (Benner 1984). It is this process which appeared to be

responsible for differences in participants' experiences of the DELAROSE programme, and not their chronological age.

Beyond these differentials, there was little indication that participants' experiences of the programme was influenced by their age. For example, a limitation of the programme described by several participants was that while they developed skills and knowledge in managing stress, they were also working within exceptionally stressful environments (Section 6.1.1.2). As an online programme completed by one individual, DELAROSE could not help them address these issues. This was not because of their age or position within the workplace. Instead, it was noted as a limitation of DELAROSE and of stress management initiatives generally, and as a criticism of broader organisational or sectoral challenges they faced.

With the exception of modality of support, there were few differentials in participants' perceptions of the characteristics of the programme that encouraged or discouraged their engagement. As discussed in Section 6.1.3.1, it appears that there were positive and negative aspects to the design and delivery of this programme. These were common to the experience of most participants, regardless of their age.

For example, the flexibility and convenience of the programme, afforded by the online and asynchronous nature of its delivery, was valued by nearly all participants. The challenges associated with online delivery, in terms of contributing to feelings of a lack of urgency and obligation, or making it difficult for workers to get into a regular flow of work, did not vary according to participants' age (Section 6.1.2.3). Meeting additional demands such as family responsibilities, other training obligations and occupational pressures while trying to find time for the programme was experienced by most participants. These additional findings as they relate to DELAROSE are discussed in more detail in Section 6.2.

There was variation among participants in terms of the aspects of the programme that they felt should be changed or actions that could have been taken to enhance their experience of undertaking the programme. For example, some participants expressed a desire for more of the programme content to be

presented in different modalities such as videos and podcasts, as this may have helped to stimulate and maintain their engagement with the programme (Section 6.1.3.2). Others expressed a preference to read text and were satisfied with material in its existing format. These appeared to reflect differences in individual personal preferences, as opposed to differences determined by age.

One exception to this was the communication between the tutor and the learner (Section 6.1.3.3), which was perhaps the only aspect of the delivery of the programme in which an age-related difference was noted. Ageing participants tended to value more regular communication, particularly via phone, while among younger participants, it was email communication as and when required that was favoured. Outside of this specific domain, however, there was little indication that participants' perceptions of the design or delivery of the programme, including aspects that should be changed, varied according to their age.

6.2 Discussion

The following section presents a critical discussion of the implications of these findings as they relate to the issue of age and the further development of the DELAROSE programme. This is referenced to what is already known from the quantitative and qualitative literature about online work-stress management interventions. This includes existing knowledge of the effectiveness of such interventions and how workers experience them, both generally and according to age.

This discussion is presented in three parts. First, the usefulness of the programme in terms of participants' stress management is considered (Section 6.2.1). This is followed by an analysis of what aspects of the programme participants indicated should remain the same and what aspects should change (Sections 6.2.2 and 6.2.3). A thematic map illustrating the link between the sub-themes generated as part of the findings of this study to the further development of DELAROSE is presented in Figure 8.

6.2.1 The usefulness of the DELAROSE programme for managing stress

Differences according to age in the usefulness of online work-stress management interventions is not something that has been investigated to any meaningful extent to date. Indeed, only one intervention that focused on a

specific age cohort of workers was identified through the systematic review of the literature presented in Chapter Three (Section 3.3.4). This was a website-delivered programme trialled with I.T. workers aged over 50 (Cook *et al.* 2015). A range of health promotion material was provided, including some stress management content similar to DELAROSE. No positive improvements on symptoms of distress or coping with stress post-intervention were found, possibly due to the use of a single post-test at three months.

The findings here indicate that the usefulness of DELAROSE to participants in terms of their personal stress management did not appear to vary according to age. Participants developed new skills and knowledge relevant to reducing the negative effects of stress or mitigating stressors in their working environment. One exception to this was the usefulness of the programme in terms of reducing concern and increasing confidence in work-stress management. As noted in Section 6.1.4, variation among participants in this regard did not appear to be due to chronological age but rather their position in the workplace (in terms of experience and responsibility).

That participants in this study reported that the programme was useful for personal stress management is consistent with existing research demonstrating the efficacy of similar content in online formats for other occupational groups (e.g. Heber et al. 2017; Ebert et al. 2015). This is the case with similar 'in-person' stress management programmes trialled with health and social care workers (Richardson and Rothstein 2008, Ruotsalainen et al. 2015, Foster, Wood and Clowes 2021).

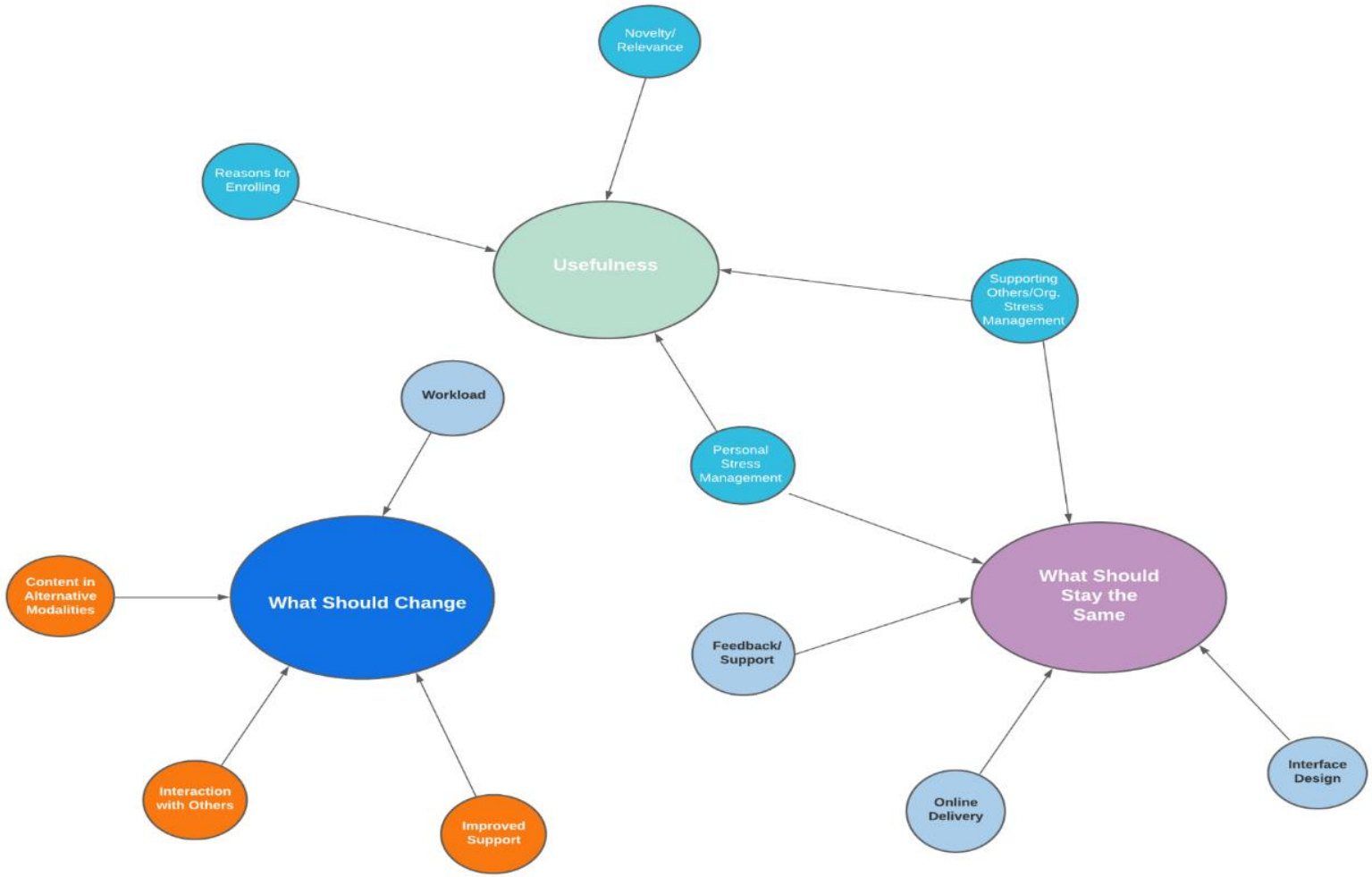
As noted in Chapter Three, almost all existing online work-stress management interventions are individual-focused (Section 3.3). This means that they are delivered to an individual user with the intention of enhancing their personal coping skills or reducing their perceptions of stress in the workplace. The impact of such programmes on outcomes beyond the individual user (such as alleviating the stress of others in the workplace) are rarely considered (Carolan, Harris and Cavanagh 2017, Phillips, Gordeev and Schreyögg 2019).

Age-related differences in the utility of online work-stress management interventions for organisational outcomes are under-investigated. Only one online intervention that encompassed an organisational focus or considered outcomes beyond the individual was identified in Chapter Three. This was an online mental health training programme delivered to managers (Gayed *et al.* 2019). Though it was not associated with positive changes in stress-related outcomes for workers, it did contribute to increased knowledge and confidence among managers.

Such changes in knowledge and confidence are consistent with the findings of Study Two (Section 6.1.1.2). Given that the DELAROSE programme is person-centred in nature, it is not surprising that organisational changes featured less prominently in discussions about the benefits of the programme. Benefits typically derived from organisational interventions, such as fewer referrals and complaints and less absenteeism, are difficult to assess and alter through online programmes.

Participants in Study Two did describe some positive effects at a broader workplace level. The programme was useful in this domain as it enabled them to develop their knowledge in relation to work-related stress. They were able to support their colleagues by directing them to useful resources and being able to talk to them about what they were doing to manage their stress (Section 6.1.1.2).

Figure 8: Thematic map of sub-themes linked to further development of the DELAROSE programme



The variation in these particular benefits of the programme among participants appeared to be influenced by their position in the workplace, rather than their chronological age. That is, for those who were more experienced and/or held managerial-level positions, being able to support others was of particular value. They were also more likely to be in a position where they could contribute to a less stressful working environment.

Being more experienced and/or holding a position of management or leadership appeared to contribute to feelings of an obligation or responsibility to support their colleagues in managing stress. As such, a primary reason for enrolling for such workers centred on gaining skills to support others or learning how to manage stress in the workplace. Some sought to gain formal recognition of their ability to manage work-related stress.

These findings as they relate to the usefulness of the DELAROSE programme call into question the value of a focus on age in terms of supporting health and social care workers through online work-stress management interventions. The DELAROSE programme helped participants reduce a lack of confidence and uncertainty, support others, and introduce changes at a workplace level. While there was variation among participants in the salience of these benefits, this variation was not due to age, but rather the influence of their position in the workplace. This would suggest that the further development of programmes such as DELAROSE should focus on ensuring that their content is tailored to the level of experience or responsibility of the target user. These factors may be more likely to determine what they seek from such a programme and the extent to which they are likely to benefit from it.

6.2.2 What should stay the same

A number of characteristics of programme and its delivery were regarded positively by participants. These were the *dual-focused nature of the programme*, the *online asynchronous delivery*, *personalised feedback and support*, and the *interface design*. Many of these have been identified in previous qualitative investigations of online work-stress management interventions (see Chapter Three, Section 3.5 for a summary of findings arising from review of this literature).

As discussed in Section 6.2.1, participants' perceptions of these characteristics did not seem to vary according to their age. Rather, it appears as though there are positive aspects to online programmes like DELAROSE that are to the benefit of all who may undertake them, regardless of their age. Nonetheless, in some domains differences in participants' experiences were observed. These differences appeared to be due to participants' position in the workplace, rather than being as a direct result of their chronological age. This is discussed in more detail in the following sub-section.

6.2.2.1 A dual-focused work-stress management programme

Gaining skills and knowledge in both personal stress management and contributing to a less stressful working environment were significant in terms of what some participants sought from the programme and the utility of it for their stress management. Though there were differences related to age in the salience of these benefits, these were due to occupational position, rather than chronological age itself. Ageing participants tended to be more experienced and hold managerial-level positions, which influenced their reasons for enrolling and the ways in which they benefited from the programme.

Consistent with the conclusions drawn in the preceding section (Section 6.2.1), this suggests that the dual-focused format of DELAROSE should remain in place in order to meet the requirements of health and social care workers who seek to contribute to a less stressful working environment. Though such workers may more likely be older, the findings here suggest that age is not the key contributing factor in why such a format is desirable to them. Rather, it is their position in the workplace (in terms of experience, leadership or responsibility) that influences the value of a dual-focused programme to them. That said, not all participants valued the comprehensive and dual-focused nature of DELAROSE. This requires consideration, and is discussed in Section 6.2.3.4.

6.2.2.2 Online asynchronous delivery

Previous qualitative investigations of online work-stress management interventions have reported that online delivery can make it easier for users to engage with such programmes (see Chapter Three, Section 3.5 for a review of

this literature). Indeed, as noted in Chapter One, the value of online delivery modalities in terms of their practicality and convenience is evidenced by the proliferation of online psychological supports provided during the course of the recent Covid-19 pandemic.

The online asynchronous delivery of DELAROSE was appreciated for the convenience and flexibility it offered participants, particularly in the face of competing work and personal commitments. This did not appear to vary according to age. While a positive perception of online delivery is to be expected considering that participants self-selected onto the programme, it does suggest that such formats are likely to be acceptable to most users, and is an aspect of the programme that should remain. This would likely be to benefit of ageing health and social care workers, not because of their age, but because of the valuable flexibility that online modalities can provide.

Online work-stress management interventions can be susceptible to disengagement. This vulnerability was identified in two separate reviews of the quantitative and qualitative literature as it relates to such interventions (see Chapter Three, Sections 3.3 and 3.4). It was a feature of participants' experiences in Study Two here, regardless of their age. Thus, while online asynchronous delivery is a positive aspect of the programme and should remain, the potential for disengagement is an issue that needs to be managed. This is discussed further in Section 6.2.3.

6.2.2.3 Personalised feedback and support

Participants should continue to receive personalised feedback that addresses any specific issues they raise or the particular nature of their work-related stress. Support should also be readily available and issues relating to accessing content should be resolved quickly. Indeed, the value of tailored feedback and support has been highlighted in previous qualitative investigations of online work-stress management interventions (Chapter Three, Section 3.8).

Age-related differentials in the benefits of these characteristics were not apparent. As with online asynchronous delivery, this suggests that these features

should remain as it would be to the likely benefit of all who may undertake the programme. A specific focus on age does not appear warranted in this regard.

The modality of communication was an aspect of the delivery of the DELAROSE programme in which an age-related difference was found, in that ageing participants tended to value both phone and email communication (Section 6.1.2.3). For younger participants, it was email communication, as and when required, that was favoured. Though video support was available, it was rarely utilised. Thus, email and phone contact should remain in place, particularly as it is likely to meet the preferences of ageing workers.

6.2.2.4 Simple and attractive interface design

Previous qualitative investigations of online work-stress management interventions indicate that participants tend to be satisfied with an online design once it is simple and user-friendly (Chapter Three, Section 3.8). In this study, participants reported that the design of the DELAROSE programme was attractive and that the Moodle interface was intuitive and easy to navigate. This probably reflects that in-house technical expertise in WIT was employed to assist with the transfer of DELAROSE content onto Moodle and to ensure that the design of the programme was appealing and easy to use. Participants' perceptions of the design in this regard did not vary by age, and so a simple, attractive design should continue to remain in place.

Whether the design of an online stress management intervention has an impact on its usefulness is unclear from the extant qualitative literature (Chapter Three, Section 3.8). Previous investigations have found that online interfaces that are confusing and complex can lead to frustration and dis-engagement. Similarly, meta-analytic work by Carolan, Harris and Cavanagh (2017) identified that technological design predicted adherence to online psychological interventions among workers.

These findings suggest that the existing design of DELAROSE should be maintained. Again, as with the domains of online asynchronous delivery and personalised feedback and support, retaining these feature is important as they would be to the likely benefit of all users, regardless of their age. The value of an attractive design does not appear to vary by age, and does not requires any

age-related amendment in the further development of the DELAROSE programme.

6.2.3 What should change

Analysis of findings indicated that there are some specific changes to the DELAROSE programme that should be made. These relate to the delivery of learning *content in different modalities*; *facilitating interaction with other learners; the nature of the support from the tutor,* and *excessive content and workload*. Many of these factors have been identified through qualitative investigations of similar programmes (Chapter Three, Section 3.8).

With the exception of excessive workload, participants' perceptions of these aspects of the programme did not appear to vary according to age. This is an important finding in the context of this research as it suggests that a focus on age is not required in the further development of the programme. Rather, it indicates that focus should be placed on meeting varying personal preferences among participants. Amending these aspects of the delivery of the DELAROSE programme to the likely benefit of all who may undertake it, regardless of their age.

6.2.3.1 Content in alternative modalities

The value of delivering content in alternative modalities has not been examined in previous qualitative evaluations of online work-stress management interventions (see Chapter Three, Section 3.8). This may be because most of these interventions used different technologies to present their content, or because they did not take the form of a learning programme.

This desire for content in different formats, such as videos or podcasts, varied among participants. This appeared to reflect differing personal preferences, rather than being due to age. Indeed, it differed among ageing participants themselves, as some expressed a preference to read text and were satisfied with text-based learning material. Delivering content in alternative formats may be helpful in meeting varying personal preferences among those who may undertake the programme, regardless of their age.

6.2.3.2 Facilitating interaction with others

Several participants indicated that the ability to interact with other learners on the programme would have been desirable (Section 6.1.3.3). That said, others indicated that they valued the privacy of the programme and appreciated that the portfolio activities were completed for their own benefit and did not have to be shared with others. This variation, which is consistent with the findings of previous qualitative investigations of online work-stress management interventions (Chapter Three, Section 3.8), did not appear to be due to age. Rather, it seemed to reflect varying personal preferences as to what was attractive to some and discouraging to others. Similar to the issue of providing content in alternative modalities, enabling users to interact with others, should they so choose, may be helpful in meeting differing preferences among users. Accommodating such differences in personal preferences as part of the further development of DELAROSE would appear to be more pertinent than focusing on age.

6.2.3.3 The nature of the support from the tutor

The provision of effective support with online work-stress management interventions is a complex issue. Previous qualitative investigations of such interventions have noted that users tend to dislike a lack of human support (Carolan and de Visser 2018) and value guidance and reminders to help them stay engaged (Asplund *et al.* 2019). However, these can easily become unhelpful and make users feel overwhelmed (Eklund *et al.* 2018).

Support was found to be an aspect of the DELAROSE programme that almost all participants felt should be improved, regardless of their age. Specifically, they indicated that they would have preferred more regular communication and/or an agreed timeline for submitting assignments. Making such changes could be important not only in meeting needs of ageing workers in terms of support and guidance, but may also help to manage the issue of disengagement arising from online asynchronous delivery. As discussed in Chapter Three, the nature of the support from those delivering online interventions can make a

valuable contribution to mitigating potential disengagement (Harrer *et al.* 2018; Ebert *et al*. 2018).

6.2.3.4 Excessive content and workload

Successful completion of the DELAROSE programme required significantly more time and effort than what some participants anticipated from a part-time online learning programme. As a result, the programme came to be perceived as an additional burden on top of an already demanding volume of work and personal obligations. This is consistent with what is known about existing online work-stress management interventions, as several have been criticised for being overly demanding and time-consuming (Chapter Three, Section 3.8). This is a limitation as their perceived high workload can become a barrier to completion and place an additional demand on users who may already be experiencing much stress.

Some participants reported that the organisation-focused aspects of the DELAROSE programme lacked relevance to them. Being able to support others or contribute to stress management at an organisational level was less of a priority for them. A shorter programme that is purely individual-focused and skills-orientated could help meet the needs and preferences of some health and social care workers, including those who are ageing. This should not involve a change to the current programme (the dual-focused nature of which was found to be useful to many participants), but rather the development of a separate programme focused purely on personal stress management and with a much reduced volume of content and assessment. This may help avoid learners feeling overburdened by the programme at a later stage.

This is consistent with conclusions drawn in Section 6.1.1 and Section 6.2.2.1 as they related to the usefulness of DELAROSE and the value of maintaining its dual-focused design. The findings of Study Two suggest that the further development of the programme in these domains should not be guided by the age of potential users. It is their position in the workplace that is perhaps more worthy of attention, as it is likely that those who are less experienced or do not hold managerial-level positions will be less able to make use of the organisation-focused content, and so less interested in workplace stress

management. Developing a separate, shorter programme focused solely on personal stress management may be more valuable for them. In contrast, and as reasoned in Section 6.1.2 and Section 6.2.2.1, the dual-focused design should be maintained for those interested in workplace stress management and supporting others. In either event, it is not age but occupational position that should determine the further development of the programme in this regard.

6.3 Limitations in the interview process

On a final note, it is important that the findings presented in this chapter are interpreted in the context of certain limitations in the interview process. As discussed in Chapter Four (Section 4.2.3.3) and Chapter Eight (Section 8.2.5 and 8.2.6), the interviews conducted with each participant were unstructured and conversational in style. A semi-structured interview schedule of questions based on the research objective at hand had been prepared (see Appendix I), however, over the course of each interview, I deviated from the question schedule and my interviewing became conversational in nature.

As a result, my questioning of each participant was conversational in nature and was steered by the semi-structured schedule of questions, rather than adhering to it strictly. While this may be considered a strength as the interviews became more free-flowing and directed towards issues that were pertinent to the participants, ultimately, the use of an unstructured approach does have implications for the interpretation of data and findings from Study Two. Following the semi-structured interview process as initially intended for Study Two may have contributed to greater consistency in this aspect of the research (Lincoln and Guba 1985), as it cannot be guaranteed that every aspect of the topic guide was discussed with each participant. The unstructured format may limit the ability of readers to examine the research process and judge the dependability and confirmability of the findings (Tobin and Begley 2004), particularly as it relates to comparing differences in what was reported across different groups of participants.

This is important given the use of thematic analysis approaches to analyse the data (Chapter Four Section 4.2.4). On a positive note, a robust and coherent interpretation of the data was generated. The salience of the various themes was not determined by quantifiable measures, but by whether they captured something meaningful in relation to the research question. Data analysis followed an approach that is well demarcated and was aided by NVivo software to enhance quality and consistency. The analysis and

final report as presented in this chapter is comprehensive and the findings are substantiated by the data.

However, the use of unstructured interviews does place limitations on the extent to which thematic analysis can be harnessed to address questions such as differences according to age across the data. The relative strengths of the different themes generated from the data or the differences between participants are challenging to ascertain using these approaches. The interpretation of the data in Study Two must be considered in the context of this limitation.

6.4 Conclusion

This chapter presented the findings of Study Two, which comprised an investigation of the experience of undertaking the DELAROSE online learning programme. Individual interviews were conducted to explore the experiences of a sample of registered learners who had completed the programme. The data were analysed thematically, with subsequent consideration given to age-related differences in participants' experiences.

Analysis of the findings of Study Two indicated that age did not appear to be a major factor in participants' experiences of the DELAROSE programme. Differences associated with age were identified in some benefits gained from the programme. However, these differences were more influenced by the positions of participants in the workplace (in terms of their experience or managerial responsibilities) rather than their chronological age.

How participants experienced the design and delivery of the DELAROSE programme did not seem to vary according to their age. Consistent with the findings of previous qualitative evaluations of online work-stress management interventions, it appears that there are positive and negative aspects to such programmes, and that varying perceptions of their design and delivery most likely reflect differences in personal preference, rather than age. These are important findings in the context of this research as they call into question the value of a focus on age in the development of online work-stress management interventions for health and social care workers.

The chapter concluded with a critical discussion of the implications of these findings for the further DELAROSE programme, referenced to the existing literature. This is presented in terms of what participants' discussed in terms of the usefulness of the

programme, in addition to how the content and delivery might be improved and how the engagement of learners could be sustained. In this way, Objective Four of this research as it related to conducting a qualitative investigation of the experience of undertaking the DELAROSE online learning programme was achieved. In the following chapter (Chapter Seven) these findings of Study Two are combined with those from Study One, where relevant, to examine their implications as they relate to issues of age, online work-stress management interventions and the further development of the DELAROSE programme.

Chapter Seven

COMBINED FINDINGS OF STUDY ONE AND STUDY TWO

7.0 Introduction

Chapter Seven comprises a critical analysis of the combined findings of Studies One and Two of this research. This is presented in two parts. First, the key findings of Study One and Study Two are reviewed as they relate to issues of age and supporting health and social care workers in the management of their work-related stress through online programmes (Section 7.1). These findings include age and workplace characteristics; physical exertion and well-being; the usefulness of the DELAROSE programme; online intervention design and delivery, and meeting personal preferences.

Analysis of these combined findings indicated that a focus on age does not appear to be warranted with regard to the development, design and delivery of online work-stress management interventions for health and social care workers. For this reason, the second part of this chapter (Section 7.2) considers the implications of these findings for the further development of online work-stress management interventions more generally, without specific reference to age. Referenced to the existing literature, a series of recommendations relating to the development of online work-stress management interventions to meet the requirements of health and social care workers are presented. Proposals for the further development of the DELAROSE online stress management programme are detailed as part of this.

7.1 Analysis of findings as they relate to age, health and social care work, and online work-stress management interventions

This research explored and analysed the requirements of health and social care workers as these relate to issues of age and online work-stress management interventions, utilising the specific case example of the DELAROSE programme to explore broader issues of need, engagement and adherence. This was achieved through the conduct of two studies. Study One comprised a quantitative investigation of age-related differences in the contribution of workplace characteristics to the experience of work-related stress among a sample of health and social care workers (Chapter Five). Study Two comprised a qualitative investigation of the experience of undertaking the

DELAROSE online stress management programme (Chapter Six). In this section, the key findings arising from these studies are critically analysed in the context of existing knowledge to identify their broader implications as they relate to age, health and social care work, and the development of online work-stress management interventions.

Finding One: Age did not influence the contribution of workplace psychosocial characteristics to the experience of stress among a sample of nurses and intellectual disability care workers (Study One).

A key finding in the context of this research was that perceived stress was negatively correlated with both age and the number of years spent working in the health and social care sector. Hierarchical regression analysis indicated that age did not make a significant unique contribution to predicting Perceived Stress or Mental Health scores (Study One, Chapter Five, Sections 5.2 and 5.3).

These findings are consistent with the conclusions drawn in Chapter Two (Section 2.5) from analyses of the literature pertaining to the occupational experiences of ageing nurses and of intellectual disability care workers. There was little evidence from the reviewed literature that age plays a role in stress perception among nurses or intellectual disability care workers. Being older did not appear to constitute a source of stress for either occupational cohort (albeit it was noted that there is a lack of research examining this issue among intellectual disability care workers). Chronological age does not appear to have an impact on how nurses or intellectual disability care workers perceive stress, nor does it appear that their work is more stressful, or that they become less capable of managing stress as they age (Chapter Two, Section 2.5.2). This suggests that a focus on age in developing tailored supports for health and social care workers is not justified purely on stress perception alone.

Study One added to these findings by analysing data relating to age and the contribution of workplace characteristics to the psychological and physical manifestations of work-related stress among a sample of health and social care workers in the South-East of Ireland (Chapter Five). Despite some evidence that it may exert an influence (Besen *et al.* 2015, Schultz and Edington 2010), the effect of age on the contribution of workplace psychosocial characteristics to the experience of stress among workers generally is under-investigated (Zacher and Schmitt 2016). There appears to have been little (if any)

such investigation among nurses or intellectual disability care workers, as evidenced through the scoping reviews of the literature presented Chapter Two. Age has not formed a focus of existing research as it relates to developing a theory-informed understanding of the experience of stress among these occupational cohorts.

With regard to the experiences of ageing nurses in the workplace (see Chapter Two, Section 2.3), for example, much of the extant literature is qualitative in nature. While this has provided useful contextual insight into the occupational challenges experienced by nurses as they age, it does not offer an understanding as to whether or how age affects the contribution of workplace characteristics to the experience of stress among this cohort. Only a small number of quantitative studies have been conducted, few of which are theory-informed (Chapter Two, Section 2.5.2).

A different issue was noted with the literature as it relates to stress and intellectual disability care work. Most of the research as it relates to these workers is quantitative (primarily cross-sectional survey research). Though much of it is informed by work-stress theory, few of the studies that were analysed in Chapter Two considered the impact of age on the experiences of the intellectual disability care workers they researched (Section 2.4). This is most likely because of a lack of data globally as it relates to those engaged in this sector, meaning that a trend or otherwise towards an ageing workforce in the intellectual disability care sector has not been determined.

Through cross-sectional survey research (Study One) it was found that age did not influence the main (additive) effects of the JDC and JDC(S) work-stress models (Johnson and Hall 1988) among a sample of nurses and intellectual disability care workers. The main effects of these models were supported, in that psychological job demands, decision latitude and social support were each significantly correlated with experience of stress and mental well-being among this sample. This is consistent with previous investigations of the JDC and JDC(S) models across a range of occupational groups, including health and social care workers (Hausser *et al.* 2010, Pisanti *et al.* 2015). Age, however, did not affect the contribution of these characteristics to the experience of stress among these cohorts (Chapter Five, Section 5.3).

Investigation of the interactive effects of the JDC and JDC(S) models among these samples indicated that they were not supported (Chapter Five, Section 5.3). This is consistent with most previous evaluations of these effects, not just among health and

social care workers, but other workers generally (Hausser *et al.* 2010, Gonazalez-Mule *et al.* 2020). There was no evidence that they might vary according to age. Overall, there was little to suggest that there are age-related differences in how these psychosocial workplace characteristics, as hypothesised according to the JDC and JDC(S) models, contribute to the experience of stress among nurses and intellectual disability care workers.

Finding Two: Nurses and intellectual disability care workers reported poorer physical health with increasing age (Study One)

Through a scoping review of the literature (Chapter Two, Section 2.3), it was found that nurses can struggle to cope with the negative effects of physically strenuous care work as they age (Gabrielle *et al.* 2008, Letvak 2013). Much of the existing literature relating to the challenges encountered by ageing nurses in the workplace examines issues arising from poor physical well-being, including pain, ill-health, physical fatigue and increased recovery needs (e.g. Clendon and Walker 2015, Fragar and Depczynski 2011).

Consistent with this, through survey research in Study One, it was found that nurses and intellectual disability care workers reported poorer physical health with increased age (Chapter Five, Section 5.4.3). While younger workers reported that their work was more physically exerting, it was ageing workers who reported poorer physical health. In addition, poorer physical health was associated with poorer mental health, while physical exertion was associated with greater perceived stress (Section 5.2). Hierarchical regression analysis indicated that both age and physical exertion significantly and uniquely predicted poorer physical health (Section 5.3).

These findings suggest that a focus on physical well-being and the management of physically exerting working environments could be useful in online work-stress management interventions for health and social care workers. This was the sole domain in Study One in which a clear difference according to age was found. Such workers could benefit from tailored interventions to maintain their physical well-being and limit the negative effects of physically exerting care work. These could prove particularly useful for ageing workers in these sectors, as there is evidence that such workers are challenged by a lack of physical stamina and increasing vulnerability to physically exerting workplaces (Chapter Two, Section 2.3). Practical examples of how these issues

could be addressed through online work-stress management interventions are outlined in Section 7.2.

Finding Three: Age did not appear to influence users' perceptions of the usefulness of the DELAROSE programme (Study Two)

Much of what is known about the usefulness of online work-stress management interventions derives primarily from quantitative evaluations of their efficacy. Systematic reviews and meta-analyses of this literature (e.g. Carolan, Harris and Cavanagh 2017, Phillips, Gordeev and Schreyögg 2019) point to the usefulness of such interventions for improving worker stress and related psychological outcomes (such as anxiety and burnout). This was confirmed in the findings of an updated systematic review and meta-analysis of this literature presented in Chapter Three (Section 3.3).

Differences according to age in the efficacy or usefulness of online work-stress management interventions have not been much investigated to date. Only one randomised controlled trial of an intervention that focused on a specific age cohort of workers was identified through the systematic review of the literature in Chapter Three (Section 3.3.2.5). This was a website-delivered health promotion intervention, similar in nature to Module One of DELAROSE, that was trialled by Cook *et al.* (2015) with IT workers aged over 50. No positive improvement on any stress-related outcome post-intervention was reported. No explanations for this lack of efficacy were provided, though it may have been due to the limitations in the study design (that is, a single three-month post-test was employed).

Almost all existing online work-stress management interventions are individual-focused. This means that they are delivered to individual users with the intention of enhancing their personal coping skills or reducing their perceptions of stress in the workplace. Usually, their impact is assessed solely in terms of individual changes in perceived stress or related outcomes, such as anxiety and depression (Carolan, Harris and Cavanagh 2017, Phillips, Gordeev and Schreyögg, 2019).

This means that the efficacy of online work-stress management interventions for organisational outcomes is under-investigated. This reflects a lack of investigation generally as it relates to organisational stress management interventions, including those delivered 'in-person' (Holman, Johnson and O'Connor, 2018). Indeed, only one

online intervention with an organisational focus was identified through the systematic review of the literature in Chapter Three. This was an online mental health training programme delivered to managers (Gayed *et al.* 2019). Though it was not associated with positive changes in stress-related outcomes for workers, it was found that managers who completed the programme significantly increased their knowledge and confidence regarding stress management.

Within the qualitative literature, perceived utility or efficacy has not formed a central focus of investigations of online work-stress management (see Chapter Three, Section 3.3 for a review of this literature). For example, Asplund *et al.* (2019) simply noted that most participants regarded their online intervention as useful, and asked them to state which sections they found most useful. Eklund *et al.* (2018) identified that their intervention helped participants generate insights into the nature of their stress and how it could be handled. Carolan and de Visser (2018) did not examine the issue of usefulness at all.

The lack of focus on utility in these qualitative studies may be because, in most instances, the efficacy of these interventions were examined separately through randomised controlled trials (Carolan *et al.* 2016, Asplund *et al.* 2018, Eklund *et al.* 2021, Xu *et al.* 2021). Indeed, their usefulness may simply have been assumed owing to the fact that they delivered therapeutic content (such as CBT) demonstrated to be effective in other stress management interventions (van der Klink *et al*. 2001, Richardson and Rothstein 2008).

Analysis of the qualitative findings from Study Two indicated that participants' perceptions of the utility of the DELAROSE programme for their personal stress management did not appear to vary according to age (Chapter Six, Section 6.1.1.1). Participants reported that the programme was beneficial in helping them cope with the effects of stress and manage certain personal stressors (Section 6.1.1.). This complements the findings of a number of randomised controlled trials of online interventions similar in nature to the individual-focused module of DELAROSE (e.g. Ebert *et al.* 2016, Heber *et al.* 2016, Thiart *et al.* 2015).

Qualitative findings from Study Two of this research also indicated that participants experienced positive changes in their knowledge and confidence for managing work-

related stress. As noted in Chapter Six (Section 6.1.4), there did appear to be variation among participants in the salience of this benefit. This, however, did not seem to associated with their chronological age, but rather their position in the workplace.

That is, those who were more experienced and/or held positions of management or leadership tended to desire or report a perceived obligation to support their colleagues and contribute to a less stressful working environment (Chapter Six, Section 6.1.1.3). Awareness of the impact of work-related stress and concern in relation to a lack of knowledge or ability in work-stress management was itself a stressor for some of these workers. The programme was useful in helping them reduce their concern and uncertainty around managing stress. It enabled them to support their colleagues and contribute to a less stressful working environment (Chapter Six, Sections 6.1.1.2 and 6.1.1.3).

Others reported that the organisation-focused content of the programme lacked relevance to them. This was because they did not hold a position within their workplaces that gave them the power to make changes in their workplace. As such, contributing to stress management at an organisational level was not a priority for them. Not all the of participants could make use of organisation-focused content or were interested in stress management at a broader workplace level. The extensive nature of the programme content was viewed as excessive by some participants, and came to form an additional pressure on them (Chapter Six, Section 6.1.2.4). It did not match what they expected or were looking for, and so the programme came to be perceived as an additional burden on top of already demanding work and personal obligations (Chapter Six, Section 6.1.3).

While occupational position can be related to age (Schalk *et al*. 2010, for example, describe how workers tend to accumulate increased experience, expertise and responsibility as they age), chronological age itself did not appear to influence participants' perceptions of the usefulness of the DELAROSE programme. With the exception of the challenges posed by decreasing physical stamina and increasing vulnerability to physically exerting workplaces, there is little evidence from either Study One or Study Two that specific stress management content is required to meet the needs of health and social care workers as they age. This would imply that there is

little value in tailoring online work-stress management interventions for health and social care workers on the basis of age.

Rather, it may be more useful for online work-stress management interventions such as DELAROSE to account for the experience, leadership and responsibility of their target users, rather than their age, in their form and focus (this is discussed further in Section 7.2). These factors may be more likely to determine what they seek from such a programme and the extent to which they are likely to benefit from it. A specific focus on age does not appear to be warranted.

Finding Four: Users' experiences of the online design or delivery of the DELAROSE programme did not appear to vary according to their age

What is known about the experience of undertaking online work-stress management interventions derives from a small number of qualitative studies, as reviewed in Chapter Three (Section 3.3). Several of the interventions that have been evaluated qualitatively are quite similar in nature to Module One of DELAROSE (e.g. Eklund *et al.* 2018, Asplund *et al.* 2019, Xu *et al.* 2021). That is, they are individual-focused and typically comprise cognitive-behavioural techniques (either on their own or combined with approaches such as problem-solving and relaxation).

The relative sparsity of qualitative investigations of online stress management interventions (compared to quantitative evaluations) may reflect an assumption among researchers that existing interventions are feasible and acceptable should they prove effective through quantitative evaluation. It may also reflect a broader emphasis on a form of scientific thinking within psychological research that has privileged quantitative approaches over other forms of inquiry (Breen and Darlaston-Jones 2010). This may have contributed to researchers prioritising establishing the efficacy of different types of online stress management interventions over examining how workers experience undertaking them.

The existing research suggests that there are positive and negative aspects to online work-stress management interventions, and that these are commonly reported by those who undertake them (Chapter Three, Section 3.3). For example, the flexibility and convenience provided by online delivery has been praised for making it easier for

workers to engage with online work-stress management interventions (Asplund *et al.* 2019, Blake *et al.* 2022). However, it can also leave these interventions susceptible to disengagement through a lack of accountability and diminished priority in the face of additional pressures (Carolan and de Visser 2018). Online work-stress management interventions are prone to disengagement, as identified in previous systematic reviews of the literature (e.g. Carolan, Harris and Cavanagh 2017, Phillips, Gordeev and Schreyögg 2019).

This is reflected in the findings of Study Two as they relate to the experience of the DELAROSE programme (Chapter Six, Section 6.1.2). The wholly asynchronous delivery format of DELAROSE was identified as both a facilitator and barrier to engagement by participants (Chapter Six, Section 6.1.2.1). While the convenience and flexibility of online delivery was appreciated for making it possible to undertake and complete the programme, it also made it susceptible to disengagement. This appeared to be have been exacerbated by the fact that several participants faced considerable personal and professional demands on their time.

Age differentials in the experience of online work-stress management interventions have not been investigated previously. Through qualitative investigation as part of Study Two, it was found that the experiences of participants as they related to online design and delivery did not appear to vary according to age (Chapter Six, 6.1.2). This would suggest that there are aspects of the experience of online work-stress management interventions that appear to be shared by almost all who undertake them. These include the positives and negatives of online delivery and the need for tailored support and guidance.

Though participants' experience of DELAROSE did not appear to vary according to age, it is worth noting that some of the challenges participants reported were reflective of the contextual stressors described in the literature as it relates to ageing nurses in the workplace (Chapter Two, Section 2.3.2). These stressors include a lack of work-life balance, the neglected self and meeting a range of additional responsibilities outside of the workplace (Andrews *et al.* 2005, Hayes *et al.* 2012, Mion *et al.* 2006).

Relatedly, the provision of effective support is a complex aspect of online stress management delivery. Previous investigations have indicated that participants tend to

dislike a lack of human support (Carolan and de Visser 2018) and value guidance to help them stay engaged and complete such programmes (Asplund *et al.* 2019, De Korte *et al.* 2018). Others who have completed online work-stress interventions have reported that while they needed reminders, these can easily become unhelpful and make them feel overwhelmed (Freund *et al.* 2022).

This was similarly the case with the DELAROSE programme. While participants generally expressed satisfaction with the support they received, some indicated that an agreed timeline for completing and submitting assignments would have been preferable and might have encouraged them to complete the programme in a timely manner (Chapter Six, Section 6.1.3.3). Several also suggested that a more structured and regular pattern of communication could have been beneficial in maintaining their engagement with the programme. Again, these aspects of the experience of the programme did not appear to vary according to the age of the participant (Chapter Six, Section 6.1.3.3).

The implication of these findings is that a focus on age does not appear to be warranted in the design or delivery of online work-stress management interventions. However, they do suggest that successful intervention delivery may require careful management of issues that are commonly experienced by most who undertake online programmes. A focus on these issues, which include support, communication, and flexibility, is likely to be beneficial to all workers. This is discussed in more detail in Section 7.2.

Finding Five: Differences among users in how online work-stress management interventions should be designed and delivered reflect variations in personal preferences, rather than age.

Online work-stress management interventions typically involve users working privately and independently (Stratton *et al.* 2022). This reflects a purported benefit of online delivery in terms of the protection of user anonymity and minimising potential stigma associated with accessing psychosocial supports (Kelders *et al.* 2012). The findings of a scoping review of the qualitative literature (Chapter Three, Section 3.3), however, suggest that this benefit is not universally desired by those engaging with stress management interventions. Some of those who have completed online work-stress management interventions have indicated that they would have preferred more direct communication and interaction with others, and less anonymity.

Existing online work-stress management interventions have also been criticised for being overly time-consuming (Asplund *et al.* 2019, Xu *et al.* 2021). This is problematic as it can place additional demands on users who may be experiencing much stress. This can serve as a barrier to engaging with these interventions (Carolan and de Visser 2018)

These variations were reflected in the experiences of those who completed the DELAROSE programme. Some participants reported that would have appreciated the opportunity to interact with others. Others, however, indicated that they valued the privacy of the programme and appreciated that some portfolio activities did not have to be shared (Chapter Six, Section 6.1.3.2). Likewise, while several participants expressed a desire for the programme content to be delivered in alternative formats, such as audio and video, some expressed satisfaction with the existing layout of the programme and favoured written text, as it was perceived to be more easily reviewed (Chapter Six, Section 6.1.3.1).

As discussed in Chapter Six, these differences appear to reflect varying personal preferences among participants, rather than being associated with their age (Section 6.1.4). What is attractive to some may be discouraging to others. The implication of this is that the design and delivery of online work-stress management interventions may need to account for varying personal preferences among target users. There is little evidence to suggest that age has a role to play in this regard. Accommodating differences in personal preferences in these domains as part of the further development of DELAROSE would appear to more pertinent, rather than focusing on age. Proposals for how this may be achieved are presented in Section 7.2.

7.1.1 Summary and implications of these findings

The findings of Study One and Two call into question whether a specific focus on age is warranted as it relates to the further development of DELAROSE and other online work-stress management interventions more generally. Through cross-sectional survey research (Study One), it was found that age had little impact on the perception of stress or contribution of workplace psychosocial characteristics to the experience of stress and well-being among a sample of health and social care workers. These imply that the use of work-stress theoretical frameworks to inform the design and content of online interventions does not need to account for differences according to age. While it was noted that ageing workers in these sectors can struggle with reduced physical stamina

and well-being, and may be increasingly vulnerable to physically exerting workplaces, these are intervention targets that would likely benefit most workers in these sectors. Specific and separate focus on the ageing worker may not be required or justified.

Similarly, the findings of Study Two offer little to suggest that the design or delivery of online work-stress management interventions needs to be tailored according to age. While the experience of undertaking an online work-stress management intervention can vary, this does not appear to be because of chronological age. Though some differences among workers may be related to age, they are probably better explained by the influence of participants' position in the workplace (in terms of their experience or leadership responsibilities), as opposed to their age. Other differences among participants in their perception of the programme reflected variations in personal preferences. As such, a focus on factors such as occupational position, the typical facilitators and barriers to online interventions, and differing personal preferences, may be more valuable in the further development of DELAROSE and other online interventions.

In summary, several useful findings as they relate to the content, design and delivery of online work-stress management interventions such as DELAROSE were generated from these two studies. These findings are explored in the following section in the form of a series of recommendations for the development of online work-stress management interventions. Specific proposals for the further development of the DELAROSE programme to meet the needs and preferences of health and social care workers more generally are also considered.

7.2 Recommendations for the further development of online work-stress management interventions

Section 7.1. presented a critical analysis of the findings of this research as they related to the issue of age and supporting health and social care workers in the management of their work-related stress through online interventions. While it was intended that these findings would be combined and analysed to identify their implications for the design and delivery of online interventions to support ageing workers, critical reflection suggested that a focus on age is not warranted in that regard.

Several useful findings as they relate to the further development of online work-stress management interventions were generated from these studies. These findings are detailed in the following sub-sections in the form a series of recommendations. Specific proposals for the further development of the DELAROSE programme to meet the needs and preferences of health and social care workers are also presented.

Recommendation One: Online work-stress management interventions for health and social care workers should target each of the workplace psychosocial characteristics of psychological job demands, decision latitude and social support.

Based on the findings of Study One and in light of existing research, the workplace characteristics of psychological job demands, decision latitude and social support can be considered to make unique contributions to the experience of stress among health and social care workers. Though the relationships between these variables and the experience of stress and well-being among health and social care workers were not affected by age, this is not to say that online work-stress management interventions should not be informed by the JDC or JDC(S) theoretical frameworks, or seek to address these workplace characteristics.

As noted in Chapter One and Chapter Four, the use of theory is important in the design of online work-stress management as it explains the mechanism of an intervention and facilitates the selection and refinement of intervention content (Michie *et al.* 2008). However, it should always be supported by empirical evidence relevant to the target audience for the intervention (Davidoff *et al.* 2016).

Each of these characteristics were significantly (albeit only moderately) correlated with stress and well-being outcomes in a sample of nurses and intellectual disability care workers (Study One, Section 5.2). It is possible that addressing the manifestations of these characteristics in the working environment will likely benefit most health and social care workers.

Similarly, the empirical evidence from Study One complements an increasing body of research that contradicts the interactive hypotheses of the JDC and JDC(S) models (see Chapter Five, Section 5.4.2 and 5.4.3). These suggest that it is not justified to focus on increasing social support or decision latitude for health and social care workers with the intention of mitigating high levels of psychological job demands. These are useful

findings for those seeking to draw upon work-stress theories such as the JDC(S) model in intervention design.

These workplace characteristics are perhaps most relevant to online work-stress management interventions that are organisation-focused. In practice, this means targeting the interface between the user and their workplace, by focusing delivery of the intervention on those who possess the requisite power to make positive changes in the working environment (such as managers). The aim of such interventions should be to provide such workers with the skills and knowledge to lessen psychological job demands or enhance the decision latitude and social support of themselves and colleagues, where relevant.

There are a number of practical ways in which content targeting these psychosocial characteristics could be incorporated into an online intervention. In this regard, it is worth noting that much of the existing research in terms of the contextual stressors experienced by ageing nurses and intellectual disability care workers can be referenced to the main psychosocial characteristics of the JDC(S) model.

An important point of clarification should be made here. The findings of Study One indicate that a focus on age in not warranted in terms of the theoretical design of an online work-stress management intervention for health and social care workers. However, the literature as it relates to ageing nurses does suggest that they encounter different types of stressors and challenges in the workplace compared to their younger colleagues. The findings of the review of the literature in Chapter Two, for example, indicated that there are contextual stressors and challenges specific to nurses as they age. These stressors can be linked to the JDC and JDC(S) theoretical frameworks, and may be worth taking into account in online work-stress management intervention design.

For example, ageing nurses reported struggling with a range of psychological job demands including keeping up with the required pace of their work and avoiding mistakes (Letvak 2005, 2009, Philips and Miltner 2015). Among intellectual disability care workers, challenging behaviour from clients and a lack of reciprocity in their professional relationships were significant demands that they faced in their practice (Rose *et al.* 2005, Thompson and Rose 2009).

Both groups experience contextual stressors consistent with the workplace characteristics of decision latitude and social support. Role issues such as ambiguity and conflict have been shown to contribute to the experience of stress among intellectual disability care workers (Hatton *et al.* 2001, Hensel, Lunsky and Dewa 2012). Similarly, a lack of recognition of their expertise, generational differences, and bullying were identified in several studies as significant age-related challenges experienced by nurses in the workplace (Mion *et al.* 2006, Spiva, Hart and McVey 2011). These are contextual examples of the workplace characteristics experienced by nurses and intellectual disability care workers that are stress-inducing and could be targeted as part of an online stress management intervention.

As psychological job demands, decision latitude and social support are generic workplace characteristics, how they are experienced by workers will vary according to their particular occupational settings. This would suggest that online work-stress management interventions should focus on delivering the skills to conduct effective risk assessments of the working environment. It may also be of value to make management aware of the particular challenges that health and social care workers can face in the workplace and enable them to determine whether action is needed to mitigate their effects. This could allow managerial staff, for example, to identify whether there are contextual stressors specific to different cohorts within the workplace.

Other relevant approaches could be the delivery of content based on job redesign and participatory approaches (e.g. Daniels *et al.* 2017). Again, these should be provided to managerial staff with the intention of providing them with the skills to implement such initiatives in their workplace. Content that enables managers to create a socially supportive workplace could be included. This may involve addressing role issues, such as ambiguity and conflict.

Recommendation Two: Online work stress management interventions for health and social care workers should focus on physical well-being and their vulnerability to physically exerting workplaces

Through survey research in Study One, it was determined that nurses and intellectual disability care workers reported poorer physical health with increased age (Chapter Five, Section 5.4.3). While younger workers experienced more physically exerting jobs, it was ageing workers who reported poorer physical health. Poorer physical health

was correlated with poorer mental health, while physical exertion was correlated with greater perceived stress (Section 5.2). Hierarchical regression analysis indicated that both age and physical exertion significantly and uniquely predicted poorer physical health (Section 5.3). These findings suggest that efforts to support health and social care workers should incorporate a focus on their physical well-being and their vulnerability to physically exerting workplaces. There is clear and consistent research to suggest that such a focus is warranted in online work-stress management for this sectoral group.

This has two specific implications for the further development of the DELAROSE programme. First, it suggests that individual-focused content that provides health and social care workers with strategies to maintain their physical well-being should be incorporated into the programme. This could be delivered to workers directly, and could include techniques to help them limit the negative effects of physically exerting care work, maintain an appropriate work-life balance and avoid neglecting their own personal health and recovery needs. Consistent with the findings of the review of the literature in Chapter Two (Section 2.3.1), this may also include techniques to help them manage the effects of shift work and improve their recovery from work.

Second, organisational approaches to mitigate the effects of physically exerting working environments are required to support health and social care workers. As physical exertion is a characteristic of the working environment, its effective management may require alterations to physically strenuous working environments. In terms of online work-stress management, this may involve targeting managerial staff who possess the requisite power to make meaningful changes in the working environment of their colleagues.

This would most likely involve providing them with the skills and knowledge to create less physically exerting environments or support workers to manage the effects of physically strenuous work. This may comprise education on the relationship between physical health and stress. It could also include organisational strategies that managers can implement to support workers in physically strenuous working situations.

Recommendation Three: Online work-stress management interventions should consider the occupational position of target users.

Meeting the requirements of health and social care workers in online work-stress management may be enhanced by providing them with a programme that is tailored to their position in the workplace, defined here in terms of their levels of experience, expertise and responsibilities. The is evidenced by the findings of Study Two, where it was suggested that the occupational position of workers influenced what they sought from DELAROSE, as well as their perceptions of the usefulness of the programme and benefits they derived from it (Section 6.1.1 and 6.1.4).

That is, being more experienced and/or holding senior or managerial-level positions appeared to contribute to them seeking a programme that delivered skills and knowledge in both personal stress management and in promoting a less stressful working environment. Awareness of the impact of work-related stress and concern in relation to a lack of knowledge or ability in work-stress management was itself a stressor for some participants. In addition to changes in personal stress management, the programme helped them reduce their concern and uncertainty around managing stress. It enabled them to support their colleagues and contribute to a less stressful working environment.

Position in the workplace also appeared to influence a lack of utility reported by some participants. For example, some participants reported that the organisation-focused aspects of the DELAROSE programme lacked relevance to them. This was because they did not hold a position with the power or responsibility to make changes in their workplace. Being able to support others or contribute to stress management at an organisational level was less of a priority for them.

Variation among participants in the salience of these benefits appeared to be linked to the aforementioned influence of occupational position, in terms of experience, expertise and responsibility (Chapter Six, Section 6.1.1.1). It may be more useful for the further development of programmes such as DELAROSE to focus on ensuring that their content is tailored to the level of experience or responsibility of the target user. These factors may be more likely to determine what they seek from such a programme and the extent to which they are likely to benefit from it. Meeting this perceived responsibility as it relates to organisational stress management does not necessarily

imply a change to the focus of DELAROSE. Rather, it suggests that the dual-focused nature of the programme should stay in place, and efforts placed on ensuring that it meet the requirements of workers in personal and organisational stress management.

Related to this is the need to provide online work-stress management interventions that are appropriate in content and focus. Some may value a comprehensive programme that provides content related to both individual and organisational stress management. Others, however, may simply seek support for personal stress management, and may prefer a programme this is purely individual focused and with much less content.

A shorter programme that is solely individual-focused and skills-orientated could help meet the needs and preferences of such users. This may not involve a change to the current programme (the dual-focused nature of which was found to be useful to many participants), but rather the development of a separate programme focused on personal stress management and with a much reduced volume of content and assessment. This may help avoid learners feeling overburdened by the programme at a later stage.

These recommendations are consistent with conclusions drawn in Chapter Six (Section 6.3.1 and Section 6.3.2.1) as they related to the usefulness of DELAROSE and the value of maintaining its dual-focused design. The further development of the programme in these domains should be guided by the occupational position of potential users, as it is likely that those who are less experienced or do not hold managerial-level positions will be less able to make use of the organisation-focused content. Developing a separate, shorter programme focused solely on personal stress management may be more valuable for them. In contrast, and as reasoned in Section 6.3.1 and Section 6.3.2.1, the dual-focused design should be maintained for those interested in workplace stress management and supporting others.

Recommendation Four: The design and delivery of online work-stress management interventions should account for varying personal preferences among target users.

The qualitative findings of Study Two indicated that some participants would have appreciated the opportunity to interact with others and share their experiences of work-related stress with those in similar situations (Section 6.1.2.) These interactions may have helped to provide insight as to how others handled stressful scenarios, or

empowered them to respond more effectively to particular stressors. Others, however, indicated that they valued the privacy of the programme and appreciated that some portfolio activities were completed for their own benefit and did not have to be shared with others. In addition to this, several participants expressed a desire for the programme content to be delivered in alternative formats, such as audio and video, in order to make it more engaging and manageable. Others were satisfied with the current layout of the programme and approved of written text as it was perceived to be more easily reviewed.

These variations appeared to reflect differing personal preferences among learners. The implication of this is that choice and flexibility is needed to meet the personal preferences of workers in terms of modality of learning content and interaction with others. This differs from issues of support and online delivery, which appear to be challenges common to online work-stress management interventions (see Recommendation Five).

This acknowledges that what may be desirable for some may actually be unappealing to others and even discourage their completion of the programme. To this end, the opportunity to discuss programme content in interactive sessions with others should be incorporated into the programme in an optional rather than an obligatory manner. This would be in keeping with the benefits of online programmes as they relate to working privately and independently. Delivering programme content in multiple formats (such as written text, audio or recorded video) would not be difficult in practice and can easily be provided simultaneously to all learners.

Linked to this is the finding from Study Two that the volume of the DELAROSE programme content and workload was excessive for some participants (Chapter Six, Section 6.1.3). Successful completion required significantly more time and effort than some participants anticipated from a part-time online learning programme. The amount of content and assignments did not reflect what they were looking for, and so the programme came to be perceived as an additional burden on top of an already demanding volume of work and personal obligations.

This is consistent with what is known about existing online work-stress management interventions, as several have been criticised for being overly demanding and time-

consuming (Chapter Three, Section 3.3). This is a limitation as their perceived high workload can become a barrier to completion and place an additional demand on users who may already be experiencing much stress. Online work-stress management interventions should therefore be tailored in content and focus in order to meet differing needs and preferences among workers.

Drawing specifically on these findings as they relate to workload and content, and in line with Recommendation Three, a shorter programme that is purely individual-focused and skills-orientated may be more likely to meet the needs and preferences of some health and social care workers. Different formats of assessment may also be required, or it may comprise several individual components that combine into a larger award. This is more akin to existing online work-stress management interventions similar in nature to the individual-focused module in DELAROSE. As discussed in Chapter Three (Section 3.4), these have proven efficacy in personal stress management with a number of occupational groupings. A tailored version of these could have much value in meeting the needs of some health and social care workers, particularly in times of significant personal and work-life demands.

Recommendation Five: The support provided to those undertaking online work-stress management interventions should be consistent and structured, with a focus on providing accountability and sustaining engagement.

Enhancing the quality of support provided to those who undertake online work-stress management interventions may be helpful in mitigating the issues many users seem to face as they relate to maintaining their engagement and focus. The practical implication of these findings is that the support provided to users should be consistent and structured, with a focus on providing accountability and sustaining engagement. This could be valuable for health and social care workers who are likely to have to balance busy personal and working lives in addition to undertaking an online work stress management intervention. Indeed, the nature of support from those delivering online stress-management intervention has been shown to make a meaningful contribution to mitigating disengagement (Harrer *et al.* 2018, Ebert *et al.* 2018).

With regard to DELAROSE, the use of a theoretical framework of human support to inform the relationship between tutor and learner could be beneficial (Nixon *et al.*

2021). As noted in Chapter Three (Section 3.4), the Supportive Accountability Model, a framework of human support in enhancing adherence to online interventions (Mohr, Cujpers and Lehman 2011), is perhaps most suited to this purpose. This model proposes that adherence to online interventions is influenced by human support and moderated by user motivation and computer-mediated communication. That is, adherence is more likely when the user feels accountable to a 'coach' who possesses requisite expertise and who is perceived to be trustworthy and caring. Clearly defined goals and benefits, reciprocity and a strong relational bond are also important in promoting adherence (Mohr, Cujpers and Lehman 2011).

7.3 Conclusion

This chapter presented a combined analysis of the findings of Study One and Study Two of this research as they relate to the question of age and supporting health and social care workers through online interventions. Analysis of the findings of this research suggested that a focus on age in the development and delivery of online work-stress management interventions is not warranted. To that end, a series of recommendations as to the development and implementation of online work-stress management interventions to meet the requirements of health and social care workers more generally were outlined. The further development of the DELAROSE online programme to meet the needs and preferences of health and social care workers was also considered.

Chapter Eight

DISCUSSION AND CONCLUSION

8.0 Introduction

Chapter Eight presents a final discussion of the findings and processes of this research. The chapter commences with an overview of the new knowledge that has been generated, in addition to which findings are confirmatory in nature and what remains to be explored (Section 8.1). The strengths and limitations of this research are then considered (Sections 8.2). Areas for potential research arising from the findings are presented (Section 8.3), leading into a personal reflection on the research process (Section 8.4) and final conclusions (Section 8.5).

8.1 New knowledge and confirmatory findings arising from this research

The extent to which the findings arising from this research constitute new knowledge or are confirmatory in nature is considered here in two parts. First, the findings as they relate to the relationship between age, workplace psychosocial characteristics, and the stress and well-being of nurses and intellectual disability care workers are discussed (Section 8.1.1). Second, the findings of this research with regard to the design and delivery of online work-stress management interventions (Section 8.1.2) are analysed with reference to what is already known about such interventions. What remains unknown as it relates to these findings is also noted; this informs a discussion on future research in Section 8.3.

8.1.1 Age, workplace psychosocial characteristics, and stress among nurses and intellectual disability care workers

The finding that age was not correlated with perceived stress and mental health outcomes (Study One, Chapter Five, Section 5.2) adds to existing knowledge of the occupational experiences of nurses and intellectual disability care workers. Taken with the extant literature (Chapter Two), age does not appear to play a role in stress perception among nurses or intellectual disability care workers. That is, being older does not appear to constitute a source of stress for either occupational cohort (albeit it should be noted that there is a lack of research

examining this issue among intellectual disability care workers, as evidenced through the scoping review of this literature presented in Chapter Two).

That age did not influence the contribution of psychological job demands, decision latitude or social support to the experience of stress among nurses and intellectual disability care workers in Study One of this research (Chapter Five, Section 5.3) adds new knowledge to the literature. Previous investigations of the relationship between age and workplace psychosocial characteristics are sparse (Zacher and Schmitt 2016). The finding of this research that age did not influence of the experiences of this occupational cohort contributes new knowledge in this regard.

Support for the main effects of the JDC and JDC(S) models (Karasek *et al.* 1979, Johnson and Hall 1988), evidenced in this research by the significant correlations between psychological job demands, decision latitude and social support and stress outcomes, is a confirmatory finding (Hausser *et al.* 2010, Gonzalez-Mule *et al.* 2020). Though the finding that neither decision latitude nor social support influenced the relationship between psychological job demands and stress (Chapter Five, Section 5.3) contradicts the interactive hypotheses of these models, it is consistent with most previous examinations of these models. As noted in Chapter Five (Section 5.4), meta-analytic review work indicates that support for the interactive effects of the JDC and JDC(S) is weak and inconsistent. The findings of this research complement an increasing body of research that suggests that the interactive hypotheses of these models are not supported empirically. Study One here adds new knowledge to the literature by indicating that age does not influence support for the interactive hypotheses of these work-stress models.

That poorer physical health was significantly correlated with increased age (Chapter Five, Section 5.2) is a confirmatory finding as it relates not just to nurses but many other occupational groups (Ng and Feldman 2013). Much previous research highlights the challenges posed by the physical declines in well-being and stamina experienced by nurses as they age (Chapter Two, Section 2.3). As no research to date has explored this issue among intellectual disability care workers, including intellectual disability nurses (Chapter Two,

Section 2.5.2), Study One contributes new knowledge to what is known about age and physical health among this cohort.

The finding that physical exertion was correlated with poorer physical health (Chapter Five, Section 5.2) is consistent with much existing research relating to health and social care workers (e.g. Andersen *et al.* 2012, Merkus *et al.* 2012). It was also determined that the nature of the work undertaken by the nurses and intellectual disability care workers surveyed in Study One tended to be less physically exerting with increasing age (Chapter Five, Section 5.2). Why this was the case is unclear and may be worthy of further investigation (see Section 8.3). In addition, that the relationship between physical health and age was not affected by the psychosocial characteristics of decision latitude or social support adds new knowledge to the literature. Future research could determine whether other workplace characteristics, such as the use of technology or flexible working, influence the relationship between physical health and age among health and social care workers (this is discussed in more detail in Section 8.3).

8.1.2 The experience of online work-stress management interventions

Qualitative investigation of the experience of undertaking the DELAROSE programme (Study Two) yielded both new knowledge and confirmed existing findings relating to online work-stress management interventions. For example, that age does not appear to impact upon participants' experience of the usefulness of online interventions is a new finding and one that that adds to existing knowledge. This is because differences according to age in the efficacy or usefulness of online work-stress management interventions have not been much investigated to date (see Chapter Three, Sections 3.2 and 3.3).

Indeed, only one randomised controlled trial of an intervention that focused on a specific age cohort of workers (Cook *et al.* 2015) was identified through the systematic review of the literature in Chapter Three (Section 3.3.2.5). Within the qualitative literature, perceived utility or efficacy has not formed a central focus of investigations of online work-stress management interventions (see Chapter Three, Section 3.3 for a review of this literature). That age did not appear to influence participants' experience of the DELAROSE programme,

including their perception of the utility of the programme, adds new knowledge to what is known about online work-stress management.

The finding that the level of experience or workplace responsibility (such as holding a position of management or leadership) of some participants appear to influence what they sought from the DELAROSE programme and how useful they perceived it to be contributes new knowledge to the literature. Previous qualitative investigations of the experience of online work-stress management interventions (Chapter Three, Section 3.3) have not examined nor identified whether issues of experience or responsibility influence how workers perceive such interventions. These issues were not a feature of the literature reviewed in Chapter Two relating to the experiences of ageing nurses or intellectual disability care workers (Chapter Two, Sections 2.3 and 2.4).

As such, the finding from Study Two of this research (Chapter Six, Section 6.1.1.3). that workers may seek online interventions in order to meet a personal desire or perceived obligation to support their colleagues and contribute to a less stressful working environment constitutes new knowledge. That awareness of the impact of work-related stress and concern in relation to a perceived lack of knowledge or ability to manage stress may constitute sources of stress for some of these workers is a new finding in this regard.

It is important to note that the usefulness of online work-stress management interventions, included those delivered 'in-person', for these types of workplace outcomes is under-investigated. As noted, only one online intervention with an organisational focus (Gayed *et al.* 2019) was identified through the systematic review of the literature in Chapter Three. That an online work-stress management intervention can enable users to support their colleagues and contribute to a less stressful working environment (depending on their levels of experience and responsibility within their workplace – see Chapter Six, Section 6.1.1.2 and 6.1.1.3) is a finding that adds to existing knowledge.

Most of those undertaking the DELAROSE programme reported common facilitators and barriers relating to online delivery, support, work-life balance and workload. This consistent with the findings of existing qualitative research,

as reviewed in Chapter Three (Section 3.3). That the salience of these issues did not appear to vary according to age constitutes new knowledge. Age differentials in the experience of online work-stress management interventions have not been previously investigated.

However, and as noted in Chapter Seven (Section 7.1), this is not to say that the experience of online work-stress management interventions is likely to be the same for all workers. In this regard, Study Two generated new knowledge through the finding some participants expressed a desire to receive programme content in alternative modalities (Chapter Six, Section 6.2.3.1). This has not been identified in previous qualitative investigations of online work-stress management interventions (Chapter Three, Section 3.3). Similarly, that the practical relevance and utility of DELAROSE varied amongst participants (Chapter Six, Section 6.1.1.4 and Section 6.1.2.4) also comprises new knowledge. This links with the previous discussion on the influence of participants' experience or level of responsibility in their workplace, as it was found that not all participants desired or were able to make use of the DELAROSE programme's organisational content.

Finally, that participants differed in their desire to interact with others mirrors a variation in the existing literature (see Chapter Six, Section 6.2.3.2). That the volume of workload associated with DELAROSE did not meet the needs and preferences of some participants confirms the findings of existing research as it relates to the time-consuming nature of online work-stress management interventions (Chapter Three, Section 3.3).

8.2 Strengths and limitations of this research study

It is important that the findings of this research and the contributions made to the literature are considered within the context of the strengths and limitations of the processes of investigation. These strengths include, for example, the use of mixed methods approaches and the conduct of comprehensive reviews of the literature to explore emerging research areas and facilitate critical discussion of the findings. Limitations relate to the constraints of the methodological approaches that informed the processes of data collection and analysis (quantitative cross-sectional surveys and qualitative interviewing), and specific issues relating to the procedures of data

collection and analysis as conducted by the researcher (e.g. how participants were recruited and the use of unstructured interviewing).

8.2.1 The use of scoping and systematic review frameworks

One of strengths of this research lies in the fact that it is grounded in a series of thorough and novel explorations of the literature. These were informed by established and clearly demarcated scoping (Arksey and O'Malley 2005) and systematic review (PRISMA and Cochrane) frameworks and accompanied by quality assessments of the literature (using MMAT and Cochrane Risk of Bias tools). These reviews underpinned two separate chapters and contributed to addressing several objectives of this research (Chapter One, Section 1.3). Four of these reviews (including two that examined emerging issues arising from this work) were published in high impact peer reviewed journals and have made timely and relevant contributions to the literature in their respective fields (see Section 1.5 of Chapter One and Appendix J for details of the publications arising from this study). A further two papers are currently under review or in preparation for publication.

The use of scoping review frameworks to chart, analyse and appraise the literature in a systematic manner adds strengths of this research. Scoping reviews are particularly useful for examining emerging research areas where it is unclear at the outset what specific questions can posed and addressed (Aromataris and Pearson 2014, Daudt, van Mossel and Scott 2013). This proved to be the case with this research. For example, with one of the scoping reviews it was intended to examine the literature as it related to issues of age and intellectual disability care work (Chapter Two, Section 2.4). However, as research of this specific nature had not yet been conducted, it was decided to examine the experience of stress and burnout in this occupational cohort more generally. The iterative nature of the scoping review process meant that such a course of action was possible (Levac, Colquhoun and O'Brien 2010), while the use of the MMAT quality appraisal tool helped shaped the thematic analysis and added confidence in the credibility of the findings.

Systematic review frameworks were employed to examine the literature relating to online work-stress management interventions[4] (Chapter Three). An update of an existing systematic review and meta-analysis as it related to online interventions delivered in the workplace (Phillips, Gordeev and Schreyögg 2019) was conducted. This existing review was published in 2019, and the updated review considered new literature up to January 2023. Adhering to PRISMA guidelines and checklists and following PROSPERO protocols with these reviews helped ensure that the most up to date evidence in relation to online work-stress management interventions was garnered. In combination with use of the Cochrane Risk of Bias tool, they helped to ensure the accuracy and completeness of the information reported, thus allowing readers to assess the strengths and weaknesses of the review.

The findings of both the existing (Phillips Gordeev and Schreyögg 2019) and the updated systematic review (Chapter Three), in addition to a novel review of the qualitative literature relating to workers' experiences of online work-stress management interventions, were drawn upon to generate a comprehensive picture of what programmes similar in nature to DELAROSE were available. This facilitated a critical analysis and reflection on the DELAROSE programme within the context of similar interventions delivered elsewhere. This allowed for the findings of this research to be analysed with reference to the existing literature. Apparent contradictions between the findings of previous studies and this research were identified and considered throughout this thesis.

8.2.2 The value of a mixed-methods approach

A mixed methods research approach was used to meet to address the aim and objectives of this research question. This was informed by a toolkit approach (Ritchie and Lewis 2003) whereby data collection methods deemed most suited for addressing specific objectives were selected. This meant that the relative strengths of quantitative and qualitative approaches were harnessed to investigate the issues that underpinned these objectives (Chapter Four, Section 4.1). This in turn contributed to the generation of findings that were usefully combined and analysed in Chapter Seven to address the issue of age and

[4] This was a suggestion arising from the initial examination of this thesis

supporting health and social care workers in their management of work-related stress through online interventions.

8.2.3 Nurses and intellectual disability care workers

Focusing on both health and social care workers (i.e. nurses and intellectual disability care workers) is a strength of this research as it acknowledges the variegated professional landscape as it relates to those who provide care and support services in Ireland (Chapter One, Section 1.3). The recruitment of participants Study One of this research spanned three areas of health and social care practice, incorporating multiple services and care settings. This included nurses and social care workers in intellectual disability care services, as well as nurses working in hospital and mental health care settings. This enhanced the representativeness of the final sample and reflects the importance of ensuring that the experiences of different groups within these occupational cohorts are examined.

8.2.4 Cross-sectional survey design and correlational analysis

There are strengths and limitations to the use of quantitative cross-sectional survey approaches in this research. They were usefully and appropriately employed here to address Objective Three of this research, which involved gathering data to examine the relationship between age and the contribution of workplace characteristics to the manifestations of stress among a sample of health and social care workers (Study One, Chapter Five). Quantitative survey approaches were suited to meeting this objective as it involved testing hypotheses within a theoretical framework. Important also was that the variables to be analysed needed to be precisely defined and assessed, which can be achieved by quantitative means.

However, correlational analysis cannot be relied upon to indicate a causal relationship between variables. This means that causal interpretations from the findings of Study One as they relate to how workplace characteristics contribute to stress and well-being outcomes among nurses and intellectual disability care workers cannot be drawn. In addition to this, it is worth noting that many of the reported correlations, though consistent with existing findings and theory, were

only weak to moderate in strength. This may limit their usefulness for testing the validity of the theoretical assumptions of the JDC and JDC(S) models.

8.2.5 The survey instrument

There are strengths and limitations relating to the measurement tools used to assess workplace psychosocial characteristics in Study One of this research. A generic version of the Job Content Questionnaire was used to for this purpose, and it is possible that strain and buffering effects in line with the JDC and JDC(S) model would have been identified had measures tailored to the specific occupational groups been employed. This is supported by a study of intellectual disability care workers conducted by Vassos *et al.* (2017), who used tailored measures of demands, resources and support to investigate how these variables contributed to their workplace engagement and burnout. Support for the iso-strain and iso-buffer hypotheses was reported in that study. Tailored measures may have strengthened this study and contributed to greater explanation of the variance in the stress-related outcomes.

Hausser *et al.* (2010) suggest that the extent to which job control buffers against the effects of job demands is predicated on a 'matching principle', i.e. additional job control is only valuable when it relates directly to the demands placed on the individual. Similarly, Zacher and Schmitt (2016) report that interactions between age and workplace characteristics appear to be dependent on the specific nature of these characteristics. Drawing on additional perspectives as they relate to ageing and work, such as Selection, Compensation and Optimisation theory (Baltes and Baltes 1993) or life span approaches (Schmitt and Unger 2019) to inform the content of the survey would have strengthened the investigation. It is possible that this may have led to the identification of significant interactions as they relate to age, workplace psychosocial characteristics and the experience of stress among health and social care workers.

The inclusion of a measure of burnout, such as the Maslach Burnout Inventory, would have been a useful and instructive addition to the survey instrument in Study One. The decision not to include a measure of burnout was reasoned from

the fact that DELAROSE was designed as a resource to support workers in management of stress in the workplace, and not as a psychotherapeutic treatment for symptoms of burnout. As described in Chapter One (Section 1.3), the concept of burnout differs from that of work-related stress in that it is a syndrome that develops in response to chronic stress, and is conceptualised as feelings of cynicism, emotional exhaustion and lack of accomplishment. Its mitigation is likely to require tailored therapeutic treatment, which is beyond the remit of DELAROSE as an online resource that delivers skills and knowledge in work-stress management (Chapter Three, Section 3.4). The use of the SF-12, which includes a measure of mental well-being, did provide some useful insight alongside the Perceived Stress Scale (Chapter Five, Sections 5.2 and 5.3). However, given the focus on burnout outcomes among intellectual disability care workers (Chapter Two, Section 2.4), and that burnout is an established contributor to attrition among nurses and intellectual disability care workers, a measure of burnout would have strengthened the survey tool and can be considered a limitation of Study One of this research.

8.2.6 The representativeness of the research samples

In order to generate meaningful findings, the population of interest for this research was narrowed to nurses and a particular type of social care worker, namely intellectual disability care workers. The participants for Study One of this research were further limited to a convenience sample of a subset of nurses and intellectual disability care workers employed by the HSE or an organisation affiliated to the NFVB in the South-East region of Ireland. While there was a clear justification for limiting the population of interest to these cohorts (see Chapter One, Section 1.3), this does limit the extent to which the findings generalise to other cohorts of the health and social care workforce.

The use of convenience sampling to recruit participants for Study One of this research was justified for pragmatic purposes arising from the lack of a sampling frame (Chapter Four, Section 4.2.1.4). Several actions (such as the use of mixed mode surveys, recruiting gatekeepers, and surveying participants from a range of care settings and services) were taken to try to achieve as representative a sample as possible. A clear description of the target population,

the range of care settings surveyed, and the sample under investigation were provided so that a comparison between the two can be made (Chapter One, Section 1.3.2 and Chapter Four, Section 4.1.2.8). Power analysis was also provided to add confidence in the validity of the statistical analysis (Chapter Four, Section 4.2.2.3).

Nonetheless, the lack of a sampling frame means that a response rate for Study One can only be estimated. It is possible that the gatekeeper approach resulted in the recruitment of biased samples, as the influence of placement co-ordinators and other staff members as gatekeepers may have affected the selection of individuals for the survey. In addition, not all services who were contacted consented to participate in Study One. A lack of time was the most common reason for declining. In some services, staff members were already participating or had just participated in other survey research related to stress and job satisfaction. The use of a cluster sampling approach is one potential way in which this aspect of the research could have been strengthened. Dividing the population into clusters based on care settings, for example, and then randomly selecting services within those clusters could have helped to limit sampling bias and achieve a more rigorous study. Cluster sampling would have been more suited limiting sampling bias arising from the internally heterogeneous nature of the health and social care sector.

For these reasons, the findings of Study One cannot be taken as representative of the full Irish health and social care sector. Data were collected and analysed from a sample of self-selected participants within a specific domain of health and social care workers in a particular region in Ireland. This means that the sample is unlikely to be fully representative, and that caution should be exercised when considering the generalisability of the findings.

Similar limitations apply to the findings generated from Study Two of this research (qualitative interviews). Recruitment of participants was limited to a convenience sample of those who had undertaken the Certificate in the Management of Work-Related Stress with WIT. As such, the qualitative findings were generated from a small number of self-selected participants who had enrolled in a specific educational programme. Though the programme

generated much interest and many queries, this did not always translate into enrolment. Not all who enrolled in the programme consented to participate in the individual interviews. While the final sample of participants represented a diversity of persons engaged in health and social care work (increasing confidence that the findings are applicable to more than just one specific cohort within the health and social care sector), a clear gender bias is present in the final sample (with nine of the twelve participants identifying as female).

Caution must be exercised when considering the implications of the findings and the conclusions that can be drawn from Study Two. The extent to which specific findings as they relate to, for example, the influence of leadership and responsibility on participants' experiences generalise to other stress management programmes or the wider health and social care workforce is unclear. That said, it is important to recognise that generalisability was not necessarily sought from the outset. In keeping with the nature and strengths of qualitative research, the objective of Study Two was to generate rich, contextual insight into participants' experience of undertaking an online work-stress management programme.

This was achieved through the use of qualitative approaches that were appropriate and suited to answering the objective that underpinned Study Two and the research question more generally. There are limitations in the extent to which thematic analysis can be harnessed to address the question of age differentials, while the relative strengths of the different themes generated from the data is challenging to ascertain using these approaches. However, data analysis followed an approach that is well demarcated (thematic analysis) and was aided by NVivo software to enhance quality and consistency. The analysis and final report is comprehensive and coherent, and the interpretation of results is substantiated by the data.

8.2.7 Unstructured individual interviews

The use of unstructured 'conversational' style interviewing may be a limitation in terms of the rigour of the qualitative data collection procedures and the

trustworthiness of the findings of this research[5]. Following the semi-structured interview process as intended for Study Two may have contributed to greater consistency in this aspect of the research (Lincoln and Guba 1985), as it cannot be guaranteed that every aspect of the topic guide was discussed with each participant. The use of an unstructured format may limit the ability of readers to examine the research process and judge the dependability and confirmability of the findings (Tobin and Begley 2004), particularly as it relates to comparing differences in what was reported across participants.

Nonetheless, there are recognised advantages to the use of unstructured formats (Mueller and Segal 2014). At a practical level, following a conversational style made it easier to establish rapport with participants over the phone and conduct interviews that were engaging and interactive. It may have helped garner a more accurate picture of each individual participant's experiences and the pertinent issues from their perspectives as they related to online stress management. These points are discussed in detail in Chapter Four (Section 4.2.4) and Chapter Six (Section 6.3).

8.2.7 DELAROSE as the case example for online work-stress management

Finally, the findings of Study Two relate to the specific case example of an existing online stress management programme (DELAROSE). The dual-focused nature of the programme adds strength to this research as it allowed for the experiences of participants as they related to personal and organisational stress management to be captured. As a result, new knowledge as it related to differentials in the utility of online stress management was generated (Chapter Six, Section 6.1.1). In addition, Module One of the programme is quite similar

[5] It was intended that semi-structured interviews following a question schedule would be employed for the individual interviews as part of Study Two. However, it was highlighted by my PhD examiners that, based on examination of extracts from these interviews, I had not followed the question schedule correctly. The interviews were unstructured in nature. It was not a conscious decision to deviate from the question schedule during each interview. Rather my lack of adherence to the specific questions detailed in this schedule occurred as part of interview process while trying to establish rapport with participants and explore topics in more depth. The interviews were incorrectly presented as semi-structured in the original thesis for examination. An accurate description of their conduct is detailed in Chapter Four (Section 4.2.3).

in focus and form to many existing online work-stress management interventions (particularly those that have been evaluated through qualitative means; see Chapter Three Sections 3.2 and 3.3). This adds to its value as a case example in this research.

Nonetheless, Module Two of DELAROSE is relatively unique due to its focus on organisational stress management. This may limit the extent to which the experience of undertaking DELAROSE is indicative of the experience of other online work-stress management interventions. The findings as they relate to Study Two must be considered within this context and it is fair to question their representativeness as they relate to the experience of all health and social care workers undertaking online interventions.

8.3 Future work arising from this research

There are several potential areas of further research arising from this work. For example, future research could identify and examine more specific hypotheses as they relate to age and the contribution of workplace characteristics to the experience of stress among health and social care workers. That is, it may be that only particular aspects of job control and social support, such as certain types of autonomy or instrumental support related to mid-life demands, are uniquely meaningful to health and social care workers as they age. Identifying whether this is the case could be useful in terms of informing appropriate targets for intervention to support such workers.

Based on the findings of this research it was recommended that online work-stress management interventions for health and social care workers should target each of the three psychosocial characteristics of psychological job demands, decision latitude and social support through organisational approaches (Chapter Seven, Section 7.2). However, the most effective ways to target such characteristics through online stress management interventions are not yet fully clear. This is because almost all existing online work-stress management interventions are individual-focused. As such, they offer little guidance as to the particular content that can be included in online stress management interventions in order to target such workplace characteristics.

In Chapter Seven actions based on an analysis of existing ‘in-person’ organisational interventions, such as risk assessment and job redesign, were suggested as examples of how these psychosocial characteristics can be targeted (Section 7.2). Determining the

most effective ways to target and address these characteristics through online modalities would be a valuable continuation from this research.

The finding from Study One that the nature of the work undertaken by nurses and intellectual disability care workers appeared to be less physically exerting with increasing age may be worthy of further examination (Chapter Five, Section 5.2). It would be interesting to clarify whether this is unique to the recruited sample of participants or whether it reflects a more general trend in health and social care practice. For example, it may that workers in these sectors tend to move into roles that are less strenuous care as they age. This may be as a result of a change in occupational position (e.g. moving into a managerial role) or that their roles have been adapted to become less physically exerting (perhaps indicative of a recognition that they may be more vulnerable to the negative effects of physically exerting workplaces).

In terms of online work-stress management intervention development, it would be worth determining whether the nature of health and social care workers' roles generally become less physically exerting as they age. Should this be the case then interventions to support them may be more useful if they focus on coping with declines in physical stamina and sustaining their well-being, rather than targeting physically strenuous aspects of their working environments.

Future research could examine the extent to which issues of experiences and workplace responsibility (such as holding positions of management or leadership) influences the requirements of health and social care workers in their work-stress management. For example, the extent to which nurse managers experience a need or desire to support the psychosocial well-being of their workplace colleagues or supervisees is not apparent from the extant literature as it relates to this cohort (Labrague *et al.* 2018, Shirely 2006). It would be helpful to determine whether the Covid-19 pandemic has placed added pressure or obligation on managers in health and social care services to support their colleagues in coping with stress (Dimino, Learmonth and Fajardo 2021).

Finally, it was recommended that the support provided to those undertaking online stress management should be consistent and structured, with a focus on providing accountability and sustaining engagement (Chapter Seven, Section 7.2). Not only might this meet their needs in terms of the support they require, but it may also help mitigate a vulnerability to disengagement (Harrer *et al.* 2018, Ebert *et al.* 2018). The quality of

support provided to participants in online programmes has been shown to positively impact on their engagement and adherence (Mohr *et al.* 2013). Future research could examine the practical implications of delivering such support to health and social care workers, and determine the extent to which it would have a positive impact on sustaining their engagement.

8.4 Reflection on the research process

Many aspects of the process of conducting this research proved to be considerably more challenging than I had anticipated. Perhaps most difficult was maintaining a clear focus on the overall aim of this research through each part of the investigation. This was my first experience of conducting research which comprised multiple objectives and in which the findings of different studies would be combined to address an overarching aim. Upon reflection, at times I became overly focused on addressing issues relating to specific objectives, as opposed to determining how my approaches and analysis would interact with each other to meet the overall research aim.

Another aspect of the research process that proved more difficult than had I anticipated related to the use of qualitative approaches. I was much less familiar with the philosophies and processes that underpin qualitative data collection and analysis compared to quantitative approaches. I had to re-introduce myself to qualitative research and develop a better understanding of the methods and analytical approaches available to me.

Indeed, in terms of qualitative data analysis, the work of coding the data and generating the final thematic report was considerably more time-consuming and complex than I had anticipated. Prior to the commencement of Study Two, I had naively assumed that once data were transcribed and imported into NVivo, the process of coding and producing a thematic report would be quite straightforward and almost intuitive. This did not prove to be the case, as I had to learn to manage a range of different challenges relating to the volume of text and reconciling the idiosyncratic and common features of the data in order to generate the final thematic analysis.

My inexperience in conducting qualitative interviews probably contributed to my lack of adherence to the semi-structured format as intended. As noted earlier in this chapter, it was not a conscious decision to deviate from the question schedule during each

interview (Section 8.2.7). Instead, my questioning took on an unstructured 'conversational' style as part of trying to establish rapport with participants and explore topics in more depth.

Upon reflection, a more appropriate approach to have taken would have been to pilot the semi-structured question schedule as part of the first interview. I should have then consulted with my supervisors and informed them of the way in which the interviews were developing. In this way, I could have adapted my approach based on what was learned from the experience of the first interview, while maintaining the benefits of semi-structured interviewing in terms of rigour and consistency.

The process of recruiting participants for survey research as part of Study One was a much more difficult and time-consuming process than I anticipated. Not all services who were contacted consented to participate, with a lack of time the most common reason for declining. In some services, staff members were participating or had just participated in other survey research with regard to stress in the workplace.

In some cases, there were no existing connections that I could build on. The only pathway to recruiting such services was through 'cold' calling and emailing. This was the most challenging type of recruitment I engaged in. This usually required many attempted communications over several weeks before I could make contact with a relevant staff member to request participation in the research.

The recruitment of participants for individual interviews in Study Two also presented certain challenges. For example, the recruitment of learners onto the programme was slower and more difficult than I anticipated. Bureaucratic structures still existed in terms of academic programme delivery, as learners could only be registered at certain times of the year. That said, I was fortunate that many who did enrol in the programme and who were eligible to participate in an interview consented to do so. Though there was some drop-out, once learners had signed up to the programme it was possible to recruit them for an interview. Thankfully most were willing to speak about their experiences.

Working with participants as learners on the DELAROSE programme and listening to their experiences was perhaps the most rewarding aspect of this research. It very much strengthened my sense of the value of health and social care work as a public service.

Key to this was that my understanding of the nature and intricacies of the health and social care landscape in Ireland increased substantially as I progressed through the study and as I engaged more and more with participants and service providers alike.

I felt much gratitude to those who participated in this research and that they were willing to share their personal experiences with me. These interactions helped me to appreciate just how challenging health and social care work can be. I was impressed by their commitment to their work, especially those who had dedicated a significant number of years to the sector. Their efforts to cope personally and that they were still very much keen to support their colleagues in managing challenging and pressurised caring environments left a meaningful positive impression on me. This was juxtaposed at times with feelings of sadness and frustration, provoked mainly by my own limitations in being able to help those in difficult and stressful working environments.

8.5 Final conclusions

This research examined issues of age, stress and well-being as they related to health and social care workers and online work-stress management interventions. Analysis of the findings of this research suggested that a focus on age may not be warranted in the design and delivery of interventions to support health and social care workers in the management of their work-related stress. Age did not appear to influence stress perception or the contribution of psychological job demands, decision latitude or social support to the experience of stress among a sample of nurses and intellectual disability care workers. While each of these characteristics were significantly associated with well-being outcomes, this did not vary according to age, and there was no evidence for interactions among these characteristics.

Arising from these findings, it was recommended that the design of online stress management interventions should target each of those characteristics. A focus on age does not appear to be required. That said, those seeking to support health and social care workers should pay particular attention to the issue of physical well-being and the potential vulnerability of some workers to physically exerting workplaces with increased age (Chapter Two, Section 2.3; Chapter Five, Section 5.2).

This is supported by an analysis of the existing literature as it relates to the experience of ageing nurses in the workplace. Such workers have been shown to encounter

personal and organisational stressors that are specific to their own sphere (Chapter Two, Section 2.2). These stressors include issues arising from reduced physical and cognitive stamina, working through pain and injury, and a lack of support and recognition of their abilities and circumstances (Chapter Two, Section 2.3). These issues may warrant specific consideration in the development of stress management supports.

The findings of this research suggest that occupational position (in terms of experience, expertise and levels of responsibility in the workplace) is important to understanding and meeting the requirements of health and social care workers in online work-stress management (Chapter Six, Sections 6.1.1 and 6.1.2). As workers gain in experience and responsibility in the workplace, they may be more likely to seek online support in both personal stress management and in supporting others/contributing to a less stressful workplace.

Age does not appear to have a particularly meaningful influence on the experience of undertaking online stress management interventions, in terms of the design and delivery of such programmes. There are certain aspects of the delivery of online interventions that appear to affect most who undertake them. Specifically, the benefits of online modalities, in terms of flexibility and convenience, must be weighed against the vulnerability of such interventions to disengagement (Chapter Six, Section 6.1.2).

It may also be important that health and social care workers are not assumed to be a uniform group in terms of their needs and preferences in online stress management (Chapter Seven, 7.2). Online stress management interventions may need to be tailored in their form and focus to address differing needs of target users. Not all workers are likely to be motivated by a desire or perceived obligation to support others or contribute to workplace stress management. This also applies to meeting the differential preferences of workers as they relate to interacting with others or the modality of content (Chapter Seven, 7.2).

In conclusion, it was determined that a focus on age does not appear to be warranted as it relates to the issue of supporting health and social care workers through online work-stress management interventions. For these reasons, the key outputs from this research were recommendations as to the development and implementation of online stress management programmes to meet the requirements of health and social care workers

more generally. The further development of the DELAROSE online programme to meet the needs and preferences of health and social care workers was also considered.

REFERENCES

Abbott, J. A., Klein, B., Hamilton, C., & Rosenthal, A. J. (2009) The impact of online resilience training for sales managers on wellbeing and performance. *Sensoria: A Journal of Mind, Brain & Culture*, *5*(1), 89-95.

Alberts, N.M., Hadjistavropoulos, H.D., Titov, N. and Dear, B.F. (2018). Patient and provider perceptions of Internet-delivered cognitive behavior therapy for recent cancer survivors. *Supportive Care in Cancer*, *26*(2), 597-603.

Alexander, M., & Hegarty, J. R. (2000) Measuring staff burnout in a community home. *The British Journal of Development Disabilities*, *46*(90), 51-62.

Alexiou, E., Kotsoni, A., & Stalikas, A. (2021). The Effectiveness of an Online Positive Psychology Intervention among Healthcare Professionals with Depression, Anxiety or Stress Symptoms and Burnout. *Psychology*, *12*(03), 392–403.

Alfonsson, S., Olsson, E., Linderman, S., Winnerhed, S., & Hursti, T. (2016). Is online treatment adherence affected by presentation and therapist support? A randomized controlled trial. *Computers in Human Behavior*, *60*(1), 550-558.

Alikhani, R., Salimi, A., Hormati, A., & Aminnejad, R. (2020) Mental health advice for frontline healthcare providers caring for patients with COVID-19. *Canadian Journal of Anesthesia*, *67*(8), 1068-1069.

Althaus, V., Kop, J. L., & Grosjean, V. (2013). Work, stress and health: From theoretical models to a meta-model: Critical review of theoretical models linking work environment, stress and health: Towards a meta-model. *Le Travail Humain*, 81-103.

Agüir, V. E., Pons, R. M., & Reus, E. F. (2001). Validación del Job Content Questionnaire en personal de enfermería hospitalario. *Gaceta sanitaria: Organo oficial de la Sociedad Española de Salud Pública y Administración Sanitaria*, *15*(2), 142-149.

American Psychological Association (2021). Work and Well-being Survey Results. Retrieved from https://www.apa.org/pubs/reports/work-well-being/2022-mental-health-support Accessed 8th September 2022.

Amick III, B. C., Kawachi, I., Coakley, E. H., Lerner, D., Levine, S., & Colditz, G. A. (1998). Relationship of job strain and iso-strain to health status in a cohort of women in the United States. *Scandinavian Journal of Work, Environment & Health*, *24*(1), 54-61.

Andersen, L. L., Clausen, T., Mortensen, O. S., Burr, H., & Holtermann, A. (2012). A prospective cohort study on musculoskeletal risk factors for long-term sickness absence among healthcare workers in eldercare. *International Archives of Occupational and Environmental Health*, *85*(6), 615-622.

Andrews, J., Manthorpe, J., & Watson, R. (2005). Employment transitions for older nurses: a qualitative study. *Journal of Advanced Nursing*, *51*(3), 298-306.

Ang, S. Y., Ayoob, S. B. M., Hussain, N. B. S., Uthaman, T., Adenan, H., Chiang, P., ... & Ostbye, T. (2017). Challenges faced by older nurses in Singapore: A mixed methods study. *International Nursing Review*, *64*(4), 502-510.

Ansley, B. M., Houchins, D. E., Varjas, K., Roach, A., Patterson, D., & Hendrick, R. (2021). The impact of an online stress intervention on burnout and teacher efficacy. *Teaching and Teacher Education*, *98*(2), 103251.

Archer, T. M. (2003). Web-based surveys. *Journal of Extension*, *41*(4), 1-5.

Arksey H, O'Malley L. (2005) Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology. 8*(1):19-32.

Armstrong-Stassen, M., & Schlosser, F. (2010). When hospitals provide HR practices tailored to older nurses, will older nurses stay? It may depend on their supervisor. *Human Resource Management Journal*, *20*(4), 375-390.

Armstrong-Stassen, M., & Ursel, N. D. (2009). Perceived organizational support, career satisfaction, and the retention of older workers. *Journal of Occupational and Organizational Psychology*, *82*(1), 201-220.

Aromataris, E., & Pearson, A. (2014). The systematic review: An overview. *The American Journal of Nursing*, *114*(3), 53-58.

Arthur, S., & Nazroo, J. (2003). Designing fieldwork strategies and materials. In Ritchie, J., & Lewis., J. (Eds.) *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London: Sage Publications, pp. 109 – 177.

Asplund, R. P., Jäderlind, A., Björk, I. H., Ljótsson, B., Carlbring, P., & Andersson, G. (2019). Experiences of internet-delivered and work-focused cognitive behavioral therapy for stress: A qualitative study. *Internet Interventions, 18*(2), 100-282.

Avey, J., Newman, A., & Herbert, K. (2022). Fostering employees' resilience and psychological well-being through an app-based resilience intervention. *Personnel Review*, (ahead-of-print).

Beck, A. T., Steer, R. A., & Brown, G. K. (1987). *Beck depression inventory*. New York: Harcourt Brace Jovanovich.

Bailey, B. A., Hare, D. J., Hatton, C., & Limb, K. (2006) The response to challenging behaviour by care staff: emotional responses, attributions of cause and observations of practice. *Journal of Intellectual Disability Research, 50*(3), 199-211.

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*. *22*(3), 309-328

Bakker, A. B., Demerouti, E., & Euwema, M. C. (2005). Job resources buffer the impact of job demands on burnout. *Journal of Occupational Health Psychology*, *10*(2), 170.

Bakker, A. B., Le Blanc, P. M., & Schaufeli, W. B. (2005). Burnout contagion among intensive care nurses. *Journal of Advanced Nursing*, *51*(3), 276-287.

Baltes, P. B., & Baltes, M. M. (Eds.). (1993). *Successful Aging: Perspectives from the Behavioral Sciences* (Vol. 4). Cambridge University Press.

Barriball, K. L., Christian, S. L., While, A. E., & Bergen, A. (1996). The telephone survey method: a discussion paper. *Journal of Advanced Nursing, 24*(1), 115-121.

Bartz, J. A., Zaki, J., Bolger, N., & Ochsner, K. N. (2011). Social effects of oxytocin in humans: context and person matter. *Trends in Cognitive Sciences, 15*(7), 301-309.

Bendelin, N., Björkdahl, P., Risell, M., Nelson, K.Z., Gerdle, B., Andersson, G. and Buhrman, M. (2020). Patients' experiences of internet-based Acceptance and commitment therapy for chronic pain: a qualitative study. *BMC Musculoskeletal Disorders*, *21*(1), 1-12.

Bendelin, N., Hesser, H., Dahl, J., Carlbring, P., Nelson, K.Z. and Andersson, G. (2011). Experiences of guided Internet-based cognitive-behavioural treatment for depression: a qualitative study. *BMC Psychiatry*, *11*(1),1-10.

Benner, P. (1982). From novice to expert. *The American Journal of Nursing*, *82*(3), 402-407.

Berg, M., Malmquist, A., Rozental, A., Topooco, N. and Andersson, G. (2020). Knowledge gain and usage of knowledge learned during internet-based CBT treatment for adolescent depression-a qualitative study. *BMC Psychiatry*, *20*(1), 1-11.

Besen, E., Matz-Costa, C., Brown, M., Smyer, M. A., & Pitt-Catsouphes, M. (2013). Job characteristics, core self-evaluations, and job satisfaction: what's age got to do with it? *The International Journal of Aging and Human Development*, *76*(4), 269-295.

Bhui, K. S., Dinos, S., Stansfeld, S. A., & White, P. D. (2012) A synthesis of the evidence for managing stress at work: a review of the reviews reporting on anxiety, depression, and absenteeism. *Journal of Environmental and Public Health* https://doi.org/10.1155/2012/515874

Bienertova-Vasku, J., Lenart, P., & Scheringer, M. (2020). Eustress and distress: neither good nor bad, but rather the same? *BioEssays*, *42*(7), 1900238.

Billings, D. W., Cook, R. F., Hendrickson, A., & Dove, D. C. (2008). A web-based approach to managing stress and mood disorders in the workforce. *Journal of Occupational and Environmental Medicine*, *50*(8), 960 – 968.

Blake, H., Bermingham, F., Johnson, G., & Tabner, A. (2020). Mitigating the psychological impact of COVID-19 on healthcare workers: a digital learning package. *International Journal of Environmental Research and Public Health*, *17*(9), 2997.

Blake, H., Mahmood, I., Dushi, G., Yildirim, M. and Gay, E. (2021). Psychological impacts of COVID-19 on healthcare trainees and perceptions towards a digital wellbeing support package. *International journal of environmental research and public health*, *18*(20), 10647.

Blackham, A. (2017). Addressing the ageing workforce: a critical examination of legal policy objectives and values in the United Kingdom. *Ageing & Society*, *37*(7), 1362-1393.

Blumenthal, S., Lavender, T., & Hewson, S. (1999). Role clarity, perception of the organization and burnout amongst support workers in residential homes for people with intellectual disability: A comparison between a National Health Service trust and a charitable company. *Occupational Health and Industrial Medicine*, *1*(40), 28-37.

Boamah, D. A., & Barbee, A. P. (2022). Prevalence of secondary traumatic stress among direct support professionals in intellectual and developmental disabilities field. *Intellectual and Developmental Disabilities*, *60*(4), 273-287.

Boamah, D. A., Barbee, A. P., & Cunningham, M. (2022). Predictors of secondary traumatic stress among intellectual and developmental disabilities workforce: An examination of risk and protective factors. *Traumatology*. https://doi.org/10.1037/trm0000414

Boamah, S., & Laschinger, H. (2015). Engaging new nurses: The role of psychological capital and workplace empowerment. *Journal of Research in Nursing*, *20*(4), 265-277.

Bolier, L., Ketelaar, S. M., Nieuwenhuijsen, K., Smeets, O., Gärtner, F. R., & Sluiter, J. K. (2014). Workplace mental health promotion online to enhance well-being of nurses and allied health professionals: A cluster-randomized controlled trial. *Internet Interventions*, *1*(4), 196-204.

Bond, F. W., & Bunce, D. (2000). Mediators of change in emotion-focused and problem-focused worksite stress management interventions. *Journal of Occupational Health Psychology*, *5*(1), 156.

Bonneterre, V., Liaudy, S., Chatellier, G., Lang, T., & de Gaudemaris, R. (2008). Reliability, validity, and health issues arising from questionnaires used to measure Psychosocial and Organizational Work Factors (POWFs) among hospital nurses: a critical review. *Journal of Nursing Measurement*, *16*(3), 207-230.

Bossi, F., Zaninotto, F., D'Arcangelo, S., Lattanzi, N., Malizia, A. P., & Ricciardi, E. (2022). Mindfulness-based online intervention increases well-being and decreases stress after Covid-19 lockdown. *Scientific Reports*, *12*(1), 6483.

Bostock, S., Crosswell, A. D., Prather, A. A., & Steptoe, A. (2019). Mindfulness on-the-go: Effects of a mindfulness meditation app on work stress and well-being. *Journal of Occupational Health Psychology*, *24*(1), 127-139.

Bourbonnais, R., Comeau, M., & Vézina, M. (1999). Job strain and evolution of mental health among nurses. *Journal of Occupational Health Psychology*, *4*(2), 95-108.

Bourbonnais, R., Comeau, M., Vezina, M., & Dion, G. (1998). Job strain, psychological distress, and burnout in nurses. *American Journal of Industrial Medicine, 34*(1), 20-28.

Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development.* London: Sage.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.

Braun, V., & Clarke, V. (2021). To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qualitative Research In Sport, Exercise and Health*, *13*(2), 201-216.

Brazier, J. E., & Roberts, J. (2004). The estimation of a preference-based measure of health from the SF-12. *Medical Care*, *42*(9), 851-859.

Breen, L. J., & Darlaston-Jones, D. (2010). Moving beyond the enduring dominance of positivism in psychological research: Implications for psychology in Australia. *Australian Psychologist*, *45*(1), 67-76.

Bromley, J., & Emerson, E. (1995). Beliefs and emotional reactions of care staff working with people with challenging behaviour. *Journal of Intellectual Disability Research*, *39*(4), 341-352.

Buchan, J., Catton, H., & Shaffer, F.A. (2020). Ageing Well? Policies to support older nurses at work. Retrieved from: https://www.icn.ch/sites/default/files/inlinefiles/Ageing%20ICNM%20Report%20December%209%202020.pdf Accessed July 18th 2021.

Buerhaus, P. I., Staiger, D. O., & Auerbach, D. I. (2000). Implications of an aging registered nurse workforce. *Journal of Americal Medical Association, 283*(22), 2948-2954.

Bültmann, U., Franche, R. L., Hogg-Johnson, S., Côté, P., Lee, H., Severin, C., ... & Carnide, N. (2007). Health status, work limitations, and return-to-work trajectories in injured workers with musculoskeletal disorders. *Quality of Life Research, 16(3),* 1167-1178.

Busija, L., Pausenberger, E., Haines, T. P., Haymes, S., Buchbinder, R., & Osborne, R. H. (2011). Adult measures of general health and health-related quality of life: Medical outcomes study short form 36-item (SF-36) and short form 12-item (SF-12) health surveys, Nottingham health profile (NHP), sickness impact profile (SIP), medical outcomes study short form 6D (SF-6D), health utilities index mark 3 (HUI3), quality of well-being scale (QWB), and assessment of quality of life (AQoL). *Arthritis Care & Research, 63*(11), 383-S412.

Cai, H., Tu, B., Ma, J., Chen, L., Fu, L., Jiang, Y., & Zhuang, Q. (2020). Psychological impact and coping strategies of frontline medical staff in Hunan between January and March 2020 during the outbreak of coronavirus disease 2019 (COVID-19) in Hubei, China. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*, *26*(4), e924171-1.

Calero Elvira, A., Santacreu Ivars, M., Marchena Giráldez, C., & Shih, P. C. (2021). Internet-based cognitive behavioural therapy programme with and without videoconference guidance sessions: A randomized controlled trial to treat work-related symptoms of anxiety and depression. *Clinical Psychology & Psychotherapy*. *28*(5), 1230-1242

Camerino, D., Conway, P. M., Van der Heijden, B. I. J., Estryn-Behar, M., Consonni, D., Gould, D., & Hasselhorn, H. M. (2006). Low-perceived work ability, ageing and intention to leave nursing: a comparison among 10 European countries. *Journal of Advanced Nursing, 56*(5), 542-552.

Cameron, S. J., Armstrong-Stassen, M., Kane, D., & Moro, F. B. (2008). Musculoskeletal problems experienced by older nurses in hospital settings. *Nursing Forum, 43*(2), 103-114.

Cannon, W. B. (1932). *Homeostasis. The Wisdom of The Body.* Norton, New York.

Caplan, R. D. (1987). Person-environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanisms. *Journal of Vocational Behavior*, *31*(3), 248-267.

Carolan, S., Harris, P. R., & Cavanagh, K. (2017). Improving employee well-being and effectiveness: systematic review and meta-analysis of web-based psychological interventions delivered in the workplace. *Journal of Medical Internet Research, 19*(7), e271.

Carolan, S., Harris, P. R., Greenwood, K., & Cavanagh, K. (2017). Increasing engagement with an occupational digital stress management program through the use of an online facilitated discussion group: results of a pilot randomised controlled trial. *Internet Interventions 10*(5), 1-11.

Carolan, S., & de Visser, R. O. (2018). Employees' perspectives on the facilitators and barriers to engaging with digital mental health interventions in the workplace: qualitative study. *JMIR Mental Health, 5*(1), 1-11.

Central Statistics Office (2017a). Census of Population 2016 - Profile 3 An Age Profile of Ireland. Retrieved from https://www.cso.ie/en/releasesandpublications/ep/pcp3oy/cp3 Accessed August 3rd 2021.

Central Statistics Office (2017b) Census of Population 2016 – Profile 11 Employment, Occupations and Industry. Retrieved from: https://www.cso.ie/en/releasesandpublications/ep/p-cp11eoi/cp11eoi/ioscs/ Accessed August 3rd 2021.

Chelidoni, O., Plans, D., Ponzo, S., Morelli, D., & Cropley, M. (2020). Exploring the Effects of a Brief Biofeedback Breathing Session Delivered Through the BioBase App in Facilitating Employee Stress Recovery: Randomized Experimental Study. *JMIR mHealth and uHealth, 8*(10), e19412.

Chien, T. W., Lai, W. P., Wang, H. Y., Hsu, S. Y., Castillo, R. V., Guo, H. R., ... & Su, S. B. (2011). Applying the revised Chinese Job Content Questionnaire to assess psychosocial work conditions among Taiwan's hospital workers. *BMC Public Health, 11*(1), 1-8.

Choi, B., Bjorner, J. B., Ostergren, P. O., Clays, E., Houtman, I., Punnett, L., ... & Karasek, R. (2009). Cross-language differential item functioning of the job content questionnaire among European countries: the JACE study. *International Journal of Behavioral Medicine, 16*(11), 136-147.

Chung, M. C., & Corbett, J. (1998). The burnout of nursing staff working with challenging behaviour clients in hospital-based bungalows and a community unit. *International Journal of Nursing Studies*, *35*(1), 56-64.

Chung, M. C., & Harding, C. (2009) Investigating burnout and psychological well-being of staff working with people with intellectual disabilities and challenging behaviour: the role of personality. *Journal of Applied Research in Intellectual Disabilities*, *22*(6), 549-560.

Chung, M. C., Corbett, J., & Cumella, S. (1996). Relating staff burnout to clients with challenging behaviour in people with a learning difficulty: Pilot study 2. *European Journal of Psychiatry*, *10*(3), 155-166.

Clarke, V., Braun, V., & Hayfield, N. (2015). Thematic analysis. In Smyth, J. (Ed.) *Qualitative psychology: A practical guide to research methods*, pp.222-248.

Clayton A.M. & Thorne T. (2000) Diary data enhancing rigour: Analysis framework and verification tool. *Journal of Advanced Nursing 32*(6), 1514-1521.

Clegg, A. (2001). Occupational stress in nursing: a review of the literature. *Journal of Nursing Management, 9*(2), 101-106.

Clendon, J., & Walker, L. (2013a). The health of nurses aged over 50 in New Zealand. *Contemporary Nurse*, *45*(1), 85-94.

Clendon, J., & Walker, L. (2013b). Nurses aged over 50 years and their experiences of shift work. *Journal of Nursing Management, 21*(7), 903-913.

Clendon, J., & Walker, L. (2016). Nurses aged over 50 and their perceptions of flexible working. *Journal of Nursing Management*. *24*(3), 336-346.

Clendon, J., & Walker, L. (2016). The juxtaposition of ageing and nursing: the challenges and enablers of continuing to work in the latter stages of a nursing career. *Journal of Advanced Nursing*, *72*(5), 1065-1074.

Cleveland, J., & Hanscom, M. (2017). What is old at work? Moving past chronological age. In Parry, M., & McCarthy J. (Eds.) *The Palgrave Handbook of Age Diversity and Work*, London: Palgrave Macmillan, pp. 17-46.

Cobanoglu, C., Moreo, P. J., & Warde, B. (2001). A comparison of mail, fax and web-based survey methods. *International Journal of Market Research, 43*(4), 1-15.

Coelhoso, C. C., Tobo, P. R., Lacerda, S. S., Lima, A. H., Barrichello, C. R. C., Amaro Jr, E., & Kozasa, E. H. (2019). A new mental health mobile app for well-being and stress reduction in working women: randomized controlled trial. *Journal of Medical Internet Research*, *21*(11), e14269.

Cohen, S. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), *The Social Psychology of Health* London: Sage Publications, Inc. (pp. 31–67).

Cohen S. (2005). Keynote presentation at the eight international congress of behavioral medicine: The Pittsburgh common cold studies: Psychosocial predictors of susceptibility to respiratory infectious illness. *International Journal of Behavioural Medicine* (*12),* 123–131.

Cohen, J. D. (2006). The aging nursing workforce: how to retain experienced nurses. *Journal of Healthcare Management, 51*(4), 233-245.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behaviour*, 385-396.

Cohen, S. and Williamson, G. (1988). Perceived Stress in a Probability Sample of the United States. In Spacapan, S. and Oskamp, S. (Eds.) *The Social Psychology of Health*. Newbury Park, CA: Sage.

Collins-McNeil, J., Sharpe, D., & Benbow, D. (2012). Aging workforce: Retaining valuable nurses. *Nursing Management, 43*(3), 50-54.

Colquhoun, H. L., Levac, D., O'Brien, K. K., Straus, S., Tricco, A. C., Perrier, L., ... & Moher, D. (2014). Scoping reviews: time for clarity in definition, methods, and reporting. *Journal of Clinical Epidemiology*, *67*(12), 1291-1294.

Connelly, L. M. (2009). Mixed methods studies. *Medsurg Nursing*, *18*(1), 31-33.

Conradie, M., Erwee, D., Serfontein, I., Visser, M., Calitz, F. J., & Joubert, G. (2017). A profile of perceived stress factors among nursing staff working with intellectually disabled in patients at the Free State Psychiatric Complex, South Africa. *Curationis*, *40*(1), 1-8.

Cook, R. F., Hersch, R. K., Schlossberg, D., & Leaf, S. L. (2015). A Web-based health promotion program for older workers: Randomized controlled trial. *Journal of Medical Internet Research*, *17*(3), 32-56.

Cooper, C. L., Dewe, P. J., & O'Driscoll, M. P. (2001). *Organizational Stress: A Review and Critique of Theory, Research, and Applications.* United Kingdom: Sage Publications.

Corrigan, P. W. (1993). Staff stressors at a developmental center and state hospital. *Mental Retardation, 31*(4), 234–251.

Couderc, S., Cousson-Gélie, F., Pernon, E., Porro, B., Miot, S., & Baghdadli, A. (2021). Burnout among direct support workers of adults with autism spectrum disorder and intellectual disability. *Scandinavian Journal of Caring Sciences.* https://doi.org/10.1111/scs.13008

Cox, T, & Griffiths, A. (2005) The nature and measurement of work-related stress: theory and practice. In: Wilson, J.R. and Corlett, N. (eds.) *Evaluation of Human Work, 3rd Edition.* Abingdon, UK: Routledge. ISBN 9780415267571.

Coyle, J., & Williams, B. (2000). An exploration of the epistemological intricacies of using qualitative data to develop a quantitative measure of user views of health care. *Journal of Advanced Nursing*, *31*(5), 1235-1243.

Cox, T. (1993). *Stress Research and Stress Management: Putting Theory to Work* (Vol. 61). Sudbury: HSE Books.

Creswell, J.W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Method Approaches.* London: Sage Publications.

Creswell, J. W. & Plano Clark, V. L. (2011) *Designing and Conducting Mixed Methods Research,* Thousand Oaks, California: Sage Publications

Cummings, T. G., & Cooper, C. L. (1998). A cybernetic theory of organizational stress. In Cooper, C. (3rd Ed.) *Theories of Organizational Stress,* United Kingdom: Oxford.

Dagnan, D., Trower, P., & Smith, R. (1998). Care staff responses to people with learning disabilities and challenging behaviour: A cognitive—emotional analysis. *British Journal of Clinical Psychology*, *37*(1), 59-68.

Dall'Ora, C., Griffiths, P., Ball, J., Simon, M., & Aiken, L. H. (2015). Association of 12 h shifts and nurses' job satisfaction, burnout and intention to leave: findings from a cross sectional study of 12 European countries. *BMJ Open, 5*(9), e008331.

Daniels, K., Gedikli, C., Watson, D., Semkina, A., & Vaughn, O. (2017). Job design, employment practices and well-being: A systematic review of intervention studies. *Ergonomics*, *60*(9), 1177-1196.

Daudt, H. M., van Mossel, C., & Scott, S. J. (2013). Enhancing the scoping study methodology: a large, inter-professional team's experience with Arksey and O'Malley's framework. *BMC Medical Research Methodology*, *13*(1), 48.

Deady, M., Glozier, N., Calvo, R., Johnston, D., Mackinnon, A., Milne, D., ... & Harvey, S. B. (2020). Preventing depression using a smartphone app: A randomized controlled trial. *Psychological Medicine*, *52*(3), 1-10.

De Cieri, H., Shea, T., Cooper, B., & Oldenburg, B. (2019). Effects of work-related stressors and mindfulness on mental and physical health among Australian nurses and healthcare workers. *Journal of Nursing Scholarship*, *51*(5), 580-589.

DeFrank, R. S., & Cooper, C. L. (1987). Worksite stress management interventions: Their effectiveness and conceptualisation. *Journal of Managerial Psychology*, *2*(1), 4-10.

De Jonge, J., & Dollard, M. F. (2002). *Stress in the Workplace: Australian Master OHS and Environment Guide.* Sydney: CCH Australia Ltd.

De Kock, J. H., Latham, H. A., Cowden, R. G., Cullen, B., Narzisi, K., Jerdan, S., ... & Eze, J. (2022). Brief digital interventions to support the psychological well-being of NHS staff during the COVID-19 pandemic: 3-Arm pilot randomized controlled trial. *JMIR Mental Health, 9*(4), e34002.

De Korte, E. M., Wiezer, N., Janssen, J. H., Vink, P., & Kraaij, W. (2018). Evaluating an mHealth app for health and well-being at work: mixed-method qualitative study. *JMIR mHealth and uHealth*, *6*(3), e72.

De Leeuw, E. D. (2005). To mix or not to mix data collection modes in surveys. *Journal of Official Statistics*, *21*(5), 233-255.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*(3), 499 – 511.

Denny, M., Wells, J., & Cunningham, J. (2011) Assessing psychosocial work-related stress across five European countries: implications for workforce development. *The Journal of Mental Health Training, Education and Practice*. *6*(2) 93-101.

Denton, J., Evans, D., & Xu, Q. (2020). Older nurses and midwives in the workplace: A scoping review. *Collegian*. *28*(2), 222–228.

DeTore, N.R., Sylvia, L., Park, E.R., Burke, A., Levison, J.H., Shannon, A., Choi, K.W., Jain, F.A., Coman, D.C., Herman, J. and Perlis, R., 2022. Promoting resilience in healthcare workers during the COVID-19 pandemic with a brief online intervention. *Journal of Psychiatric Research, 146*(4), 228-233.

Deveau, R., & McGill, P. (2019). Staff experiences working in community-based services for people with learning disabilities who show behaviour described as challenging: The role of management support. *British Journal of Learning Disabilities, 47*(3), 201-207.

Devereux, J. M., Hastings, R. P., Noone, S. J., Firth, A., & Totsika, V. (2009). Social support and coping as mediators or moderators of the impact of work stressors on burnout in intellectual disability support staff. *Research in Developmental Disabilities, 30*(2), 367-377.

Devereux, J., Hastings, R., & Noone, S. (2009). Staff stress and burnout in intellectual disability services: Work stress theory and its application. *Journal of Applied Research in Intellectual Disabilities, 22*(6), 561-573.

Dewe, P. J., O'Driscoll, M. P., & Cooper, C. (2010). *Coping with Work Stress: A Review and Critique.* United Kingdom: Wiley-Blackwell.

Dillman, D. A. (2000). *Mail and web-based survey: The tailored design method.* New York: John Wiley & Sons.

Dillman, D. A., West, K. K., & Clark, J. R. (1994). Influence of an invitation to answer by telephone on response to census questionnaires. *Public Opinion Quarterly, 58*(4), 557-568.

Dilworth, J. A., Phillips, N., & Rose, J. (2011). Factors relating to staff attributions of control over challenging behaviour. *Journal of Applied Research in Intellectual Disabilities, 24*(1), 29-38.

Diment, K., & Garrett-Jones, S. (2007). How demographic characteristics affect mode preference in a postal/web mixed-mode survey of Australian researchers. *Social Science Computer Review, 25*(3), 410-417.

Dimino, K., Learmonth, A. E., & Fajardo, C. C. (2021). Nurse managers leading the way: re-envisioning stress to maintain healthy work environments. *Critical Care Nurse, 41*(5),1-7.

Disley, P., Hatton, C., & Dagnan, D. (2009). Applying equity theory to staff working with individuals with intellectual disabilities. *Journal of Intellectual and Developmental Disability, 34*(1), 55-66.

Donkin L, Glozier N. (2012). Motivators and motivations to persist with online psychological interventions: A qualitative study of treatment completers. *Journal of Medical Internet Research. 14*(3), 284-295.

Doyle, L., Brady, A. M., & Byrne, G. (2009). An overview of mixed methods research. *Journal of Research in Nursing, 14*(2),175-185.

Duffield, C., Graham, E., Donoghue, J., Griffiths, R., Bichel-Findlay, J., & Dimitrelis, S. (2015). Why older nurses leave the workforce and the implications of them staying. *Journal of Clinical Nursing, 24*(56), 824-831.

Durosaiye, I. O., Hadjri, K., & Liyanage, C. L. (2016). Identifying Challenging Job and Environmental Demands of Older Nurses Within the National Health Service. *HERD: Health Environments Research & Design Journal, 9*(3), 82-105.

Dyer, S., & Quine, L. (1998). Predictors of job satisfaction and burnout among the direct care staff of a community learning disability service. *Journal of Applied Research in Intellectual Disabilities, 11*(4), 320-332.

Eccles, H., Nannarone, M., Lashewicz, B., Attridge, M., Marchand, A., Aiken, A., Ho, K. and Wang, J., 2021. Barriers to the use of web-based mental health programs for preventing depression: qualitative study. *JMIR Formative Research, 5*(7), e.16949.

Ebert, D. D., Heber, E., Berking, M., Riper, H., Cuijpers, P., Funk, B., & Lehr, D. (2016). Self-guided internet-based and mobile-based stress management for employees: results of a randomised controlled trial. *Occupational and Environmental Medicine, 73*(5), 315-323.

Ebert, D. D., Lehr, D., Boß, L., Riper, H., Cuijpers, P., Andersson, G., ... & Berking, M. (2014). Efficacy of an Internet-based problem-solving training for teachers: Results of a randomized controlled trial. *Scand J Work Environ Health*, *40*(6), 582-96.

Edimansyah, B. A., Rusli, B. N., Naing, L., Mazalisah, M., & Kamarudin, H. (2005). Reliability and construct validity of the malay version of the Job Content Questionnaire (JCQ): Preliminary results of the validation study. *The Malaysian Journal of Medical Sciences, 12*(8), 278-279.

Edwards, P., & Miltenberger, R. (1991). Burnout among staff members at community residential facilities for persons with mental retardation. *Mental Retardation, 29*(3), 125-137.

Eklund, C., Elfström, M. L., Eriksson, Y., & Söderlund, A. (2018). Evaluation of a Web-Based Stress Management Application—a Feasibility Study. *Journal of Technology in Behavioral Science, 3*(3), 150-160.

Elliott, J. L., & Rose, J. (1997). An investigation of stress experienced by managers of community homes for people with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities, 10*(1), 48-53.

Embregts, P. J., Tournier, T., & Frielink, N. (2021). Experiences and needs of direct support staff working with people with intellectual disabilities during the COVID-19 pandemic: A thematic analysis. *Journal of Applied Research in Intellectual Disabilities, 34*(2), 480-490.

Eriksson, T., Germundsjö, L., Åström, E., & Rönnlund, M. (2018). Mindful self-compassion training reduces stress and burnout symptoms among practicing psychologists: A randomized controlled trial of a brief web-based intervention. *Frontiers in Psychology, 9*(5), 23-40.

Eum, K. D., Li, J., Jhun, H. J., Park, J. T., Tak, S. W., Karasek, R., & Cho, S. I. (2007). Psychometric properties of the Korean version of the job content questionnaire: data from health care workers. *International Archives of Occupational and Environmental Health, 80*(2), 497-504.

Evans, B., Richmond, T., & Shields, J. (2005). Structuring neoliberal governance: The nonprofit sector, emerging new modes of control and the marketisation of service delivery. *Policy and Society*, *24*(1), 73-97.

Evans-Turner, T., Veitch, S. G., & Higgins, N. (2010). The Maslach Burnout Inventory and its relationship with staff transition in and out of the intellectual disability workforce. In *Seventh New Zealand Association for the Study of Intellectual Disability Conference* (pp. 24-26).

Fackler, C. A. (2019). Retaining older hospital nurses: Experienced hospital nurses' perceptions of new roles. *Journal of Nursing Management, 27*(6), 1325-1331.

Figueiredo-Ferraz, H., Gil-Monte, P. R., & Olivares-Faúndez, V. E. (2015). Influence of mobbing (workplace bullying) on depressive symptoms: a longitudinal study among employees working with people with intellectual disabilities. *Journal of Intellectual Disability Research*, *59*(1), 39-47.

Figueiredo-Ferraz, H., Gil-Monte, P. R., Grau-Alberola, E., Llorca-Pellicer, M., & García Juesas, J. A. (2012). Influence of some psychosocial factors on mobbing and its consequences among employees working with people with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, *25*(5), 455-463.

Fillion, L., Tremblay, I., Truchon, M., Côté, D., Struthers, C. W., & Dupuis, R. (2007). Job satisfaction and emotional distress among nurses providing palliative care: Empirical evidence for an integrative occupational stress-model. *International Journal of Stress Management*, *14(*1), 1–13.

Finkelstein, A., Bachner, Y. G., Greenberger, C., Brooks, R., & Tenenbaum, A. (2018). Correlates of burnout among professionals working with people with intellectual and developmental disabilities. *Journal of Intellectual Disability Research*, *62*(10), 864-874.

Fiol-DeRoque, M. A., Serrano-Ripoll, M. J., Jiménez, R., Zamanillo-Campos, R., Yáñez-Juan, A. M., Bennasar-Veny, M., ... & Ricci-Cabello, I. (2021). A Mobile Phone–Based Intervention to Reduce Mental Health Problems in Health Care Workers During the COVID-19 Pandemic (PsyCovidApp): Randomized Controlled Trial. *JMIR mHealth and uHealth*, *9*(5), e27039.

Fitzgerald, D. C. (2007). Aging, experienced nurses: their value and needs. *Contemporary Nurse: A Journal for the Australian Nursing Profession, 24*(2), 237-243.

Fleischmann, R. J., Harrer, M., Zarski, A. C., Baumeister, H., Lehr, D., & Ebert, D. D. (2018). Patients' experiences in a guided internet-and app-based stress intervention for college students: a qualitative study. *Internet Interventions*, *12*(4),130-140.

Flynn, S., Hastings, R. P., Gillespie, D., McNamara, R., & Randell, E. (2018). Is the amount of exposure to aggressive challenging behaviour related to staff work-related well-being in intellectual disability services? Evidence from a clustered research design. *Research in Developmental Disabilities*, *81*(6), 155-161.

Folkman, S. (Ed.). (2011). *The Oxford handbook of stress, health, and coping*. United Kingdom: Oxford University Press.

Fontana, A., & Frey, J. H. (2005). The interview. *The Sage Handbook of Qualitative Research*, *3*, 695-727.

Ford, J., & Honnor, J. (2000). Job satisfaction of community residential staff serving individuals with severe intellectual disabilities. *Journal of Intellectual and Developmental Disability*, *25*(4), 343-362.

Foster, A., Wood, E., & Clowes, M. (2021). Identifying the evidence base of interventions supporting mental health nurses to cope with stressful working environments: A scoping review. *Journal of Nursing Management*. *29*(6), 1639-1652

Fragar, L. J., & Depczynski, J. C. (2011). Beyond 50. challenges at work for older nurses and allied health workers in rural Australia: a thematic analysis of focus group discussions. *BMC Health Services Research, 11*(1), 1-15.

Fransson, E. I., Heikkilä, K., Nyberg, S. T., Zins, M., Westerlund, H., Westerholm, P., ... & Kivimäki, M. (2012). Job strain as a risk factor for leisure-time physical inactivity: an individual-participant meta-analysis of up to 170,000 men and women: the IPD-Work Consortium. *American Journal of Epidemiology*, *176*(12), 1078-1089.

Freeman, M. (1994). The differential impact on carers dealing with clients with challenging behaviours. *Journal of Community & Applied Social Psychology*, *4*(3), 181-187.

French Jr, J. R. (1973). Person Role Fit. *Occupational Mental Health*. *3*(1), 15-20.

Freund, J., Buntrock, C., Braun, L., Thielecke, J., Baumeister, H., Berking, M., Ebert, D.D. and Titzler, I. (2022). Digital prevention of depression for farmers? A qualitative study on participants' experiences regarding determinants of acceptance and satisfaction with a tailored guided internet intervention program. *Internet Interventions*, *29*(1), 100566.

Friedrich, L. A., Prasun, M. A., Henderson, L., & Taft, L. (2011). Being a seasoned nurse in active practice. *Journal of Nursing Management*, *19*(7), 897-905.

Fronteira, I., & Ferrinho, P. (2011). Do nurses have a different physical health profile? A systematic review of experimental and observational studies on nurses' physical health. *Journal of Clinical Nursing*, *20*(17-18), 2404-2424.

Gabrielle, S., Jackson, D., & Mannix, J. (2008). Older women nurses: health, ageing concerns and self-care strategies. *Journal of Advanced Nursing*, *61*(3), 316-325.

Galbraith, N., Boyda, D., McFeeters, D., & Hassan, T. (2021). The mental health of doctors during the COVID-19 pandemic. *BJPsych Bulletin*, *45*(2), 93-97.

Gallup (2022). State of the Global Workplace 2022 - Report The Voice of the World's Employers. Retrieved from https://www.gallup.com/workplace/349484/state-of-the-global-workplace-2022-report.aspx Accessed 10th September 2022.

Gahan, P., Harbridge, R., Healy, J., & Williams, R. (2017). The ageing workforce: policy dilemmas and choices. *Australian Journal of Public Administration*, *76*(4), 511-523.

Gnanapragasam, S. N., Tinch-Taylor, R., Scott, H. R., Hegarty, S., Souliou, E., Bhundia, R., ... & Wessely, S. (2023). Multicentre, England-wide randomised controlled trial of the 'Foundations' smartphone application in improving mental health and well-being in a healthcare worker population. *The British Journal of Psychiatry*, *222*(2), 58-66

Gandek, B., Ware, J. E., Aaronson, N. K., Apolone, G., Bjorner, J. B., Brazier, J. E., ... & Sullivan, M. (1998). Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: results from the IQOLA Project. *Journal of Clinical Epidemiology*, *51*(11), 1171-1178.

Ganster, D. C., & Rosen, C. C. (2013). Work stress and employee health: A multidisciplinary review. *Journal of Management*, *39*(5), 1085-1122.

Garner, P., Hopewell, S., Chandler, J., MacLehose, H., Akl, E. A., Beyene, J., ... & Schünemann, H. J. (2016). When and how to update systematic reviews: Consensus and checklist. *BMJ, 354*: i3507.

Gayed, A., Bryan, B. T., LaMontagne, A. D., Milner, A., Deady, M., Calvo, R. A., ... & Harvey, S. B. (2019). A cluster randomized controlled trial to evaluate HeadCoach: an online mental health training program for workplace managers. *Journal of Occupational and Environmental Medicine*, *61*(7), 545-551.

Geraedts, A. S., Kleiboer, A. M., Wiezer, N. M., van Mechelen, W., & Cuijpers, P. (2014a). Short-term effects of a web-based guided self-help intervention for employees with depressive symptoms: randomized controlled trial. *Journal of Medical Internet Research*, *16*(5), e121.

Geraedts, A. S., Kleiboer, A. M., Twisk, J., Wiezer, N. M., van Mechelen, W., & Cuijpers, P. (2014b). Long-term results of a web-based guided self-help intervention for employees with depressive symptoms: randomized controlled trial. *Journal of Medical Internet Research*, *16*(7), e168.

Giga, S. I., Noblet, A. J., Faragher, B., & Cooper, C. L. (2003). The UK perspective: A review of research on organisational stress management interventions. *Australian Psychologist*, *38*(2), 158-164.

Gil-Monte, P. R. (2012). The influence of guilt on the relationship between burnout and depression. *European Psychologist*. 17(3).

Gingi, P. (2012). *Factors associated with the psychological response of nurses' victims of inpatients violence in a psychiatric facility for adults with intellectual disability In Cape Town* (Doctoral Dissertation, University of the Western Cape).

Glasby, J. (2017). *Understanding Health and Social Care*. Bristol, England: Policy Press.

Griep, R. H., Rotenberg, L., Vasconcellos, A. G. G., Landsbergis, P., Comaru, C. M., & Alves, M. G. M. (2009). The psychometric properties of demand-control and effort–reward imbalance scales among Brazilian nurses. *International Archives of Occupational and Environmental Health*, *82*, 1163-1172.

Goldberg D. (1978). *Manual of the general healh questionnaire.* Windsor: NFER.

Golden, E. A., Zweig, M., Danieletto, M., Landell, K., Nadkarni, G., Bottinger, E., ... & Charney, D. S. (2021). A Resilience-Building App to Support the Mental Health of Health Care Workers in the COVID-19 Era: Design Process, Distribution, and Evaluation. *JMIR Formative Research*, *5*(5), e26590.

Gollwitzer, P. M., Mayer, D., Frick, C., & Oettingen, G. (2018). Promoting the self-regulation of stress in health care providers: An internet-based intervention. *Frontiers in Psychology*, *9*: 838.

Gómez-Ortiz, V. (2011). Assessment of psychosocial stressors at work: psychometric properties of the JCQ in Colombian workers. *Artículos desde 2007 hasta 2013. Desde 2020 visítenos en, 43*(2), 125-138.

Gonzalez-Mulé, E., Kim, M. M., & Ryu, J. W. (2021). A meta-analytic test of multiplicative and additive models of job demands, resources, and stress. *Journal of Applied Psychology, 106*(9), 1391 – 2003.

Graham, J. E., Christian, L. M., & Kiecolt-Glaser, J. K. (2006). Stress, age, and immune function: toward a lifespan approach. *Journal of Behavioral Medicine, 29*(4), 389-400.

Graham, E., Donoghue, J., Duffield, C., Griffiths, R., Bichel-Findlay, J., & Dimitrelis, S. (2014). Why do older RNs keep working? *Journal of Nursing Administration, 44*(11), 591-597.

Gray, J. A., & Muramatsu, N. (2013). When the job has lost its appeal: Intentions to quit among direct care workers. *Journal of Intellectual and Developmental Disability*, *38*(2), 124- 133.

Gray-Stanley, J. A., & Muramatsu, N. (2011). Work stress, burnout, and social and personal resources among direct care workers. *Research in Developmental Disabilities*, *32*(3), 1065-1074.

Grossi, G., Perski, A., Osika, W. and Savic, I. (2015). Stress-related exhaustion disorder–clinical manifestation of burnout? A review of assessment methods, sleep impairments, cognitive disturbances, and neuro-biological and physiological changes in clinical burnout. *Scandinavian Journal of Psychology*, *56*(6), pp.626-636.

Geuens, N., Franck, E., Verheyen, H., De Schepper, S., Roes, L., Vandevijvere, H., ... & Van Bogaert, P. (2021). Vulnerability and stressors for burnout within a population of hospital nurses: A qualitative descriptive study. *Canadian Journal of Nursing Research*, *53*(1), 16-26.

Guidi, J., Lucente, M., Sonino, N., & Fava, G. A. (2021). Allostatic load and its impact on health: a systematic review. *Psychotherapy and Psychosomatics*, *90*(1), 11-27.

Guyatt, G. H., Oxman, A. D., Vist, G. E., Kunz, R., Falck-Ytter, Y., Alonso-Coello, P., & Schünemann, H. J. (2008). GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*, *336*(7650), 924-926.

Hackman JR, Oldham GR. (1980). *Work Redesign*. Reading, MA: Addison-Wesley

Hansen, N., Sverke, M., & Naswall, K., (2009). Predicting nurse burnout from demands and resources in three acute care hospitals under different forms of ownership: a cross sectional questionnaire survey. *International Journal of Nursing Studies, 46*(1), 96- 107.

Happell, B., Reid-Searl, K., Dwyer, T., Caperchione, C. M., Gaskin, C. J., & Burke, K. J. (2013). How nurses cope with occupational stress outside their workplaces. *Collegian*, *20*(3), 195-199.

Harenstam, A. (2008). Organizational approach to studies of job demands, control and health. *Scandinavian Journal of Work, Environment & Health*, *34*(6), 144 – 155.

Harrer, M., Adam, S. H., Fleischmann, R. J., Baumeister, H., Auerbach, R., Bruffaerts, R., ... & Ebert, D. D. (2018). Effectiveness of an internet-and app-based intervention for college students with elevated stress: randomized controlled trial. *Journal of Medical Internet Research*, *20*(4), e136.

Harries, J., Ng, K. Y. Y., Wilson, L., Kirby, N., & Ford, J. (2015). Evaluation of the work safety and psychosocial wellbeing of disability support workers. *The Australasian Journal of Organisational Psychology*, *8*(3), e9.

Harris, P., Humphreys, J., & Thomson, G. (1994). A checklist of challenging behaviour: the development of a survey instrument. *Mental Handicap Research*, *7*(2), 118-133.

Haslam, S. A., & McGarty, C. (2008). *Research methods and statistics in psychology*. London: Sage.

Hassard, J., Teoh, K. R., Visockaite, G., Dewe, P., & Cox, T. (2018). The cost of work-related stress to society: A systematic review. *Journal of Occupational Health Psychology*, *23*(1), 1 - 14.

Hasson, D., Anderberg, U. M., Theorell, T., & Arnetz, B. B. (2005). Psychophysiological effects of a web-based stress management system: a prospective, randomized controlled intervention study of IT and media workers *BMC Public Health*, *5*(1), 1 - 15.

Hastings, R. P. (1997). Measuring staff perceptions of challenging behaviour: the Challenging Behaviour Attributions Scale (CHABA). *Journal of Intellectual Disability Research, 41*(6), 495-501.

Hastings, R. P. (2002). Do challenging behaviors affect staff psychological well-being? Issues of causality and mechanism. *American Journal on Mental Retardation, 107*(6), 455 467.

Hastings, R. P., Horne, S., & Mitchell, G. (2004). Burnout in direct care staff in intellectual disability services: a factor analytic study of the Maslach Burnout Inventory. *Journal of Intellectual Disability Research*, *48*(3), 268-273.

Hatch, D. J., Freude, G., Martus, P., Rose, U., Müller, G., & Potter, G. G. (2018). Age, burnout and physical and psychological work ability among nurses. *Occupational Medicine, 68*(4), 246-254.

Hatton, C., Brown, R., Caine, A., & Emerson, E. (1995). Stressors, coping strategies and stress related outcomes among direct care staff in staffed houses for people with learning disabilities. *Mental Handicap Research*, *8*(4), 252-271.

Hatton, C., & Emerson, E. (1993). Organizational predictors of perceived staff stress, satisfaction, and intended turnover in a service for people with multiple disabilities. *Mental Retardation, 31*(6), 388.

Hatton, C., Emerson, E., Rivers, M., Mason, H., Mason, L., Swarbrick, R., & Alborz, A. (1999). Factors associated with staff stress and work satisfaction in services for people with intellectual disability. *Journal of Intellectual Disability Research, 43*(4), 253-267.

Hatton, C., Emerson, E., Rivers, M., Mason, H., Swarbrick, R., Mason, L., & Alborz, A. (2001). Factors associated with intended staff turnover and job search behaviour in services for people with intellectual disability. *Journal of Intellectual Disability Research*, *45*(3),258-270.

Hatton, C., Rivers, M., Mason, H., Mason, L., Kiernan, C., Emerson, E., ... & Reeves, D. (1999). Staff stressors and staff outcomes in services for adults with intellectual disabilities: The Staff Stressor Questionnaire. *Research in Developmental Disabilities, 20*(4), 269-285.

Häusser, J. A., Mojzisch, A., Niesel, M., & Schulz-Hardt, S. (2010). Ten years on: A review of recent research on the Job Demand–Control (-Support) model and psychological well-being. *Work & Stress*, *24*(1), 1-35.

Hayes, C. J., Bhandari, N. R., Kathe, N., & Payakachat, N. (2017, April). Reliability and validity of the medical outcomes study short form-12 version 2 (SF-12v2) in adults with non-cancer pain. In *Healthcare* (Vol. 5, No. 2, p. 22).

Health and Safety Executive (2001). *Tackling Work Related Stress: A Managers' Guide to Improving and Maintaining Employee Health and Well-being*. Sudbury, UK.

Health Service Executive (HSE) (2016) *Health Services People Strategy 2015-2018: Leaders in People Services.* Retrieved from: http://www.hse.ie/eng/staff/Resources/hrstrategiesreports/peoplestrategy.pdf Accessed 4th December 2017.

Health Service Executive (HSE) (2017) *Our People/Our Workforce – Public Health Service – 2016.* Retrieved from http://www.hse.ie/eng/staff/Resources/OurWorkforce/Public-Health-Service-Workforce-Profile-at-December2016.pdf . Accessed 13th October 2017.

Health Service Executive (HSE) (2021). Medical Workforce Report 2020 – 2021 HSE National Doctors Training and Planning. Retrieved from: https://www.hse.ie/eng/staff/leadership-education-development/met/ed/rep/medical-workforce-report-2020-21.pdf

Health Service Executive (HSE) (2022) Health Service Personnel Census September 20022. Retrieved from: https://www.hse.ie/eng/staff/resources/our-workforce/workforce-reporting/health-service-personnel-census-september-2022.pdf Accessed 13th December 2022.

Heath, C., Sommerfield, A., & von Ungern-Sternberg, B. S. (2020). Resilience strategies to manage psychological distress among healthcare workers during the COVID-19 pandemic: a narrative review. *Anaesthesia*, *75*(10), 1364-1371.

Heber, E., Ebert, D. D., Lehr, D., Nobis, S., Berking, M., & Riper, H. (2013). Efficacy and cost-effectiveness of a web-based and mobile stress-management intervention for employees: design of a randomized controlled trial. *BMC Public Health*, *13*(1), 655.

Heber, E., Lehr, D., Ebert, D. D., Berking, M., & Riper, H. (2016). Web-Based and Mobile Stress Management Intervention for Employees: A Randomized Controlled Trial. *Journal of Medical Internet Research*, *18*(1), e5112.

Heiden, B., Weigl, M., Angerer, P., & Müller, A. (2013). Association of age and physical job demands with musculoskeletal disorders in nurses. *Applied Ergonomics, 44*(4), 652- 658.

Helaß, M., Greinacher, A., Götz, S., Müller, A., Gündel, H., Junne, F., ... & Maatouk, I. (2022). Age stereotypes towards younger and older colleagues in registered nurses and supervisors in a university hospital: A generic qualitative study. *Journal of Advanced Nursing, 78(*2), 471-485.

Hensel, J. M., Lunsky, Y., & Dewa, C. S. (2012). Exposure to client aggression and burnout among community staff who support adults with intellectual disabilities in Ontario, Canada. *Journal of Intellectual Disability Research*, *56*(9), 910-915.

Hensel, J. M., Lunsky, Y., & Dewa, C. S. (2014). The mediating effect of severity of client aggression on burnout between hospital inpatient and community residential staff who support adults with intellectual disabilities. *Journal of Clinical Nursing*, *23*(9-10), 1332-1341.

Heyen, J.M., Weigl, N., Müller, M., Müller, S., Eberle, U., Manoliu, A., Vetter, S., Brown, A.D., Berger, T. and Kleim, B., 2021. Multimodule web-based COVID-19 anxiety and stress resilience training (COAST): single-cohort feasibility study with first responders. *JMIR Formative Research*, *5*(6), e28055.

Hickey, R. (2014). Prosocial motivation, stress and burnout among direct support workers. *Journal of Applied Research in Intellectual Disabilities*, *27*(2), 134-144.

Higgins, J. P., Altman, D. G., Gøtzsche, P. C., Jüni, P., Moher, D., Oxman, A. D., ... & Sterne, J. A. (2011). The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *BMJ, 343*:d5928

Hirshberg, M. J., Frye, C., Dahl, C. J., Riordan, K. M., Vack, N. J., Sachs, J., ... & Goldberg, S. B. (2022). A randomized controlled trial of a smartphone-based well-being training in public school system employees during the COVID-19 pandemic. *Journal of Educational Psychology, 114*(8),1895-1903.

Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *American Psychologist,* 44(3), 513 – 535.

Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology, 50*(3), 337-421.

Hobfoll, S. E., & Freedy, J. (2018). Conservation of resources: A general stress theory applied to burnout. In *Professional Burnout: Recent Developments in Theory and Research* (Schaufeli, W.B., Maslach, C, & Marek, T Eds.) pp. 115-129. CRC Press.

Hochwalder, J. (2007). The psychosocial work environment and burnout among Swedish registered and assistant nurses: The main, mediating, and moderating role of empowerment. *Nursing & Health Sciences,* 9(3), 205−211.

Hodgson, K., Grimm, F., Vestesson, E., Brine, R., & Deeny, S. (2020). *Briefing: adult social care and COVID-19. Assessing the impact on social care users and staff in England so far.* London: Health Foundation.

Holman, D, Johnson, S & O'Connor, E 2018, Stress management interventions: Improving subjective psychological well-being in the workplace. In *Handbook of Well-Being.* E Diener, S Oishi & L Tay (Eds). Salt Lake City, UT: DEF Publishers.

Howard, R., & Hegarty, J. R. (2003). Violent incidents and staff stress. *The British Journal of Development Disabilities, 49*(96), 3-21.

Howard, R., Rose, J., & Levenson, V. (2009). The psychological impact of violence on staff working with adults with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities, 22*(6), 538-548.

Hsieh, H. F., Huang, I., Liu, Y., Chen, W. L., Lee, Y. W., & Hsu, H. T. (2020). The effects of biofeedback training and smartphone-delivered biofeedback training on resilience, occupational stress, and depressive symptoms among abused psychiatric nurses. *International Journal of Environmental Research and Public Health*, *17*(8), 2905–2921.

Hurrell, J. J., & McLaney, M. A. (1988). Exposure to job stress: A new psychometric instrument. *Scandinavian Journal of Work, Environment & Health*. *14*(1), 27–28.

Hussein, S. (2017). The English social care workforce: The vexed question of low wages and stress. In *The Routledge Handbook of Social Care Work Around the World* (Christensen, Karen and Pilling, Doria, eds). Taylor & Francis ISBN 978-1-4724-7945-7. (pp. 74-87).

Hussein, S., Stevens, M., & Manthorpe, J. (2010). *International Social Care Workers In England: Profile, Motivations, Experiences And Future Expectations*. London: Social Care Workforce Research Unit.

Hussein, S., Stevens, M., & Manthorpe, J. (2011). What drives the recruitment of migrant workers to work in social care in England? *Social Policy and Society*, *10*(3), 285-298.

Hwang, W. J., & Jo, H. H. (2019). Evaluation of the effectiveness of mobile app-based stress-management program: A randomized controlled trial. *International Journal of Environmental Research and Public Health*, *16*(21), 4270.

Imamura, K., Sasaki, N., Sekiya, Y., Watanabe, K., Sakuraya, A., Matsuyama, Y., ... & Kawakami, N. (2022). The effect of the Imacoco Care Psychoeducation website on improving psychological distress among workers during the COVID-19 pandemic: randomized controlled trial. *JMIR Formative Research*, *6*(3), e33883.

Imamura, K., Tran, T. T. T., Nguyen, H. T., Sasaki, N., Kuribayashi, K., Sakuraya, A., ... & Kawakami, N. (2021). Effect of smartphone-based stress management programs on depression and anxiety of hospital nurses in Vietnam: a three-arm randomized controlled trial. *Scientific Reports*, *11*(1), 1-12.

Ineland, J., Molin, M., & Sauer, L. (2018). Handling plurality and dealing with difficult work experiences. A comparative study of human service professionals' work with individuals with intellectual disabilities. *Journal of Policy and Practice in Intellectual Disabilities*, *15*(1), 36-42.

Ineland, J., Sauer, L., & Molin, M. (2017). Sources of job satisfaction in intellectual disability services: A comparative analysis of experiences among human service professionals in schools, social services, and public health care in Sweden. *Journal of Intellectual & Developmental Disability*, *43*(4), 1-10.

Innstrand, S. T., Espnes, G. A., & Mykletun, R. (2004). Job stress, burnout and job satisfaction: an intervention study for staff working with people with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, *17*(2), 119-126

Irvine, A. (2011). Duration, dominance and depth in telephone and face-to-face interviews: A comparative exploration. *International Journal of Qualitative Methods*, *10*(3), 202-220.

Ito, H., Kurita, H., & Shiiya, J. (1999). Burnout among direct-care staff members of facilities for persons with mental retardation in Japan. *Mental Retardation*, *37*(6), 477-481.

Ivancevich, J. M., Matteson, M. T., Freedman, S. M., & Phillips, J. S. (1990). Worksite stress management interventions. *American Psychologist*, *45*(2), 252- 259.

Jabali, S. T., Ghaffari, M., Pournik, O., Ghalichi, L., Yazdi, A. T., & Motevalian, S. A. (2013). Reliability and validity of Persian version of job content questionnaire in health care workers in Iran. *International Journal of Occupational & Environmental Medicine, 4*(2), 96-101.

Jansen, P., Kerkstra, A., Abu-Saad, H. & Van Der Zee, J. (1996). The effects of job characteristics and individual characteristics on job satisfaction and burnout in community nursing. *International Journal of Nursing Studies*, *33*(6), 407–421.

Jenkins, K. (2009). *Psychological correlates of well-being in direct care staff in services for children with intellectual disabilities and challenging behaviour* (Doctoral Dissertation, University of Southampton).

Jenkinson, C., & Layte, R. (1997). Development and testing of the UK SF-12. *Journal of Health Services Research & Policy*, *2*(1), 14-18.

Johnson, J. V., & Hall, E. M. (1988). Job strain, work place social support, and cardiovascular disease: a cross-sectional study of a random sample of the Swedish working population. *American Journal of Public Health*, *78*(10), 1336-1342.

Joffe, H. (2012). Thematic analysis. In D. Harper & A. Thompson (Eds.), *Qualitative research methods in mental health and psychotherapy: A guide for students and practitioners* (pp. 203–223). United Kingdom: Wiley-Blackwell.

Johnston, D. W., Jones, M. C., Charles, K., McCann, S. K., & McKee, L. (2013). Stress in nurses: Stress-related affect and its determinants examined over the nursing day. *Annals of Behavioral Medicine*, *45*(3), 348-356.

Joyce, S., Shand, F., Lal, T. J., Mott, B., Bryant, R. A., & Harvey, S. B. (2019). Resilience@ Work mindfulness program: results from a cluster randomized controlled trial with first responders. *Journal of Medical Internet Research*, *21*(2), e12894.

Judd, M. J., Dorozenko, K. P., & Breen, L. J. (2017). Workplace stress, burnout and coping: a qualitative study of the experiences of Australian disability support workers. *Health & Social Care in the Community*, *25*(3), 1109-1117.

Judkins, S., Reid, B., & Furlow, L. (2006). Hardiness training among nurse managers: Building a healthy workplace. *The Journal of Continuing Education in Nursing*, *37*(5), 202-207.

Juul, S., Gluud, C., Simonsen, S., Frandsen, F. W., Kirsch, I., & Jakobsen, J. C. (2021). Blinding in randomised clinical trials of psychological interventions: a retrospective study of published trial reports. *BMJ Evidence-Based Medicine*, *26*(3), 109-109.

Karam, F., Bérard, A., Sheehy, O., Huneau, M. C., Briggs, G., Chambers, C., ... & OTIS Research Committee. (2012). Reliability and validity of the 4-item Perceived Stress Scale among pregnant women: Results from the OTIS antidepressants study. *Research in Nursing & Health*, *35(*4), 363-375.

Karasek Jr, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 285-308.

Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). The Job Content Questionnaire (JCQ): an instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology*, *3*(4), 322.

Karasek, R., & Theorell, T. (1990). *Healthy Work: Stress, Productivity, and the Reconstruction of Working Life.* New York: Basic Books.

Kawakami, N., & Fujigaki, Y. (1996). Reliability and validity of the Japanese version of Job Content Questionnaire: replication and extension in computer company employees. *Industrial Health*, *34*(4), 295-306.

Kawakami, N., Kobayashi, F., Araki, S., Haratani, T., & Furui, H. (1995). Assessment of job stress dimensions based on the job demands-control model of employees of telecommunication and electric power companies in Japan: reliability and validity of the Japanese version of the Job Content Questionnaire. *International Journal of Behavioral Medicine, 2,* 358-375.

Keesler, J. M. (2016). *An evaluation of individual and organizational factors in predicting professional quality of life among direct support professionals in intellectual/developmental disability services* (Doctoral Dissertation, State University of New York at Buffalo).

Kelders SM, Kok RN, Ossebaard HC, Van Gemert-Pijnen JE. (2012). Persuasive system design does matter: a systematic review of adherence to web-based interventions. *Journal of Medical Internet Research. 14*(6):e152.

Keller, S. M. (2010). The aging nurse. *Workplace Health & Safety, 58*(10), 437-449.

Ketelaar, S. M., Nieuwenhuijsen, K., Gärtner, F. R., Bolier, L., Smeets, O., & Sluiter, J. K. (2013). Effect of an e-mental health approach to workers' health surveillance versus control group on work functioning of hospital employees: a cluster-RCT. *PloS One*, *8*(9), e72546.

Kiernan, N. E., Kiernan, M., Oyler, M. A., & Gilles, C. (2005). Is a web survey as effective as a mail survey? A field experiment among computer users. *American Journal of Evaluation, 26*(2), 245-252.

Kile, A. C. (2014). *Relationship among relational coping and reciprocity in direct care staffing services for adults with developmental disabilities and challenging behavior* (Doctoral Dissertation, Fielding Graduate University).

Kines, P., Lappalainen, J., Mikkelsen, K. L., Olsen, E., Pousette, A., Tharaldsen, J., ... & Törner, M. (2011). Nordic Safety Climate Questionnaire (NOSACQ-50): A new tool for diagnosing occupational safety climate. *International Journal of Industrial Ergonomics, 41*(6), 634-646.

King, N., Horrocks, C., & Brooks, J. (2018). *Interviews in Qualitative Research*. United Kingdom: Sage.

Kirkcaldy, B. D., & Martin, T. (2000). Job stress and satisfaction among nurses: individual differences. *Stress and Health, 16*(2), 77-89.

Klaver, M., van den Hoofdakker, B. J., Wouters, H., de Kuijper, G., Hoekstra, P. J., & de Bildt, A. (2021). Exposure to challenging behaviours and burnout symptoms among care staff: the role of psychological resources. *Journal of Intellectual Disability Research,* 65(2), 173-185.

Kloos, N., Drossaert, C. H., Bohlmeijer, E. T., & Westerhof, G. J. (2019). Online positive psychology intervention for nursing home staff: A cluster-randomized controlled feasibility trial of effectiveness and acceptability. *International Journal of Nursing Studies, 98*(8), 48-56.

Klopper, H. C., Coetzee, S. K., Pretorius, R., & Bester, P. (2012). Practice environment, job satisfaction and burnout of critical care nurses in South Africa. *Journal of Nursing Management, 20*(5), 685-695.

Ko, C., Lunsky, Y., Hensel, J., & Dewa, C. S. (2012). Burnout among summer camp staff supporting people with intellectual disability and aggression. *Intellectual and Developmental Disabilities, 50*(6), 479-485.

Kontodimopoulos, N., Pappa, E., Niakas, D., & Tountas, Y. (2007). Validity of SF-12 summary scores in a Greek general population. *Health and Quality of Life Outcomes, 5*(1), 1-9.

Kooij, D. T. A. M. (2015). Successful aging at work: the active role of employees. *Work Aging Retirement* 1, 309–319.

Koritsas, S., Iacono, T., Carling-Jenkins, R., & Chan, J. (2010). Exposure to challenging behaviour and support worker/house supervisor well-being. *Melbourne: The Centre for Developmental Disability Health Victoria*.

Kowalski, C., Driller, E., Ernstmann, N., Alich, S., Karbach, U., Ommen, O., ... & Pfaff, H. (2010). Associations between emotional exhaustion, social capital, workload, and latitude in decision-making among professionals working with people with disabilities. *Research in Developmental Disabilities, 31*(2), 470-479.

Kozak, A., Kersten, M., Schillmöller, Z., & Nienhaus, A. (2013). Psychosocial work-related predictors and consequences of personal burnout among staff working with people with intellectual disabilities. *Research in Developmental Disabilities*, *34*(1), 102-115.

Kravits, K., McAllister-Black, R., Grant, M., & Kirk, C. (2010). Self-care strategies for nurses: A psycho-educational intervention for stress reduction and the prevention of burnout. *Applied Nursing Research*, *23*(3), 130-138.

Kristensen, T. S., Borritz, M., Villadsen, E., & Christensen, K. B. (2005). The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. *Work & Stress, 19*(3), 192-207.

Kröll, C., Doebler, P., & Nüesch, S. (2017). Meta-analytic evidence of the effectiveness of stress management at work. *European Journal of Work and Organizational Psychology, 26*(5), 677-693.

Kupperschmidt, B. (2006). Addressing multigenerational conflict: Mutual respect and carefronting as strategy. *Online Journal of Issues in Nursing, 11*(2), 4-9.

Kurz, A. S., Bethay, J. S., & Ladner-Graham, J. M. (2014). Mediating the relation between workplace stressors and distress in ID support staff: Comparison between the roles of psychological inflexibility and coping styles. *Research in Developmental Disabilities*, *35*(10), 2359-2370.

Labrague, L. J., McEnroe-Petitte, D. M., Leocadio, M. C., Van Bogaert, P., & Cummings, G.G. (2018). Stress and ways of coping among nurse managers: An integrative review. *Journal of Clinical Nursing*, *27*(7-8), 1346-1359.

Lahana, E., Papadopoulou, K., Roumeliotou, O., Tsounis, A., Sarafis, P., & Niakas, D. (2017). Burnout among nurses working in social welfare centers for the disabled. *BMC Nursing*, *16*(1), 15.

Lahtinen, O., Aaltonen, J., Kaakinen, J., Franklin, L., & Hyönä, J. (2021). The effects of app-based mindfulness practice on the well-being of university students and staff. *Current Psychology*, *42*(44), 12–21.

Lalor, K., & Share, P. (2013). *Understanding Social Care*. Dublin, Ireland: Gill and MacMillan.

Lam, L. T., Lam, M. K., Reddy, P., & Wong, P. (2022). Efficacy of a workplace intervention program with Web-based online and offline modalities for improving workers' mental health. *Frontiers in Psychiatry*, 975.13:888157

Lambert, S., & Mahon, A. (2021). *An exploration of the wellbeing of nurses and midwives in Ireland*. Irish Nurses and Midwives Association.

LaMontagne, A. D., Keegel, T., Louie, A. M., Ostry, A., & Landsbergis, P. A. (2007). A systematic review of the job-stress intervention evaluation literature, 1990-2005. *International Journal of Occupational and Environmental Health, 13*(3), 268-280.

Langdon, P. E., Yágüez, L., & Kuipers, E. (2007). Staff working with people who have intellectual disabilities within secure hospitals: Expressed emotion and its relationship to burnout, stress and coping. *Journal of Intellectual Disabilities, 11*(4), 343-357.

Laschinger, H., Finegan, J., Shamian, J., & Almost, J. (2001). Testing Karasek's Demands Control Model in restructured healthcare settings: effects of job strain on staff nurses' quality of work life. *The Journal of Nursing Administration, 31*(2), 233-243.

Lazarus, R. S. (1966). *Psychological Stress and The Coping Process.* United States: McGraw-Hill.

Lazarus, R. S. (1991). Cognition and motivation in emotion. *American Psychologist*, *46*(4), 352 – 369.

Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and Coping*. Springer Publishing Company, New York.

Lee, E. H. (2012). Review of the psychometric evidence of the perceived stress scale. *Asian Nursing Research*, *6*(4), 121-127.

Lee, T. N., Lin, J. D., Yen, C. F., Loh, C. H., Hsu, S. W., Tang, C. C., ... & Chu, C. M. (2009). Extrinsic high-effort and low-reward conditions at work among institutional staff caring for people with intellectual disabilities in Taiwan. *Research in Developmental Disabilities*, *30*(2), 284-293.

Leiter, M. P., Jackson, N. J., & Shaughnessy, K. (2009). Contrasting burnout, turnover intention, control, value congruence and knowledge sharing between Baby Boomers and Generation X. *Journal of Nursing Management, 17*(1), 100-109.

Leiter, M. P., Price, S. L., & Spence Laschinger, H. K. (2010). Generational difference in distress, attitudes and incivility among nurses. *Journal of Nursing Management, 18*(8), 970-980.

Leka, S., Cox, T., & Zwetsloot, G. (2008). *The European framework for psychosocial risk management: PRIMA-EF*. I-WHO Publication: Nottingham.

Lehr, D., Geraedts, A., Persson Asplund, R., Khadjesari, Z., Heber, E., De Bloom, J., ... & Funk, B. (2016). Occupational e-mental health: current approaches and promising perspectives for promoting mental health in workers. In Wiencke, M., Cacace, M., & Fischer, S. *Healthy at Work: Interdisciplinary Perspectives*.

Lernihan, E., & Sweeney, J. (2010). Measuring levels of burnout among care workers. *Learning Disability Practice, 13*(8), 27–42.

Letvak, S. (2002). Retaining the older nurse. *Journal of Nursing Administration, 32*(7/8), 387-392.

Letvak, S. (2003a). The Experience of Being an Older Perioperative Nurse. *AORN Journal, 78*(4), 635-649.

Letvak, S. (2003b). The experience of being an older staff nurse. *Western Journal of Nursing Research, 25*(1), 45-56.

Letvak, S. (2005). Health and safety of older nurses. *Nursing Outlook, 53*(2), 66-72.

Letvak, S. (2009). Hurting at work: the lived experience of older nurses. *International Journal for Human Caring, 13*(4), 9-13.

Letvak, S., Ruhm, C., & Gupta, S. (2013). Differences in health, productivity and quality of care in younger and older nurses. *Journal of Nursing Management, 21*(7), 914-921.

Leung, S. S., Chiang, V. C., Chui, Y. Y., Lee, A. C., & Mak, Y. W. (2011). Feasibility and potentials of online support for stress management among secondary school teachers. *Stress and Health*, *27*(3), e282-e286.

Levac D, Colquhoun H, O'Brien KK. (2010). Scoping studies: advancing the methodology *Implementation Science. 5*(1), 69-81.

Lewis, J. (2003). Design issues. In Ritchie, J., Lewis, J., McNaughton Nicholls, C., &Ormston, R. (1st Ed.) *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London: Sage.

Lewko, J., Misiak, B., & Sierżantowicz, R. (2019). The relationship between mental health and the quality of life of Polish nurses with many years of experience in the profession: a cross-sectional study. *International Journal of Environmental Research and Public Health*, *16*(10), 1798-1811.

Leyin, A., & Wakerly, E. (2007). Staff support, staff stress and job satisfaction in working with people with learning disabilities and challenging behaviours. *Tizard Learning Disability Review*, *12*(4), 31-41.

Li, Y.I.N. & Jones, C.B. (2013). A literature review of nursing turnover costs. *Journal of Nursing Management, 21*(3), 405–418.

Li, X., Jiang, T., Sun, J., Shi, L., & Liu, J. (2021). The relationship between occupational stress, job burnout and quality of life among surgical nurses in Xinjiang, China. *BMC Nursing, 20*(4), 1-11.

Li, J., Yang, W., Liu, P., Xu, Z., & Cho, S. I. (2004). Psychometric evaluation of the Chinese (mainland) version of Job Content Questionnaire: a study in university hospitals. *Industrial Health*, *42*(2), 260-267.

Lim, L. L. Y., & Fisher, J. D. (1999). Use of the 12-item short-form (SF-12) Health Survey in an Australian heart and stroke population. *Quality of Life Research, 8*(4), 1-8.

Limm, H., Gündel, H., Heinmüller, M., Marten-Mittag, B., Nater, U. M., Siegrist, J., & Angerer, P. (2011). Stress management interventions in the workplace improve stress

reactivity: a randomised controlled trial. *Occupational and Environmental Medicine, 68*(2), 126-133.

Lin, N. (1999). Building a network theory of social capital. *Connections, 22*(1), 28-51.

Lin, J. D., Lee, T. N., Yen, C. F., Loh, C. H., Hsu, S. W., Wu, J. L., & Chu, C. M. (2009). Job strain and determinants in staff working in institutions for people with intellectual disabilities in Taiwan: A test of the Job Demand-Control-Support model. *Research in Developmental Disabilities, 30*(1), 146-157.

Lincoln, Y. S., & Guba, E. G. (1985). Establishing trustworthiness. *Naturalistic Inquiry, 289*(331), 289-327.

Longo, J. (2013). Bullying and the older nurse. *Journal of Nursing Management, 21*(7), 950 955.

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*(3), 335-343.

Llorens, S., Bakker, A. B., Schaufeli, W., & Salanova, M. (2006). Testing the robustness of the job demands-resources model. *International Journal of Stress Management, 13*(3), 378-398.

Loretto, W., & White, P. (2006). Population ageing and older workers: employers' perceptions, attitudes and policies. *Population, Space and Place, 12*(5), 341-352.

Luo, X., George, M. L., Kakouras, I., Edwards, C. L., Pietrobon, R., Richardson, W., & Hey, L. (2003). Reliability, validity, and responsiveness of the short form 12-item survey (SF-12) in patients with back pain. *Spine, 28*(15), 1739-1745.

Luchman, J. N., & González-Morales, M. G. (2013). Demands, control, and support: a meta analytic review of work characteristics interrelationships. *Journal of Occupational Health Psychology, 18*(1), 37-45.

Ludden GDS, van Rompay TJL, Kelders SM, van Gemert-Pijnen JEWC. (2015). How to Increase Reach and Adherence of Web-Based Interventions: A Design Research Viewpoint. *Journal Of Medical Internet Research, 17*(7), e172.

Lundström, M., Graneheim, U. H., Eisemann, M., Richter, J., & Åström, S. (2007). Personality impact on experiences of strain among staff exposed to violence in care of people with intellectual disabilities. *Journal of Policy and Practice in Intellectual Disabilities*, *4*(1), 30-39.

Lundström, M., Saveman, B. I., Eisemann, M., & Åström, S. (2007). Prevalence of violence and its relation to caregivers' demographics and emotional reactions–an explorative study of caregivers working in group homes for persons with learning disabilities. *Scandinavian Journal of Caring Sciences*, *21*(1), 84-90.

Lunsky, Y., Hastings, R. P., Hensel, J., Arenovich, T., & Dewa, C. S. (2014). Perceptions of positive contributions and burnout in community developmental disability workers. *Intellectual and Developmental Disabilities*, *52*(4), 249-257.

Lunsky, Y., Bobbette, N., Abou Chacra, M., Wang, W., Zhao, H., Thomson, K., & Hamdani, Y. (2021). Predictors of worker mental health in intellectual disability services during COVID-19. *Journal of Applied Research in Intellectual Disabilities*. *34*(6), 1655-1660

Ly, K. H., Janni, E., Wrede, R., Sedem, M., Donker, T., Carlbring, P., & Andersson, G. (2015). Experiences of a guided smartphone-based behavioral activation therapy for depression: a qualitative study. *Internet Interventions*, *2*(1), 60-68.

Magnavita, N., Capitanelli, I., Falvo, R., Ferraro, P., Lops, E. A., Manetta, S., ... & Garbarino S. (2017). Occupational stress and metabolic syndrome in health care workers. *European Journal of Public Health*, *27*(3), 234-242.

Manfreda, K. L., Bosnjak, M., Berzelak, J., Haas, I., & Vehovar, V. (2008). Web surveys versus other survey modes: A meta-analysis comparing response rates. *International Journal of Market Research*, *50*(1), 79-104.

Mark, G. M., & Smith, A. P. (2008). Stress models: A review and suggested new direction. *Occupational Health Psychology*, *3*(9), 111-144.

Mascha, K. (2007). Staff morale in day care centres for adults with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, *20*(3), 191-199.

Maslach, C. (1976). Burned-out. *Human Behavior*, *5*(9), 16-22.

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Organizational Behavior, 2*(2), 99-113.

Maslach, C., Jackson, S. E., & Leiter, M. P. (1997). *Maslach Burnout Inventory*. United States: Scarecrow Education.

Malach-Pines, A. (2005). The burnout measure, short version. *International Journal of Stress Management, 12*(1), 78-89.

Matrix, (2013). Economic analysis of workplace mental health promotion and mental disorder prevention programmes and of their potential contribution to EU health, social and economic policy objectives, Executive Agency for Health and Consumers. Retrieved from at: http://ec.europa.eu/health/mental_health/docs/matrix_economic_analysis_mh_promoion_en.pdf Accessed 24th April 2019.

McCabe, S. E. (2004). Comparison of web and mail surveys in collecting illicit drug use data: A randomized experiment. *Journal of Drug Education, 34*(1), 61-72.

McCarthy, J., Heraty, N., Cross, C., & Cleveland, J. N. (2014). Who is considered an 'older worker'? Extending our conceptualisation of 'older'from an organisational decision maker perspective. *Human Resource Management Journal, 24*(4), 374-393.

MacKusick, C. I., & Minick, P. (2010). Why are nurses leaving? Findings from an initial qualitative study on nursing attrition. *Medsurg nursing, 19*(6).

McEwen, B. S. (2007). Physiology and neurobiology of stress and adaptation: central role of the brain. *Physiological Reviews, 87*(3), 873-904.

McHorney, C. A., Ware Jr, J. E., & Raczek, A. E. (1993). The MOS 36-Item Short-Form Health Survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. *Medical Care*, 247-263.

McLaney, M. A., & Hurrell, J. (1988). Control, stress, and job satisfaction in Canadian nurses. *Work & Stress, 2*(6), 217–224.

McMahon, M., Nadigel, J., Thompson, E., & Glazier, R. H. (2020). Informing Canada's health system response to COVID-19: priorities for health services and policy research. *Healthcare Policy, 16*(1), 112-121.

Merkus, S. L., Van Drongelen, A., Holte, K. A., Labriola, M., Lund, T., Van Mechelen, W., & Van der Beek, A. J. (2012). The association between shift work and sick leave: a systematic review. *Occupational and Environmental Medicine*, *69*(10), 701-712.

Merrill, N., Waters, T. E., & Fivush, R. (2016). Connecting the self to traumatic and positive events: Links to identity and well-being. *Memory*, *24*(10), 1321-1328.

Meyers, C. A. (2015). *Exploring the Experiences of Older Workers in Online Learning.* Retrieved from: https://research-repository.griffith.edu.au/handle/10072/366429 Accessed 21st March 2020.

Michie S, Johnston M, Francis J, Hardeman W, Eccles M. (2008). From theory to intervention: mapping theoretically derived behavioural determinants to behaviour change techniques. *Applied Psychology*, *57*(4), 660-680.

Mills, S., & Rose, J. (2011). The relationship between challenging behaviour, burnout and cognitive variables in staff working with people who have intellectual disabilities. *Journal of Intellectual Disability Research*, *55*(9), 844-857.

Mion, L. C., Hazel, C., Cap, M., Fusilero, J., Podmore, M. L., & Szweda, C. (2006). Retaining and recruiting mature experienced nurses: a multicomponent organizational strategy. *Journal of Nursing Administration*, *36*(3), 148-154.

Mirra, A. F. (2011). *Social problem solving and psychological distress in caregivers of adults with intellectual disabilities* (Doctoral Dissertation, Drexel University).

Mitchell, G., & Hastings, R. P. (2001). Coping, burnout, and emotion in staff working in community services for people with challenging behaviors. *American Journal on Mental Retardation*, *106*(5), 448-459.

Molina-Praena, J., Ramirez-Baena, L., Gómez-Urquiza, J. L., Cañadas, G. R., De la Fuente, E. I., & Cañadas-De la Fuente, G. A. (2018). Levels of burnout and risk factors in medical area nurses: A meta-analytic study. *International Journal of Environmental Research and Public Health*, *15*(12), 2800.

Monfries, N., Sandhu, N., & Millar, K. (2022). A Smartphone App to Reduce Burnout in the Emergency Department: A Pilot Randomized Controlled Trial. *Workplace Health & Safety, 71*(4), 181-189.

Montazeri, A., Vahdaninia, M., Mousavi, S. J., & Omidvari, S. (2009). The Iranian version of 12-item Short Form Health Survey (SF-12): factor structure, internal consistency and construct validity. *BMC Public Health, 9*(1), 1-10.

Moriarty, J., Regan, D., & Honan, R. (2019). Role-related stress and perceptions of the keyworker role among professionals supporting adults with intellectual disabilities. *International Journal of Workplace Health Management*. 4(2) 228-246.

Morse, G., Salyers, M. P., Rollins, A. L., Monroe-DeVita, M., & Pfahler, C. (2012). Burnout in mental health services: A review of the problem and its remediation. *Administration and Policy in Mental Health and Mental Health Services Research, 39,* 341-352.

Moore, L. J., Vine, S. J., Wilson, M. R., & Freeman, P. (2015). Reappraising threat: How to optimize performance under pressure. *Journal of Sport and Exercise Psychology, 37*(3), 339-343.

Mueller, A. E., & Segal, D. L. (2014). Structured versus semi-structured versus unstructured interviews. *The Encyclopaedia of Clinical Psychology*, 1-7.

Mulkeen, M. (2016). Going to market! An exploration of markets in social care.*Administration, 64*(2), 33-59.

Munn, Z., Peters, M. D., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, *18*(1), 1-7.

Muuraiskangas, S., Harjumaa, M., Kaipainen, K. and Ermes, M. (2016). Process and effects evaluation of a digital mental health intervention targeted at improving occupational well-being: lessons from an intervention study with failed adoption. *JMIR Mental Health*, *3*(2), p.e.4465.

Mutkins, E., Brown, R. F., & Thorsteinsson, E. B. (2011). Stress, depression, workplace and social supports and burnout in intellectual disability support staff. *Journal of Intellectual Disability Research*, *55*(5), 500-510.

Nadler, R., Carswell, J. J., & Minda, J. P. (2020). Online mindfulness training increases well-being, trait emotional intelligence, and workplace competency ratings: A randomized waitlist-controlled trial. *Frontiers in Psychology*, *11*(9), 255-265.

Nagarajan, N. R., Wada, M., Fang, M. L., & Sixsmith, A. (2019). Defining organizational contributions to sustaining an ageing workforce: a bibliometric review. *European Journal of Ageing*, *16*(3), 337-361.

Nantsupawat, A., Nantsupawat, R., Kunaviktikul, W., Turale, S., & Poghosyan, L. (2016). Nurse burnout, nurse-reported quality of care, and patient outcomes in Thai hospitals. *Journal of Nursing Scholarship, 48*(1), 83-90.

Nevill, R. E., & Havercamp, S. M. (2019). Effects of mindfulness, coping styles and resilience on job retention and burnout in caregivers supporting aggressive adults with developmental disabilities. *Journal of Intellectual Disability Research*, 63(5), 441-453.

Nevill, R. E., Istvan, E. M., & Havercamp, S. M. (2021). The Effects of Aggression Subtypes on Burnout and Caregiver Instability in Direct Support Professionals. *Journal of Positive Behavior Interventions*. https://doi.org/10.1177/10983007211013794

Newton, J. T., & Sturmey, P. (1988). The Aberrant Behaviour Checklist: a British replication and extension of its psychometric properties. *Journal of Intellectual Disability Research, 32*(2), 87-92.

Niedhammer, I., David, S., Bugel, I., & Chea, M. (2001). Catégorie socioprofessionnelle et exposition aux facteurs psychosociaux au travail dans une cohorte professionnelle. *Travailler, (1*), 23-45.

Nimmo W. (2014). *Stress among new graduate nurses. Is the Rose Program a successful intervention in a hospital setting?* (Doctoral Dissertation, John Fischer College, Rochester, New York).

Nishimura, Y., Ochi, K., Tokumasu, K., Obika, M., Hagiya, H., Kataoka, H., & Otsuka, F. (2021). Impact of the COVID-19 pandemic on the psychological distress of medical students in Japan: cross-sectional survey study. *Journal of Medical Internet Research*, *23*(2), e25232.

Nistor, A. A., & Chilin, T. F. (2013). Challenging behaviour of children with intellectual disabilities and its relation to burnout for those working with them: a systematic review. *Scientific Journal of Humanistic Studies*, *5*(9). 119-127.

Nixon, P., Boß, L., Heber, E., Ebert, D. D., & Lehr, D. (2021). A three-armed randomised controlled trial investigating the comparative impact of guidance on the efficacy of a web-based stress management intervention and health impairing and promoting mechanisms of prevention. *BMC Public Health*, *21*(1), 1-18.

Nixon, P., Ebert, D. D., Boß, L., Angerer, P., Dragano, N., & Lehr, D. (2022). The Efficacy of a Web-Based Stress Management Intervention for Employees Experiencing Adverse Working Conditions and Occupational Self-efficacy as a Mediator: Randomized Controlled Trial. *Journal of Medical Internet Research*, *24*(10), e40488.

Ng, T. W., & Feldman, D. C. (2008). The relationship of age to ten dimensions of job performance. *Journal of Applied Psychology*, *93*(2), 392-401.

Ng, T. W., & Feldman, D. C. (2013). Employee age and health. *Journal of Vocational Behavior*, *83*(3), 336-345.

Novick, G. (2008). Is there a bias against telephone interviews in qualitative research?. *Research in Nursing & Health*, *31*(4), 391-398.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, *16*(1), 1-13.

Nursing and Midwifery Council (2022). The NMC register mid-year update. Retrieved from https://www.nmc.org.uk/globalassets/sitedocuments/data-reports/sep-2022/0082a-mid-year-data-report-uk-web.pdf Accessed 3rd January 2023.

Nursing and Midwifery Board of Ireland (2022). NMBI State of the Register 2022. Retreived https://www.nmbi.ie/NMBI/media/NMBI/NMBI-State-of-the-Register-2022.pdf?ext=.pdf Accessed 14th November 2022.

Ornell, F., Halpern, S. C., Kessler, F. H. P., & Narvaez, J. C. D. M. (2020). The impact of the COVID-19 pandemic on the mental health of healthcare professionals. *Cadernos De Saude Publica*, *36*(4) e00063520.

Onyejose, M. A. (2021). *Stress, Burnout, and Depression among African Immigrant Direct Support Professionals Working with Adults with Intellectual Disabilities.* (Doctoral Dissertation, Walden University).

Osipow, S. H., & Spokane, A. R. (1998). *Occupational stress inventory-revised.* Psychological Assessment Resources, Incorporated.

Osman, I., Hamid, S. and Singaram, V.S. (2021). Efficacy of a brief online mindfulness-based intervention on the psychological well-being of health care professionals and trainees during the COVID-19 pandemic: A mixed method design. *Health SA Gesondheid (Online), 26*,1-9.

Outar, C. (2014). Burnout in direct care staff working in adult intellectual disability services (Doctoral Dissertation, University of Birmingham).

Outar, C., & Rose, J. (2017). Is there a relationship between role identity, work demands, and burnout in direct care staff working with individuals with intellectual disability? *Journal of Intellectual & Developmental Disability, 42*(2), 123-130.

Oyeleye, O., Hanson, P., O'Connor, N., & Dunn, D. (2013). Relationship of workplace incivility, stress, and burnout on nurses' turnover intentions and psychological empowerment. *The Journal of Nursing Administration, 43*(10), 536-542.

Pace, R., Pluye, P., Bartlett, G., Macaulay, A.C., Salsberg, J., Jagosh, J. and Seller, R. (2012). Testing the reliability and efficiency of the pilot Mixed Methods Appraisal Tool (MMAT) for systematic mixed studies review. *International Journal of Nursing Studies, 49*(1), 47-53.

Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS.* United Kingdom: McGraw-Hill Education.

Park, J., Chung, S., An, H., Park, S., Lee, C., Kim, S. Y., ... & Kim, K. S. (2012). A structural model of stress, motivation, and academic performance in medical students. *Psychiatry Investigation, 9*(2), 143-155.

Parker, H. W., Abreu, A. M., Sullivan, M. C., & Vadiveloo, M. K. (2022). Allostatic load and mortality: a systematic review and meta-analysis. *American Journal of Preventive Medicine, 63*(1), 131-140.

Parker, A., Dash, S., Bourke, M., Patten, R., Craike, M., Baldwin, P., Hosking, W., Levinger, I., Apostolopoulos, V., de Courten, M. and Sharples, J. (2022). A Brief, Daily, Online Mental Health and Well-being Intervention for University Staff During the COVID-19 Pandemic: Program Description and Outcomes Using a Mixed Methods Design. *JMIR Formative Research, 6*(2), e35776.

Perrotta, G. (2021). Maladaptive stress: Theoretical, neurobiological and clinical profiles. *Archives of Depression and Anxiety, 7*(1), 1-7.

Perry, L., Xu, X., Duffield, C., Gallagher, R., Nicholls, R., & Sibbritt, D. (2017). Health, workforce characteristics, quality of life and intention to leave: The 'Fit for the Future' survey of Australian nurses and midwives. *Journal of Advanced Nursing, 73*(11), 2745-2756.

Pelfrene, E., Vlerick, P., Mak, R. P., De Smet, P., Kornitzer, M., & De Backer, G. (2001). Scale reliability and validity of the Karasek's 'Job Demand-Control-Support' model in the Belstress study. *Work & Stress, 15*(4), 297-313.

Persson R. A., Dagöö, J., Fjellström, I., Niemi, L., Hansson, K., Zeraati, F., ... & Andersson, G. (2018). Internet-based stress management for distressed managers: results from a randomised controlled trial. *Occupational and Environmental Medicine, 75*(2), 105-113.

Pfaffinger, K. F., Reif, J. A., Spieß, E., Czakert, J. P., & Berger, R. (2022). Using digital interventions to reduce digitalization-related stress: does it work? *International Journal of Occupational Safety and Ergonomics, 33*(2), 1-16.

Phakthongsuk, P., & Apakupakul, N. (2008). Psychometric properties of the Thai version of the 22-item and 45-item Karasek job content questionnaire. *International Journal of Occupational Medicine and Environmental Health, 21*(4), 331.

Phillips, E. A., Gordeev, V. S., & Schreyögg, J. (2019). Effectiveness of occupational e-mental health interventions: a systematic review and meta-analysis of randomized controlled trials. *Scandinavian Journal of Work, Environment & Health, 45*(6), 560-576.

Phillips, J. A., & Miltner, R. (2015). Work hazards for an aging nursing workforce. *Journal of Nursing Management, 23*(6), 803-812.

Phillips, N., & Rose, J. (2010). Predicting placement breakdown: individual and environmental factors associated with the success or failure of community residential placements for adults with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, *23*(3), 201-213.

Pisanti, R. (2012). *Beyond the job demand control (-support) model: explaining stress reactions in nurses*. Leiden University.

Pham, M. T., Rajić, A., Greig, J. D., Sargeant, J. M., Papadopoulos, A., & McEwen, S. A. (2014). A scoping review of scoping reviews: advancing the approach and enhancing the consistency. *Research Synthesis Methods, 5*(4), 371-385.

Pluye, P., Gagnon, M.P., Griffiths, F. and Johnson-Lafleur, J. (2009). A scoring system for appraising mixed methods research, and concomitantly appraising qualitative, quantitative and mixed methods primary studies in mixed studies reviews. *International Journal of Nursing Studies*, *46*(4), 529-546.

Pluye, P., Robert, E., Cargo, M., Bartlett, G., O'Cathain, A., Griffiths, F. and Rousseau, M., (2011). *Mixed-methods appraisal tool* (MMAT). Montréal: Department of Family Medicine, McGill University.

Polsinelli, A. J., Kaszniak, A. W., Glisky, E. L., & Ashish, D. (2020). Effects of a brief, online, focused attention mindfulness training on cognition in older adults: A randomized controlled trial. *Mindfulness, 11*(4),1-12.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *International Journal of Surgery, 88*(9), 105906.

Privalko, I., Russel, H., & Maitre, B. (2019). *The Ageing Workforce in Ireland: Working Conditions, Health and Extending Working Lives*. The Economic and Social Research Institute, Dublin.

Purcell, S. R., Kutash, M., & Cobb, S. (2011). The relationship between nurses' stress and nurse staffing factors in a hospital setting. *Journal of Nursing Management*, *19*(6), 714-720.

Purdie, D. R., Federman, M., Chin, A., Winston, D., Bursch, B., Olmstead, R., ... & Irwin, M. R. (2022). Hybrid Delivery of Mindfulness Meditation and Perceived Stress in Pediatric Resident Physicians: A Randomized Clinical Trial of In-Person and Digital Mindfulness Meditation. *Journal of Clinical Psychology in Medical Settings*, 2(7), 1-10.

Raczka, R. (2005). A focus group enquiry into stress experienced by staff working with people with challenging behaviours. *Journal of Intellectual Disabilities*, *9*(2), 167-177.

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*(3), 385-401.

Rajacich, D., Kane, D., Williston, C., & Cameron, S. (2013). *If they do call you a nurse, it is always a "male nurse": Experiences of men in the nursing profession.* Paper presented at the Nursing Forum.

Rappaport, J., & Stewart, E. (1997). Discursive psychology. In D. Fox & I. Prilleltensky (Eds.), *Critical Psychology: An Introduction* (pp. 301–317). United States: Sage Publications.

Ravalier, J.M., Wainwright, E., Smyth, N., Clabburn, O., Wegrzynek, P. and Loon, M. (2020). Co-creating and evaluating an app-based well-being intervention: The HOW (Healthier Outcomes at Work) Social Work Project. *International Journal of Environmental Research and Public Health*, *17*(23), 8730-8739.

Resnick, B., & Parker, R. (2001). Simplified scoring and psychometrics of the revised 12-item Short-Form Health Survey. *Outcomes Management for Nursing Practice*, *5*(4), 161-166.

Rich, R. M., Ogden, J., & Morison, L. (2021). A randomized controlled trial of an app-delivered mindfulness program among university employees: effects on stress and work-related outcomes. *International Journal of Workplace Health Management*, *14*(2), 201-216.

Richardson, K. M., & Rothstein, H. R. (2008). Effects of occupational stress management intervention programs: a meta-analysis. *Journal of Occupational Health Psychology*, *13*(1), 69-78.

Ritchie, J., & Lewis, J. (2003). *Qualitative Research Practice: A Guide for Social Science Students and Researchers.* United Kingdom: Sage Publications.

Ritterband, L. M., Thorndike, F. P., Cox, D. J., Kovatchev, B. P., & Gonder-Frederick, L. A. (2009). A behavior change model for internet interventions. *Annals of Behavioral Medicine, 38*(1), 18-27.

Rigby, J., & O'Connor, M. (2012). Retaining older staff members in care homes and hospices in England and Australia: the impact of environment. *International Journal of Palliative Nursing, 18*(5), 235-249.

Roberti, J. W., Harrington, L. N., & Storch, E. A. (2006). Further psychometric support for the 10-item version of the perceived stress scale. *Journal of College Counseling, 9*(2), 135-147.

Robertson, J., Hatton, C., Felce, D., Meek, A., Carr, D., Knapp, M., ... & Lowe, K. (2005) Staff stress and morale in community-based settings for people with intellectual disabilities and challenging behaviour: a brief report. *Journal of Applied Research in Intellectual Disabilities, 18*(3), 271-277.

Roelen, C. A., van Hoffen, M. F., Waage, S., Schaufeli, W. B., Twisk, J. W., Bjorvatn, B., ... & Pallesen, S. (2018). Psychosocial work environment and mental health-related long term sickness absence among nurses. *International Archives of Occupational and Environmental Health*, *91*(2), 195-203.

Roozeboom, M. C., Schelvis, R. M., Houtman, I. L., Wiezer, N. M., & Bongers, P. M. (2020). Decreasing employees' work stress by a participatory, organizational level work stress prevention approach: a multiple-case study in primary education. *BMC Public Health, 20(8),* 1-16.

Rose, D., & Rose, J. (2005). Staff in services for people with intellectual disabilities: the impact of stress on attributions of challenging behaviour. *Journal of Intellectual Disability Research, 49*(11), 827-838.

Rose, D., Horne, S., Rose, J. L., & Hastings, R. P. (2004). Negative emotional reactions to challenging behaviour and staff burnout: Two replication studies. *Journal of Applied Research in Intellectual Disabilities, 17*(3), 219-223.

Rose, J. (1993). Stress and Staff in Residential Settings: The Move from Hospital to the Community. *Mental Handicap Research*, *6*(4), 312-332.

Rose, J. (1997). Stress & stress management among residential care staff. *Tizard Learning Disability Review*, *2*(1), 8-15.

Rose, J. (1999). Stress and residential staff who work with people who have an intellectual disability: A factor analytic study. *Journal of Intellectual Disability Research, 43*(4), 268-278.

Rose, J. (2011). How do staff psychological factors influence outcomes for people with developmental and intellectual disability in residential services? *Current Opinion in Psychiatry, 24*(5), 403-407.

Rose, J. L., & Cleary, A. (2007). Care staff perceptions of challenging behaviour and fear of assault. *Journal of Intellectual and Developmental Disability, 32*(2), 153-161.

Rose, J., & Schelewa-Davies, D. (1997). The relationship between staff stress and team climate in residential services. *Journal of Learning Disabilities for Nursing, Health, and Social Care*, *1*(1), 19-24.

Rose, J., Ahuja, A. K., & Jones, C. (2006). Attitudes of direct care staff towards external professionals, team climate and psychological wellbeing: A pilot study. *Journal ofIntellectual Disabilities*, *10*(2), 105-120.

Rose, J., David, G., & Jones, C. (2003). Staff who work with people who have intellectual disabilities: The importance of personality. *Journal of Applied Research in Intellectual Disabilities*, *16*(4), 267-277.

Rose, J., Jones, C., & Elliott, J. (2000). Differences in stress levels between managers and direct care staff in group homes. *Journal of Applied Research in Intellectual Disabilities, 13*(4), 276-282

Rose, J., Madurai, T., Thomas, K., Duffy, B., & Oyebode, J. (2010). Reciprocity and burnout in direct care staff. *Clinical Psychology & Psychotherapy, 17*(6), 455-462.

Rose, J., Mills, S., Silva, D., & Thompson, L. (2013). Client characteristics, organizational variables and burnout in care staff: The mediating role of fear of assault. *Research in Developmental Disabilities, 34*(3), 940-947.

Rose, J., Mullan, E., & Fletcher, B. (1994). An examination of the relationship between staff behaviour and stress levels in residential care. *Mental Handicap Research, 7*(4), 312-327.

Roth, G., Wendt, F., Nübling, M., & Janßen, C. (2020). Working conditions in residential homes for people with disabilities in Germany, with a particular focus on organizational structures. Retrieved from http://dx.doi.org/10.2139/ssrn.3533793 Accessed 19th May 2021.

Rozental, A., Boettcher, J., Andersson, G., Schmidt, B., & Carlbring, P. (2015). Negative effects of internet interventions: a qualitative content analysis of patients' experiences with treatments delivered online. *Cognitive Behaviour Therapy, 44*(3), 223-236.

Rupp, D. E., Vodanovich, S. J., & Credé, M. (2005). The multidimensional nature of ageism: Construct validity and group differences. *Journal of Social Psychology, 145*(8), 335–362.

Ruotsalainen, J. H., Verbeek, J. H., Mariné, A., & Serra, C. (2014). Preventing occupational stress in healthcare workers. *Cochrane Database of Systematic Reviews*, (11). DOI: 10.1002/14651858.CD002892.pub2

Rushton, C. H., Batcheller, J., Schroeder, K., & Donohue, P. (2015). Burnout and resilience among nurses practicing in high-intensity settings. *American Journal of Critical Care, 24*(5), 412-420.

Ruwaard, J., Lange, A., Bouwman, M., Broeksteeg, J., & Schrieken, B. (2007). E-Mailed standardized cognitive behavioural treatment of work-related stress: A randomized controlled trial. *Cognitive Behaviour Therapy, 36*(3), 179-192.

Sadovich, J. (2005). Work excitement in nursing: An examination of the relationship between work excitement and burnout. *Nursing Economics, 23*(2), 91–96.

Salehi, B., Cordero, M. I., & Sandi, C. (2010). Learning under stress: the inverted-U-shape function revisited. *Learning & Memory, 17*(10), 522-530.

Sale, J. E., & Kerr, M. S. (2002). The psychometric properties of Karasek's demand and control scales within a single sector: data from a large teaching hospital. *International Archives of Occupational and Environmental Health, 75*(3), 145-152.

Sanderson, K., & Andrews, G. (2002). The SF-12 in the Australian population: cross-validation of item selection. *Australian and New Zealand Journal of Public Health, 26*(4), 343-345.

Sanne, B., Torp, S., Mykletun, A., & Dahl, A. A. (2005). The Swedish Demand—Control—Support Questionnaire (DCSQ): Factor structure, item analyses, and internal consistency in a large population. *Scandinavian Journal of Public Health, 33*(3), 166-174.

Santavirta, N., Solovieva, S., & Theorell, T. Ö. (2007). The association between job strain and emotional exhaustion in a cohort of 1,028 Finnish teachers. *British Journal of Educational Psychology, 77*(1), 213-228.

Santos, S. R., Simon, S. D., Carroll, C. A., Bainbridge, L., Cox, K. S., Cunningham, M., . . . Ott, L. (2003). A Four-Site Study of Stress, Strain, and Coping for Inpatient Registered Nurses: Baby Boomer Nurses Bearing the Burden of Care. *Journal of Nursing Administration, 33*(4), 243-250.

Sarafis, P., Rousaki, E., Tsounis, A., Malliarou, M., Lahana, L., Bamidis, P., ... & Papastavrou, E. (2016). The impact of occupational stress on nurses' caring behaviors and their health related quality of life. *BMC Nursing*, *15*(1), 1-9.

Sauer, P. A., & McCoy, T. P. (2018). Nurse bullying and intent to leave. *Nursing Economics, 36*(5), 219-245.

Schalk, R., Van Veldhoven, M., De Lange, A. H., De Witte, H., Kraus, K., Stamov-Roßnagel, C., ... & Zacher, H. (2010). Moving European research on work and ageing forward: Overview and agenda. *European Journal of Work and Organizational Psychology, 19*(1), 76-101.

Schaufeli, W. B., & Buunk, B. P. (2003). Burnout: An overview of 25 years of research and theorizing. In Schabracq, M., Winnburst, J., & Cooper, C. (Eds.) *The Handbook of Work and Health Psychology*, pp. 282-424.

Schaufeli, W. B., & Greenglass, E. R. (2001). Introduction to special issue on burnout and health. *Psychology & Health, 16*(5), 501-510.

Schaufeli, W. B., Leiter, M. P., & Maslach, C. (2009). Burnout: 35 years of research and practice. *Career Development International*, *14*(3), 204-220.

Scheutzow, J., Attoe, C. and Harwood, J. (2022). Acceptability of web-based mental health interventions in the workplace: systematic review. *JMIR Mental Health*, *9*(5), e34655.

Schmitt, A., & Unger, D. (2019). Lifespan perspectives on occupational health. In Baltes, B., Rudolph, C, & Zacher, H. (Eds). *Work Across the Lifespan* pp. 369-393.

Schultz, A. B., & Edington, D. W. (2010). Analysis of the association between metabolic syndrome and disease in a workplace population over time. *Value in Health, 13*(2), 258-264.

Settersten Jr, R. A., & Mayer, K. U. (1997). The measurement of age, age structuring, and the life course. *Annual Review of Sociology*, *23*(1), 233-261.

Selye, H. (1950). Stress and the general adaptation syndrome. *British Medical Journal*, *1*(4667), 1383.

Shaddock, A. J., Hill, M., & Van Limbeek, C. A. H. (1998). Factors associated with burnout in workers in residential facilities for people with an intellectual disability. *Journal of Intellectual and Developmental Disability*, *23*(4), 309-318.

Shannon, D. M., Johnson, T. E., Searcy, S., & Lott, A. (2002). Using electronic surveys: Advice from survey professionals. *Practical Assessment, Research, and Evaluation*, *8*(1), 1-13.

Shead, J., Scott, H., & Rose, J. (2016). Investigating predictors and moderators of burnout in staff working in services for people with intellectual disabilities: the role of emotional intelligence, exposure to violence, and self-efficacy. *International Journal of Developmental Disabilities*, *62*(4), 224-233.

Sheehan, R., Dalton-Locke, C., Ali, A., San Juan, N. V., Totsika, V., & Hassiotis, A. (2021). Effects of the COVID-19 pandemic on mental healthcare and services: results of a UK survey of front-line staff working with people with intellectual disability and/or autism. *British Journal of Psychology Bulletin*, *46*(4), 201-207.

Sheerin, F., Allen, A. P., Fallon, M., McCallion, P., McCarron, M., Mulryan, N., & Chen, Y. (2023). Staff mental health while providing care to people with intellectual disability during the COVID-19 pandemic. *British Journal of Learning Disabilities, 51*(1), 80-90.

Shen, H. C., Cheng, Y., Tsai, P. J., & Guo, Y. L. (2005). Occupational stress in nurses in psychiatric institutions in Taiwan. *Journal of Occupational Health, 47*(3), 218-225.

Sheppard-Jones, K., Kleinert, H., Butler, L., Li, J., Moseley, E., & Adams, C. (2022). Direct Support Professionals: Stress and Resiliency Amidst the COVID-19 Pandemic. *Intellectual and Developmental Disabilities, 60*(3), 246-255.

Shih, T. H., & Fan, X. (2007). Response rates and mode preferences in web-mail mixed-mode surveys: a meta-analysis. *International Journal of Internet Science, 2*(1), 59-82.

Shirey, M. R. (2006). Stress and coping in nurse managers: two decades of research. *Nursing Economics, 24*(4), 193-209.

Shook, J. R., & Margolis, J. (Eds.) (2008). *A Companion to Pragmatism*. United Kingdom: John Wiley & Sons.

Short CE, Rebar AL, Plotnikoff RC, Vandelanotte C. (2015). Designing engaging online behaviour change interventions: A proposed model of user engagement. *The European Health Psychologist, 17*(1),32-38.

Shultz, K. S., Wang, M., Crimmins, E. M., and Fisher, G. G. (2010). Age differences in the demand-control model of work stress: an examination of data from 15 European countries. *Journal of Applied Gerontology, 29*(4), 21–47.

Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology*, *1*(1), 27.

Siegrist, J., & Li, J. (2017). Work stress and altered biomarkers: a synthesis of findings based on the effort–reward imbalance model. *International Journal of Environmental Research and Public Health, 14*(11), 1373.

Silverman, D. (2005). *Doing Qualitative Research: A practical handbook*. London: Sage.

Silverman, D. (2010). *Doing Qualitative Research.* London: Sage.

Skirrow, P., & Hatton, C. (2007). 'Burnout' amongst direct care workers in services for adults with intellectual disabilities: a systematic review of research findings and initial normative data. *Journal of Applied Research in Intellectual Disabilities, 20*(2), 131-144.

Smiley, R. A., Ruttinger, C., Oliveira, C. M., Hudson, L. R., Allgeyer, R., Reneau, K. A., ... & Alexander, M. (2021). The 2020 national nursing workforce survey. *Journal of Nursing Regulation*, *12*(1), 1-96.

Smithson-Sims, P. (1996). *Coping and stress: Unqualified direct-care staff working with challenging behaviour clients in learning disability residential settings* (Doctoral Dissertation, University of Leicester).

Smoktunowicz, E., Lesnierowska, M., Carlbring, P., Andersson, G., & Cieslak, R. (2021). Resource-based internet intervention (Med-Stress) to improve well-being among medical professionals: randomized controlled trial. *Journal of Medical Internet Research*, *23*(1), e21445.

Smyth, E., Healy, O., & Lydon, S. (2015). An analysis of stress, burnout, and work commitment among disability support staff in the UK. *Research in Developmental Disabilities*, *47*(5), 297-305.

Snow, E., Langdon, P. E., & Reynolds, S. (2007). Care staff attributions toward self-injurious behaviour exhibited by adults with intellectual disabilities. *Journal of Intellectual Disabilities*, *11*(1), 47-63.

Solas (2019). Quarterly Skills Bulletin Q2 2019 - Older Workers. Retrieved from: https://www.solas.ie/f/70398/x/dc63ccae6d/15044_solas_older_worker_bulletin_booklet_web.pdf Accessed 3rd March 2022.

Sousa-Ribeiro, M., Lindfors, P., & Knudsen, K. (2022). Sustainable working life in intensive care: A qualitative study of older nurses. *International Journal of Environmental Research and Public Health*, *19*(10), 6130.

Spiva, L., Hart, P., & McVay, F. (2011). Discovering ways that influence the older nurse to continue bedside practice. *Nursing Research and Practice.* Retrived from: https://doi.org/10.1155/2011/840120 Accessed 17th March 2016.

Squire, M. O. (2008). *The Experiences of Older Women Participating in the Workforce.* (Master's Thesis, The University of Waikato, Hamilton, New Zealand).

Stächele, T., Domes, G., Wekenborg, M., Penz, M., Kirschbaum, C., & Heinrichs, M. (2020). Effects of a 6-week internet-based stress management program on perceived stress, subjective coping skills, and sleep quality. *Frontiers in Psychiatry, 11*(3), 463-477.

Stanley, B., & Standen, P. J. (2000). Carers' attributions for challenging behaviour. *British Journal of Clinical Psychology, 39*(2), 157-168.

Sterns, H. L., & Doverspike, D. (1989). Aging and the training and learning process. In Goldstein, I.L. (Eds.) *Training and Development in Organizations* pp. 299–332.

Stewart, D., Ahmad, F., Cheung, A., Bergman, B., & Dell, D. (2000). Women physicians and stress. *Journal of Women's Health & Gender-Based Medicine, 9*(2), 185-190.

Stevens, M., Moriarty, J. O., Manthorpe, J., Harris, J., Hussein, S., & Cornes, M. (2021). What encourages care workers to continue working in intellectual disability services in England? Interview findings. *Journal of Intellectual Disabilities, 25*(1), 13-30.

Stichler, J. F. (2013). Healthy work environments for the ageing nursing workforce. *Journal of Nursing Management, 21*(7), 956-963.

Storey, C., Cheater, F., Ford, J., & Leese, B. (2009). Retaining older nurses in primary care and the community. *Journal of Advanced Nursing, 65*(7), 1400-1411.

Storms, G., Casaer, S., De Wit, R., Van Den Bergh, O., & Moens, G. (2001). A psychometric evaluation of a Dutch version of the Job Content Questionnaire and of a short direct questioning procedure. *Work & Stress, 15*(2), 131-143.

Stratton, E., Lampit, A., Choi, I., Calvo, R. A., Harvey, S. B., & Glozier, N. (2017). Effectiveness of eHealth interventions for reducing mental health conditions in employees: a systematic review and meta-analysis. *PloS One, 12*(12), e0189904.

Stratton, E., Lampit, A., Choi, I., Gavelin, H.M., Aji, M., Taylor, J., Calvo, R.A., Harvey, S.B. and Glozier, N. (2022). Trends in effectiveness of organizational ehealth interventions in addressing employee mental health: systematic review and meta-analysis. *Journal of Medical Internet Research, 24*(9), e.37776.

Stratton, E., Jones, N., Peters, S. E., Torous, J., & Glozier, N. (2021). Digital mHealth interventions for employees: systematic review and meta-analysis of their effects on workplace outcomes. *Journal of Occupational and Environmental Medicine, 63*(8), e512-e525.

Stube, J. E. (2016). *The Prediction of Staff Burnout Indicators in IDD Community Services by Staff Depression, Work Functioning, and Working Alliance.* (Doctoral Dissertation, Pennsylvania State University).

Sturges, J. E., & Hanrahan, K. J. (2004). Comparing telephone and face-to-face qualitative interviewing: a research note. *Qualitative Research, 4*(1), 107-118.

Svartvatten, N., Segerlund, M., Dennhag, I., Andersson, G. and Carlbring, P. (2015). A content analysis of client e-mails in guided internet-based cognitive behavior therapy for depression. *Internet Interventions, 2*(2), 121-127.

Taris, T. W., Le Blanc, P. M., Schaufeli, W. B., & Schreurs, P. J. (2005). Are there causal relationships between the dimensions of the Maslach Burnout Inventory? A review and two longitudinal tests. *Work & Stress, 19*(3), 238-255.

Tartakovsky, E., Gafter-Shor, A., & Perelman-Hayim, M. (2013). Staff members of community services for people with intellectual disability and severe mental illness: values, attitudes, and burnout. *Research in Developmental Disabilities, 34*(11), 3807-3821.

Taylor, J. M. (2015). Psychometric analysis of the ten-item perceived stress scale. *Psychological Assessment, 27*(1), 90-98.

Terry, G. (2016). Doing thematic analysis. In Coyle, A., & Lyons, E. (Eds). *Analysing Qualitative Data in Psychology*, pp.104-118.

Terry, G., Hayfield, N., Clarke, V., & Braun, V. (2017). Thematic analysis. In Willig, C., & Stainton-Rogers, W. (Eds.) *The Sage Handbook of Qualitative Research in Psychology*, pp.17-37.

Thiart, H., Lehr, D., Ebert, D. D., Berking, M., & Riper, H. (2015). Log in and breathe out: internet-based recovery training for sleepless employees with work-related strain results of a randomized controlled trial. *Scand J Work Environ Health, 41*(2), 164-74.

Tholdy Doncevic, S., Romelsjö, A., & Theorell, T. (1998). Comparison of stress, job satisfaction, perception of control, and health among district nurses in Stockholm and prewar Zagreb. *Scandinavian Journal of Social Medicine, 26*(2), 106-114.

Thomas, E. C., Thomas, K. G., & Du Plessis, M. (2020). An evaluation of job crafting as an intervention aimed at improving work engagement. *South African Journal of Industrial Psychology*, *46*(1), 1-12.

Thomas, C., & Rose, J. (2010). The relationship between reciprocity and the emotional and behavioural responses of staff. *Journal of Applied Research in Intellectual Disabilities*, *23*(2), 167-178.

Thompson, L., & Rose, J. (2011). Does organizational climate impact upon burnout in staff who work with people with intellectual disabilities? A systematic review of the literature. *Journal of Intellectual Disabilities*, *15*(3), 177-193.

Thomsen, S., Arnetz B., Nolan P., Soares J. & Dallender J. (1999) Individual and organizational well-being in psychiatric nursing: a cross-cultural study. *Journal of Advanced Nursing*, *30*(9), 749–757.

Thorne, S. (2020). Untangling the misleading message around saturation in qualitative nursing studies. *Nurse Author & Editor*, *30*(1), 5-12.

Thyme, K. E., Wiberg, B., Lundman, B., & Graneheim, U. H. (2013). Qualitative content analysis in art psychotherapy research: Concepts, procedures, and measures to reveal the latent meaning in pictures and the words attached to the pictures. *The Arts in Psychotherapy*, *40*(1), 101-107.

Titov, N., Dear, B. F., Johnston, L., Lorian, C., Zou, J., Wootton, B., ... & Rapee, R. M. (2013). Improving adherence and clinical outcomes in self-guided internet treatment for anxiety and depression: randomised controlled trial. *PloS One*, *8*(7), e62873.

Tobin, G. A., & Begley, C. M. (2004). Methodological rigour within a qualitative framework. *Journal of Advanced Nursing*, *48*(4), 388-396.

Todd, Z., Nerlich, B., McKeown, S., & Clarke, D. D. (2004). *Mixing Methods in Psychology: The Integration of Qualitative and Quantitative Methods in Theory and Practice.* New York: Psychology Press.

Toker, S., & Melamed, S. (2017). Stress, recovery, sleep, and burnout. In Cooper, C., & Quick, J.C. (Eds.). *The Handbook of Stress and Health: A Guide to Research and Practice*, pp.168-185.

Topa, G., Guglielmi, D., & Depolo, M. (2016). Effort–reward imbalance and organisational injustice among aged nurses: a moderated mediation model. *Journal of Nursing Management, 24*(6), 834-842.

Truxillo, D. M., Cadiz, D. M., Rineer, J. R., Zaniboni, S., and Fraccaroli, F. (2012). A lifespan perspective on job design: fitting the job and the worker to promote job satisfaction, engagement, and performance. *Organisational Psychology Review, 2*(4), 340–360.

Tummers, G. E. R., Landeweerd, J. A., & van Merode, G. G. (2002). Work organization, work characteristics, and their psychological effects on nurses in the Netherlands. *International Journal of Stress Management, 9*(1), 183-206.

Twigg, D., & McCullough, K. (2014). Nurse retention: a review of strategies to create and enhance positive practice environments in clinical settings. *International Journal Of Nursing Studies, 51*(1), 85-92.

Umanodan, R., Shimazu, A., Minami, M., & Kawakami, N. (2014). Effects of Computer based Stress Management Training on Psychological Well-being and Work Performance in Japanese Employees: A Cluster Randomized Controlled Trial. *Industrial Health, 52*(6), 480-488.

Urick, M. J. (2017). Towards an identity-based approach for examining age in the workplace: perspectives and implications. In Parry, M., & McCarthy J. (Eds.) *The Palgrave Handbook of Age Diversity and Work,* pp.47-65.

van der Klink, J. J., Blonk, R. W., Schene, A. H., & Van Dijk, F. J. (2001). The benefits of interventions for work-related stress. *American Journal of Public Health, 91*(2), 270-283.

van der Meer, L., Nieboer, A. P., Finkenflügel, H., & Cramm, J. M. (2018). The importance of person-centred care and co-creation of care for the well-being and job satisfaction of

professionals working with people with intellectual disabilities. *Scandinavian Journal of Caring Sciences*, *32*(1), 76-81.

Van Dierendonck, D., Schaufeli, W. B., & Buunk, B. P. (2001). Burnout and inequity among human service professionals: A longitudinal study. *Journal of Occupational Health Psychology*, *6*(1), 43-58.

Van Dierendonck, D., Schaufeli, W. B., & Sixma, H. J. (1994). Burnout among general practitioners: a perspective from equity theory. *Journal of Social and Clinical Psychology*, *13*(1), 86-100.

van den Berg, T., Vrijhoef, H., Tummers, G., Landeweerd, J., & Van Merode, G. (2008). The work setting of diabetes nursing specialists in the Netherlands: A questionnaire survey. *International Journal of Nursing Studies, 45(*10), 1422-1432.

van der Doef, M., Maes, S., & Diekstra, R. (2000). An examination of the job demand-control support model with various occupational strain indicators. *Anxiety, Stress and Coping*, *13*(2), 165-185.

van Vegchel, N., de Jonge, J., Bakker, A., & Schaufeli, W. (2002). Testing global and specific indicators of rewards in the Effort-Reward Imbalance Model: does it make any difference? *European Journal of Work and Organizational Psychology*, *11*(4), 403-421.

van Yperen, N. W. (1995). Communal orientation and the burnout syndrome among nurses: A replication and extension. *Journal of Applied Social Psychology*, *26*(5), 338–354.

van Yperen, N. W., Buunk, B. P., & Schaufeli, W. B. (1992). Communal Orientation and the Burnout Syndrome Among Nurses 1. *Journal of Applied Social Psychology*, *22*(3), 173-189.

Vandelanotte C, Spathonis KM, Eakin EG, Owen N. (2007). Website-delivered physical activity interventions: A review of the literature. *American Journal Of Preventive Medicine. 33*(1), 54-64.

Vassos, M. V., & Nankervis, K. L. (2012). Investigating the importance of various individual, interpersonal, organisational and demographic variables when predicting job burnout in disability support workers. *Research in Developmental Disabilities*, *33*(6), 1780-1791.

Vassos, M., Nankervis, K., Skerry, T., & Lante, K. (2017). Can the job demand-control (support) model predict disability support worker burnout and work engagement? *Journal of Intellectual & Developmental Disability*, 44*(2),* 1-11.

Vilagut, G., Forero, C. G., Pinto-Meza, A., Haro, J. M., De Graaf, R., Bruffaerts, R., ... & ESEMeD Investigators. (2013). The mental component of the short-form 12 health survey (SF-12) as a measure of depressive disorders in the general population: results with three alternative scoring methods. *Value in Health*, *16*(4), 564-573.

Vilas-Boas, M., & Cerqueira, A. (2017). Evaluación del estrés laboral: versión portuguesa del Job Content Questionnaire. *Avaliação Psicológica*, *16*(1), 70-77.

Vine, S. J., Freeman, P., Moore, L. J., Chandra-Ramanan, R., & Wilson, M. R. (2013). Evaluating stress as a challenge is associated with superior attentional control and motor skill performance: testing the predictions of the biopsychosocial model of challenge and threat. *Journal of Experimental Psychology: Applied*, *19*(3), 185-193.

Vine, S. J., Uiga, L., Lavric, A., Moore, L. J., Tsaneva-Atanasova, K., & Wilson, M. R. (2015). Individual reactions to stress predict performance during a critical aviation incident. *Anxiety, Stress, & Coping*, *28*(4), 467-477.

Vinkers, C. H., van Amelsvoort, T., Bisson, J. I., Branchi, I., Cryan, J. F., Domschke, K., ... & van der Wee, N. J. (2020). Stress resilience during the coronavirus pandemic. *European Neuropsychopharmacology*, *35*(5), 12-16.

Visser, L., Plomp, T., Amirault, R. J., & Kuiper, W. (2002). Motivating students at a distance: The case of an international audience. *Educational Technology Research and Development*, *50*(2), 94-110.

Wangberg SC, Bergmo TS, Johnsen J. (2008). Adherence in Internet-based interventions. *Patient Preference and Adherence. 2*(7), 57-65.

Wanless, L. K., & Jahoda, A. (2002). Responses of staff towards people with mild to moderate intellectual disability who behave aggressively: a cognitive emotional analysis. *Journal of Intellectual Disability Research*, *46*(6), 507-516.

Wantland, D. J., Portillo, C. J., Holzemer, W. L., Slaughter, R., & McGhee, E. M. (2004). The effectiveness of Web-based vs. non-Web-based interventions: a meta-analysis of behavioral change outcomes. *Journal of Medical Internet Research*, *6*(4), e40.

Ware Jr, J. E., Kosinski, M., & Keller, S. D. (1996). A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Medical Care*, *34*(3), 220-233.

Ward-Smith, P., Hunt, C., Smith, J. B., Teasley, S. L., Carroll, C. A., & Sexton, K. (2007). Issues and opportunities for retaining experienced nurses at the bedside. *Journal of Nursing Administration, 37*(11), 485-487.

Weick, K.E., Sutcliffe, K.M. & Obstfeld, D. (2005). Organizing and the process o sensemaking. *Organization Science, 16*(5), 409–21.

Wells, J.S. & Norman, I. J. (2009). The 'Greying'of Europe–Reflections on the state of nursing and nurse education in Europe. *Nurse Education Today, 29*(8), 811-815.

Wells, J.S. & White, M. (2014). The impact of the economic crisis and austerity on the nursing and midwifery professions in the Republic of Ireland–'boom','bust'and retrenchment. *Journal of Research in Nursing*, *19*(7-8), 562-577.

Wells, J., Denny, M., & Cunningham, J. (2011). Work related stress and European policy–A comparative exploration of contextual stressors in the rehabilitation sector in five European countries. *Journal of Mental Health*, *20*(2), 165-173

Wells. (2011). The impact of stress amongst health professionals. *Journal of Mental Health, 20*(2), 111-114.

White, P., Edwards, N., & Townsend-White, C. (2006). Stress and burnout amongst professional carers of people with intellectual disability: another health inequity. *Current Opinion in Psychiatry*, *19*(5), 502-507.

Wilson, B., Squires, M., Widger, K., Cranley, L., & Tourangeau, A. (2008). Job satisfaction among a multigenerational nursing workforce. *Journal of Nursing Management, 16*(6), 716-723.

Wingood, G. M., & DiClemente, R. J. (2000). Application of the theory of gender and power to examine HIV-related exposures, risk factors, and effective interventions for women. *Health Education and Behavior*, *27*(5), 539-565.

Womack, K. N., Alvord, T. W., Trullinger-Dwyer, C. F., Rice, S. P., & Olson, R. (2020). Challenging aggressive behaviors experienced by personal support workers in comparison to home care workers: relationships between caregiver experiences and psychological health. *International Journal of Environmental Research and Public Health*, *17*(15), 5486.

Xu, H.G., Tuckett, A., Kynoch, K. and Eley, R. (2021). A mobile mindfulness intervention for emergency department staff to improve stress and wellbeing: A qualitative study. *International Emergency Nursing*, *58*(3), e101039.

Yaldiz, L. M., Truxillo, D. M., & Cadiz, D. M. (2020). Who Benefits More? The Moderating Role of Age on the Relationship Between Work and Person Characteristics and Employee Attitudes and Wellbeing. *Occupational Health Science*, *4*(1), 139-160.

Yoon, S. I., Lee, S. I., Suh, H. W., Chung, S. Y., & Kim, J. W. (2022). Effects of mobile mindfulness training on mental health of employees: A CONSORT-compliant pilot randomized controlled trial. *Medicine*, *101*(35), e30260.

Yoon, H. S., & Sok, S. R. (2016). Experiences of violence, burnout and job satisfaction in Korean nurses in the emergency medical centre setting. *International Journal of Nursing Practice, 22*(6), 596-604.

Zacher, H. (2015). Successful aging at work. *Work Aging Retirement*, *1*(3), 4–25.

Zacher, H., & Schmitt, A. (2016). Work characteristics and occupational well-being: the role of age. *Frontiers in Psychology*, *7*(7), 1411.

Zaghini, F., Vellone, E., Maurici, M., Sestili, C., Mannocci, A., Ercoli, E., ... & Sili, A. (2020). The influence of work context and organizational well-being on psychophysical health of healthcare providers. *La Medicina del Lavoro, 111*(4), 306-317.

Zurlo, M. C., Vallone, F., & Smith, A. P. (2018). Effects of individual differences and job characteristics on the psychological health of Italian nurses. *European Journal of Psychology*, *14*(1), 159-171.

Appendix A

DELAROSE Curriculum from Course Evaluation Documentation

Section 2: Programme Description

2.0 Introduction

The programme is overviewed in section 2.1 with aims and objectives of the programme detailed in section 2.2), together with the learning outcomes at programme level (section 2.4). An outline of the programme (section 2.3) and course schedule is provided (section 2.4) are also provided. The programme's teaching and learning strategy is then discussed (2.5). The programme access (section 2.6), entry requirements (section 2.7) and progression opportunities (section 2.8) are then detailed. Finally, the procedures for programme administration and quality assurance are discussed (section 2.9).

2.1 Description of the Programme

The DELAROSE programme will be run as a special purpose 20 credit award at Level 6, and will consist of two modules, each at 10 credits. The credits for this award will be based on the European Credit Transfer System (ECTS), but will be cross-referenced to the ECVET award system.

DELAROSE will be an open access online programme. The modules will be run concurrently in both semesters all academic year round in line with the concept of open access. This means that anyone will have online access to the DELAROSE programme (this is a stipulated requirement of the EU funding support for its development). The course content will be delivered via a Moodle platform, which will be hosted on a server at SUPSI.

Anyone who wishes to receive WIT/ KFU/ SUPSI accreditation will register online for the DELAROSE programme. In the case of this submission this will be registration with WIT. This registration will entitle registered students to extra support in relation to the completion of a series of assessments linked to units of learning in each of the two 10 credit modules (**M1** – 'Person Centered Management of Work-Related Stress'; and **M2** – 'Environment Centered Management of Work-Related Stress) and access to lecturer support.

The modules are developmental and work based in nature, allowing registered learners to incrementally increase their knowledge of occupational stress and enhance their skills in management of occupational stress as they progress through the programme. Strong emphasis is placed on enhancing learners' existing knowledge and understanding of occupational stress within their own workplace. Learners will pace their learning through the programme, with content grouped into 'Units of Learning' based upon the 'open access' Moodle presentations. Each 'Unit of Learning' consists of online lecture slides, support material and a reading list.

DELAROSE will use a specific pedagogical method - Multiple Intelligence Teaching Approach (MITA) - to address different learner abilities and intellectual dispositions. MITA involves a 5 stage process of learning – addressing problems through learner generated questions; specific and measureable objectives; collaborative development of rubrics; student adaption of task requirement to demonstrate learning and competence; student reflection on performance (Weber, 2005).

The accreditation and certification element of DELAROSE will mean that MITA will be incorporated into the development of an appropriate assessment strategy (reflective portfolio) that meets the national and local institutional requirements for accreditation. In this regard ECT's emphasis on learning agreements with the individual will be given a formal recognition within the DELAROSE programme as part of the assessment strategy.

Utilising MITA as the pedagogical framework is particularly suited to a European context as it takes account of both individual and cultural learning differences to achieve a shared outcome. The approach will facilitate holistic assessment and learning for understanding, where several work based competences can be assessed concurrently through a project or problem-based work integrated activity.

Learners will be encouraged to apply and utilise stress management principles and methods within the context of their current role. This type of learning will assist learners in merging theory with practice and knowledge with experience, and is centred around reflection and engagement with actual work experiences (Raelin, 2008). It will provide learners with the opportunity to consider and challenge their current thinking and practice, and to develop new personal knowledge, understanding and skills (Rhodes and Shiel, 2007). Learners are therefore required to become fully active and engaged participants, and to take responsibility for generating their own learning from everyday practice (Manley et al, 2009). Students will receive final credit through submission of a reflective portfolio, which will consist of accumulated assessment exercises associated with completion of the Units of Learning in each of the two modules.

2.2 Aims and Objectives

The programme will be run as a 20 credit award, and will consist of two 10 credit modules. Both modules consist of a portfolio task assessment linked to units of learning lectures (**M1** – 'Person Centered Management of Work-Related Stress'; and **M2** – 'Environment Centered Management of Work-Related Stress), reflection and access to lecturer support (through online tutorials).

This programme aims to facilitate learners to develop the requisite knowledge, skills and understanding to safely and appropriately apply stress management skills into their everyday practice.

The module **'Person Centred Management of Work-Related Stress'**, consists of the following 'Units of Learning':

1) Introduction to Stress
2) Prevention of Stress
3) Learning Ways of Coping with Stress
4) Changing How You Think About Things
5) Giving Feedback
6) Challenging Behaviour
7) Learning How to Relax
8) Physical Activity and Stress

The module **'Environment Centred Management of Work-Related Stress**', consists of the following 'Units of Learning':

1) How the Organisation Contributes to Stress
2) Interpersonal Skills
3) Leadership and Motivation
4) Change Management
5) Organisational Policies
6) Risk Assessment
7) Ergonomics

Table 4. Programme Learning Outcomes Mapped to NFQ

NFQ	NFQ	Programme learning outcome
Knowledge: breadth	An understanding of the theory, concepts and methods pertaining to a field (or fields) of learning	Describe and explain the basic theory and principles underpinning the management of work-related stress at an individual and environmental level.
Knowledge: kind	Detailed knowledge and understanding in one or more specialised areas, some of it at the current boundaries of the field(s)	Demonstrate a systematic understanding of the application of stress management techniques at an individual and environmental level.
Know-how and Skill: range	Demonstrate mastery of a complex and specialised area of skills and tools; use and modify advanced skills and tools to conduct closely guided research, professional or advanced technical activity	Develop appropriate stress management skills to manage personal stress Apply the appropriate techniques and tools to promote resilience and well-being in the workplace
Know-how and Skill: selectivity	Exercise appropriate judgement in planning, design, technical and/or supervisory functions related to products, services, operations or processes	Reflect on their application of stress management techniques in their current practice and as a component of their continuing professional development;
Competence: context	Use advanced skills to conduct research, or advanced technical or	Describe the process of enhancing resilience in the work-place, and empowering staff to

	professional activity, accepting accountability for all related decision making;	impact on work-related stress at an environmental and personal level
Competence: role	Act effectively under guidance in a peer relationship with qualified practitioners; lead multiple, complex and heterogeneous groups	Describe the use of psycho-education in the application of stress management skills at an environmental and personal level.
Competence: learning to learn	Learn to act in variable and unfamiliar learning contexts; learn to manage learning tasks independently, professionally and ethically	Reflect on their application of stress management skills in their current practice and as a component of their continuing professional development;
Competence: insight	Express a comprehensive, internalised, personal world view manifesting solidarity with others	Consider the appropriateness of integrating and applying stress management skills within their scope of professional practice

2.3 Outline of Programme

DELAROSE aims to offer an open-source self-help programme for health and social care workers in Europe to manage work related stress at an individual and environmental level. DELAROSE has been developed in close consultation with the sector at both European level (EASPD, SUPSI, KFU, KCL) national level (NFVB, QQI) and regional level (CLUAIN). This reflects a School of Health Science commitment to ensuring that programme development and implementation in relation to health and social care is rooted in the needs of the sector.

2.3.1 Programme Philosophy

Health and social care workers are especially prone to work related stress when compared to other occupations because of the nature of their work. Interventions to support health and social care workers to deal with work related stress are *ad hoc* and localised, with a tendency to associate work-related stress to illness and or 'stigma'. The DELAROSE approach is to view work related stress as a normal phenomenon of health and social care work that needs to be managed at both an individual and ergonomic level. The DELAROSE approach to learning and education also incorporates a strong commitment to learner centredness in which the learner's pre-existing knowledge and experience should be incorporated into the learning process.

2.3.2 Philosophy of education.

Principles of adult education will underpin the delivery of this programme, with an emphasis on facilitating learners to reflect upon their own learning needs and to take responsibility for these within their working environment. This is an important consideration given the complex yet dynamic and evolving nature of the health and social care system in which nurses and other health and social care professionals practice. It is acknowledged that learners may enter the programme with a wide range of previous professional and educational experiences which will be drawn upon, forming a rich resource for learning and development. Learning is viewed as a life-long, collaborative process best achieved when learners are actively engaged in their own education. A particular facet of the DELAROSE programme is an emphasis on the importance of the work place as a source of learning.

2.3.3 Curriculum Model

The content of the programme is based on a 'Learning Outcomes' structure in accordance with the European Credit System for Vocational and Educational Training (ECVET) educational framework. ECVET is a systematic framework which aims to allow the transfer, recognition and accumulation of learning outcomes to obtain a qualification.

The methodology of this system includes 1) A description of qualifications in terms of learning outcomes (knowledge, competencies and skills) organised in learning outcome units 2) The existence of a process for learning outcomes incorporated within assessment, validation, recognition and accumulation of learning outcomes, and 3) A points system assigned to learning outcome qualifications and units (for the purposes of this submission ECTs).

Key features of this framework therefore are:

(i) **Learning Outcomes:** Statements of what a learner knows, understands and is able to do on completion of a learning process defined in terms of knowledge, skills and competence
(ii) **Knowledge:** The outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that are related to a field of work or study.
(iii) **Competence:** The proven ability to use knowledge, skills and personal, social and/or methodological abilities in work or study situations and in professional and personal development.
(iv) **Skills:** The ability to apply knowledge and use know-how to complete tasks and solve problems.
(v) **Units of Learning**: Component of a qualification, consisting of a coherent set of knowledge, skills and competence, which can be assessed and validated.

2.4 Proposed Programme Schedules

Name of provider: Waterford Institute of Technology

Title of Award: Certificate in Management of Work-Related Stress

Area of Specialisation:

Level: 6

*Please see Appendix 2 (Page 72) for Student's anticipated effort hours per module.

Module Number[6]	***Title of module***	**Pre-requisite Module (s)[7]**	**Module status[8]**	**NFQ Level[9]**	Credits	**Contact hours[10]**				**Allocation of marks (%)[11]**				
						Lecture	**Tutorial**	**Practical**	**Total**	**Project**	**Continuous Assessment**	**Practical**	**Final Exam**	**Total**
1	**Person-Centred Management of Work-Related Stress**	None	M	6	10		1		1		1			100

Module Number[12]	***Title of module***	**Pre-requisite Module(s)[13]**	**Module status[14]**	**NFQ Level[15]**	Credits	**Contact hours[16]**				**Allocation of marks (%)[17]**				
						Lecture	**Tutorial**	**Practical**	**Total**	**Project**	**Continuous Assessment**	**Practical**	**Final Exam**	**Total**
2	**Environment Centered Management of Work-Related Stress**	None	M	6	10		1		1		1			100

[6] This code will be assigned by the Academic Affairs Office in Registry.
[7] Insert here the module number for pre-requisite modules. Module numbers for existing (and therefore shared) modules should be indicated in italics.
[8] Enter "M" for Mandatory modules, "E" for elective modules.
[9] Enter here the level on the National Framework of Qualifications for the module.
[10] Indicate contact hours (per week) in the categories listed below.
[11] Indicate the allocation of marks in the categories listed below. Please refer to MAP guidelines on assessment.
[12] This code will be assigned by the Academic Affairs Office in Registry.
[13] Insert here the module number for pre-requisite modules. Module numbers for existing (and therefore shared) modules should be indicated in italics.
[14] Enter "M" for Mandatory modules, "E" for elective modules.
[15] Enter here the level on the National Framework of Qualifications for the module.
[16] Indicate contact hours (per week) in the categories listed below.
[17] Indicate the allocation of marks in the categories listed below. Please refer to MAP guidelines on assessment.

2.5 Teaching and Learning Approaches

Teaching strategies and learning activities will be predominantly learner centred and foster a reflective, problem solving, critical thinking and self-evaluative approach to practice. Teaching and learning methodologies will be organised to enable learners acquire the specialist knowledge, skills and competencies specified by the programme curriculum. The role of the teacher is seen as one of facilitator of learning, helping in the acquisition of new knowledge and competencies and their subsequent transfer and integration to the learner's work based role.

The two key duties/interactions of the teacher will be the facilitation and moderation of an online discussion forum and the provision of an open skype hour tutorial in which learners interact with a course teacher. This will be the primary source of direct communication and interaction between the learners and a course teacher. The skype hour will allow for a learner to engage directly with a course teacher, enabling the solving of technical issues which may arise, enhancing quality and satisfaction with the service on offer, and supporting the learner to develop their knowledge and skills in order to achieve learning outcomes in relation to the programme.

A variety of teaching and learning methodologies/strategies are encouraged throughout the programme to ensure differing learning abilities and styles are accommodated. These strategies should enable the learner to become knowledgeable and competent in the management of work-related stress.

Teaching strategies will emphasise learner-centred approaches and reflect adult learning principles including learning for understanding. The programme will emphasise the integration of theory with practice, which is consolidated by reflection upon practice.

The following approaches will be utilised:

• *Multiple intelligences teaching and learning approaches:* this approach informs the structure of the course content and the learning outcomes. It will enable educators to use multiple methods of facilitating learning focused on the abilities of students and the practical aspects of teaching and learning for application in the work place.

• *E learning and/or prescribed reading/self-directed learning:* will enhance the learner's ability to learn independently and facilitate knowledge and understanding theories and principles of stress management.

• *Problem based learning:* will assist the learner in enhancing and expanding his/her knowledge and understanding of stress management training through learning for understanding and through completing assessments (e.g. using the Maastricht Seven Jump Approach).

• *Interactive discussion forums:* will enhance the learners' ability to critically reflect upon theoretical constructs, current evidence and the practical application of cognitive behavioural methods.

• *Practice reflection:* will support the learner in integrating the principles and methods of stress management into practice and help them to continue to refine and develop their skills.

2.6 Programme Assessment Strategy

The assessment methods for this programme consist of the submission of a portfolio of activity which is completed incrementally as the learner progresses through the various Units of

Learning. The emphasis within this approach is on the learner building upon what they already know through engagement with a series of tasks and activities associated with the units of learning and reflecting upon what they have learnt. They will be required to submit evidence that they have carried out the specific task or activity within the work place and it is the combination of these elements through the submission of the portfolio that will be assessed.

Table 5. Module Learning Outcomes Mapped to Units of Learning

Module Learning Outcomes **(Person Centred Management)**	**Unit(s) of Learning**
Recognise and describe the signs of stress across health, emotions, cognitions and behaviours as this relates to the Demands and Control Model in the workplace;	Introduction to Stress
Identify areas of the body and health that stress may affect and be able to communicate the mechanisms by which it can have effect.	Prevention of Stress
Identify and describe the benefits and principles of coping with and preventing work related stress;	Coping with Stress
Identify and describe the relationship of unhelpful thoughts to work related stress and how to manage and replace these with positive thinking;	Changing Your Thinking
Identify and use constructive criticism when giving feedback;	Giving Feedback
Understand and manage the manifestations of challenging behaviour	Challenging Behaviour.

Describe and use principles relaxation techniques;	Learning How to Relax
Describe the positive impact physical activity can have when managing the symptoms of work related stress.	Physical Activity & Stress

Table 6. Module Learning Outcomes Mapped to Units of Learning

Module Learning Outcomes **(Environment-Centred Management)**	**Unit(s) of Learning**
Discuss the role of the organisational environment and policies in both causing and managing work related stress;	Organisational Stress Organisational Policies
Describe and identify the cognitive and behavioural dimensions of the workplace;	Organisational Stress Leadership & Motivation
Detail the communication cycle and identify how non-verbal communication may enhance or detract from interpersonal communication within the workplace	Interpersonal Skills
Describe the nature and principles of a supportive working environment and the principles for developing a supportive working environment	Leadership & Motivation Organisational Policies
Describe and apply the principles of conducting a risk assessment in relation to the management of work related stress.	Risk Assessment

Describe the components of good ergonomics in relation to the workplace and management of work related stress.	Ergonomics
Describe different styles of leadership and their relationship to effecting change	Leadership & Motivation
Identify the different steps involved in planning for change & potential barriers	Change Management

2.7 Entry Requirements

The primary target audience for this programme are health and social care workers. The programme is also open to other workers (e.g. those who may not be clinically/ social qualified professionals but rather qualified in vocational disciplines related to industrial and social skills training), however, the units of learning, support materials and assessments are designed specifically for health and social care work environments.

A portion of programme material will remain as open access on the DELAROSE website (www.delarose-project.eu) as this is a stipulation of EU funding. Specifically, this will be a series of power-points slides. Full access to additional programme content is only available upon registration. This includes support material for each Unit of Learning, plus additional resources.

Learners will not have to satisfy any pre-requisites to enrol in the course (this is also a stipulation of EU funding). As such, open registration permission will be sought from Academic Council. Applicant must, however, show proof of meeting the Institute's English Language Entry Requirements if English is not their first language.

2.8 Progression Opportunities and Transfer Pathways

Students who successfully complete this programme will, if they apply to undertake the BSc in Applied Health Care (Level 7), be able to apply for exemption from the Psychology module in Year 1. The qualification will also be recognised by KFU in Austria and SUPSI in Switzerland for the purpose of programme entry.

2.9 Programme Administration and Quality Assurance

The programme will be managed by a programme board in line with the procedures for Quality Assurance and Programme Management laid down by the WIT Academic Council. As set out

in these procedures by the Academic Council, the board will comprise of the following members;

- Head of Department of Nursing and Health Care;
- Academic staff member assigned as Course Leader to the course;
- All academic staff assigned to teach on the course;
- A representative number of students from the course.
- Representation from the National Federation of Voluntary Bodies and the HSE

As a sub-committee of Academic Council, the Programme Board will be required to carry out duties of quality control and assurance as set down by Academic Council and report to Academic Council on its activities. The Programme Board will also be a committee of the School of Health Sciences and of the Department of Nursing and Health Care and as such will carry out its duties in accordance with the academic arrangements and strategic planning of the School and Department and in close collaboration with the academic management of the School and Department.

The task for ensuring the quality management of the academic processes in accordance with Institute policy lies with the Programme Board, the Department of Nursing and the School of Health Sciences. Individual members of staff are also required to co-operate with these quality management procedures within the academic structures.

The School of Health Sciences has the responsibility for the coordination of academic and other procedures, the qualifications of staff and other resource requirements, timetabling, course development and change within a broad Academic Review framework. The Department of Nursing and Health Care is the operational academic unit responsible for delivering the day-to-day teaching programmes of the Institute, and for ensuring the quality of the delivery of this programme. Due to the specialist nature the proposed programme, it is envisaged that it will be delivered by the specified staff of the Nursing, with resource also drawn from across the Institute where expertise is available (See section 3.5).

In line with Academic Council guidelines, the Programme Board will, on an annual basis, engage in the critical appraisal of the operation and success of the Programme in meeting its aims and objectives. Amongst the other quality assurance mechanisms available to the Programme Board will be periodic Programmatic Review. An external examiner will also be appointed.
In line with the other programmes in the Department, a course leader and an assistant course leader will be appointed who will have responsibility for co-ordination, administration and student support work. A programme handbook will be made available for students with an overview of the programme, details of the module and details of programme regulations and WIT procedures.

As the programme will be delivered online exclusively, learner involvement in Question & Answer sessions and through the Course Board will be achieved by asking all learners to complete a satisfaction survey at the end of each Unit of Learning.

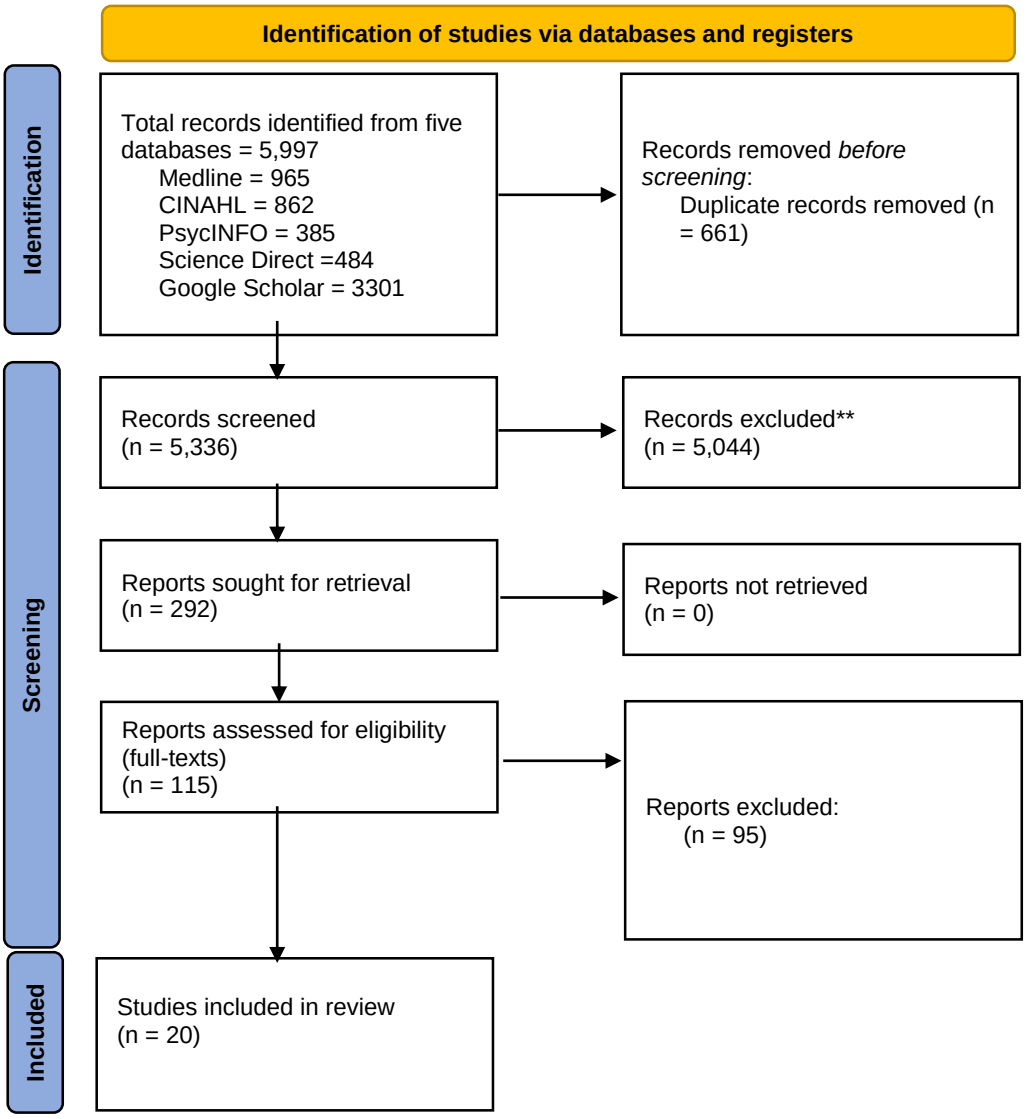
2.10 International Engagement and Collaboration

The DELAROSE programme is the product of an international collaboration between the Karl Franzens University in Austria and Scuola Universitaria Professionale della Svizzera Italiana in Switzerland. Each of these institutions will offer the DELAROSE programme as a 20 credit

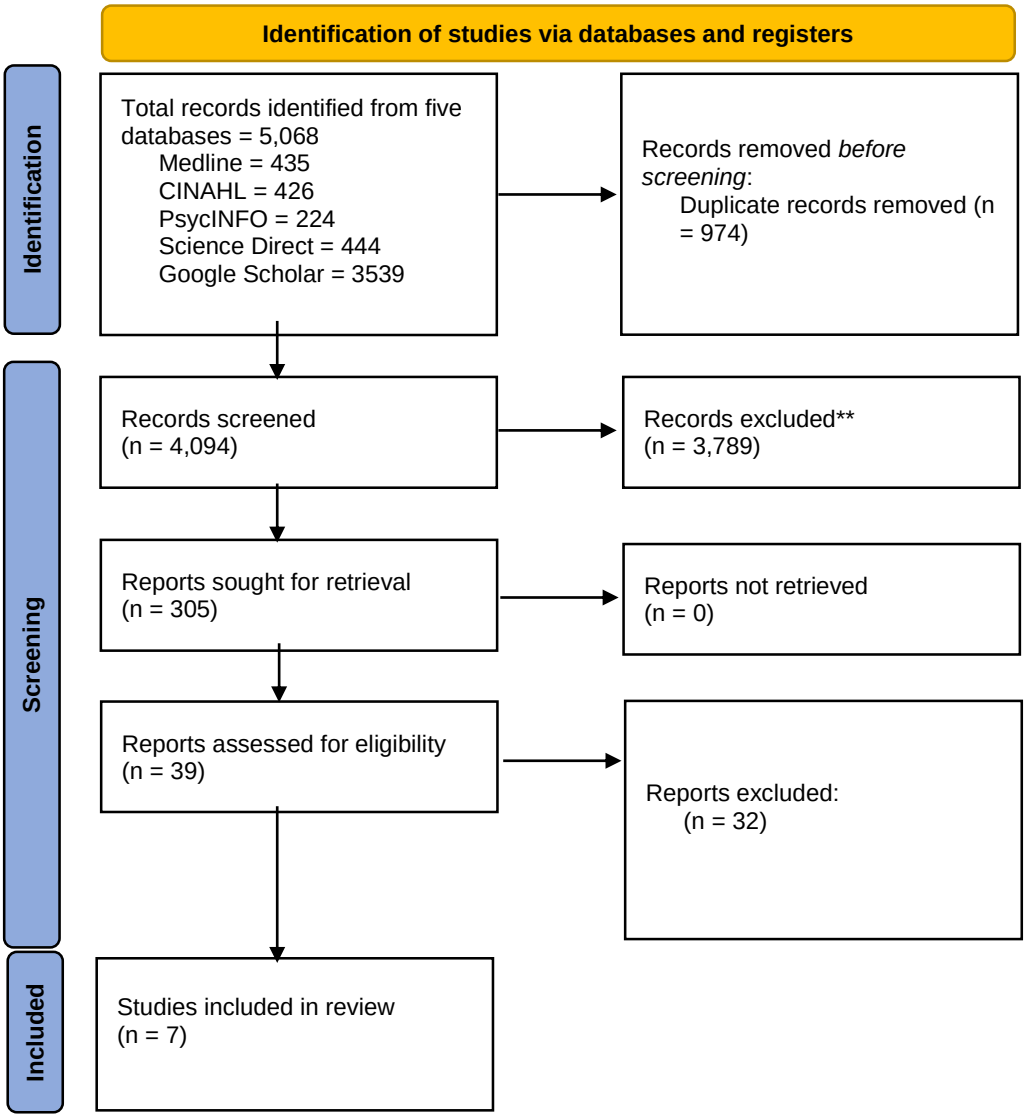
ECTs level 6 programme. To enhance the potential of the future development of the DELAROSE programme within this international context, an international programme 'oversight and development' panel will be set up consisting of the programme boards from each of these institutions (WIT, KFU and SUPSI) and the involvement of the European Association of Service Providers for People with Disabilities (EASPD). The role of this panel will be to explore potential for international collaboration in relation to programme development arising out of DELAROSE and to ensure that the DELAROSE programme in each institution broadly develops along similar lines between the three HEIs so that the needs of the sector across Europe are met.

Appendix B

Review of Challenges Encountered by Ageing Nurses in the Workplace
(Original Review -PRISMA Flow Chart)



Updated Review of Challenges Encountered by Ageing Nurses in the Workplace (PRISMA Flow Chart)



Search Terms:

(Older OR Old OR Age OR Ageing OR Aging) (Nurse OR Nurses OR Nursing) (Challenge OR Stress OR Well-being OR Health OR Strain)

(Older OR Old OR Age OR Ageing OR Aging) (Nurse OR Nurses OR Nursing)

Table 18. Chart of studies identified in initial review of ageing nurses in the workplace				
Authors; Design.	**Country**	**Participants**	**Key Findings**	**MMAT Score**
Andrews, Manthorpe and Watson (2005); Qualitative - Face to face or telephone semi-structured interviews;	United Kingdom	84 nurses aged over 50 whom work/worked in the NHS, plus 18 stakeholders (e.g. trade unions, professional bodies).	Explored employment-related decision making of nurses aged over 50. Identified 'Push' factors: Pace of Technological Change and Stress (i.e. exhaustion; short staffed workplace, lack of stamina and physical and mental 'slowing up'- need to be aware of different needs of older nurses). 'Pull' factors were Flexible Hours (important for supportive working environment, promotion of CPD, awareness of caring duties outside of workplace) and Financial Incentives (i.e. low income, need to earn full pension, may be sole household earner).	MMAT Score:****
Cameron *et al.* (2008); Mixed methods - 303 completed survey, 35 completed interviews (25 were aged 44-55, 10 aged 56-63).	Canada	303 hospital-based registered nurses, aged 45-63.	Questionnaire Findings: 57% experienced job-related lower back pain or discomfort in previous 12 months; 51% reported neck pain and over one-third reported shoulder/back, thigh/knee, ankle/foot pain in previous 12 months. Risk factors of working 12-hour or rotating shifts, inadequate sleep, little perceived control and more frequent patient handling were related to increased frequency of pain/discomfort. Of those with lower back pain, 32% felt it interfered with ability to work somewhat, nearly 20% felt it greatly interfered with ability to work. Almost half of those with thigh/knee or ankle foot problems said it interfered somewhat with ability to work. Interview findings: 63% of those aged 45-55 and 70% of those aged over 56 had experienced a musculoskeletal disorder at work. Two themes emerged as cause: patient handling and dealing patients who were mentally ill or experiencing agitation/confusion. Most had to take time off, 15% could not return to work. Injury had financial impact, affected work practices and caused guilt about leaving work to others. Nurses in this sample felt that younger workers took better care of themselves, while the impact of shift work was a cause of concern.	MMAT Score: ***
Clendon and Walker (2013); Mixed Methods - Online survey plus analysis of comments;	New Zealand	3,273 nurses aged over 50. 84.9% registered nurses, 8.04% enrolled nurses Less than 1% were	Older female nurses were significantly healthier compared to New Zealand women of same age in general population. Over 80% had no problem conducting usual activities and were not anxious or depressed. Approx. one-third reported moderate pain or discomfort, with levels of pain/discomfort increasing with age and highest in 61-70 age groups. As nurses got older they tended to move to more casual/flexible hours in order to cope with challenges of the workplace.	MMAT Score:***

		midwives or nurse practitioners. 4.7% were male.	Analysis of comments revealed that the physical demands (e.g. patient handling, giving medication) of nursing plus sensory declines, injury and chronic pain had a negative health impact on older nurses.	
Clendon and Walker (2015); Mixed Methods - Online survey plus analysis of comments. 1250 comments relating to shift work.	New Zealand	3,273 nurses aged over 50. 84.9% registered nurses, 8.04% enrolled nurses Less than 1% were midwives or nurse practitioners. 4.7% were male.	Explored older nurses' perception of shift work. Approx. one-third indicated shift work suited them and that they could cope with it, while over 30% reported that they would rather not work shifts and that it affected their health negatively. Over 20% said it was too disruptive and tiring and were worried about making mistakes due to tiredness from shift work. Comments relating to shift and impact on health/social functioning identified impact on •Family/social relationships (missed out on events, feeling isolated); •Physical/mental health (disrupted sleep patterns which caused fatigue and mistakes in practice, difficulty with living healthily); •Scheduling practices (good scheduling impacted ability to cope and their health); •Decreasing tolerance (shift work more challenging as they get older) and Coping mechanisms (changing to part-time/casual work, different area of practice, planning healthy lifestyle).	MMAT Score:***
Clendon and Walker (2015); Qualitative - Focus groups or individual interviews.	New Zealand	46 registered and enrolled nurses and nurse practitioners, aged over 50.	Explored older nurses' perception of flexible working: Identified five related themes: • Finding the balance • Personal stories (need to work flexibly due to family commitments, financial reasons or health-related reasons/fatigue) • Frustration/Barriers (experienced frustration when request for flexible working not met – obstructive procedural issues such as annual leave or minimum hours worked) • Solutions Facilitating Factors - identified that older nurses are committed to colleagues and workplace, effort and loyalty should be should be acknowledged. Experienced frustration that nurses have to be flexible but organisation is not flexible in return.	MMAT Score: ****

Durosaiye, Hadjri and Liyanage (2015); Qualitative, in-depth focus groups	United Kingdom	Study one was a preliminary study with 10 NHS staff in managerial positions from different backgrounds including HR managers and older nurses. Study two comprised a focus group with ten older nurses (age/gender not specified)	Findings from the focus group indicated that working with on the ward was most challenging for the older nurse, with physical and cognitive demands most prominent (related to moving and handling patients, caring for very sick patients). Reported the stereotype that they were less able if they had not progressed beyond staff nurse. Fast pace of work was challenging-nurses experienced less mobility and independence due to age/disability which causes difficulties relating to reduced team productivity. Lack of access and time for CPD was also an issue. Job Demands had greatest impact on physical and cognitive personal constructs. Nurses experienced reduced cognitive acuity with age which was not always recognised. Shift work also impacted sleep, recovery needs and mental performance. Environmental demands impacted physical, cognitive and sensory constructs of older nurses.	MMAT Score:**
Fragar and Depczynski (2011); Qualitative, Focus group interviews	Australia	80 nurses and allied health professionals aged over 50 from rural settings, 4 males.	Identified challenges at work for older health care workers and aged-related factors which contributed to them. Specific tasks and challenges were hospital and community ward tasks (e.g. reading communications, administering medications, manual handling, shift work, long periods of standing, sitting or walking, driving and conducting home visits); computer work and participating in education programmes. Challenges spanning work tasks and setting were mental and physical demands of work; coping with change; emotional impact of getting older; not achieving personal standards/goals or those of others; balancing work/family commitments and staying engaged and positive at work. Aged-related factors were declines in vision and hearing; reduced strength and flexibility; tiredness and mental fatigue; stiffness, pain and injury; sleep issues; deterioration in concentration and ability to learn, coping with stress, dealing with ageing and longer time to complete work.	MMAT Score:***
Friedrich *et al.* (2011);	United States	Two-phase study.	Four themes emerged in phase one which inspire nurses to remain in active practice:	MMAT Score:***

Qualitative - Focus group interviews		Phase One: 13 registered hospital nurses aged over 62. Phase Two: 12 registered hospital nurses aged from 55 to 62 years	• Attitudes and Experience (appreciation of learning, wealth of experience, culture of workplace and love of nursing) • Retention Factors (includes both retention strategies such as flexible hours and less physical challenges at work) • Needs of Older Nurse (exercise mind and body, finances, camaraderie at work • Unique contribution (sharing of experience and making a difference) Findings of phase two were consistent with data from phase one. However, there were differences in retention factors. Nurses in phase two more worried about retiring due to musculoskeletal injury and expressed greater need to move to less physical and less pressured positions in order to stay in the workplace.	
Gabrielle, Jackson and Mannix (2008); Qualitative - Semi-structured interviews face to face or via telephone (one via instant messaging)	Australia	12 nurses aged 40-60 in hospital or community settings, all female.	Explored health and ageing concerns and self-care strategies of older nurses. Two themes emerged 'Aches and Pains of Nursing' • Neglected-self • Physical changes (menopause, losses due to ageing) • Living with pain (10 of 12 had neck, shoulder or back pain due to nursing – re-injury a constant threat). • Tiredness 'Evolving self' – Changes in eating and exercise habits had positive benefits. Adaption to ageing – benefits such as maturity and confidence in abilities.	MMAT Score:****
Heiden *et al.* (2013); Quantitative, Cross-sectional survey plus physical exam	Germany	273 hospital nurses aged 21 to 63 completed a physical exam, 85% of whom were female, 35.9% aged over 45 years. 263 completed exam and survey, 165 completed survey	Investigated association between age, musculoskeletal disorders (MSD) and physical job demands in nurses. 32.7% of those aged 45 and older had a musculoskeletal disorder, with a significantly higher prevalence of among those aged over 45 compared to younger cohorts. High levels of physical job demands increased risk of MSD in middle age cohort (35-44 years) but not older or younger cohorts.	MMAT Score: ****

		only, 9 completed exam only.		
Letvak (2003a); Qualitative – in- depth interviews.	United States	14 perioperative nurses aged 50-62 years	Explored the experience of being an older perioperative (PO) nurse. Three themes emerged: • Growing old in the operating room- reported a love of the job, that PO nurses had a special status/uniqueness and much variety in work. Not 'older' but more experienced and respected. Reported loss of endurance; less energy; shift work was more difficult and mental slips/slowness on the job. 5/14 reported a work-related injury. • Interpersonal/Organisational Concerns- Stress related to being on call and scheduling which interferes with sleep and could cause hazard at work. Shift work/weekend call more difficult, while co-workers also cause of stress-need for team. Also had to cope with cultural change of surgical technologist in OR- skills of older nurse underappreciated though positive relationships were possible. • Worries about the future – staff shortage, education of new nurses, developing age gap, generational difference (attitude of younger nurses).	MMAT Score: ***
Letvak (2003b); Qualitative - in-depth interviews	United States	11 female staff hospital nurses aged 55 to 62	Explored the experience of being an older nurse Four themes emerged: • Because we care (retain love for nursing, sense of dedication and commitment) • Carry their load (confident in ability and empowered to care) • Relational workplace –Highlighted generational differences in the workplace. Older nurses enjoyed being role models, being sought after for expertise and challenge of working with younger nurses. Reported that patients were more critical now but also that they appreciated having a more experienced nurse • Organisational Relationships- most reported positive relationships with managers and that they appreciated feedback and support. Expressed concerns about staff shortage, financial worries, difficulties with work hours (night work) and the future of profession.	MMAT Score:***

Letvak (2005); Quantitative - cross-sectional survey.	United States	308 registered nurses, aged over 50. 96% were female. Range of locations (47% hospital based).	Nurses with higher job satisfaction, higher control over practice, and lower job demands had higher physical health, while higher job demands predicted lower mental health. 23.4% had experienced a job-related injury in the past five years (needle-stick and back problems most common), while 35.5% reported a job-related health problem: back pain, anxiety and depression were most common. Those with higher workplace demands and who were non-white and hospital-based were more likely to suffer an injury.	MMAT Score:**
Letvak (2009); Qualitative - In-depth interviews (two per participant – face to face and telephone follow-up).	United States	14 registered nurses aged 50-65 with a history of depression and or musculoskeletal pain.	Hurting at Work: Lived experience of the older nurse. 4 major themes emerged: • Daily Struggle- each experienced pain on a daily basis, physical (exhaustion after shift work) and emotional drain (experience of sadness) of work. Inner strength and courage required to work through pain. Reported retention of a love for bedside nursing. • Practice has changed- work more slowly, longer time to complete tasks, reaction time has decreased even in emergency. Patient safety concerns due to time to intervene and difficulties with sustaining concentration. • Coping Style- Positive coping involved changing schedule; sharing trouble; receiving support from home and seek assistance from colleagues for practice. Negative coping involved weight gain, calling in sick and taking extra time to recover. • Team support- supportive relationship and acknowledgment of when in pain very important to older nurses. Administrative support can be lacking (patients are prioritised). Need to recognise experience of older nurse and express compassion.	MMAT Score:****
Letvak, Ruhm and Gupta (2013); Quantitative – Cross sectional survey.	United States	1,171 registered nurses, 91% female, 26% aged over 50.	Compared differences in health, productivity and quality of care between older and younger nurses. Older nurses had significantly higher Body Mass Index, average pain levels and average productivity loss than younger nurses. They also had a 12% higher prevalence of health problems and significantly more health	MMAT Score: ***

			problems than younger nurses. Mental well-being was also significantly better compared to younger nurses.	
Mion et al. (2006); Qualitative - focus groups. Three groups comprised older nurses aged 46 to 73; one group comprised nurses aged 22-29 years. Another focus group with 7 nurse managers also conducted.	United States	26 staff nurses aged 22 to 73, from a trauma centre in a county healthcare system in Northeast Ohio.	Focus groups identified contributions of older nurses, potential roles or functions for older nurses, barriers to continued employment, and facilitators to continued employment. Findings were aggregated, four themes emerged; • Worth of the Older Nurse: older nurses were committed and knowledgeable, had much life experience and were empathic and understanding. Provide mentoring and leadership role. • Generational issues: Different values acknowledged by both. Older more committed to unit, more accepting of change, more experience. Conflict based on perks received by older nurses versus physical declines. • Role of Ageing Nurse: new roles needed for older nurses to utilise their clinical skills • Support me as Ageing Nurse: Important to understand reality of ageing nurse and challenges they face such as physical declines, stamina, disease, eldercare, shift work).	MMAT Score: **
Spiva, Hart and McVay (2011); Qualitative - semi-structured interviews.	United States	18 nurses in direct patient care aged 55 to 67. 17 were female, 1 was male. integrated healthcare system located in a South-eastern state. The integrated healthcare system consists of five hospitals, physician practice groups, and outpatient services	Participants described experience of being an older bedside nurse and identified ways that influence older nurses to continue practice. Findings resulted in three constitutive patterns and eight themes: • Attribution: Professional growth in skills and confidence (connection/empathy with patients, calmness, commitment, work ethic. Generational differences-younger nurses should listen more, lack of respect for experience) and Passion and love for nursing. • Enduring stress and frustration: Physical and Mental work demands (work demands, lack of energy, fast pace, emotionally draining, memory declines, dealing with own deficits); Patient acuity and patient load; Constant change and Time Constraints (electronic records, new skills, lack of time, make it harder to deliver patient care) • Enhancements needed to continue- Work environment and Organisational enhancements (change physical layout-need for	MMAT Score: ****

			support, education, teamwork. 12 hour shifts are demanding. Supportive and understanding administration- need to understand demands of patient care and needs of older nurses.	
Squire (2008); Qualitative - in-depth interviews.	New Zealand	10 registered nurses aged over 60, all female, range of healthcare settings	Explore the lived experiences and their meaning for older nurses: Five main themes emerged: • Changing nature of work - Nursing role has expanded into community, cultural change, biomedical technology advances, much expertise required (new or up-grading of skills), development of specialist nursing roles. • Meaning of Work-nursing still offers meaningful quality work- nurses highlighted importance of autonomy, enjoyment, contribution, intellectual stimulation, diversity. Reported an interest in teaching/mentoring role and that they retained fitness/energy. • Social role of women- difficulties with re-entering workforce, traditional carer roles (eldercare), managing stereotypes of women working • Work and the ageing body- did not perceive they had a disability/unable to work but did experience sensory changes, a need to move into different settings and a greater need for recovery. Musculoskeletal issues were more common and several had their own health concerns. • Ethic of Care- experienced contrast between biomedical/business model of care and the need for empathy, connectedness, emotional feeling and protecting vulnerable patients.	MMAT Score:****
Rigby & O'Connor (2012); Qualitative - informal discussions with staff;	Australia and England	Care home and inpatient hospice centres: 9 in England and 7 in Australia. Anonymised - number and gender of participants not specified- older nurses	Explored impact of physical working environment on older nurses Reported that physical and emotional stressors were becoming more stressful due to patient needs being more complex and poor quality of work conditions Nurses struggled with their own health concerns: several reported back and shoulder pain from years of work. Physical environment caused emotional stress (e.g. making changes in working environment without consultation, working in a medicalised environment).	MMAT Score: **

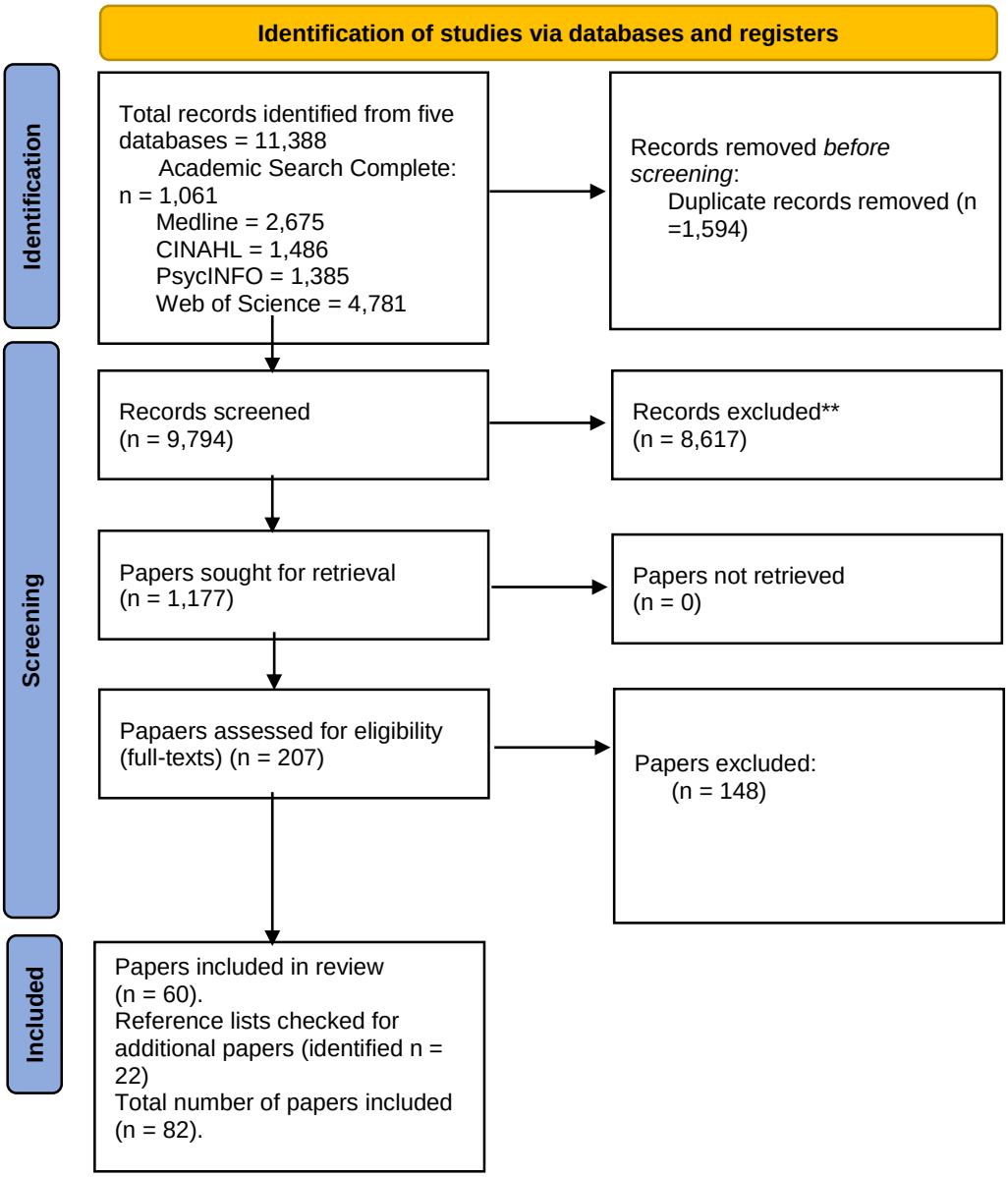
		(mostly female, two male staff included).		
Ward-Smith *et al.* (2007); Qualitative - focus groups.	United States	33 Older paediatric nurses ('Baby Boom' generation – born between 1946 and 1964)	Identify characteristics that enabled them to provide care and describe practices that would enable them to continue in their position. Each group identified that they appreciated the atmosphere and culture of the organisation they worked for. Physical demands, specifically 12 hour shifts, were identified as the most challenged aspect of the job (those with 10 years or less tenure at their hospital highlighted both physical and mental demands as most challenging). Increased use of computer technology was identified as stressful. Assistance with stress management, coping support, help in caring for both children and aging parents, benefit flexibility were identified as important.	MMAT Score: ***

Table 19. Chart of studies identified in updated review of ageing nurses in the workplace				
Authors, Methods, Sample	**Country**	**Sample**	**Key Findings**	**MMAT Score**
Ang *et al.* (2017); Mixed-methods - Survey and interviews.	Singapore	534 nurses completed survey, 30 completed interviews. All aged 50 and older, working in a healthcare cluster.	The top three challenges were coping with changes, working with computers and reading labels. Place of work, salary range, gender and race were significantly associated with different work-related challenges. Five themes emerged from the qualitative data: physical demands of work and workload, new technology, need for further education, working with younger nurses and in intercultural teams, and changing public expectations and professional image.	MMAT: ***
Clendon and Walker (2016); Mixed-methods - Survey and Interviews.	New Zealand	3,273 completed survey that collected free text and categorical data. 46 participated in focus groups and interviews.	Data were categorised in two themes: the challenges of ageing and nursing; and factors that enable nurses to continue to practice. Physical challenges, fatigue, guilt, ageism and demands to complete continuing education were considered challenges. Maintaining personal fitness, self-care, flexible working and a strong belief in their ability to contribute to the profession were present in older nurses who continued to practice.	MMAT: ***
Fackler *et al.* (2019); Qualitative - focus groups	United States	20 hospital medical and surgical clinical nurses aged 50 and older	Two key themes in relation to work-related stress. Shorter/fewer work hours Nurse participants across multiple focus groups discussed the de- sire and/or necessity as they aged to decrease the number of hours worked, either per week or per shift. Nurses also expressed worry resignation about the physical changes of ageing and the demands of the physical work of nursing. Both the reality of ageing and the worry about carrying on was expressed across all the focus groups. Some nurse participants also discussed the physical challenges in the context of a commitment to care for themselves so they could continue working.	MMAT: ***

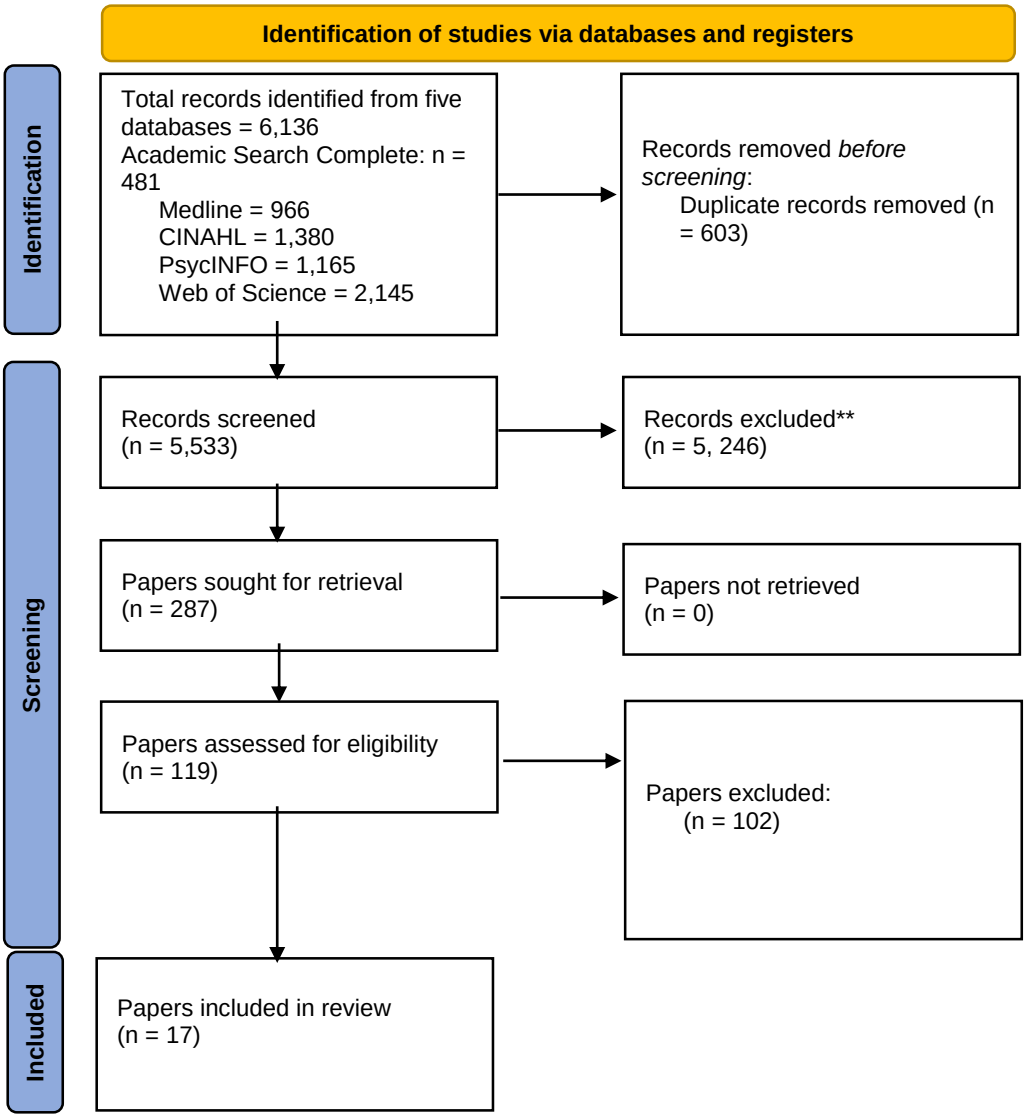
Helass *et al.* (2022); Qualitative – Individual interviews and focus groups.	Germany	50 hospital nurses	Working in mixed-age teams triggered difficulties and was responsible for conflicts between generations. A perceived lack of equal treatment between older and younger colleagues in the planning of work shifts, financial benefits, vacation days, and work distribution (e.g. physically demanding work or difficult patients) led feelings of injustice and frustration, and conflicts.	MMAT: ***
Sousa-Ribeiro Lindfors and Knudsen (2022); Qualitative – semi-structured interviews.	Sweden	12 ICU nurses aged 55 – 65 years.	The nurses in this study reported good health and were satisfied and committed to their job and organisation. They possessed the job and personal resources required to cope with the physical and mental demands of their work. These were perceived as motivational challenges, rather than hinders.	MMAT: ***
Topa *et al.* (2016); Quantitative - cross-sectional survey.	Spain	255 nurses aged 45 years and over, recruited from four large hospitals	The direct effect of imbalance on health complaints was supported; it was significant when over-commitment was low but not when it was high. Organisational injustice mediated the influence of effort–reward imbalance on health complaints. The conditional effect of the mediation of organisational injustice was significant in three of the over-commitment/age conditions but it weakened, becoming non-significant, when the level of over-commitment was low and age was high.	MMAT: ***
Lewko *et al*. (2019); Quantitative - cross-sectional survey.	Poland	523 randomly selected professionally active nurses aged over 40 years old	Mental health was significantly correlated with financial situation. Among respondents describing their financial status as bad, the assessment of negative mental health symptoms was higher. The co-occurrence of chronic diseases affected the intensification of negative mental health symptoms	MMAT: ***

Appendix C

Review of Experience of Work-Related Stress among Intellectual Disability Care Workers (Original Review - PRISMA Flow Chart)



Updated Review of Experience of Work-Related Stress Among Intellectual Disability Care Workers
(PRISMA Flow Chart)



Search Terms: (challenge OR Stress OR well-being OR health OR strain OR burnout OR stress) AND (learning disability OR intellectual disability OR developmental OR retardation) AND (staff OR care OR carer OR support OR work OR worker OR occupation)

Table 20. Papers Identified in Initial Review of Intellectual Disability Care Workers				
Authors, Methods, Sample	**Country**	**Study Title; Setting; Measures**	**Key Findings**	**MMAT Score; Nurses Included?**
Aitken and Schloss (1994) Quantitative, n = 150 Cross-sectional survey	Australia	Occupational stress and burnout amongst staff working with people with an intellectual disability Institution and community setting. Occupational Stress Inventory; Maslach Burnout Inventory.	Burnout and stress found to be higher in institutional settings compared to community settings.	MMAT: ** Not stated if nurses sampled. 40% response rate.
Alexander and Hegarty (2000) Quantitative, n = 13 Cross-sectional survey	United Kingdom	Measuring staff burnout in a community home. Community residential home. Maslach Burnout Inventory	Both staff groups reported moderate stress/burnout; Day care reported shortage of staff; medical problems (back pain); shift work; morale; working with others and feeling 'always on'. Senior staff reported demands; bad attitude; medical administration; staff issues; autonomy; demands from others. Colleagues/supervision main source of support.	MMAT: ** Not stated if nurses sampled. No response rate indicated.
Bailey *et al.* (2006) Mixed-methods; n = 43, 17 completed two surveys, 16 completed one. 16 care staff observed also.	United Kingdom	The response to challenging behaviour by care staff: emotional responses, attributions of cause and observations of practice Day centres. Challenging Behaviour Attributions Scale; Emotional Responses to Challenging Behaviour Scale; Optimism and Willingness to Help	Care staff's internal, stable and uncontrollable attribution of challenging behaviour (including self-injury) related to negative emotional responses. Did not support Weiner's (1988) Model of Attribution.	MMAT: **** Not stated if nurses sampled. No response rate indicated.
Blumenthal, Lavender and Hewson (1999) Quantitative, n = 106 Cross-sectional survey	United Kingdom	Role clarity, perception of the organization and burnout amongst support workers in residential homes for people with intellectual disability: A	Constructed a measure of role clarity and perception of the organization. Most support workers regarded their role as being clear and their levels of burnout to be comparable with UK nursing norms. Charity staff more likely to view	MMAT: *** Not stated if nurses sampled. 75% response rate.

		comparison between a National Health Service trust and a charitable company Residential homes. Constructed measure of role clarity; Maslach Burnout Inventory.	their organization positively and rated their emotional exhaustion as significantly lower than NHS trust staff. Significant proportion of colleagues displayed emotional reactions such as sadness, despair, anger, annoyance, fear and disgust to episodes of challenging behaviour	
Bromley and Emerson (1995) Quantitative, n = 70, cross-sectional survey.	United Kingdom	Beliefs and emotional reactions of care staff working with people with challenging behaviour. Range of different care settings including residential homes, schools, day care, and hostels. Opinion regarding causes of challenging behaviour; the emotional reactions of care staff, and aspects challenging behaviour judged to cause the greatest stress.	The 'daily grind' of caring, difficulty in understanding the person's behaviour, the unpredictability of the behaviour and the apparent absence of an effective way forward most stressful aspects. Causes of challenging behaviour attributed to internal psychological, broad environmental, behavioural and medical factors	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Chung, Corbett and Cumella (1996) Quantitative, n = 26 Cross-sectional survey	United Kingdom	Relating staff burnout to clients with challenging behaviour in people with a learning difficulty: Pilot study 2 Maslach Burnout Inventory	Burnout among care workers more related to management issues at work rather than client issues.	MMAT: ** Not stated if nurses sampled. No response rate indicated.
Chung and Corbett (1998) Quantitative, n = 26	United Kingdom	The burnout of nursing staff working with challenging behaviour clients in hospital-based bungalows and a community unit.	Nurses in hospital-based units experienced more severe challenging behaviour, complained more, were less satisfied with pay, experienced less client contact, were more likely to feel their	MMAT: ** Described as nursing staff though not

Cross-sectional survey, compare groups.		Hospital-based bungalows and community unit. Maslach Burnout Inventory	training was inadequate and experienced more emotional exhaustion and depersonalisation than those based in community units.	completed nursing training. No response rate indicated.
Chung and Harding (2009) Quantitative, n =103 Cross-sectional survey	United Kingdom	Investigating burnout and psychological well-being of staff working with people with intellectual disabilities and challenging behaviour: the role of personality. Residential community setting. Aberrant Behaviour Checklist; Maslach Burnout Inventory; General Health Questionnaire; NEO-Five Factor Inventory.	Higher neuroticism predicted higher levels of emotional exhaustion and lower personal accomplishment. Converse found for extraversion. Higher conscientiousness predicted higher levels of depersonalisation (moderated by agreeableness) while neuroticism and extraversion moderated the relationship between challenging behaviour and personal accomplishment.	MMAT: *** 20% of sample were qualified nurses. 69% response rate.
Conradie *et al.* (2017) Quantitative, n = 89 Cross-sectional survey.	South Africa	A profile of perceived stress factors among nursing staff working with intellectually disabled in-patients at the Free State Psychiatric Complex, South Africa Psychiatric Complex Personal stress factors; occupational stress factors; stress factors influencing the health status of the nursing staff.	Occupational stressors identified were workload and long hours; lack of decision-making; underpayment; endangerment of physical health and safety issues; pressure; uncertainty of employment; responsibility and perceiving that their skills/training not appreciated.	MMAT: ** Most of the nursing staff were nursing assistants (50.7%), followed by health workers (20.5%) and nursing students (11.0%). 89% response rate.
Corrigan *et al.* (1993) Quantitative, n = 322 Cross-sectional survey	United States	Staff stressors at a developmental center and state hospital Developmental centre and state hospital	Factor analysis of stress revealed lack of admin control and practice-related stress. Opposition to behaviour therapy predicted job stress	MMAT: *** Included nursing staff.

		Survey of stressful experiences.	Difference in stress by job category – higher in nurses, developmental specialists and psychiatric technicians.	
Cudre-Mauroux (2010) Qualitative, n = 10 Semi-structured interviews	Switzerland	Self-efficacy and stress of staff managing challenging behaviours of people with learning disabilities Social institutions for persons with intellectual disabilities	Perceptions of competencies to support the persons showing challenging behaviours influences their stress experience. Strong self-efficacy represented by perseverance to reach the goals and the ability to adapt their responses to the situation – one without the other risks staff exhaustion. Multiple competencies involved in a situation of challenging behaviour, including context, difficulty of the task has to be addressed and domains of functioning	MMAT: *** Not stated if nurses sampled.
Dagnan, Trower and Smith (1998) Quantitative, n = 40 Cross-sectional survey.	United Kingdom	Care staff responses to people with learning disabilities and challenging behaviour: A cognitive—emotional analysis. Residential care. Attributional Style Questionnaire; Optimism-pessimism scale; plus, their emotional response and willingness to put extra effort in to helping change the behaviour in response to six examples of challenging behaviour.	Those working with people with challenging behaviour more likely to evaluate the person more positively and report they would be more likely to offer extra effort in helping. Helping behaviour best predicted by optimism, which was best predicted by negative emotion which was best predicted by the attribution of controllability.	MMAT: *** Not stated if nurses sampled. 40 selected for survey - no response rate indicated.
Devereux *et al.* (2009) Quantitative; n = 96, 38 completed 22 month-follow up. Cross-sectional survey	United Kingdom	Social support and coping as mediators or moderators of the impact of work stressors on burnout in intellectual disability support staff. Residential hospital site and a small community-based unit.	Social support at work moderated relationship between workplace demands and personal accomplishment. Higher demands related to greater emotional exhaustion (partially mediated by 'Wishful thinking'). Practical coping did not effect relationship but was predictive of personal accomplishment. Longitudinal analysis did not find that perceived work demands, wishful	MMAT: *** Half of the sample comprised qualified nurses at both time points. 50% response rate.

		Staff Stressor Questionnaire; Maslach Burnout Questionnaire; Shortened Ways of Coping Questionnaire; Staff Support and Satisfaction Questionnaire.	thinking or practical coping predicted emotional exhaustion over time.	
Dilworth, Phillips and Rose (2010) Quantitative, n = 43 care managers, n = 43 residential key workers, n = 96 care staff. Cross sectional survey, comparison b/n groups	United Kingdom	Factors relating to staff attributions of control over challenging behaviour. Residential services with challenging behaviour. 43 CM and 43 RKW completed assessments, remaining care staff completed survey. Disability Assessment Schedule; Adaptive Behaviour Scale – Residential and Community; Controllability Beliefs Scale; Service System Assessment.	Challenging behaviour perceived to being less under personal control if the organisation was of better quality. Attributions of control lower if staff displayed positive attitudes towards the client, the physical and social environment was appropriate and the overall approach to delivering care seemed well-structured. No relationship between attributions of control and ability of the individual or the overall level of challenging behaviour.	MMAT: *** Not stated if nurses sampled. 44% response rate.
Dyer and Quine (1998) Quantitative, n = 80 Cross-sectional survey.	United Kingdom	Predictors of job satisfaction and burnout among the direct care staff of a community learning disability service Community Service. Role conflict and role ambiguity scales.	Role conflict; role ambiguity and role overload as prominent demands placed upon staff in an NHS learning disability service. Lack of participation in decision-making as a significant demand placed encountered by staff in a learning disability service	MMAT: *** There were staff at all levels of the nursing scale, from Grade A through to Grade I, with 51% of the respondents working at Grade B (the level of experienced nursing assistants) 91% response rate.
Edwards and Miltenberger (1991) Quantitative, n =125	United States	Burnout among staff members at community residential facilities for persons with mental retardation	Moderate degree of burnout reported by both direct care workers and supervisors. Supervisors	MMAT: *** Not stated if nurses sampled.

Cross-sectional survey		Community residential facilities. Maslach Burnout Inventory.	reported higher burnout (greater emotional exhaustion) and less personal accomplishment.	No response rate indicated.
Elliott and Rose (1997), Quantitative, n = 44 community home managers Cross-sectional survey	United Kingdom	An investigation of stress experienced by managers of community homes for people with intellectual disabilities. Community homes. Job Pressure and Job Dissatisfaction; Powell's Questionnaire of Occupational Stress; Sources of Support.	Exploration of sources of stress based on Powell's (1992) questionnaire of sources of stress suggested staff represented more of a supervisory burden than a source of support	MMAT: ** No response rate indicated.
Freeman (1994) Mixed-methods. n = 89 from Time 1-2; n = 71 from Time 2-3 for longitudinal survey; plus, three interviews.	United Kingdom	The differential impact on carers dealing with clients with challenging behaviours. Community homes. Optimism and Pessimism Scale; Malaise Inventory.	Carers socialised in a traditional setting responded to challenging behaviours by becoming more negative in their attitudes towards clients. Strain related directly to challenging behaviours and unrelated to attitudes which remained positive.	MMAT: ** Not stated if nurses sampled. No response rate indicated.
Figueiredo-Ferraz *et al.* (2012) Quantitative, n = 422 Longitudinal with one year follow up (2015), n = 372. Cross-sectional survey	Spain	Influence of some psychosocial factors on mobbing and its consequences among employees working with people with intellectual disabilities. Companies that provide care to people with intellectual disabilities in stimulation, occupational, day and residential centres.	Mobbing – interpersonal aggression and intention to harm between workers. Role clarity and social support at work can play a role in preventing mobbing, while role ambiguity can encourage it. Significant consequences for employee health (psychosomatic well-being and predicts absenteeism). Longitudinal study found that mobbing had a longer term impact on depressive symptoms – significantly higher depressive symptoms at Time 2 compared to those who did not experience at Time 1 or 2 or just Time 2	MMAT: **** Not stated if nurses sampled. 62.5% response rate.

		UNIPSICO Scale to assess Role Ambiguity, Clarity, Support, and Mobbing.	.	
Gil-Monte and Peiró (1996) Quantitative, n = 95. Cross-sectional survey.	Spain	A study on significant sources of the "burnout syndrome" in workers at occupational centres for the mentally disabled. Occupational centres for the mentally disabled. Trait Sport-Confidence Inventory; Organisational Stress Questionnaire; Maslach Burnout Inventory.	Regression analysis showed that role ambiguity, together with self-confidence, were significant predictors of personal accomplishment, while role conflict was found to be a significant predictor of emotional exhaustion. Evidence for modulation effects of self-confidence on the relationship between role ambiguity and personal accomplishment was obtained.	MMAT: ** Not stated if nurses sampled. No response rate indicated.
Gil-Monte (2012) Quantitative, n = 700 Cross-sectional survey	Spain	The Influence of Guilt on the Relationship Between Burnout and Depression. Did not specify area of work. Organisational Stress Questionnaire; Job Content Questionnaire; SBI; Zung Self-Rating Depression Scale;	Guilt defined as unpleasant/remorseful feeling associated with violating a moral standard. Guilt found to moderate relationship between depersonalisation and depression, may have role in burnout process.	MMAT: **** Not stated if nurses sampled. 50.4% response rate.
Gingi (2012) Quantitative, n = 127 Cross-sectional survey Inclusion criteria was involved in or having witnessed violence directed at a nurse.	South Africa	Responses of nurses to violence from adults with ID in an in-patient psychiatric facility. In-patient psychiatric facility. Resilience Assessment Scale; Revised Impact of Events Scale.	Response distributed across avoidance, introversion, hyper arousal. 82.75% of the nurses in this sample fitted the symptoms of PTSD, over 80% scored moderately to very highly on scores of resilience.	MMAT: ** Professional nurses, enrolled nurses and enrolled nursing assistants). 71.4% response rate.

Gray-Stanley and Muramatsu (2011) Quantitative, n = 323 Cross-sectional survey	United States	Stress, burnout and social and personal resources among direct care workers in community ID. Community-based organizations that provide residential, vocational, and personal care services Maslach Burnout Inventory; Work Stress (Overload; Ambiguity; Conflict; Participation in Decision-Making, Client Disability); Work Social Support; Locus of Control	Work-overload, limited participation in decision making and client disability care associated with increased burnout. Low social support related to increased burnout when workload was high. Internal control beliefs reduced feeling of burnout when participation in decision making was limited (reverse for external control beliefs).	MMAT: **** Not stated if nurses sampled. 47% response rate.
Harries *et al.* (2015) Quantitative, n = 87 Cross-sectional survey	Australia	Evaluation of the Work Safety and Psychosocial Wellbeing of Disability Support Workers: Predicting wellbeing using the Job Demand-Control-Support (JDCS) model General Nordic Questionnaire for Psychological and Social Factors at Work; Nordic Occupational Safety Climate Questionnaire-50; Copenhagen Burnout Inventory.	Participants experienced significantly higher personal and work-related burnout but significantly lower client-related burnout compared to population norms. The JDCS model components did not all predict any single wellbeing measure. However, they each predicted individual aspects of burnout and job satisfaction. Well-being measures were associated with safety performance. Role Conflict was moderated by support for personal and work-related burnout and job satisfaction.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Hatton and Emerson (1993) Quantitative, n = 64 Cross-sectional survey	United Kingdom	Organizational predictors of perceived staff stress, satisfaction, and intended turnover in a service for people with multiple disabilities Residential facility.	Support from other staff (mainly supervisory), job variety, perceived org democracy, goodness of fit b/n attitude and aims of staff and those of org, staff development and income.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Hatton *et al.* (1995) Quantitative, n = 68	United Kingdom	Stressors, coping strategies and stress-related outcomes among direct care	Work stress predicted by emotional impact of work, violent behaviour and wishful thinking.	MMAT: **

Cross-sectional survey		staff in staffed houses for people with learning disabilities. Small staffed community houses.	General distress related to conflict of work with personal/family life. Stress, uncertainty with tasks and limited opportunity for advancement all had a high impact on work stress.	Not stated if nurses sampled. No response rate indicated.
Hatton *et al.* (1999) Quantitative, n = 450 Cross-sectional survey.	United Kingdom	Factors associated with staff stress and work satisfaction in services for people with intellectual disability Residential and non-residential community services. Job activities; Job Control; Quantitative Workload; Role Ambiguity and Conflict; Job Feedback; Support from supervisors/colleagues; Influence over work decisions; Potential Sources of Stress; Job Strain; Commitment; Actual and ideal organisational culture; Coping Strategies; Community services orientation; GHQ; Work Satisfaction (Hackman and Oldman); Labour Conditions. Most adapted from NHS Workforce Initiative Survey (Borrill et *al.* 1996).	Wishful thinking; work-home conflict and role ambiguity predicted stress. Job strain related to wishful thinking, lack of support, alienative commitment, role ambiguity, low status of job, longer hours.	MMAT: *** Describes a range of staff, not indicated if any were nurses. 44% response rate
Hatton *et al.* (1999) Quantitative, n = 522 Cross-sectional survey.	United Kingdom	Staff Characteristics, Working Conditions and Outcomes Amongst Staff in Services for People with Intellectual Disabilities Community residential and educational services General Health Questionnaire; Self-reported health behaviours.	One-third of staff reported high levels of distress, which was reflected in poorer self-reported health and greater self-reported stress or pressure, compared to population generally. Just over half had taken sick leave in the past six months, and one-eighth of staff had applied for another job in the past three months.	MMAT: ** Sample comprised a range of staff, including nurses, though did not specify how many 42% response rate

Hensel, Lunsky and Dewa (2012) Quantitative, n = 926, Cross-sectional survey	Canada	Exposure to client aggression and burnout among community staff who support adults with intellectual disabilities in Ontario, Canada Community services. Frequency and severity of exposure to client aggression; Maslach Burnout Inventory	Nearly all reported exposure to aggression in previous six months. Aggression related to burnout (emotional exhaustion and depersonalisation).	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Hensel *et al.* (2014) Quantitative, n = 42 matched pairs sample created by matching community and hospital staff on gender, age, years of experience, hours worked and education	Canada	The mediating effect of severity of client aggression on burnout between hospital inpatient and community residential staff who support adults with intellectual disabilities. Hospital, community and residential staff. Exposure to Aggression; Difficult Behaviour Self-Efficacy Scale; Maslach Burnout Inventory.	Hospital staff experienced more severe aggression and were more emotionally exhausted than community staff. Partial mediating effect of severity of aggression in hospital and community – more severe, more emotionally exhausted.	MMAT: ** Matched sample included some with nursing qualification. No response rate indicated.
Hickey (2012) Quantitative, n = 1570 Cross-sectional survey	Canada	Prosocial motivation, stress and burnout among direct support workers. Range of different services. PANAS; Job Satisfaction; Affective Organisational Commitment; Prosocial Behaviour; Occupational Role Questionnaire; Maslach Burnout Inventory.	Prosocial motivation may moderate or buffer against burnout among direct care workers. Depersonalisation scores lower for staff with high motivation, this was especially pronounced in cases where staff had high emotional exhaustion. Depersonalisation higher among staff with high role boundary stress in case of low motivation. Increased role ambiguity stress associated with lower personal accomplishment in case of lower motivation.	MMAT: **** Not stated if nurses sampled. Estimated 40% response rate.

Howard and Hegarty (2003) Qualitative, n = 6 Interviews	United Kingdom	Violent Incidents and Staff Stress Specialist, residential school for children with learning disabilities	Content analysis of semi-structured interviews identified seven key themes: The physical force of violence; Staff reactions to violence; Acceptance of violence; The importance of support; Coping strategies used by staff; Effect of violence on the relationship between staff and students, and Mediators of the staff reaction to violence.	MMAT: ** Not stated if nurses sampled.
Howard, Rose and Levenson (2008). Quantitative, n = 44 in medium security, n = 38	United Kingdom	The Psychological Impact of Violence on Staff Working with Adults with Intellectual Disabilities Community Services. Maslach Burnout Inventory; The Staff Support and Satisfaction Questionnaire; Difficult Behaviour Self-Efficacy Scale; Fear of Violence.	Lower fear of violence and higher self-efficacy in medium secure staff. Burnout related to increased exposure to physical violence and reduced staff support. Higher threat of violence related to lower fear. Higher support related to lower emotional exhaustion; higher self-efficacy related to higher personal accomplishment. More physical/verbal aggression related to increased emotional exhaustion, verbal aggression also related to reduced personal accomplishment. Physical violence related to burnout but self-efficacy moderated relationship.	MMAT: ** Not stated if nurses sampled. Response rates of 48% and 43%.
Ito, Kurita and Shiiya (1999) Quantitative, n = 3,774. Cross-sectional survey.	Japan	Burnout among direct-care staff members of facilities for persons with mental retardation in Japan Range of facilities. Pines' Burnout Scale; working conditions; characteristics of consumers; supervisor support.	Burnout higher among direct care staff compared to facility director or middle managers. Burnout was lower among staff who felt that they could consult supervisors about work or personal problems compared to those who felt they could not.	MMAT: *** Not stated if nurses sampled. 84.6% response rate.
Jenkins, Rose and Lovell (1997) Quantitative, n = 78	United Kingdom	Psychological well-being of staff working with people who have challenging behaviour.	Higher anxiety among staff working in houses where clients had challenging behaviours – also felt less supported, less clear about identifying	MMAT: *** Not stated if nurses sampled.

Cross-sectional survey		Small community homes. AAMR Adaptive Behaviour Scale—Residential and Community, Checklist of Challenging Behaviour; Demands of the Job Questionnaire; Thoughts and Feeling Index; The Staff Support Questionnaire; Perceptions of Challenging Behaviour.	risky situations and lower job satisfaction. No difference in demand or depression. Challenging Behaviour emerged as the best predictor of anxiety, with Job Demands second best predictor. These accounted for 21% of the variance.	82.7% response rate.
Judd, Dorozenko and Breen (2017) Qualitative, n = 12 Interviews.	Australia	Workplace stress, burnout and coping: a qualitative study of the experiences of Australian disability support workers. Disability services that provided supported employment for people living with intellectual and physical disabilities.	Theme of Balance identified, relation to positive and negative experiences of work, managing periods of imbalance and strategies to reclaim balance. Rewards included seeing client develop new skills and express appreciation for work. Challenges were challenging behaviour, low income and limited decision making power. Sought support and developed own strategies to manage.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Kile (2014) Quantitative, n = 222 Cross-sectional survey	United States	**Relationship among relational coping and reciprocity in direct care staffing services for adults with developmental disabilities and challenging behaviour** Behaviour Problems Inventory; Ways of Coping Inventory; Relationship-focused Coping; Reciprocity; Maslach Burnout Inventory.	Low to moderate levels of burnout found. Challenging behaviour related to higher emotional exhaustion and depersonalisation. Emotion-focused coping was related to emotional exhaustion and depersonalisation. Problem focused coping related to increased personal accomplishment. Relationship-focused most effective; related to higher personal accomplishment. Emotional exhaustion related to lack of reciprocity (across clients, colleagues and organisation). Inequity within the org related to all three burnout measures. Relationship between challenging behaviour and burnout weaker when	MMAT: *** Not stated if nurses sampled. No response rate indicated.

			staff felt they had invested more in clients and organisation than the reverse.	
Ko *et al.* (2012) Quantitative, n = 169 Cross-sectional survey.	Canada	Burnout among summer camp staff supporting people with intellectual disability and aggression. Exposure to aggression (frequency and severity); Maslach Burnout Inventory.	Frequent exposure to severe aggression was related to higher levels of emotional exhaustion and lower personal accomplishment	MMAT: *** Not stated if nurses sampled. 16/28 camps participated. No response rate indicated.
Koritsas *et al.* (2010) Mixed-methods. Qualitative, n =11; Quantitative, n = 191 Survey and interview.	Australia	Exposure to challenging behaviour and support worker/house supervisor well-being. Supported accommodation (44%), day programmes (40%), respite (10%), supported employment (4%), and case management (0.5%). For qualitative component, seven of the participants worked in shared supported accommodation, and four worked in day programmes. Exposure to Challenging Behaviour Questionnaire; Maslach Burnout Inventory; Ways of Coping; DASS; Job Content Questionnaire.	Qualitative research found awareness of triggers for challenging and that staff implemented strategies to manage (mostly reactive). Most were exposed to CB (almost half had experienced injury; over half had seen injury in others). Depression related to reduced decision latitude, lower education, exposure to challenging behaviour. Stress was predicted by exposure to challenging behaviour, lower education, and decision latitude. Emotional exhaustion associated with higher psychological job demands and more exposure to challenging behaviour. Personal accomplishment increased as decision latitude increased.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Kowalski *et al.* (2010) Quantitative, n = 175 Cross-sectional survey	Germany	Associations between emotional exhaustion, social capital, workload, and latitude in decision-making among professionals working with people with disabilities	Workload, latitude in decision-making and being of a male gender were all significant predictors of emotional exhaustion in this study. The strongest inter-correlations between professional experience, age, and job tenure. Social capital was inversely correlated with emotional	MMAT: *** Included nurses and nursing assistants in sample, but not stated how many.

		Sheltered workshop and homes. Maslach Burnout Inventory; Social capital in organizations; Workload; Latitude in Decision-making (Richter *et al*. 2000).	exhaustion; the lower the social capital in the organisation perceived by an employee, the higher the emotional exhaustion.	56.8% response rate.
Kozak *et al.* (2013) Quantitative, n = 409 Cross-sectional survey.	Germany	Psychosocial work-related predictors and consequences of personal burnout among staff working with people with intellectual disabilities. Range of different facilities and service providers. Copenhagen Psychosocial Questionnaire; Copenhagen Burnout Inventory.	Personal burnout related to work-privacy conflict, emotional demands, role conflict, job insecurity and feedback (49%). Higher burnout related to higher intention to leave and stress symptoms. Lower burnout related to job satisfaction, good health and higher life satisfaction.	MMAT: **** 13.9% nurses, 4.9 nurses' aides. 45% response rate, though this varied from 11% to 90% across facilities.
Kurz, Bethay and Ladner-Graham (2014) Quantitative, n = 128 Cross-sectional survey	United States	Mediating the relation between workplace stressors and distress in ID support staff: Comparison between the roles of psychological inflexibility and coping styles. Large state residential programme. DASS; Staff Stressor Questionnaire Shortened Ways of Coping Questionnaire-Revised; Acceptance and Action Questionnaire.	Psychological flexibility (defined as 'Willingness to experience difficult thoughts and emotions, and to relinquish one's efforts to control the same') mediated the impact of workplace demands on psychological distress.	MMAT: *** Not stated if nurses sampled.7.4% worked in a nursing department. No response rate indicated.
Lahana *et al.* (2017) Quantitative, n = 180 Cross-sectional survey	Greece	Burnout among nurses working in social welfare centres for the disabled	Burnout levels were found to be high. Marital status, routine and supervisor relationship and professional experience related to emotional exhaustion and depersonalisation. Relationship	MMAT: *** Included registered nurses, assistant nurses and carers.

		Regional annexes of social welfare centres for the intellectually disabled in Greece. Maslach Burnout Inventory; Occupational variables including income satisfaction; work relationships with colleagues and superiors; staff adequacy; daily routine; the types of shifts and the number of shifts.	with colleagues was associated with all three dimensions of burnout syndrome.	59.60% response rate,
Langdon, Yágüez and Kuipers (2007) Mixed-methods, n = 27. Speech sample plus survey	United Kingdom	Staff working with people who have intellectual disabilities within secure hospitals: Expressed emotion and its relationship to burnout, stress and coping. Secure hospitals	63% coded as having high expressed emotion. These participants reported significantly higher levels of depersonalisation and lower levels of personal accomplishment.	MMAT: ** Not stated if nurses sampled. Initially, the participants completed the taped five-minute speech sample (FMSS) about a client of their choice for whom they acted as a keyworker.
Lee *et al.* (2009) Quantitative, n = 1,243 Cross-sectional survey	Taiwan	Extrinsic high-effort and low-reward conditions at work among institutional staff caring for people with intellectual disabilities in Taiwan Range of institutions. Effort-Reward Imbalance Questionnaire	15% - Low Effort/Low Reward; 35.9% - Low Effort/High Reward;17.9% - High Effort/High Reward; 31.1% - High Effort/Low Reward. Perceived job support, control, demands and stress related to high effort/low reward at work.	MMAT: **** Not stated if nurses sampled. 76.7% response rate.
Lernihan and Sweeney (2010) Quantitative, n = 69 Cross-sectional survey	Ireland	Measuring levels of burnout among care workers. Residential and day care facilities. Maslach Burnout Inventory.	30% reported moderate to high emotional exhaustion, most did not report high depersonalisation. Two-thirds higher in personal accomplishment. Emotional exhaustion significantly higher in residential compared to day care staff.	MMAT: ** Not stated if nurses sampled. No response rate indicated.

Leyin and Wakerly (2007) Quantitative. Cross-sectional survey.	United Kingdom	Staff Support, Staff Stress and Job Satisfaction in Working with People with Learning Disabilities and Challenging Behaviours Residential facilities.	Only informal supports from colleagues were negatively correlated with ratings of work-related stress. Work-related stress and job satisfaction were not correlated.	MMAT: ** Not stated if nurses sampled. No response rate indicated.
Lin and Lin (2009) Quantitative, n = 276 Cross-sectional survey.	Taiwan	Job burnout amongst the institutional caregivers working with individuals with intellectual and developmental disabilities: Utilization of the Chinese version of the Copenhagen Burnout Inventory survey Disability institutions Chinese Burnout Inventory; Personal Burnout.	Burnout scores higher compared with general full time employees in Taiwan. 17.8% were moderately burnt out; 7.6% were in the highest exhaustion level. Multiple regression analysis determined that self-report health status and work burnout significantly predicted higher respondent personal burnout.	MMAT: *** 92% response rate.
Lin *et al.* (2009) Quantitative, n = 1,243 Cross-sectional survey.	Taiwan	Job strain and determinants in staff working in institutions for people with intellectual disabilities in Taiwan: A test of the Job Demand-Control-Support model. Range of institutions. Job Content Questionnaire; Effort–Reward Imbalance Questionnaire; and self-perceived heath status.	Staff characteristics such as working hours, age, gender, job title, educational level, religion, in-job training, working years in disability institutions and Effort–Reward Imbalance factors were correlated with job strain. Organization factors, such as geographical, institutional ownership and accreditation performance and size were also correlated with staff's job strain. Logistic regression model found that financial reward, extrinsic effort and perceived job stress significantly correlated with the high job strain.	MMAT: *** 3.7% nurses. 76.7% response rate.
Lin, Wu and Lin (2015) Quantitative, n = 46,	Taiwan	Comparison of job burnout and life satisfaction between native and foreign female direct care workers in disability institutions	Native workers had higher burnout (personal and work-related). Job satisfaction slightly higher among foreign compared to native workers (non-significant).	MMAT: ** Not stated if nurses sampled.

Cross-sectional survey 23 locals, 23 foreign workers.		Two disability institutions. Maslach Burnout Inventory; Subjective Happiness Scale; Satisfaction with Life Scale.		No response rate indicated.
Lundstrom *et al.* (2007a) Quantitative, n =112 Cross-sectional survey	Sweden	Personality impact on experiences of strain among staff exposed to violence in care of people with intellectual disabilities. Group homes for persons with learning disabilities.	No evidence of direct influence of personality variables on exposure to violence. Personality dimensions of harm avoidance and self-directedness were related to increased burnout, tedium, emotional exhaustion, and depersonalization. Temperament and Character Inventory; Rosenberg's Self-Esteem Scale; Emotional Reactions in Nursing Care Scale; Strain in Nursing Care; Pines Burnout; Maslach Burnout Inventory.	MMAT: *** One registered nurse (1%), five assistant nurses (4%), and 106 nurse's aides (95%). No response rate indicated.
Lundstrom *et al.* (2007b) Quantitative, n = 120 Cross-sectional survey	Sweden	Prevalence of violence and its relation to caregivers' demographics and emotional reactions – an explorative study of caregivers working in group homes for persons with learning disabilities Group homes Frequency and types of incidents, and respondents' emotional reactions and management of violent incidents.	31% exposed to violence during the preceding year with physical violence most common. Daytime work was the only independent factor in a regression model predicting violence towards the caregivers. Of those exposed to violence; violent incidents occurred several times a week (41%) while 24% (7.5% of all caregivers) reported daily exposure to violence. 73% of caregivers reported that the violent incidents were only managed by internal discussions with colleagues.	MMAT: *** All caregivers, i.e. Registered Nurses, assistant nurses and nurse's aides, working in group homes for persons with learning disabilities were invited. 81% response rate.

Lunsky et al. (2014) Quantitative, n = 926 Cross-sectional survey.	Canada	Perceptions of positive contributions and burnout in community developmental disability workers. Community services staff, including residential services, vocational supports, and other types of day programmes. Maslach Burnout Inventory; Staff Positive Contributions Scale.	Factor analysis identified two factors: General positive contributions and Positive work motivation. Positive work motivation associated with higher levels of personal accomplishment.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Mascha (2006) Quantitative, n =36 Cross-sectional survey	United Kingdom	Staff morale in day care centres for adults with intellectual disabilities. Day care centres Maslach Burnout Inventory; Staff Support Questionnaire; Shortened Ways of Coping (Revised) Questionnaire .	Wishful thinking related to lower levels of role clarity and more emotional exhaustion, as well as lower levels of lack of personal accomplishment. Staff who were satisfied with supervision reported higher role clarity and job satisfaction and lower levels of intended turnover and emotional exhaustion. Emotional exhaustion also highly associated with lower levels of satisfaction with support, role clarity and overall job satisfaction.	MMAT: ** Not stated if nurses sampled. No response rate indicated.
Mitchell and Hastings (2001) Quantitative, n = 83 Cross-sectional survey	United States	Coping, burnout, and emotion in staff working in community services for people with challenging behaviors Community residential services. Emotional Reactions to Aggressive Challenging Behavior Scale; Maslach Burnout Inventory; COPE Inventory	Adaptive coping more frequent than maladaptive coping when faced with challenging behaviour. Disengagement, adaptive coping and emotional reaction to aggressive behaviour predicted burnout. Negative emotional reaction to aggressive behaviour predicted emotional exhaustion and depersonalisation.	MMAT: ** Not stated if nurses sampled. 41% response rate.
Mills and Rose (2011) Quantitative, n = 78	United Kingdom	The relationship between challenging behaviour, burnout and cognitive	Relationship between challenging behaviour and burnout mediated by ‘fear of potential assault’.	MMAT: **

Cross-sectional survey		variables in staff working with people who have intellectual disabilities. Residential homes Checklist of Challenging Behaviour; Maslach Burnout Inventory; Challenging Behaviour Perception; Controllability Beliefs Scale; Fear of Assault.	Higher challenging behaviour related to greater fear of assault. Greater fear of assault and challenging behaviour related to increased burnout (on all measures). Cognitive variables of consequence carer/control carer/emotional representation related to burnout. 'Fear of assault' mediated the relationship between aggressive behaviour and emotional exhaustion and depersonalisation. 'Emotional representation' mediated relationship between CB and depersonalisation.	11.84% qualified nursing staff. 33% response rate.
Mutkins *et al.* (2011) Quantitative, n = 80 Cross-sectional survey	Australia	Stress, depression, workplace and social supports and burnout in intellectual disability support staff. Range of support services. Maslach Burnout Inventory; Exposure to Challenging Behaviour; DASS; Social Support Questionnaire.	Depression and lower perceived organisational support related to higher worse emotional exhaustion and depersonalisation. Less social support related to lower personal accomplishment. Satisfaction with social support moderated between psychological stress and burnout.	MMAT: *** One third had allied healthcare qualification, such as nursing. Estimated 23% response rate.
Outar and Rose (2017) Quantitative, n = 70 Cross-sectional survey	United Kingdom	Is there a relationship between role identity, work demands, and burnout in direct care staff working with individuals with intellectual disability? Community services. Maslach Burnout Inventory; Demands of the Job Inventory; Self-Determination; Role Identity	Demands related to emotional exhaustion and depersonalisation; role identity related to personal accomplishment and self-determination.	MMAT: ** Not stated if nurses sampled. 44.6% response rate.
Raczka (2005) Qualitative, Focus group interviews	United Kingdom	A focus group enquiry into stress experienced by staff working with people with challenging behaviours.	Gathered information from community staff regarding their experiences of stress when	MMAT: *** Not stated if nurses sampled.

		Community services	working with people with learning disabilities and challenging behaviours.	
Robertson *et al.* (2005) Quantitative, n = 157 Cross-sectional survey	United Kingdom	Staff stress and morale in community-based settings for people with intellectual disabilities and challenging behaviour: a brief report Community supported accommodation. Sources of Stress; Job Strain; General Health Questionnaire; Sick Leave; Work Satisfaction (Hackman and Oldman).	Congregate settings not associated with higher levels of stress. Overall, over a quarter of staff reached criterion on the GHQ for experiencing emotional distress, and over a third were likely to actively seek new employment in the next year. The greatest perceived sources of stress were lack of resources and lack of staff support. The lowest level of satisfaction was with the rate of pay. Those in non-congregate settings reported greater perceived stress due to lack of procedures to deal with challenging behaviour.	MMAT: *** Not stated if nurses sampled. 44% response rate.
Rose (1993) Quantitative, n = 112 Cross-sectional survey	United Kingdom	Stress and Staff in Residential Settings: The Move from Hospital to the Community. Hospital, community unit, and group home staff. Questionnaire based on Payne's Model of Occupational Stress.	Hospital and group home staff reported similar, relatively high levels of strain. Community unit group reported significantly lower levels of strain.	MMAT: *** Not stated if nurses sampled. 64% to 79% response rates.
Rose (1999) Quantitative, n = 216 Cross-sectional survey	United Kingdom	Stress and residential staff who work with people who have an intellectual disability: A factor analytic study. Residential staff.	Development of a questionnaire and collection of data. Factors of demands and support correlated with depression and anxiety among staff.	MMAT: *** Not stated if nurses sampled. 76% response rate.
Rose, Ahuja and Jones (2006) Quantitative, n = 72	United Kingdom	Attitudes of direct care staff towards external professionals, team climate	Care staff attitudes towards professionals and levels of team climate related to psychological well-being.	MMAT: *** Not stated if nurses sampled.

Cross-sectional survey		and psychological wellbeing: A pilot study Residential care homes		60% response rate.
Rose and Cleary (2007) Quantitative, n = 87 Cross-sectional survey	United Kingdom	Care staff perceptions of challenging behaviour and fear of assault. Residential services Fear of Assault (Leather *et al.* 1997; Van der Wurff *et al.* 1988)	Investigated fear of assault in relation to exposure to challenging behaviour. The extent to which a social psychological model of fear of assault could be generalised to care staff was tested. Staff exposed to more challenging behaviour had high a fear of assault.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Rose, David and Jones (2003) Quantitative, n = 131 Cross-sectional survey	United Kingdom	Staff who work with people who have intellectual disabilities: The importance of personality. Community based homes. Demands of the Job Inventory; Staff Support and Satisfaction Questionnaire; Eysenck Personality Inventory; Ways of Coping Questionnaire; General Health Questionnaire.	Higher demands and lower support linked to poorer psychological well-being. Higher neuroticism and lower extraversion related to higher stress. Practical coping not related to work strain, though wishful thinking related to higher stress. Neuroticism and wishful thinking moderated relationship between demands and higher stress.	MMAT: *** Not stated if nurses sampled. 81% response rate.
Rose *et al.* (2004) Two quantitative studies, n = 101 and n = 99, both surveys.	United Kingdom	Negative emotional reactions to challenging behaviour and staff burnout (replication studies of a previous study by Mitchell and Hastings, 2001). Community services Maslach Burnout Inventory; Emotional Reactions to Challenging Behaviour scale.	Both studies found relationship between negative emotional reaction to challenging behaviour and emotional exhaustion and depersonalisation (not personal accomplishment).	MMAT: *** Not stated if nurses sampled, training/qualification varied, typically support workers. No response rate indicated.

Rose *et al.* (2010) Quantitative, n = 242 Cross-sectional survey	United Kingdom	Reciprocity and burnout in direct care staff. Residential care workers in a range of services; 92 were ID staff. Reciprocity (Van Horn *et al.* 2001); Maslach Burnout Inventory.	'Under benefit' in relationships with service users, colleagues and the organisation related to emotional exhaustion. 'Under benefit' in organisational and staff relationships related to increased depersonalisation.	MMAT: *** Not stated if nurses sampled. 45% response rate.
Rose *et al.* (2013) Quantitative, n = 77 Cross-sectional survey	United Kingdom	Client characteristics, organizational variables and burnout in care staff: The mediating role of fear of assault. Residential services, majority community, some secure units. Checklist of Challenging Behaviors; Maslach Burnout Inventory; Modified Essen Climate Evaluation Schema.	Relationship between challenging behaviour and emotional exhaustion fully mediated by fear of assault. Relationship between emotional exhaustion and experienced safety also fully mediated by fear of assault.	MMAT: ** Not stated if nurses sampled. 11.84% qualified nurses. No response rate indicated.
Rose and Schelewa-Davies (1997) Quantitative, n = 29 Cross-sectional survey	United Kingdom	The relationship between staff stress and team climate in residential services. All community residences within a trust.	Team climate, namely greater support for innovation and task orientation (commitment to high performance) associated with reduced staff stress	MMAT: ** Not stated if nurses sampled. 75.5% response rate.
Rose and Rose (2005) Quantitative, n = 107 Cross-sectional surveys	United Kingdom	Staff in services for people with intellectual disabilities: the impact of stress on attributions of challenging behaviour. Attribution Style Questionnaire; Emotion Reactions; Optimism; Aberrant Behaviour Checklist; General	Although staff reported high stress levels and moderate burnout, this did not appear to have any relationship to their reporting of thoughts and feelings and propensity to help regarding challenging behaviour in study vignettes.	MMAT: *** Not stated if nurses sampled. 71% response rate.

		Health Questionnaire; Maslach Burnout Inventory; Helping Behaviour.		
Rose, Jones and Fletcher (1998) Mixed-methods, n = 33. Survey plus observational data	United Kingdom	Investigating the relationship between stress and worker behaviour Community residential homes. Adaptive Behaviour Scale; Behaviour Problems Inventory; Thoughts and Feelings Index;	Residential group homes were classified as `low stress' and four as `high stress'. Staff in the high stress homes reported greater demands and less support than those in the low stress homes. Higher levels of interaction were found between staff and residents in low stress houses, whereas activities in higher-stress group homes appeared to be more community oriented.	MMAT: ** Not stated if nurses sampled. No response rate indicated.
Shaddock, Hill and van Limbeek (1998) Quantitative, n = 173 Cross-sectional survey	Australia	Factors associated with burnout in workers in residential facilities for people with an intellectual disability. Residential facilities	Association between the burnout and variables such as religious affiliation, personal relationships, perceived skill levels, job satisfaction, case-loads, decision-making and social support. Significant associations were found between burnout scores and some demographic variables. Low burnout scores were associated with some features of the work situation.	MMAT: *** Not stated if nurses sampled. 73% response rate.
Shead, Scott and Rose (2016) Quantitative, n = 86 Cross-sectional survey	United Kingdom	Investigating predictors and moderators of burnout in staff working in services for people with intellectual disabilities: the role of emotional intelligence, exposure to violence, and self-efficacy. Residential support workers. Violence Scale; Difficult Behaviour Self-efficacy; Maslach Burnout Inventory; Trait Emotional Intelligence Questionnaire.	Exposure to violence and low self-efficacy predicted emotional exhaustion and depersonalisation. Self-efficacy moderated the relationship between exposure to violence, emotional exhaustion and depersonalisation.	MMAT: *** Not stated if nurses sampled. 43% response rate.
Smithson-Sims (1996)	United Kingdom	Coping and stress: Unqualified direct-care staff working with challenging	Both emotion-focused and problem-focused coping strategies used when dealing with the	MMAT: ***

Quantitative, n = 105, Cross-sectional survey. Two wards in hospital and four units in community bed unit.		behaviour clients in learning disability residential settings. Hospital and community settings. Ways of Coping Questionnaire; General Health Questionnaire.	demands of the workplace. Significant association between use of problem-focused coping strategies and lower levels of stress and incidence of stress caseness. Also significant association between use of predominantly emotion-focused coping strategies and higher levels of stress and incidence of stress 'caseness'.	Unqualified refers to without requisite qualifications e.g. nurses (nurses excluded). 62% response rate.
Smyth, Healy and Lydon (2015) Quantitative, n = 138 Cross-sectional survey	United Kingdom	An analysis of stress, burnout, and work commitment among disability support staff in the UK. Residential community homes in large organisation. Behaviour Problems Inventory; Maslach Burnout Inventory; Perceived Stress Scale; TCM Employee Commitment Survey.	Exposure to challenging behaviour associated with perceived stress and emotional exhaustion. Perceived stress and burnout were associated with work commitment. Frequency and severity of aggressive/destructive behaviour predicted depersonalisation. Greater perceived stress was a predictor of depersonalisation and emotional exhaustion.	MMAT: **** Not stated if nurses sampled. No response rate indicated.
Stube (2015) Quantitative, n = 201 Cross-sectional survey	United States	The prediction of staff burnout indicators in ID community services by staff depression, work functioning, and working alliance. Community services Maslach Burnout Inventory; Treatment Outcome Package; Working Alliance Inventory.	Depression, working alliance and work functioning all related to difference aspect of burnout (no interaction effect for working alliance). Depression predicted all burnout measures (emotional exhaustion strongest). Work functioning predicted emo exhaustion and depersonalisation (depersonalisation strongest). Working alliance predicted depersonalisation (best predictor of personal accomplishment).	MMAT: *** Diversity in range of jobs, including some nursing staff, but not stated how many. No response rate indicated.
Tartakovsky, Gafter-Shor and Perelman-Hayim (2013)	Israel	Staff members of community services for people with intellectual disability	Higher preference for self-transcendence values and a lower preference for the self-enhancement values associated with a lower level of	MMAT: *** Not stated if nurses sampled.

Quantitative, n = 222 Cross-sectional survey		and severe mental illness: values, attitudes, and burnout. Community services Community Living Attitudes Scale; Portrait Value Questionnaire; Maslach Burnout Inventory.	depersonalisation and a higher sense of professional accomplishment. A more positive attitude toward empowerment, a higher sense of similarity, and a more negative attitude toward exclusion associated with lower burnout.	Response rate ranged from 25% to 60%.
Thomas and Rose (2010) Quantitative, n = 102 Cross-sectional survey	United Kingdom	The relationship between reciprocity and the emotional and behavioural responses of staff. Community care homes. Global Reciprocity; Specific Reciprocity; Maslach Burnout; Optimism; Helping Behaviour Scale; PANAS.	A lack of reciprocity in care staff relationships related to burnout. Emotional exhaustion and depersonalisation were also found to be related to negative affect, positive emotion, optimism and helping behaviours; while personal accomplishment was related to negative mood, positive emotion, optimism and helping behaviour.	MMAT: *** Not stated if nurses sampled. 66% response rate.
Van Dierendonck, Schaufeli and Buunk (1996) Quantitative, n = 301 Cross-sectional survey (n = 189 in care of mentally disabled)	Netherlands	Inequity Among Human Service Professionals: Measurement and Relation to Burnout Staff members in institute and also therapists in forensic setting (small scale institutions). Maslach Burnout Inventory; Austin Measure; measure of detailed and global equity.	Majority of professionals felt under-benefited in relation with recipients as well as in relation with their organization. Inequity was curvilinearly related to burnout. Staff who felt over-benefited experienced more burnout than colleagues who felt under-benefited.	MMAT: *** Not stated if nurses sampled. 73% response rate.
Van Dierendonck, Schaufeli and Buunk, (2001) Quantitative, n = 245 (n = 125 in care of mentally disabled)	Netherlands	Burnout and inequity among human service professionals: A longitudinal study. Range of professionals in different groups/studies.	Inequity affected the central component of burnout (emotional exhaustion). This relationship was curvilinear. Feeling more deprived and feeling more advantaged resulted in higher future emotional exhaustion levels. No	MMAT: *** Not stated if nurses sampled. Response rate of 68% to 72%.

Longitudinal survey		Maslach Burnout Inventory; Perceptions of Equity.	longitudinal relation between inequity and depersonalisation.	
Vassos and Nankervis (2012) Quantitative, n = 108 Cross-sectional survey	Australia	Investigating the importance of various individual, interpersonal, organisational and demographic variables when predicting job burnout in disability support workers. Range of ID disability settings, including employment, supported accommodation, outreach, day programmes, and respite. Maslach Burnout Inventory; Staff Stressor Questionnaire.	Challenging behaviour (interpersonal), workload (individual), supervisor support (individual), work-home conflict (individual), job feedback (individual), role ambiguity (organisational), low job status (organisational), role conflict (organisational), gender (demographic) and work hours (demographic) all predicted one or more of the facets of burnout	MMAT: ** Not stated if nurses sampled. No response rate indicated.
Vassos *et al.* (2013) Quantitative, n = 258 Cross-sectional survey	Australia	Engagement and burnout in disability support staff as predicted by JDR model. Primarily day and residential services Utrecht Work Engagement Scale; Maslach Burnout Inventory; Staff Stressor Questionnaire.	Role ambiguity related to all three measures of engagement and burnout. Accounted for most unique variance in 3 scores of engagement and PA. Resources (job feedback) related to engagement and all burnout measures.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Vassos *et al.* (2017) Quantitative, n = 325 Cross-sectional survey	Australia	Can the JDR-S model predict stress in disability workers? Primarily day and residential services Workload/Control and Support (from Hatton *et al.* 1999); Maslach Burnout	High workload, low control and low colleague support related to higher burnout and lower engagement. High support and increased control reduced the impact of workload on these variables.	MMAT: *** Not stated if nurses sampled. No response rate indicated.

		Inventory; Utrecht Work Engagement Scale.		
Wanless and Jahoda (2002) Quantitative, n = 38. Vignette survey.	United Kingdom	Responses of staff towards people with mild to moderate intellectual disability who behave aggressively: a cognitive emotional analysis Six day centre services. Questionnaires with two brief vignettes describing incidents of physical and verbal aggression; Cognitive-Emotional Interview followed by same measures.	More negative emotions to real aggression versus hypothetical vignettes. Failed to support Weiner's model of aggression.	MMAT: ** Not stated if nurses sampled. 38 responded and consented.

Table 21. Papers identified through updated review of intellectual disability care workers				
Authors, Methods, Sample	**Country**	**Study Title and Setting**	**Key Findings**	**MMAT Score; Nurses Included?**
Boamah and Barbee (2022) Quantitative, n = 406 Cross-sectional survey	United States	Prevalence of secondary traumatic stress among direct support professionals in intellectual and developmental disabilities field Community agencies	DSPs were exposed to traumatic experiences; exposure to a greater number of traumatised clients significantly correlated with symptoms of secondary traumatic stress. At least 12.4% of DSPs in this sample met the diagnostic criteria for experiencing post-traumatic stress disorder symptoms. Differences in secondary traumatic stress symptoms may be based on demographics	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Boamah Barbee and Cunningham (2022) Quantitative, n = 406 Cross-sectional survey	United States	Predictors of secondary traumatic stress among intellectual and developmental disabilities workforce: An examination of risk and protective factors. Community agencies	Exposure to client trauma, exposure to frequency of client challenging behaviours, and workers' own trauma history were risk factors for secondary traumatic stress. Personal resilience and organisational support were protective factors. Perceived supervisor support did not significantly impact secondary traumatic stress.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Couderc *et al.* (2021) Quantitative, n = 125 Cross-sectional survey	France	Burnout among direct support workers of adults with autism spectrum disorder and intellectual disability Residential care homes Maslach Burnout Inventory; Appraisal of Life Events Scale; Ways of Coping Checklist;	Five per cent of DSWs were in a state of burnout. Eighteen, six and fifty-nine per cent showed high average scores of emotional exhaustion, depersonalisation and loss of a sense of personal accomplishment, respectively. Being older, specialised training in ASD, stress perceived as a challenge and problem-focused coping strategies were associated with low levels of depersonalisation and loss of a sense of personal accomplishment	MMAT: *** Health professionals (e.g. nurses) excluded. 31% held nursing auxiliary qualification. 96.1% response rate.

Deveau and McGill (2019) Quantitative, n = 144 Cross-sectional survey	United Kingdom	Staff experiences working in community-based services for people with learning disabilities who show behaviour described as challenging: The role of management support Community-based residential services Perceived severity of challenging behaviour; Practice Leadership measure; Copenhagen Burnout Inventory; Staff Experiences and Satisfaction Questionnaire; Difficult behaviour self-efficacy.	Practice leadership was positively associated with more frequent contact with the manager. Better staff experiences were associated with more frequent contact with the manager and practice leadership and negatively with challenging behaviours.	MMAT: *** Not stated if nurses sampled. 34.4% response rate.
Embregts Tournier and Frielink (2021) Qualitative, n = 11 Audio-recorded messages	Netherlands	Experiences and needs of direct support staff working with people with intellectual disabilities during the COVID-19 pandemic: A thematic analysis Five intellectual disability care services	The four themes generated from the data related to the emotional, cognitive, practice and professional impact of the pandemic on their work.	MMAT: ** Not stated if nurses sampled. No response rate indicated.
Finkelstein *et al.* (2018) Quantitative, n = 199 Cross-sectional survey	Israel	Correlates of burnout among professionals working with people with intellectual and developmental disabilities: Burnout among professionals working with people with IDD Facilities that provide care. Maslach Burnout Inventory; Subjective Overload (Hatton *et al*.); Role Conflict and Ambiguity questionnaire; Job Involvement (Kanungo 1982).	No significant differences in burnout levels among the different professionals. Role ambiguity, perceived overload, care-recipient group and job involvement were significant predictors of burnout. Most predictors were organisational measures.	MMAT: *** 12.1% Physicians or nurses. 66% response rate.
Flynn *et al.* (2018) Quantitative, n = 186	United Kingdom	Is the amount of exposure to aggressive challenging behaviour related to staff	Little association between staff exposure to aggressive CB and work-related well-being.	MMAT: ***

Cross-sectional survey		work-related well-being in intellectual disability services? Evidence from a clustered research design Residential care homes and supported living services Maslach Burnout Questionnaire; Staff Empathy for People with Challenging Behaviour Questionnaire; Challenging Behaviour Self-Efficacy Scale; Staff Positive Contributions Questionnaire.	Clustering effects were found for emotional exhaustion and positive work motivation, suggesting these variables are more likely to be influenced by the environment in which staff work.	Not stated if nurses sampled. No response rate indicated.
Klaver *et al*. (2021) Quantitative, n = 1271 Cross-sectional survey	Netherlands	Exposure to challenging behaviours and burnout symptoms among care staff: the role of psychological resources Day and residential services Maslach Burnout Inventory-Human Services Survey (MBI-HSS); Aberrant Behaviour Checklist; Job Content Questionnaire; Challenging Behaviour Self-efficacy; Utecht Coping; NEO-5; Brief Resilience.	Exposure to challenging behaviours related to increased burnout symptoms in staff. Perceived supervisor social support, staff self-efficacy, resilience, and extraversion were associated with reduced burnout. Psychological resources did not moderate association between exposure to challenging behaviours and burnout symptoms of staff.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Lunsky *et al*. (2021) Quantitative, n = 833 Cross-sectional survey	Canada	Predictors of worker mental health in intellectual disability services during COVID-19 Range of services. Perception of Covid-19 related risks; Patient Health Questionnaire.	One in four workers reported moderate to severe emotional distress. Being older and more experienced, having counselling services available through one's agency, and engaging in regular exercise or hobbies outside work were associated with less distress. Workers who reported increased stress, stigma towards their families because of their job, personal fears about spreading COVID-19, and receipt of	MMAT: ** Not stated if nurses sampled. No response rate indicated..

			medications for mental health conditions or therapy reported greater distress.	
McMahon *et al.* (2020) Quantitative, n = 285 Cross-sectional survey	Ireland	An audit of the well-being of staff working in intellectual disability settings in Ireland during the COVID-19 pandemic Range of services - most worked in residential or congregated care settings Copenhagen Burnout Inventory; Patient Health Questionnaire; General Anxiety Disorder-7.	Moderate levels of personal and work-related burnout and mild levels of anxiety and depression. Higher mean scores from staff who worked in independent living settings and from staff who supported individuals with challenging behaviour.	MMAT: ** The majority of respondents were nurses (n = 134), health-care assistants (n = 64) and social care workers (n = 59). No response rate indicated.
Moriarty *et al.* (2019) Quantitative, n = 69 Cross-sectional survey	Ireland	Role-related stress and perceptions of the keyworker role among professionals supporting adults with intellectual disabilities Residential units, day/training services and supported employment centres, supported independent living services and administration. Key-DAB inventory; Experiences with the keyworking role; job autonomy, perceived influence over work decisions, role clarity, role conflict, peer support, and supervisor support (from West *et al.* 1996); pressure at work; work satisfaction.	Keyworkers had more internally oriented LoC and experienced lower work pressure than non-keyworking colleagues. Keyworkers who are clear about what is expected of the keyworker are more satisfied with their role and perceive keyworking as beneficial to them.	MMAT: ** Not stated if nurses sampled. 48.8% response rate.

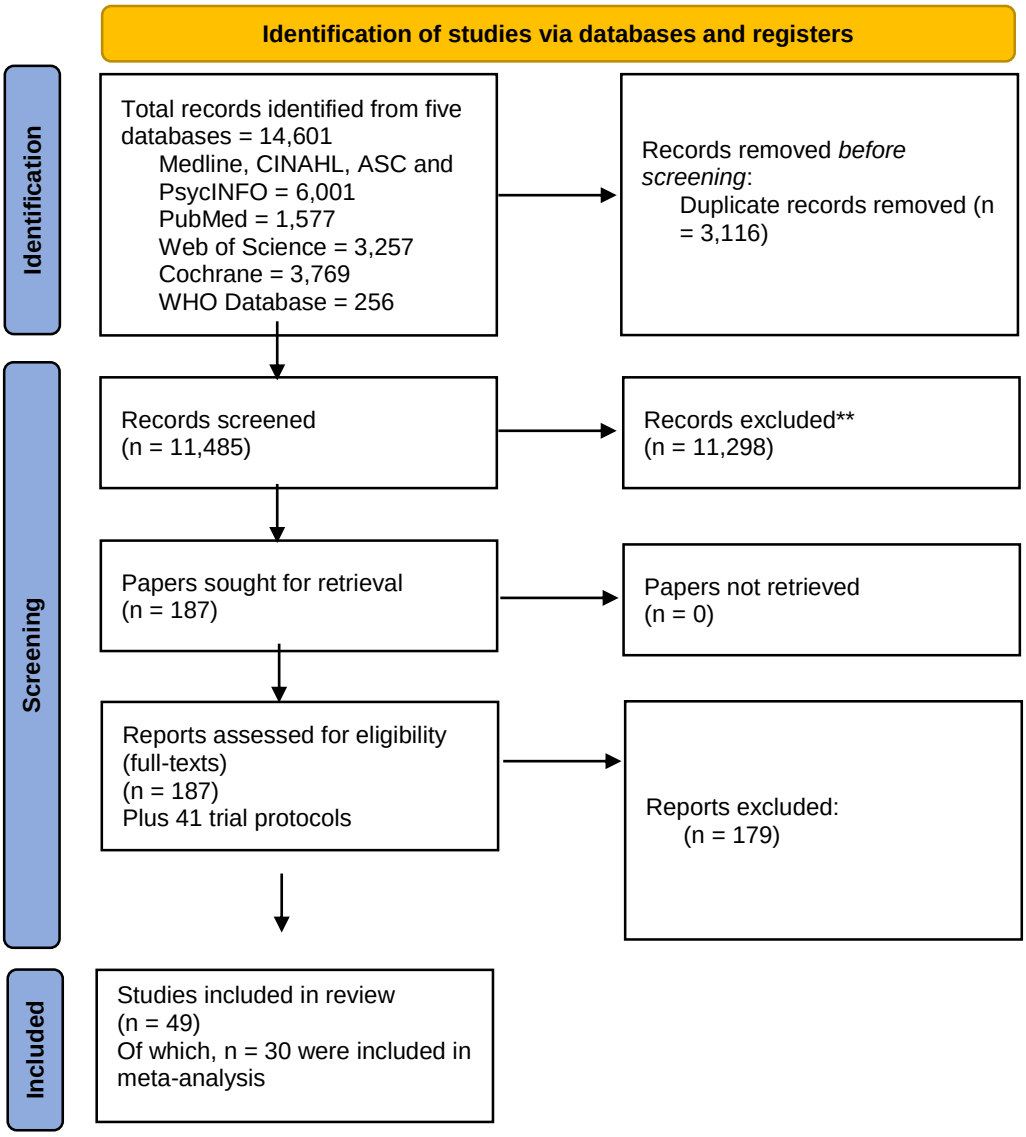
Nevill and Havercampe (2019) Mixed-methods, n = 97. Cross-sectional survey, plus interview three months later.	United States	Effects of mindfulness, coping styles and resilience on job retention and burnout in caregivers supporting aggressive adults with developmental disabilities Residential agencies, day programmes, and sheltered workshops. Maslach Burnout Inventory; Kentucky Inventory of Mindfulness Skills; Brief Coping Orientation to Problems Experienced; Brief Resilience.	Mindfulness skills and problem-focused coping protective factors against burnout, while avoidance-focused and maladaptive coping emerged as risk factors.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Nevill *et al*. (2021) Quantitative, n = 90. Longitudinal survey (3-month follow up).	United States	The Effects of Aggression Subtypes on Burnout and Caregiver Instability in Direct Support Professionals	Verbal aggression and reduced length of time knowing the aggressive adult significantly predicted caregiver instability. Hostile affect significantly predicted burnout.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Onyejose (2021) Quantitative, n = 111 Cross-sectional Survey	United States	Investigate whether burnout mediates the relationship between stress and depression among African immigrants working with adults with IDDs Organisations that provide support. Maslach Burnout Inventory; Job Stress Scale; Beck Depression Inventory.	Stress significantly predicted burnout and depression, and remained a significant predictor of depression after controlling for burnout, so full mediation was not supported.	MMAT: ** Not stated if nurses sampled. No response rate indicated.

Roth *et al.* (2020) Quantitative, n = 1912 Cross-sectional survey	Germany	Working conditions in residential homes for people with disabilities in Germany, with a particular focus on organizational structures Residential homes. COPSOQ	Causes for dissatisfaction and burnout are perceptions of emotional and quantitative demands, work-privacy-conflicts, centralization of decision making and role ambiguity, while formalization confirms positive effects, as it fosters role clarity, predictability and perception of less quantitative demands. Leadership and sense of community also have positive impacts on working conditions.	MMAT: *** Not stated if nurses sampled. 68.2% response rate.
Sheehan *et al.* (2021) Mixed-methods, n = 648. Cross-sectional survey with some qualitative data.	United Kingdom	The challenges and innovations reported by staff working in services for people with intellectual disability and/or autism in National Health Service (NHS) and non-NHS sectors, and in in-patient and community settings In-patient and community settings Challenges at work during the COVID-19 pandemic; perspectives of problems faced by mental health patients and family carers, and sources of help at work in managing the effects of the pandemic.	Issues around infection risk and mitigation were more important to those working in the NHS and in-patient settings. Community staff were more likely to express concern about the practicalities of a rapid shift to remote working and engaging patients remotely. Qualitative data revealed support for maintaining remote staff working and remote service provision post-pandemic.	MMAT: *** 28.2% were nurses. No response rate indicated.
Sheerin *et al.* (2023) Qualitative, n = 13 Semi-structured interviews	Ireland	Staff mental health while providing care to people with intellectual disability during the COVID-19 pandemic.	The participants spoke in depth about the challenges of the working environment, the impact of providing care during the pandemic on staff mental health, supporting staff mental health and wellbeing and learning for the future.	MMAT: *** Healthcare workers providing care to people with an intellectual disability during the Covid-19 pandemic.

Sheppard-Jones *et al.* (2022) Quantitative, Cross-sectional survey	United States	Direct Support Professionals: Stress and Resiliency Amidst the COVID-19 Pandemic	Perceived stress was strongly correlated with both self-reported quality of life and resilience, but not with years of DSP experience. While DSPs knew and affirmed health care rights for people with disabilities, they were less knowledgeable about their legal rights during hospital stays.	MMAT:** Not stated if nurses sampled. No response rate indicated.
Womack *et al.* (2021) Quantitative, n = 240 Cross-sectional survey	United States	Challenging Aggressive Behaviors Experienced by Personal Support Workers in Comparison to Home Care Workers: Relationships between Caregiver Experiences and Psychological Health Community-based workers Workplace Aggression and Violence Scale; Swedish Occupational Fatigue Inventory; Perceived Stress Scale; CES-D.	PSWs generally reported higher rates of exposure to aggression compared to HCWs. Experiences with aggression were positively associated with fatigue and weakly associated with depression, but not stress. PSWs' self-reported lost work time injury rate was elevated compared to the US average, but it was comparable to previous self-reported injury rates from HCWs. Physical demands of work were the most prevalent reported primary safety concern.	MMAT: *** Not stated if nurses sampled. No response rate indicated.
Van der Meer (2017) Quantitative, n = 466 Cross-sectional survey.	Netherland	The importance of person-centred care and co-creation of care for the well-being and job satisfaction of professionals working with people with intellectual disabilities. Residential care facility for people with intellectual disabilities. Social Production Function Instrument for the Level of Well-being; Job Satisfaction Questionnaire; Person-centred Care; Relational Co-ordination Instrument.	After controlling for background variables, person-centred care and co-creation of care were associated positively with job satisfaction and well-being of professionals.	MMAT: *** Not stated if nurses sampled. 41% response rate.

Appendix D

Updated Review of Online Work-Stress Management Interventions (PRISMA Flow Chart)



Search Process

Final List:

Condition: (Stress OR strain OR distress OR **mental** OR depression OR anxiety OR well-being OR burnout OR **disorder** OR resilience OR psychological OR **ill-health**) AND

Intervention: (Internet OR web OR web-based OR online OR computerized OR computerised OR computer OR e-health OR app OR digital OR mobile OR application OR m-health OR smartphone) AND

(occupation OR worker or working OR workplace or “at work” or workforce or work-related OR employee or occupational OR “employee assistance” OR intervention or worksite)

Medline, PsycINFO, Academic Search Complete, CINAHL – Title first two, then Abstract 6,001 returns.

"TI (Stress OR strain OR distress OR mental OR depression OR anxiety OR well-being OR burnout OR disorder OR resilience OR psychological OR ill-health) AND TI (Internet OR web OR web-based OR online OR computerized OR computerised OR computer OR e-health OR app OR digital OR mobile OR application OR m-health OR smartphone) AND AB (occupation OR worker or working OR workplace or “at work” or workforce or work-related OR employee or occupational OR “employee assistance” OR intervention or worksite)

Web of Science – Same process, returned 3,257 hits.

(((TI=(Stress OR strain OR distress OR mental OR depression OR anxiety OR well-being OR burnout OR disorder OR resilience OR psychological OR ill-health)) AND TI=(Internet OR web OR web-based OR online OR computerized OR computerised OR computer OR e-health OR app OR digital OR mobile OR application OR m-health OR smartphone))) AND AB=(occupation OR worker or working OR workplace or “at work” or workforce or work-related OR employee or occupational OR “employee assistance” OR intervention or worksite)

PubMed – Same process, 1,577 hits.

((Stress[Title] OR strain[Title] OR distress[Title] OR mental[Title] OR depression[Title] OR anxiety[Title] OR well-being[Title] OR burnout[Title] OR disorder[Title] OR resilience[Title] OR psychological[Title] OR ill-health)[Title]) AND (Internet[Title] OR web[Title] OR web-based[Title] OR online[Title] OR computerized[Title] OR computerized[Title] OR computer[Title] OR e-health[Title] OR app[Title] OR digital[Title] OR mobile[Title] OR application[Title] OR m-health[Title] OR smartphone[Title])) AND (occupation[Title/Abstract] OR worker[Title/Abstract] OR working[Title/Abstract] OR workplace[Title/Abstract] OR "at work"[Title/Abstract] OR workforce[Title/Abstract] OR

work-related[Title/Abstract] OR employee[Title/Abstract] OR occupational[Title/Abstract] OR "employee assistance"[Title/Abstract] OR intervention[Title/Abstract] OR worksite[Title/Abstract])

Cochrane – Same Process, 3,769 hits.

(Stress OR strain OR distress OR mental OR depression OR anxiety OR well-being OR burnout OR disorder OR resilience OR psychological OR ill-health) in Record Title AND (Internet OR web OR web-based OR online OR computerized OR computerised OR computer OR e-health OR app OR digital OR mobile OR application OR m-health OR smartphone) in Record Title AND (occupation OR worker or working OR workplace or “at work” or workforce or work-related OR employee or occupational OR “employee assistance” OR intervention or worksite) in Title Abstract Keyword - with Cochrane Library publication date Between Apr 2018 and Jul 2021 (Word variations have been searched)

WHO – Title, Condition, Intervention (256 results)

Condition: (Stress OR strain OR distress OR **mental** OR depression OR anxiety OR well-being OR burnout OR **disorder** OR resilience OR psychological OR **ill-health**) AND

Intervention: (Internet OR web OR web-based OR online OR computerized OR computerised OR computer OR e-health OR app OR digital OR mobile OR application OR m-health OR smartphone)

PRISMA Systematic Review Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Chap. 3
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	n/a
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Chap. 3
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Chap. 3
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Chap. 3
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Chap. 3 & Appendix D
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Chap. 3 & Appendix D
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Chap. 3 & Appendix D
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Chap. 3
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Chap. 3
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Chap. 3
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Chap. 3 & Appendix D
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Chap. 3

Section and Topic	Item #	Checklist item	Location where item is reported
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Chap. 3
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Chap. 3
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Chap. 3 & Appendix D
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Chap. 3 & Appendix D
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	n/a
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Chap. 3 & Appendix D
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Chap. 3
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Chap. 3
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Chap. 3 & Appendix D
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Chap. 3 & Appendix D
Study characteristics	17	Cite each included study and present its characteristics.	Appendix D
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Appendix D
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Appendix D
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Chap. 3
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Chap. 3 & Appendix D

Section and Topic	Item #	Checklist item	Location where item is reported
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Chap. 3 & Appendix D
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Chap. 3
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Chap. 3
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Chap. 3 & Appendix D
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Chap. 3
	23b	Discuss any limitations of the evidence included in the review.	Chap. 3 (in context of DELAROSE)
	23c	Discuss any limitations of the review processes used.	Chap. 3
	23d	Discuss implications of the results for practice, policy, and future research.	Chap.3 (in context of DELAROSE)
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Appendix D
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Appendix D.
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Chap. 3
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	n/a
Competing interests	26	Declare any competing interests of review authors.	n/a
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	n.a

UNIVERSITY of York
Centre for Reviews and Dissemination

Systematic review

1. * Review title.

Give the title of the review in English

Occupational e-mental health interventions: an updated systematic review and meta-analysis of randomised controlled trials

2. Original language title.

For reviews in languages other than English, give the title in the original language. This will be displayed with the English language title.

3. * Anticipated or actual start date.

Give the date the systematic review started or is expected to start.

23/08/2022

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

31/02/2023

5. * Stage of review at time of this submission.

Tick the boxes to show which review tasks have been started and which have been completed. Update this field each time any amendments are made to a published record.

Reviews that have started data extraction (at the time of initial submission) are not eligible for inclusion in PROSPERO. If there is later evidence that incorrect status and/or completion date has been supplied, the published PROSPERO record will be marked as retracted.

This field uses answers to initial screening questions. It cannot be edited until after registration.

The review has not yet started: No

Review stage	Started	Completed
Preliminary searches	Yes	No
Piloting of the study selection process	No	No
Formal screening of search results against eligibility criteria	No	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

Provide any other relevant information about the stage of the review here.

6. * Named contact.

The named contact is the guarantor for the accuracy of the information in the register record. This may be any member of the review team.

Cathal Ryan

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

Mr Ryan

7. * Named contact email.

Give the electronic email address of the named contact.

cathal.ryan@setu.ie

8. Named contact address

Give the full institutional/organisational postal address for the named contact.

School of Humanities, \South-East Technological University \nCollege Street Campus, \nCollege Street,

\nWaterford,\nIreland

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

00353871337995

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

South-East Technological University

Organisation web address:

www.wit.ie

11. * Review team members and their organisational affiliations.

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong. **NOTE: email and country now MUST be entered for each person, unless you are amending a published record.**

Mr Cathal Ryan. South-East Technological University
Dr Adrian Jones. Betsi Cadwaladr University Health Board
Dr Michael Bergin. South-East Technological University
Professor John S.G. Wells. South-East Technological University

12. * Funding sources/sponsors.

Details of the individuals, organizations, groups, companies or other legal entities who have funded or sponsored the review.

Not applicable

Grant number(s)

State the funder, grant or award number and the date of award

13. * Conflicts of interest.

List actual or perceived conflicts of interest (financial or academic).

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. **NOTE: email and country must be completed for each person, unless you are amending a published record.**

15. * Review question.

State the review question(s) clearly and precisely. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS or similar where relevant.

Are occupational e-mental health interventions associated with lower levels of stress or stress-related outcomes among workers post intervention?

16. * Searches.

State the sources that will be searched (e.g. Medline). Give the search dates, and any restrictions (e.g. language or publication date). Do NOT enter the full search strategy (it may be provided as a link or attachment below.)

The following databases will be searched from April 2018 to 1st January 2023:

- Acadmic Search Complete
- PsycINFO,
- CINAHL
- MEDLINE,
- Cochrane Library,
- PubMed,
- Web of Science.
- WHO international trials registry

Inclusion criteria:

(1) Use a randomised controlled design,

(2) Aimed at employed participants aged 18 years or over (full-time/part-time employed and self-employed working individuals only to be included),

(3) Evaluate a psychological intervention focused on work-stress management (improving psychological well-being/symptoms of stress/reducing the presence of work-related stressors) and/or a stress-related outcome measure.

(4) Delivered via the Internet, mobile technology (e.g. smartphone application), e-mail or a computer programme,

(5) Published in English.

Exclusion Criteria:

• Review papers, meta-analyses or meta-syntheses,

• Qualitative investigations,

• Not an online intervention,

• Papers not published in English,

• Studies in which participants were not recruited from a working population,

• Interventions aimed at workers with a clinical psychiatric or mental health diagnosis; or if the participants exclusively comprise those on extended sick leave or those diagnosed with clinical disorders/complex mental health problems including depression, anxiety, post-traumatic stress disorder (PTSD), schizophrenia, or comorbid substance misuse will be excluded.

17. URL to search strategy.

Upload a file with your search strategy, or an example of a search strategy for a specific database, (including the keywords) in pdf or word format. In doing so you are consenting to the file being made publicly accessible. Or provide a URL or link to the strategy. Do NOT provide links to your search **results**.

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Do not make this file publicly available until the review is complete

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied in your systematic review.

Work-stress management (improving psychological well-being/symptoms of stress/reducing the presence of work-related stressors) and/or a stress-related outcome measure, such as anxiety, depression or burnout.

19. * Participants/population.

Specify the participants or populations being studied in the review. The preferred format includes details of both inclusion and exclusion criteria.

Employed participants aged 18 years or over (full-time/part-time employed and self-employed working individuals only to be included).

In terms of exclusion criteria, studies in which participants were not recruited from a working population, or interventions aimed at workers with a clinical psychiatric or mental health diagnosis; or if the participants exclusively comprise those on extended sick leave or those diagnosed with clinical disorders/complex mental health problems including depression, anxiety, post-traumatic stress disorder (PTSD), schizophrenia, or comorbid substance misuse will be excluded.

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the interventions or the exposures to be reviewed. The preferred format includes details of both inclusion and exclusion criteria.

The purposes of this review, a definition of an occupational e-mental health intervention for the management

of stress in the workplace as any activity or programme delivered online and that focuses on reducing the presence of work- related stressors or assisting individuals in minimising the negative outcomes of exposure to stress will be employed.

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the intervention/exposure will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

The systematic review will consider any comparator. The meta-analysis will only include inactive control, e.g. wait-list control or treatment as usual.

22. * Types of study to be included.

Give details of the study designs (e.g. RCT) that are eligible for inclusion in the review. The preferred format includes both inclusion and exclusion criteria. If there are no restrictions on the types of study, this should be stated.

Randomised controlled trials only will be eligible for inclusion.

23. Context.

Give summary details of the setting or other relevant characteristics, which help define the inclusion or exclusion criteria.

Work-related stress is a significant societal challenge. In response, a considerable number of studies of worker-directed stress management interventions have been published. A notable trend within this work-stress literature in recent years is the proliferation of interventions delivered through online modalities. Online interventions are delivered typically through dedicated websites, computer programmes, or smartphone applications (Wantland et al., 2004), the benefits of which include fewer constraints with regard to time and location, the potential to access a larger target group, and the protection of participant anonymity, thereby reducing possible stigma with regard to seeking help for stress.

A systematic review and meta-analysis of occupational e-mental health interventions, which included literature up to April 2018, was published in 2019 (Philips, Gordeev, & Schreyögg, 2019). The aim here is to update this review to January 2023. It will focus specifically on the outcomes of stress, anxiety, depression, well-being and burnout. This update will be guided by a checklist relating to updating systematic reviews provided by PRISMA.

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

Changes in Perceived Stress

Measures of effect

Please specify the effect measure(s) for you main outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

For each study, between-group effect sizes will be calculated for each outcome. Hedges' g will be used to

measure effect size at both primary study and meta-analysis levels. To assess different sample sizes and pre-test values, an effect size based on the mean pre-post change in the treatment group minus the mean pre-post change in the control group, divided by the pooled pre-test standard deviation, will be determined.

A p value of < 0.05 will be considered statistically significant. Positive effect sizes with a 95% confidence interval (95% CI) excluding zero indicate that treatment condition was superior to the control.

Random-effects models that account for differences in the treatment effects from heterogeneous studies will be employed to analyse the data. Separate meta-analyses will be conducted for each stress-related outcome (stress; depression; anxiety; mindfulness; well-being, and burnout). For each meta-analysis, mean effect sizes (Hedges' g), heterogeneity estimates (Q statistic) and the percentage of total variation across studies due to heterogeneity (I2) will be computed.

The degree of heterogeneity will be assessed using a statistical significance level of $p < 0.05$ as follows: 0 - 40% might not be important; 30 - 60% may be moderate heterogeneity; 50 - 90% may be substantial, and 75 - 100% may be considerable. An I2 percentage of 25% will be considered low, 50% as moderate, and 75% as high.

25. * Additional outcome(s).

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state 'None' or 'Not applicable' as appropriate to the review

Psychological Well-being, Burnout, Anxiety, Depression, Mindfulness..

Measures of effect

Please specify the effect measure(s) for you additional outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

26. * Data extraction (selection and coding).

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

Descriptive information will be obtained from each intervention on: Authors, Year, Participants, Focus, Design/Methodology, Theoretical Underpinning of Intervention, Outcomes, Results. Data extraction will be performed by one reviewer (CR), independently, and charted in a table. For assessing the effect of the interventions outcome measure(s) and reported value(s) for intervention effectiveness (i.e. p value, effect size) will be extracted.

Two reviewers (CR, AJ) will conduct the screening process independently. Discussions will occur with a third reviewer if disagreements occur (MB). The same process will be followed at the full-text screening stage of the review. A PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) flow chart will be compiled to summarise the study selection process.

27. * Risk of bias (quality) assessment.

State which characteristics of the studies will be assessed and/or any formal risk of bias/quality assessment tools that will be used.

The risk of bias of experimental trials will be evaluated using the latest version of the Cochrane Collaboration Risk of Bias 2 tool (RoB 2: A revised Cochrane risk-of-bias tool for randomized trials, updated 2021), which assesses risk of bias across seven domains, including sequence generation, allocation concealment, blinding of participants, personnel and outcome assessors, incomplete outcome data, selective outcome

reporting, and other sources of bias.

28. * Strategy for data synthesis.

Describe the methods you plan to use to synthesise data. This **must not be generic text** but should be **specific to your review** and describe how the proposed approach will be applied to your data. If meta-analysis is planned, describe the models to be used, methods to explore statistical heterogeneity, and software package to be used.

A summary table for the key information extracted from each article that meets the eligibility criteria will be presented.

A narrative synthesis of the findings from the included studies will be presented. A narrative synthesis is used to present the evidence in relation to the specific research questions, summarising and explaining the findings of the included studies (Popay et al., 2006). The process of analysis and synthesis will follow guidance to ensure full transparency within the narrative process, based on guidance in the literature (e.g. Tong, 2012).

29. * Analysis of subgroups or subsets.

State any planned investigation of 'subgroups'. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach.

It is intended that moderator analysis based on intervention content (e.g. CBT versus Mindfulness) and guidance (e.g. guided versus unguided interventions) will be conducted.

30. * Type and method of review.

Select the type of review, review method and health area from the lists below.

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.
English

There is not an English language summary

32. * Country.

Select the country in which the review is being carried out. For multi-national collaborations select all the countries involved.

Ireland

33. Other registration details.

Name any other organisation where the systematic review title or protocol is registered (e.g. Campbell, or The Joanna Briggs Institute) together with any unique identification number assigned by them. If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

If the protocol for this review is published provide details (authors, title and journal details, preferably in

Vancouver format)

Add web link to the published protocol.

Or, upload your published protocol here in pdf format. Note that the upload will be publicly accessible.

No I do not make this file publicly available until the review is complete

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Do you intend to publish the review on completion?

Yes

Give brief details of plans for communicating review findings.?

We intend to publish the review in an appropriate high-impact, peer reviewed journal.

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords help PROSPERO users find your review (keywords do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

Work-related stress, e-mental health, occupational well-being, stress management.

37. Details of any existing review of the same topic by the same authors.

If you are registering an update of an existing review give details of the earlier versions and include a full bibliographic reference, if available.

This is an update of previously published systematic review and meta-analysis.

Phillips, E. A., Gordeev, V. S., & Schreyögg, J. (2019). Effectiveness of occupational e-mental health interventions: a systematic review and meta-analysis of randomized controlled trials. Scandinavian journal of work, environment & health, 45(6), 560-576.

38. * Current review status.

Update review status when the review is completed and when it is published.New registrations must be ongoing so this field is not editable for initial submission.
Please provide anticipated publication date

Review_Ongoing

39. Any additional information.

Provide any other information relevant to the registration of this review.

40. Details of final report/publication(s) or preprints if available.

Leave empty until publication details are available OR you have a link to a preprint (NOTE: this field is not editable for initial submission). List authors, title and journal details preferably in Vancouver format.

Give the link to the published review or preprint.

Table 22. Risk of Bias Assessments for Each Study Included in Updated Systematic Review

Study	Sequence Bias	Allocation Bias	Performance Bias	Detection Bias	Incomplete Data	Selective Reporting Bias	Other Issues
Ansely et al.	No	No	Yes	No	No	Unclear	Yes
Avey et al.	No	No	Yes	No	No	Unclear	Yes
Bostock et al.	No	No	Yes	No	No	Unclear	Yes
Bossi et al.	No	No	Yes	No	No	Unclear	Yes
Calero-Elvira et al.	No	No	Yes	No	Yes	Unclear	Yes
Cavanagh et al.	No	No	Yes	No	Yes	Unclear	Yes
Coelhoso et al.	No	No	Yes	No	Yes	No	Yes
De Kock et al.	No	No	Yes	No	Yes	No	Yes
Deady et al.	No	Unclear	No	No	Yes	No	Yes
Eriksson et al.	No	Unclear	Yes	No	No	Unclear	Yes
Fiol DelRoque et al.	No	No	No	No	No	Unclear	Yes
Gnanapragasam et al.	No	No	No	No	No	Unclear	Yes
Gayed et al.	No	No	Yes	No	Yes	No	Yes
Gollwitzer et al.	No	Unclear	Yes	No	No	Unclear	Yes
Hirshberg et al.	No	Unclear	Yes	No	No	Unclear	Yes
Hwang and Jo	No	No	No	No	No	Unclear	Yes
Imamura et al.	No	No	Yes	No	No	No	Yes
Joyce et al.	No	No	No	No	Yes	No	Yes
Kloos et al.	No	No	Yes	No	Yes	Unclear	Yes

Lahtinen et al.	No	No	Yes	No	Yes	No	Yes
Lam et al.	No	Unclear	Yes	No	No	Unclear	Yes
Monfries et al.	No	Unclear	Yes	No	No	Unclear	Yes
Nadler et al.	No	No	Yes	No	Yes	No	Yes
Nixon et al. (21)	No	Unclear	Yes	No	No	Unclear	Yes
Nixon et al. (22)	No	Unclear	Yes	No	No	Unclear	Yes
Oishi et al.	No	No	Yes	No	No	Unclear	Yes
Purdie et al.	No	Unclear	Yes	No	No	Unclear	Yes
Rich et al.	No	No	Yes	No	No	Unclear	Yes
Smoktuniwcz et al.	No	No	Yes	No	Yes	No	Yes
Stachele et al.	No	Unclear	Yes	No	No	No	Yes
Yoon et al.	No	Unclear	Yes	No	No	Unclear	Yes

Table 23. Studies Included in Updated Systematic Review and Meta-Analysis of Online Work-Stress Management Interventions

Author; Participants	Country	Content	Duration	Design	Measures	Findings
Andersson *et al.* (2022); n = 182 mainly employed in the healthcare, I.T. or educational sectors	Sweden	Internet CBT intervention	10-week intervention, 6-month follow-up.	3-arm Randomised Control Trial: work-focused iCBT; generic iCBT, or Wait-list control	SMBQ (Shirom Burnout), PSS, Karolinska Exhaustion, Montgomery Depression, GAD, Insomnia.	Both intervention groups sig lower on SMBQ post (d = 1, d = 0.83) and 6 month follow up (d = 0.74, d = 0.74).
Ansley *et al.* (2021); n = 51 teachers	United States	Online stress intervention based on coping strategies, resources and promoting social-emotional competencies.	5-weeks to complete, approx. two modules per week (30 min per module), delivered via website.	Randomised Control Trial; Wait-list Control	Burnout (MBI-ES); Fidelity; Time engaged in Coping Strategies	Significant increase ($\eta p2 = 0.089$) for intervention group compared to the control group in coping engagement. Significant decrease in emotional exhaustion ($\eta^2p = 0.085$) and depersonalization compared to control ($\eta^2p = 0.074$), not for personal accomplishment. No change in physical exercise or social support, though increases in their use of mindfulness, relaxation and cognitive restructuring strategies (all decreased for control).
Avey *et al.* (2022); n = 99 Human Resource Managers.	United States	Mobile Resilience Intervention	10-week intervention	Cluster Randomised Control Trial; wait list control.	Resilience Scale, Well-being Scale	Significant post-intervention increase in resilience ($\eta2 = 0.09$) and psychological well-being ($\eta2 = 0.08$) for intervention group versus control group.
Bartlett *et al.* (2022); n = 211 public sector workers.	Australia	Mindfulness app (Smiling Mind), with or w/o supporting classes.	8-week intervention. 10/20 mins of daily practice	3-arm Randomised Control Trial; Wait-list control	PSS; Kessler; MAAS; QoL	No sig changes in PSS for either IG versus WLC ($p = 0.16$, $p = 0.46$). Small sig improvement in distress ($p = 0.02$, d = 0.21) and mindfulness (d = 0.19) for app plus class IG.

			3 and 6 months follow-up			
Bossi *et al.* (2022); n = 132 employees	Italy	Online mindfulness-based stress reduction intervention	8 week intervention	Randomised Control Trial, no intervention for control.	Mindfulness Habits, FFMQ, Emotion Regulation Questionnaire, PANAS, DASS, RSA, Insomnia Severity Index.	Significant differences between the intervention and control groups over time in the measures of mindfulness positive affect, depression, and insomnia.
Bostock *et al.* (2019); n = 238 office employees.	United Kingdom	Mindfulness meditation smartphone application(Headspace).	8-week intervention, 45 10-20 mins audio meditations.	Randomised Control Trial; Wait list Control	Warwick well-being, HADS, Job Strain, Social Support, Mindfulness (Frieburg Measure - not a study outcome)	Significant improvement for intervention group on well-being (η^2p = 0.037), daily positive emotions (η^2p = 0.04), anxiety symptoms (η^2p = 0.033), depressive symptoms (η^2p = 0.065), job strain (η^2p = 0.023), and workplace social support (η^2p = 0.020) versus controls, though not for systolic or diastolic blood pressure.
Cavanagh *et al.* (2018); n = 155 university staff and students	United Kingdom	Self-guided mindfulness-based online intervention (Learning Mindfulness Online)	2-week interventions delivered using Moodle facility.	Three-arm Randomised Control Trial: Online MBI with or without mindfulness meditation practice, or Wait- list control	FFMQ, PSS-10, PHQ, PTQ, Engagement and Experience	Significant improvements in perceived stress (both d = 0.37), and anxiety and depression scores (d = 0.32 and d = 0.33 for the respective IG versus controls). Change in perseverative thinking mediated relationship between condition and improvement on perceived stress and anxiety/depression symptom outcomes. No differences between the intervention conditions.
De Kock *et al.* (2022); n = 169 NHS frontline staff volunteers	United Kingdom	My Possible Self, a smartphone well-being app, or NHSH Staff Wellbeing Project, a	4 week intervention	Three-armed Randomised Control Trial, wait list control	GAD, PHQ, Warwick Well-being Survey, Mental	Significant differences between control and two intervention groups on anxiety (d = 0.07; d = 0.06), depression (d =

		Covid-specific digital intervention.			Toughness, Gratitude.	0.37; d = 0.18) and mental well-being (d = –0.04, d = – 0.15) post-intervention.
Ebert *et al.* (2021); n = 396 health insurance employees.	Germany	Online stress management intervention (Get.On Stress).	7 sessions, plus 1 booster. Post and 6 month follow up	Randomised Control Trial; Wait-list Control	PSS, CES-D, QoL, CD-RISC, MBI, WEMWBS, WHO-5	Significantly lower PSS post-intervention ($p < 0.001$, d = 0.71) and 6-month ($p < 0.001$, d = 0.61) follow-up vs WLC. Medium to large effect sizes for all mental health
Economides *et al.* (2022); n = 383 working adults	United Kingdom	Online Stress Management (Unmind platform - Stress/Worry/Resilience based interventions).	2-week intervention, 30 day follow up.	4-arm Randomised Control Trial; Wait-list control.	PSS, GAD, PHQ, Resilience	Only 'worry' intervention produced significant improvement (all measures) post-intervention and follow-up vs control. Medium to large effect sizes. No changes in other arms.
Eklund *et al.* (2021); n = 92 university staff	Sweden	Online stress management intervention (My Stress Control).	8-week intervention, seven strategies overall.	Randomised Control Trial; Wait-list control.	PSS; QPS; Engagement; COPE; Motivation	No significant change in stress b/n group from baseline to post intervention (d = 0.25). Small within group change (d = 0.38 and d = 0.25, neither significant.
Eriksson *et al.* (2018); n = 101 psychologists	Sweden	Online mindful self-compassion training	6-week intervention, about 15 mins of training per day, 6 days a week.	Randomised Control Trial; Wait list Control	FFMQ, Self-compassion, PSS-14, Burnout (Shirom)	Significant reduction for intervention group versus control on perceived stress (d = 0.59) and burnout symptoms (d = 0.44), plus self-compassion total and subscale scores (d = 0.86; d = 0.94), mindfulness (d = 0.60), self-coldness (d = 0.73), physical fatigue (d = 0.31) and tension (d = 0.33).
Gnanapragasam *et al.* (2023), n = 1002 healthcare workers.	United Kingdom	Foundations app, a behaviour change and positive wellbeing intervention that focuses on relaxation, sleep, anxious thoughts, feeling down, self-esteem and stress.	8-week intervention.	Randomised Control Trial; usual care control	GHQ; GAD; BRS; PHQ; Warwick-Edinburgh Mental Well-being Scale; Stanford Presenteeism Scale; Work and Social	No significant between-group reduction in psychiatric morbidity symptoms post intervention. Intervention use was associated with an increase in the SWEMWBS and reduction in the odds of insomnia (MISS) in the app group.

					Adjustment Scale; Minimal Insomnia Symptom Scale.	
Gollwitzer *et al.* (2021); n = 129 nurses	Germany	Online intervention that promotes self-regulation of stress (Mental contrasting with implementation intentions intervention)	3-week interventions	3-arm Randomised Control Trial: Two variations of MCII versus control (three questions and personal wish).	PSS-20, Physical symptoms of burnout (BOSS-II), Work engagement	Significant increase in work engagement in the MCII group versus in the control ($p = 0.046$, $\eta^2p = 0.039$). No difference in IIMCII versus control ($p = .816$, $\eta^2p = .001$). Significant reduction in stress for MCII group versus control ($p = 0.019$, $\eta^2p = 0.053$). No difference in stress between IIMCII and control ($p = 0.277$, $\eta^2p = 0.012$)
Hirshberg *et al.* (2022); n = 662 public school system employees.	United States	Meditation smartphone app that trains key constituents of well-being (Healthy Minds Program).	4-weeks intervention.	Randomised Control Trial, wait list control	Psychological Distress, FFMQ, Self-Compassion, NIH Toolbox Loneliness Questionnaire, Drexel Defusion Scale, Perseverative Thinking Questionnaire, WHO-5, Meaning in Life Presence Scale, Social Desirable Response Set Five	Intervention group had significantly larger reductions in psychological distress post intervention ($d = -0.53$) and at the 3-month follow-up ($d = -0.33$) compared to controls. Similar changes post-intervention and at follow-up on all secondary outcomes (ds = 0.19 – 0.42).

Hwang and Jo (2019); n = 56 nurses	South Korea	Stress management programme delivered smartphone application, consisted of music (focused on healing, meditation, breathing) and yoga plus health information,	4-week intervention.	Randomised Control Trial: Wait-list Control.	PSS, KOSS, PHQ, GAD, Emotional Labour, WHO-5, Self-efficacy, app satisfaction	Stress, emotional labour, self-efficacy, and well-being were significantly improved in experimental group, did not change significantly for control. Effect sizes not reported.
Imamura *et al.* (2021); n = 951 nurses	Japan	Two types of smartphone-delivered interventions: multi-module stress management and internet CBT.	10 weeks to complete one of two six-module programmes, one module completed per week, 15 mins to complete each module.	Randomised Control Trial: multi-module stress management; fixed-order iCBT, or treatment as usual control.	DASS – subscales, reported satisfaction, perceived usefulness, usage.	iCBT IG showed significant improvement on depressive symptoms at 3- month (d = 0.18), but not at 7-month (d = 0.03); follow-up. Multi-module IG failed to show a significant intervention effect on any of the outcomes at 3- or 7-month follow-up.
Kloos *et al.* (2019); n = 165 nursing home care staff	Netherlands	Online positive psychology intervention (This Is Your Life). Six key topics of well-being: positive emotions; discovering and using strengths; optimism; self-compassion; resilience, and positive relations	8-week intervention, eight modules.	Randomised Control Trial; Wait-list Control.	Well-being (MHC-SF), Job Satisfaction, Work engagement (Utrecht), Acceptability of Intervention	No significant reduction in well-being versus control post intervention (p = 0.62, d = 0.12)
Lam *et al.* (2022), n = 469 corporate employees	Australia	Online workplace psycho-educational mental health intervention	12-week intervention.	Cluster Randomised Control Trial; wait list control.	Maslach Burnout Inventory (MBI), stress subscale of DASS, EQ-	Significant differences between intervention and control groups were found on all outcome measures except the self-rated quality of life.

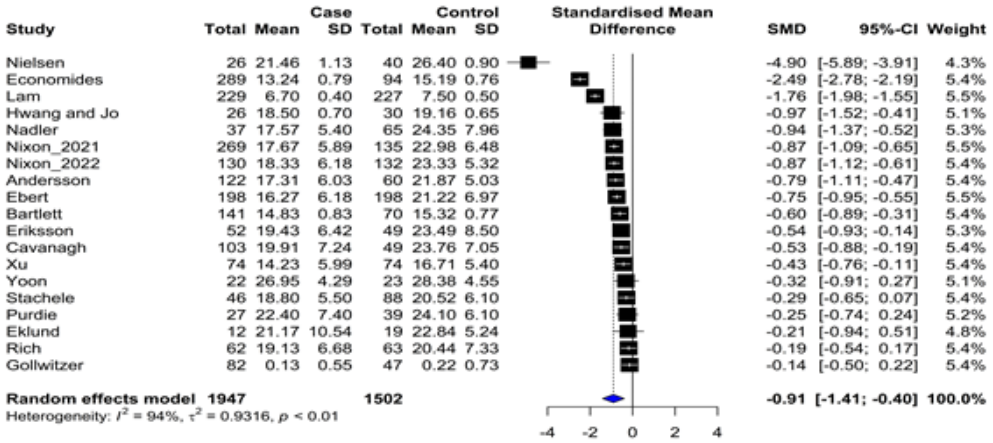
					5D-5L, Australian National Mental Health Literacy and Stigma Survey	
Monfries *et al.* (2022), n = 34 multi-disciplinary health professionals working in an ED.	Canada	Headversity smartphone application that delivered a resilience intervention. 12-weeks intervention	12-weeks intervention	Randomised Control Trial; wait list control.	MBI, CDRS, and the MAAS.	Significant change in score on the emotional exhaustion subscale of the MBI (MBI-EE) in the intervention group compared with the control group (d = 1.3). Significant mean change in mindfulness for intervention group, compared to the control group post-intervention. No statistically significant changes were noted in the depersonalisation or professional accomplishment subscales of the MBI, nor in the level of resilience of participants (measured by the CD-RISC).
Nadler *et al.* (2020); n = 102 company employees	Canada	Online mindfulness intervention comprising videos and guided meditations.	8-week intervention. 6 out of 7 days a week (for a total of 144 – 480 mins, depending on meditation practice).	Randomly (cluster) assigned to intervention or wait-list control	FFMQ (5 different scales), PSS-14, PANAS, Emotional Intelligence, BRS, Workplace Competency	Significant increases in trait mindfulness and trait emotional intelligence (with exception of empathy) for intervention group versus control group post-intervention. Control group reported reductions in resilience and increases in negative mood.
Nielsen *et al.* (2021) n = 100 legal professionals	Canada	Mindful pause: daily practice mindfulness programme.	30 day follow up	Randomised Control Trial, Wait-list control.	PSS, PANAS, DASS, FFMQ (5 scales - not suitable for	Sig lower PSS (n = .16), PANAS (n = .13) and DASS (n = .12) vs controls. Higher positive affect (n = .09) and FFMQ (n = .23). No change in resilience

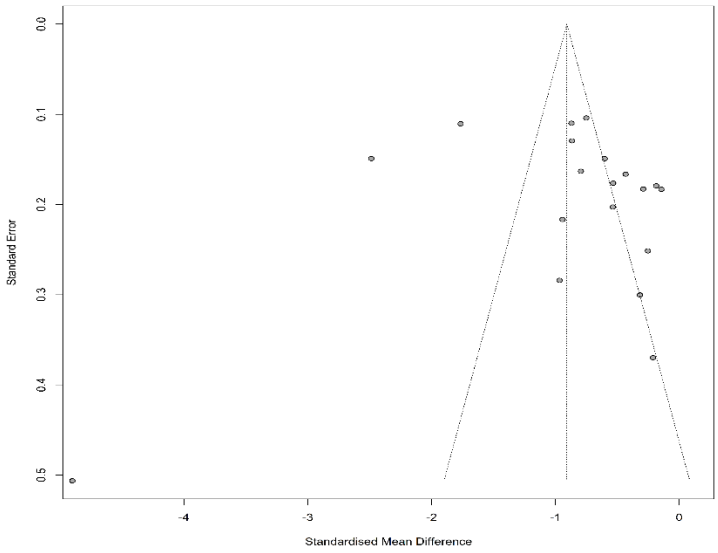
					MA) Resilience	
Nixon *et al.* (2021); n = 404 employees, advertised through health insurance company	Germany	Online stress management intervention (Get.On Stress).	7-weeks access to intervention, comprised 7 sessions.	3-arm Randomised Control Trial: With or w/o guidance, Wait-list Control).	PSS, CES, Resilience, Burnout, Engagement, Productivity	Significant reduction in stress (all p < 0.001) for both IGs vs control (d = 0. 83 and 0.80, and d = 0.88 and d = 0.91 respectively). No difference between IGs. Also significant reduction in depression (d = 0.74 and d = 0.62, and d = 0.61 and d = 0.68, and burnout (d = 0.81 and d = 0.83, and d = 0.84 and d = 0.91, respectively).
Nixon *et al.* (2022), n = 264 employees reporting elevated stress levels	Germany	Get.on Stress, intervention for employees based on Lazarus' transactional model of stress focusing on problem solving and emotion regulation skil	7-weeks intervention.	Randomised Control Trial; wait list control.	PSS-10, Effort Reward Imbalance Questionnaire Short Form; Exhaustion part of Maslach Burnout, Occupational Self-efficacy, UWES); WAI, the Work Limitations Questionnaire, CES-D, (AQoL)-8D the Client Satisfaction Questionnaire.	Stress reduction was significantly higher for the intervention group compared with the control group at T2 (d=0.87) and T3 (d=0.65).
Otared *et al.* (2021);	Iran	Online (live) group Acceptance and Commitment Therapy classes.	8 75-min classes.	Randomised Control Trial; Wait-list control.	Beck, QoL, GAF, ACE/ACTION Q	Significant decrease in depression (p = < 0.05, n = 0.52) anxiety (p < 0.05, d = 0.81), QoL (p < 0.05, d = 0.42) and

n = 40 healthcare workers						acceptance ($p < 0.05$, n = 0.55) post-intervention versus controls.
Purdie *et al.* (2022), n = 66 paediatric residents	United States	Hybrid Mindful Awareness Practices (MAPs) intervention, comprised of one in-person 60–min session and 6-week access to a digitally delivered MAPs curriculum	6 weeks intervention	Randomised Control Trial, wait list control	PSS, the Abbreviated Maslach Burnout Inventory-9, BDI, BAI, UCLA Loneliness Scale, and PSQI.	Significant decrease in perceived stress scores for intervention group versus controls. No secondary outcome group differences detected.
Rich *et al.* (2021); n = 125 university staff.	United Kingdom	Mindfulness-based smartphone app (Headspace).	Access to mindfulness programme for 2 months, delivered via smartphone. 30 foundation sessions of 10 minutes each. Reminder emails sent.	Randomised Control Trial; Wait-list control.	FFMQ, PSS-10, Work-life balance, engagement, organisational citizenship behaviour, curiosity, intention to quit.	Significant improvements in aspects of mindfulness relating to acting with awareness (d = 0.51), non-reactivity (d= 0.39) and the total mindfulness (d = 0.50) Significant reduction in perceived stress, (d = -0.55) relative to the WLC group, also for work-life balance (d = 0.46) and the emotional aspect of job engagement (d = 0.46).
Stachele *et al.* (2020); n = 230 working adults with stress.	Germany	Online stress management intervention, self-guided cognitive-behavioural training programme.	6-week access. 6 modules, 45 mins approx. to complete each module.	Randomised Control Trial; Wait-list Control.	PSS-10, MOCS (coping), SWLS (satisfaction), PSQI, MBI, PHQ-9	Significant reduction in reported stress level for intervention group (d = 0.49) versus control, in addition to significant improved abilities in appropriate anger expression and relaxation. Stress-coping skills also increased significantly in intervention group compared to the control group (d = 0.39).
Xu *et al.* (2021);	Australia	Mindfulness smartphone application. (Headspace)	4-week interventions (10 min daily	Randomised Control Trial;	PSS, Burnout, Mindfulness,	Significant positive change in stress ($p < 0.001$), burnout ($p < 0.001$), mindfulness ($p < 0.001$) and well-being ($p < 0.001$)

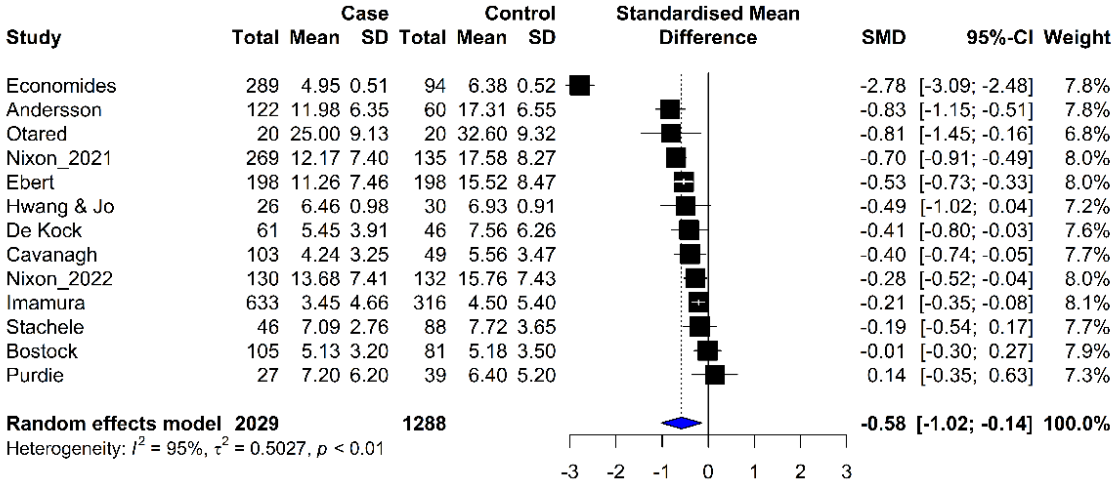
n = 148 emergency room hospital staff.			practice); 3-month follow up.	Wait-list Control.	Mental well-being	post-intervention versus controls. All small (d = 0.23 to d = 0.45).
Yoon *et al.* (2022), n = 45 employees from an attorney's office, construction company, and PR firm.	Korea	Smartphone application-based mindfulness training.	4-week intervention	Randomised Control Trial, wait list control	PSS, subjective well-being, and Mibyeong. MBI was used to measure Mibyeong.	Significant improvement in subjective well-being and Mibyeong for intervention group compared with the control group, maintained up to at least 4 weeks later. No change in perceived stress compared to the control group.

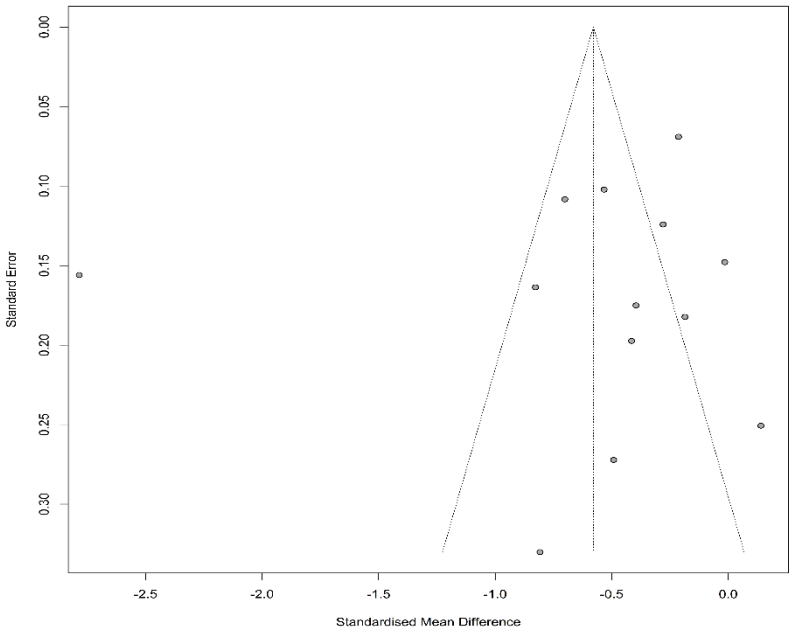
Random Effects Model and Funnel Plots for Stress



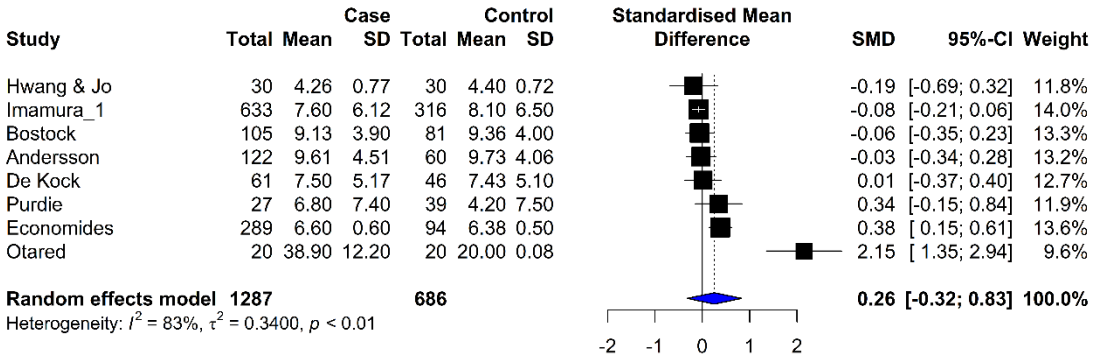


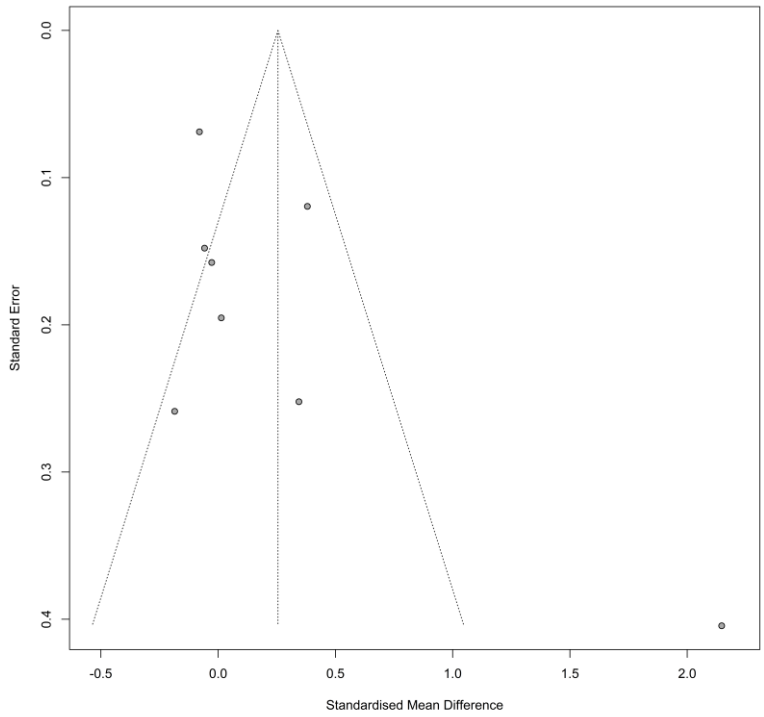
Random Effects Model and Funnel Plots for Depression



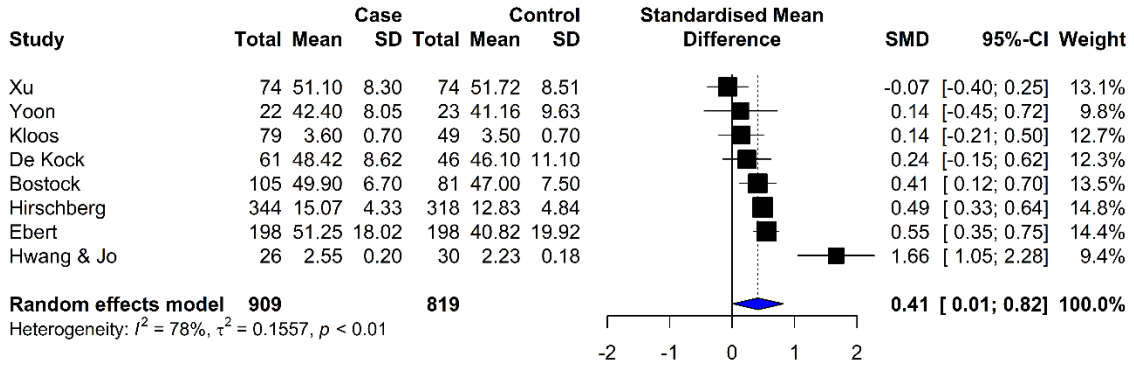


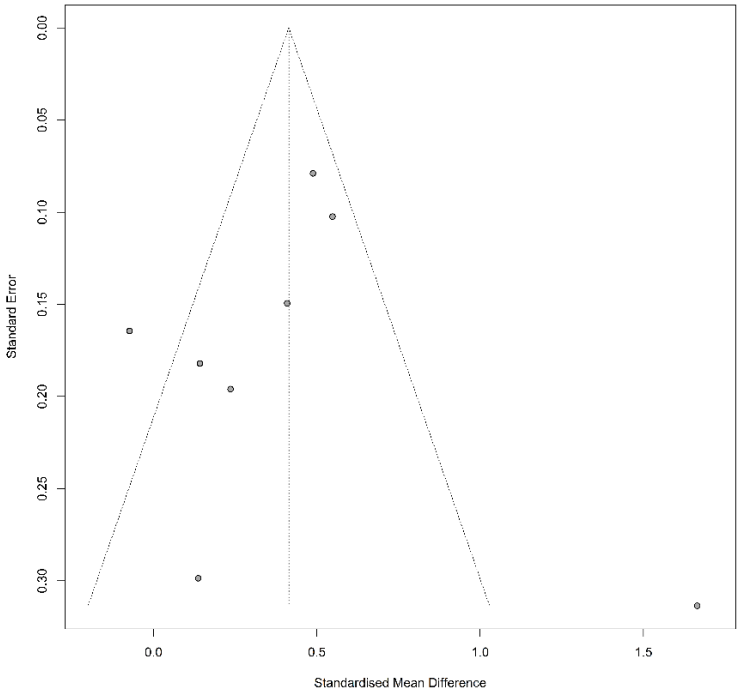
Random Effects Model and Funnel Plots for Anxiety



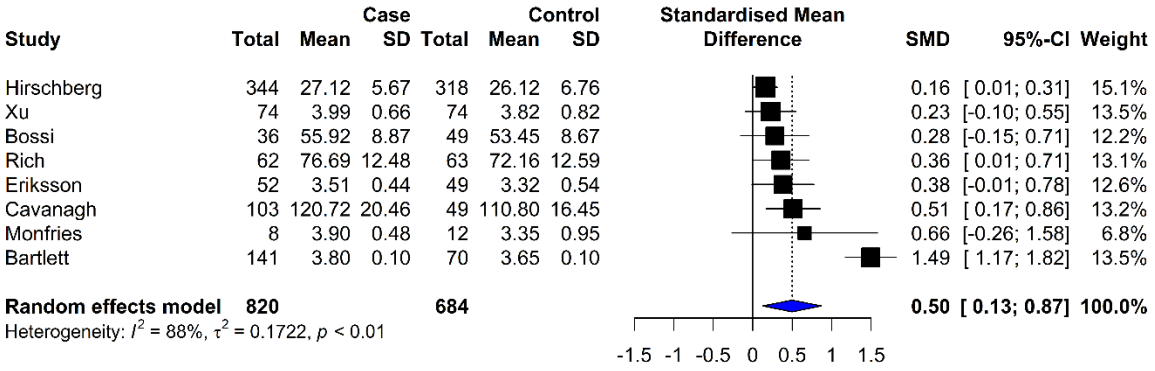


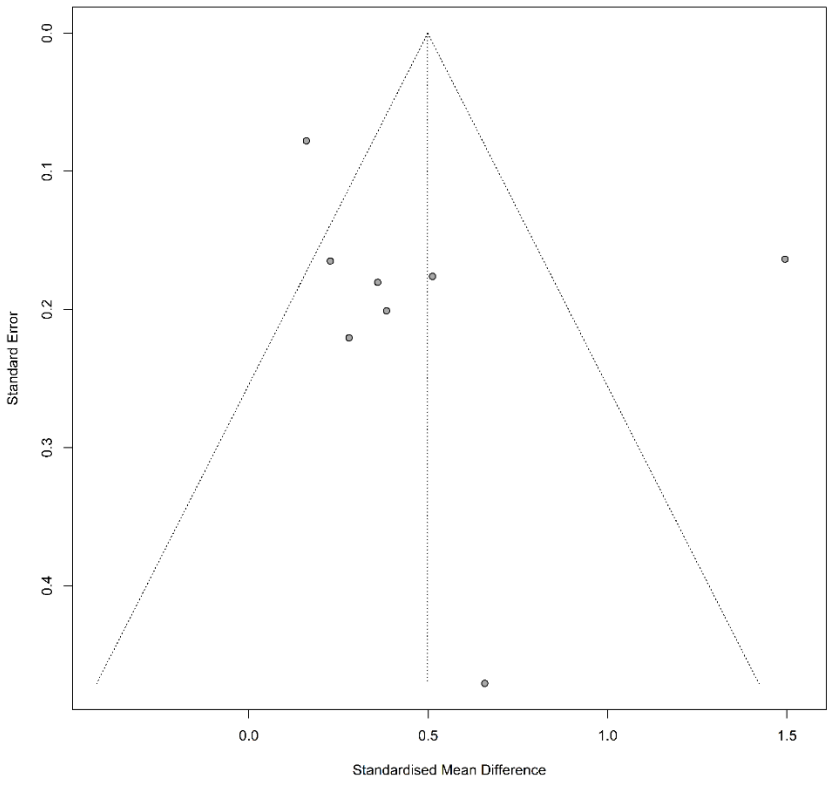
Random Effects Model and Funnel Plots for Well-being



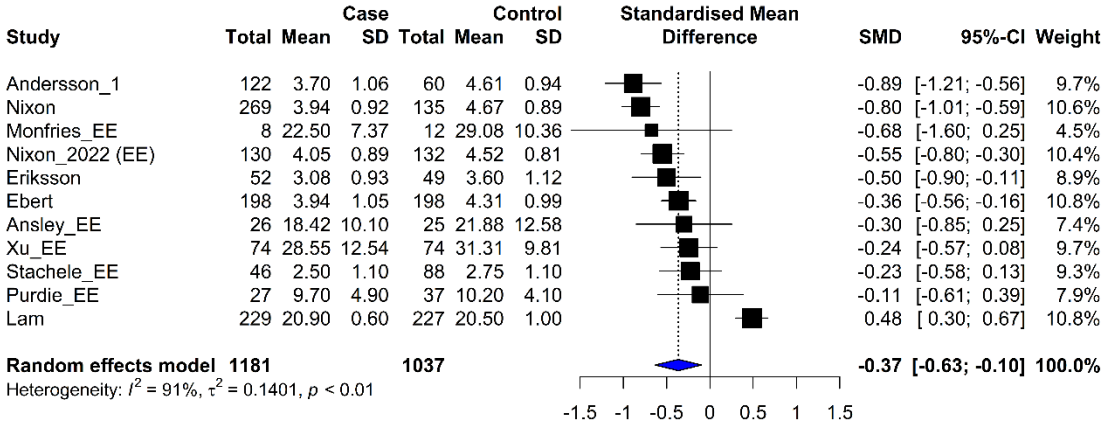


Random Effects Model and Funnel Plots for Mindfulness





Random Effects Model and Funnel Plots for Burnout



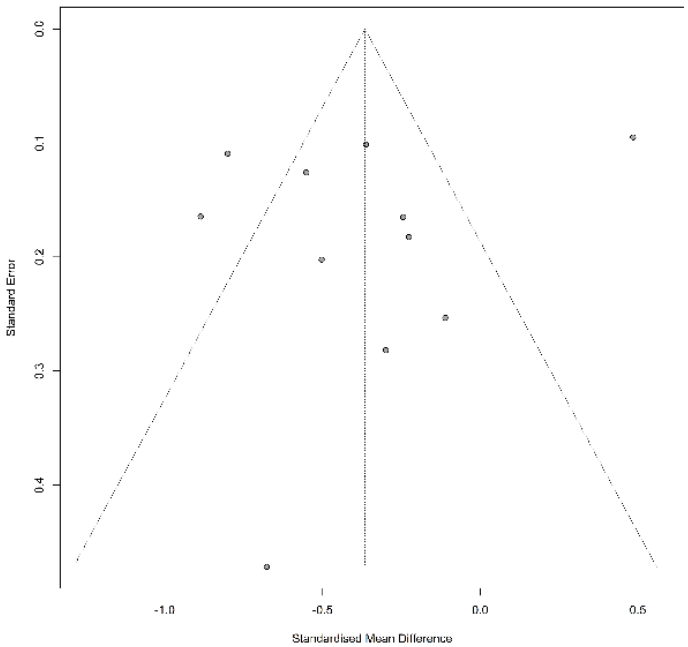


Table 24. Studies Excluded from Meta-Analysis in Updated Systematic Review

Authors; Participants	Country	Intervention Type	Duration	Design	Measures	Why Excluded	Findings
Alexiou *et al.* (2021); n = 36 health professionals	Greece	Online positive psychology intervention for depression, anxiety, stress, burnout	3-week intervention	Randomly assigned to intervention or placebo activities	DASS, MBI, Scale of Positive and Negative Experience (SPANE), Satisfaction with Life Scale (SWLS)	No inactive control	Significant decrease in depression (p = 0.004), anxiety (p = 0.007), and stress (p = 0.006) for intervention group versus control. No significant difference negative emotions (p = 0.084) after the intervention. Significant decrease in emotional exhaustion (p = 0.028), but not depersonalisation (p = 0.236), or personal accomplishment (p = 0.423) versus controls. Maintained to one-month post-intervention.
Barrett and Stewart (2021); n = 42 health and social care workers,	Ireland	Online ACT and CBT interventions for stress management	2-week three-session interventions	Randomised Trial: one of two three-session interventions.	PSS, GHQ, MBI, Work-related Acceptance and Action Questionnaire (WAAQ; Bond, Lloyd, & Guenole, 2013).	No inactive control	Significant reduction in perceived stress and mental health in both groups over time, no difference between. No change in burnout or psychological flexibility
Calero Elvira *et al.* (2021); n = 77 police workers	Spain	Therapist-guided iCBT programme for people with work-related	17 to 20-week intervention of 12 sessions. Participants	Randomised trial: with/without additional video-	Brief Symptom Inventory (BSI); State–	No inactive control	Significantly lower depression (ηp2 = 0.59) and anxiety (ηp2 = 0.74) for all participants after the programme; no significant

		anxiety and depression.	performed each session individually but were also organised in groups to analyse the effect of videoconference sessions	conference sessions.	Trait Anxiety Inventory (STAI); Beck Depression Inventory – Second Edition (BDI-II); Automatic Thoughts Questionnaire (ATQ); Rathus Assertiveness Schedule (RAS)		between group effects. Reduction in depression levels was maintained up to the 12-month follow-up, but levels of anxiety increased.
Coelhoso *et al.* (2019); n = 490 working women recruited from a hospital.	Spain	Mental health smartphone application for well-being and stress reduction. Based on relaxation training, breathing techniques, meditation and positive psychology.	8-week intervention. Participants had to attend 4 classes per week.	Randomised Control Trial; Active Control	PSS, WHO-5, subjective symptoms of stress and well-being at work and in general during the previous 30 days and at the moment.	No inactive control	Significant increase in general well-being over time ($p = 0.006$). Only the intervention group changed significantly in work-related well-being ($p < 0.001$), as well as work-related and overall stress ($p = 0.004$ and $p < 0.001$, respectively).
Deady *et al.* (2020); n = 2,271 workers	Australia	Mindfulness and behavioural activation application (HeadGear).	30-day behavioural activation and mindfulness intervention. One 5-10 minute 'challenge' per day. Delivered	Randomised Control Trial; 30-day mood monitoring app as control	PHQ-9	No inactive control	Significant reduction in for depression symptoms for IG post intervention ($d = 0.15$) and at 3-month follow up ($d = 0.13$) but not 12-month follow-up. Significant difference in mean change for work performance and resilience at follow-up also Significant differences in well-

			via smartphone app				being post-intervention but not follow-up. Decline from baseline to post-intervention for anxiety symptoms in both arms.
Fiol DeRoque *et al.* (2021); n = 482 healthcare workers	Spain	Smartphone intervention to reduce mental health problems during the Covid-19 pandemic (PsycCovid 19).	2-week access to app	Randomised Control Trial; placebo app as control	DASS, Davidson Trauma Scale (DTS), MBI, Insomnia Severity Scale, General Self-Efficacy Scale (GSE), Usability of Intervention	No inactive control	No significant between-group difference in the DASS-21 overall score at 2 weeks ($p = 0.15$). None of the secondary outcomes significantly differed between groups at 2 weeks either (all $p > 0.05$).
Gayed *et al.* (2019), n = 201 managers. 173 direct report employees provided baseline and follow-up data as well.	Australia	Online training programme for managers to better understand and support the mental health needs of their staff (HeadCoach)	6-week training period, delivered via website.	Cluster randomised control trial across three organisations, with wait-list control.	Confidence, Responsive Behaviour, Preventative Behaviour	No measures related to MA	Manager confidence significantly improved over time in the intervention group compared with the control, ($d = 0.44$) attenuated at follow-up ($d = 0.35$). Significant difference between the intervention and control groups for responsive and preventive behaviour post-intervention. For the 173 direct report employees who provided baseline and follow-up data, no significant differences identified.
Hicks *et al.* (2021); n = 30 surgical residents and faculty.	USA	Smartphone application Meditation intervention	10-week intervention, ten mobile mediation sessions	Randomised Control Trial; Wait-list control	Generalized Anxiety Disorder scale-7, Patient Health Questionnaire	Lack of Data	Significantly greater change in anxiety for IG versus control post-intervention ($p = 0.04$). There was no significant difference in average change in depression or Professional

					and Professional Quality of Life scale.		Quality of Life scale sub-scores between the intervention and control groups.
Imamura *et al.* (2022); n = 1200 nurses	Japan	Online self-guided psychoeducation website (Imacoco Care).	1-month intervention	Randomised Control Trial; Wait-list Control	Kessler Psychological Distress Scale, Fear about Covid.	No measures related to MA	Significant positive reduction in distress (p = 0.03, d = .14) for IG versus control post-intervention; adverse effect on fear (p = 0.01, d = 0.16)
Joyce *et al.* (2019); n = 144 firefighters	Australia	Online Resilience@Work [RAW] Mindfulness Program), draws upon ACT.	6- week six-session mindfulness intervention.	Cluster Randomised Control Trial.	BRS, Connor-Davidson Resilience, Acceptance and Mindfulness Skills, Resilience Resources	No inactive control	Intervention group significantly increased in adaptive resilience versus controls (d = 0.73) at six-month follow-up. No significant differences found for back resilience. Significant improvements optimism and use of emotional and instrumental support at 6-week follow-up in the IG compared with the controls, not sustained at 6-months. Improvement in active coping versus groups was sustained at 6-months.
Lahtinen *et al.* (2021); n = 561 university staff and students	Finland	Smartphone mindfulness application.	7-day programme via smartphone app, repeated four times. Daily 10 mins mediation.	Randomised control trial; brief mindfulness practice as control	PSS, Single Stress Item, GAD-7, BDI, FFMQ, Duration of Mediation, Cortisol	No inactive control	Significant decrease in perceived stress and burnout for both intervention (d = − 0.50, d = -0.45) and control group (d = − 0.34, d = - 0.29), difference between not significant. No effect for anxiety, single stress question, or cortisol.
Nielsen *et al.* (2021); n = 100 legal professionals.	Canada	Online mindfulness intervention (Mindful pause).	30-day intervention	Randomised control trial; Wait-list control	PSS, PANAS, DASS, FFMQ (5 scales - not suitable for	Data not available	Significantly lower stress (n = 0.16), PANAS (n = 0.13) and DASS (n = 0.12) for IG versus controls post-intervention.

					MA) Resilience		Higher positive affect (n = 0.09) and FFMQ (n = 0.23). No change in resilience.
Oishi *et al.* (2018); n = 240 schoolteachers	Japan	Online CBT intervention (Mind Skill Up Training) for psychological flexibility and subjective distress	12-week intervention (one session of group education and a Web-based CBT program lasting for 3 months).	Randomised control trial; wait-list control.	Cognitive Flexibility, Subjective Distress (Beck Depression and Kessle6 measured at baseline only)	No measures related to MA	Cognitive flexibility scores significantly improved in IG (d = 0.29) post-intervention versus control. Degree of subjective distress significantly decreased in IG compared with the control group post-intervention (d = 0.28).
Smoktunowicz *et al.* (2021); n = 1240 medical professionals	Poland	Online resource-based intervention (MedStress) to improve well-being.	Three exercises per module, up to 1.5 hours to complete all exercises.	4-arm Randomised control trial; (1) self-efficacy and perceived social support modules; (2) perceived social support and self-efficacy; (3) self-efficacy module, and (4) perceived social support module (active control).	PSS, Burnout, PHQ, Utrecht Work Engagement, Post-traumatic Stress Disorder Checklist, Self-efficacy, Secondary Traumatic Stress, Expectancy of Improvement and Perceived Credibility of the Intervention	No inactive control	Significant difference in job stress, social self-efficacy and burnout-related self-efficacy post-intervention but not at follow-up. No significant effect of condition on job stress indicating that stress decreased with time, apart from SE+SS versus active control SE and active SS control. , job stress was significantly lower in the experimental SE+SS condition when compared with the active control SS. There were no differences between study conditions for burnout and depression neither at time 2 nor at time 3.

Table 25. Online Work-Stress Management Interventions Included in the Existing Systematic Review (Phillips Gordeev and Schreyögg 2019)

Author/s; participants	**Intervention**	**Design**	**Intervention length; delivery modality and support/guidance provided**	**Theoretical Underpinning**	**Findings**
Abbott *et al.* (2009); *n* = 53 sales managers	'*Resilience Online'*, resilience skills training programme.	Randomised Control Trial, Wait-List Control. .	10-week programme delivered via website, plus individual and conference calls and e-mails	No theory or model indicated in study protocol	No significant difference versus control group post-intervention on scores of distress, quality of life, happiness or work performance.
Aikens *et al.* (2014); *n* = 89 chemical company employees	'*Dow Mindful Resilience Programme*' Abbreviated Mindfulness based Stress Reduction	Randomised Control Trial, Wait-List Control.	7-week programme delivered via website (virtual class and online training) plus weekly e-mailed feedback.	No theory or model indicated in study protocol	Significantly higher ratings of mindfulness and resiliency, and significantly lower perceived stress compared to wait-list controls post-intervention, with a medium average effect size of *d*=.67. Improvements were maintained at a 6-month follow-up.
Allexandre *et al.* (2016); *n* = 161 call-centre employees	'*Stress Free Now'* Mindfulness programme	Randomised Control Trial with four arms: E-mailed support (WSM) versus group support (WSM1) versus group support plus counsellor (WSM2) versus control.	8-week programme delivered via website with differing levels of support/guidance.	No theory or model indicated in study protocol	Significant improvement on measures of stress, burnout and mindfulness (no change in productivity or professional efficacy) for all intervention groups. Perceived stress the only outcome to improve for the control group. Effect sizes medium to large (*d*=.5 to *d*= .8) maintained at 16-week follow-up. Effect sizes were larger for participants who received group support than without compared to controls on all outcomes measures except for productivity (*d*=.8 versus *d*=.4 at 8 weeks and *d*= .7 versus *d*=.4 at 16 weeks).

Billings *et al*. (2008); *n* = 309 tech employees	*'Stress and Mood Management*' Cognitive-behavioural techniques plus relaxation and time management	Randomised Control Trial, Wait-List Control.	3-month programme delivered via website, no guidance or support indicated	No theory or model indicated in study protocol	Significant 'modest' improvements in knowledge and attitude to seeking help, and in the reduction of stress versus controls. Marginal changes work productivity and no change in mood, anxiety and depression compared to a control group.
Birney *et al*. (2016); n = 300 employed adults with mild to moderate depression	*MoodHacker* smartphone application	Randomised to mobile intervention or to vetted websites control group.	6-week smartphone application, clinically validated CBT-based depression self-management mobile apps currently available. Designed to directly activate key cognitive and behavioural skills and positive psychology strategies.	No theory indicated.	Significant effects from pretest to 6-week follow-up for intervention group compared to controls on depression symptoms, behavioral activation, negative thoughts, and depression knowledge and work absence. Effect sizes small to medium, larger for those with EAP access. Significant effects were maintained at 10-week follow-up for work absence for all subjects.
Bolier *et al*. (2014); n = 1140 nurses and allied health professionals	Workplace mental health online promotion plus feedback and online interventions	Cluster randomised controlled trial, with a health promotion module plus online interventions compared to a waitlisted no-intervention control group.	Participants offered a tailored choice of online interventions. Five interventions, namely PsyFit (based on positive psychology, CBT and mindfulness) or Colour Your Life, Strong at Work, Don't Panic Online, Drinking Less.	No theory or model indicated	Both the intervention and control groups improved over time regarding positive mental health, well-being and anxiety symptoms. Differences between groups on well-being, depression and anxiety symptoms were non-significant. Positive mental health significantly enhanced in OI group compared to the control group at three (d = 0.37) and six-month follow-up (d = 0.28). Also significant effect on work engagement at three and six-month follow-up, mainly due to deterioration in the control group.

Borness *et al.* (2013); n = 135 white collar workers.	Online Cognitive Training	Randomised to online cognitive training or documentaries about nature.	16-week access to online cognitive training intervention.	No theory or model indicated.	No significant effects on well-being immediately after the training. At the 6-month follow up, the control group experienced a significant increase in self-reported QOLS, a decrease in stress levels, and overall improvement in psychological well-being with small effects.
Carolan *et al.* (2017); n = 84 workers	Occupational digital stress management (*WorkGuru*)	Three-arm randomised controlled trial, comparing minimally supported web-based CBT based stress management intervention delivered with and without an online facilitated bulletin board, with a wait list control (WLC).	8-week programme based on the psychological principles of CBT, positive psychology, mindfulness and problem solving.	No theory or model indicated	Small effect size difference found between both active conditions compared with the WLC on all three sub-scales of the DASS. No difference was found between the two active conditions. At follow-up, a small effect size difference was maintained between DG and the WLC on both the anxiety and stress subscales, and a small or medium between group effect size difference was maintained between MSG and WLC on all three subscales. Means for both depression and stress were significantly smaller in the MSG.
Cook *et al.* (2007); *n* = 419 human resource employees	'*Health Connection*' Multiple Health Behaviours targeted	Randomised Control Trial, Control group received print materials.	3-month intervention period delivered via website, no guidance/support indicated	Social Cognitive Theory and Transtheorectic-al (Stages of Change) Model	Intervention had no impact on participants' perceived stress, stage of change in attempting to reduce stress, symptoms of distress or coping skills versus controls.
Cook *et al.* (2015); *n* = 278 IT workers aged over 50	*'Health Past 50'* Multiple Health Behaviours targeted	Randomised Control Trial, Wait-List Control.	3-month intervention period delivered via website, e-mailed support	Social Cognitive Theory	No impact on two stress measures; namely coping with stress and symptoms of distress

Ebert *et al.* (2014); *n*=150 teachers,	'*Everything Under Control'* Problem-solving intervention	Randomised Control Trial, Wait-List Control.	7-week programme, delivered via website with e-coach feedback following completion of exercises	No theory or model indicated in study protocol	The intervention group reported significantly greater decreases in depressive symptoms post-intervention and at 3 and 6-month follow-up points versus controls. Differences were medium post-intervention (*d* = .59) and small at 3-month (*d* = .37) and 6-month (*d* = .38) follow-up. Significant small to medium improvements made compared to controls on secondary measures of stress, self-efficacy, quality of life and worrying post-intervention (*d*= .36 to *d* = .63), at 3-month (*d* = .38 to *d* = .62) and at 6-month (*d*= .33 to *d* = .54) follow-up. No significant improvements on measures of absenteeism or burnout at any point.
Ebert *et al.* (2016a); *n*=264 employees recruited via insurance company	'*GET.ON Stress*' programme, problem-solving and emotional-regulation strategies	Randomised Control Trial, Wait-List Control.	7-week programme; delivered via website and mobile device. Programme was self-guided; participants could choose to receive automatic motivational text messages and small exercises on mobile phones.	Lazarus' Transactional Model of Stress	Significant medium to large reductions in perceived stress post-intervention (d = .96) and 6-month follow-up (d = .65) reported for participants in the intervention group versus wait-list controls. Significant small to medium improvements were also made the intervention group on measures related to mental-health and work skills and competences (d = .30 to d = .69) at both assessment points compared to controls. No improvements were made on measures of absenteeism, work engagement or physical health-related quality of life.
Ebert *et al.* (2016b); *n*=264 employees recruited via	'*GET.ON Stress*' programme, problem-solving and emotional-	Randomised Control Trial, Wait-List Control.	7-week programme; delivered via website and mobile device. Participants received	Lazarus' Transactional Model of Stress	Medium to large reductions in perceived stress post-intervention (d = .79) and 6-month follow-up (d = .85) reported for participants in the intervention group

insurance company,	regulation strategies		adherence focused guidance comprising adherence monitoring with personalised reminders and 'feedback on demand'.		versus wait-list controls. Significant improvements were also made the intervention group on measures related to mental-health; work-related health and skills and competences related to emotional regulation at both assessment points compared to controls. Work engagement, quality of life (physical health), absenteeism and presenteeism did not differ between the intervention and control groups.
Eisen *et al.* (2008); *n* = 288 manufacturing company,	Abbreviated Progressive Relaxation and Time Management	Randomised Control Trial with three arms; In-person versus Computer-based and Wait list control.	2-week programme delivered via website, no support/guidance indicated	No theory or model indicated in study protocol	Neither intervention group rated themselves as experiencing less stress or more control over stress in their lives following completion of the program or at a one- month follow-up.
Feicht *et al.* (2013); *n* = 147 insurance company employees,	Principles of Positive Psychology	Randomised Control Trial, Wait-List Control.	7-week programme, Virtual session delivered via e-mail	No theory or model indicated in study protocol	Medium to large improvements on measures of job-satisfaction and quality of life (both $d > 1$); happiness (d=.93); emotional stress (d=.69) and mindfulness (d=.62). No impact on saliva concentrations of cortisol and alpha-amylase, or the Attention Network Test performance.
Geraedts *et al.* (2014a); *n* = 231 nurses and allied health professionals One year follow-up presented in	*'Happy@Work'* Problem-solving, cognitive therapy and psycho-education.	Randomised Control Trial, 'Care as Usual' Control (received self-help booklet and advised to contact their physician).	6-week programme delivered via website with weekly feedback and e-mails	No theory or model indicated in study protocol	Anxiety (d=.16) and emotional exhaustion (d=.17) only measures on which the intervention group improved significantly more than the control group. No difference compared to controls on depressive symptoms anxiety, burnout and work-performance post-intervention or at a one-year follow-up

Geraedts *et al.* (2014b)					
Grime (2004); n = 48 employees with 10+ days absence.	Beating the Blues computerised CBT	Randomly assigned to intervention plus conventional care, or conventional care alone.	Access for one month to CBT programme. Cognitive and behavioural exercises are prescribed at the end of each module, and debriefed at the start of the next.	No theory or model indicated in study protocol	At end of treatment and 1 month later, depression and negative attributional style scores were significantly lower in the intervention group. One-month post-treatment, anxiety scores were also significantly lower in the intervention group. The differences were not statistically significant at 3 and 6- months post-treatment.
Hasson *et al.* (2005); *n* = 303 IT and media workers	Online Health Promotion Tool plus cognitive exercises, time management and relaxation techniques and 'chat'	Randomised Control Trial, Active Control who received health promotion tool only.	6-month intervention period, delivered via website, no support/guidance indicated	No theory or model indicated in study protocol	Significant improvement by intervention group on perceived ability to manage stress, sleep quality, mental energy, concentration and social support. Also significant positive changes in several biological markers including DHEA-S (a steroid with neuroprotective effects); Neuropeptide Y (NPY); Chromogranin A (CgA) and Tumour necrosis factor α (TNFα)
Heber *et al.* (2016); n = 264 employees recruited via insurance company	'*GET.ON STRESS'* programme, problem-solving and emotional-regulation strategies	Randomised Control Trial, Wait-List Control.	7-week programme; delivered via website combined with e-coach feedback and automatic texts	Transactional Model of Stress	Significant large improvements in reported stress post-intervention (d=.83) and at 6-month follow-up (d=1.02) versus controls. Maintained at a 12-month follow-up (d=1.83). Significant medium to large positive effects (d=.4 to d=.75) of mental health, work-related health and stress-related skills post-intervention and at 6-month follow-up. No impact on absenteeism or presentism).

Hirsch *et al.* (2017); n = 146 finance software company employees	*myStrength* combined web and mobile intervention for depression in workplace.	Randomly assigned to intervention or to 12 "Tip/Fact of the Week" emails.	26-week access to myStrength resources including cCBT modules for depression and anxiety, mindfulness, a mood tracker, personal inspirations and a searchable library of resources.	No theory indicated.	Participants in both study arms experienced improvement in depression symptoms. Improvements were achieved significantly faster and to a greater degree by intervention group compared to controls.
Imamura *et al.* (2014); n = 762 private company Workers. Also Imamura *et al.* (2015) - one year follow up.	Internet CBT-Useful mental health solution series for business	Randomised Control Trial; Control group received weekly e-mails with useful stress information.	6-week training programme (6 lessons in total, up to ten weeks to complete). Delivered via website with once a week e-mail reminders from researchers.	No theory or model indicated in study protocol	Small significant decreases in depressive symptoms reported post-intervention (d = .14) and at 6-month (d = .16) follow-up versus controls. Small significant improvements compared to controls were also made on scores of dysfunctional attitude, knowledge and self-efficacy. There were no significant effects on psychological distress or problem-solving. 12-month follow-up (Imamura et al., 2015) reported no effect of the intervention on scores of depression or distress at this point. However significantly lower incidence of such episodes reported for those in the intervention group versus the control group.
Jonas *et al.* (2017); n = 39 workers who scored over 3.5 on MBI	Intervention for burnout, stress and well-being	Randomly assigned to intervention or wait-list control.	Four week four exercise structured and therapist-guided intervention based on solution-focused and cognitive-behavioural therapy, delivered via website.	No theory or model indicated	Significant difference in depression (d = 0.66), cynicism (d = 0.87) and personal accomplishment (d = 0.75) for intervention group versus controls. No effect on stress, though changes in depression, cynicism and professional

					efficacy maintained at 3 and 12 month follow-up.
Ketelaar *et al.* (2013); *n* = 1140 nurses and allied health professionals	Range of CBT-based interventions targeting mental fitness; work stress; depressive and panic symptoms and risky drinking behaviour offered following screening	Randomised Control Trial, Wait-List Control.	3-month intervention period programmes delivered via website. Feedback provided following screening, access to contact forum provided.	No theory or model indicated in study protocol	No significant improvement on scores of work functioning; distress; work-related fatigue; posttraumatic stress or work ability post-intervention or a 3 or 6- month follow-up versus controls. Attrition very high.
Lappalainen *et al.* (2013); n = 24 employed males with exhaustion, stress symptoms, or sleeping problems	*P4Well* intervention cognitive behavioural therapy and the acceptance and commitment therapy with personal health technologies.	Randomly assigned to intervention or wait-list control.	Personal health technologies plus 3 psychologist-assisted group meetings. Personal health technologies were a wellness toolkit which included a Web portal, a mobile phone with 3 preinstalled applications, a pedometer and a heart rate monitor.	No theory indicated.	Depressive symptoms decreased more in the intervention group compared to the control group, medium effect size (d=0.57). Insignificant group by time interaction effect in psychological symptoms. Significant improvement for intervention versus controls on health and working ability, effect sizes small to medium. No effect for burnout.
Ly *et al*. (2014); *n* = 147 sales managers	Cognitive-Behavioural exercises based on ACT	Randomised Control Trial, Wait-List Control.	6-week programme delivered via smartphone app with text message from therapists	No theory or model indicated in study protocol	Significant small to moderate improvements were reported on scores of mood (*d*=.41) and perceived stress (*d*=.50). No impact on transformative leadership
Mori *et al.* (2014); *n* = 168	Computerised Cognitive Behaviour Therapy	Randomised Control Trial, Wait-List Control.	4-week intervention period (group session plus online homework),	No theory or model indicated in study protocol	Small significant improvement versus controls in the intervention group's ability to transform thoughts post-intervention (d

system engineers			plus e-mail feedback from CBT expert plus access to occupational health nurse for queries		= .26) and their ability to cope with stress at 6- month follow-up (d = .37). No impact on psychological distress, problem-solving scores or in the recognition of dysfunctional thinking. Participants with clinically significant emotional at baseline reported significantly lower psychological distress scores compared to similar participants in the control group, with medium effect size (*d* = .61). Improvement was maintained at 6 month-follow up (*d*=.60)
Myers *et al.* (2018); n = 479 university staff and students	*Fun for Wellness* (FFW) intervention to increase well-being	Randomised to intervention or wait list control.	30-day intervention designed to promote growth in well-being by providing capability-enhancing learning opportunities, delivered via website	No theory or model indicated	No effect on wellbeing actions at 30 and 60 days. However, participants who complied with the intervention had significantly higher well-being actions scores, compared to potential compliers in the Usual Care group, in the interpersonal dimension at 60 days, and the physical dimension at 30 days.
Neumeier *et al.* (2017); n = 303 employees	Well-being programme for employees	Three-arm randomised control trial including a wait list control group and an established gratitude programme for comparison.	Web-based positive intervention (PI) programme was based on empirical findings and latest the PERMA model of well-being.	PERMA model of well-being	Significant increases in general subjective wellbeing and work-related subjective well-being (small and medium effect sizes) for participants of the gratitude and the PERMA-based programme compared to no increases in the wait list control group.
Persson *et al.* (2018); n = 117 distressed managers,	Internet-based Stress Management	Randomised Control Trial, Attention Control.	8-week website intervention including cognitive behavioural stress management and positive management	No theory/model indicated.	Participants in the intervention group reported significantly fewer symptoms of perceived stress, depression, insomnia, and burnout, with moderate to large effects at post intervention. Significant medium to

			techniques. Mail support provided.		large effect sizes on the mental health outcomes were also found at the 6- month follow up.
Philips *et al.* (2014); *n* = 637 various occupations	*'Mood GYM'* Computerised Cognitive Behaviour Therapy	Randomised Control Trial, Attentional Control group (directed to general information website.	5-week programme delivered via website, plus e-mail prompts and weekly phone calls	No theory or model indicated in study protocol	No significant improvement versus controls on scores of health, quality of life or subjective work-related performance
Rexroth, Michel and Bosch (2017); n = 191 employees	Promoting Well-Being by Teaching Employees How to Segment Their Life Domains (Mindfulness Intervention).	Quasi-experimental study.	3-week online self-training intervention based on mindfulness	No theory or model indicated in study protocol	Intervention group experienced significantly less emotional exhaustion and negative affect, and significantly more life satisfaction compared to the control group participants.
Ruwaard *et al.* (2007); *n* = 177 various occupations,	E-mailed Cognitive Behaviour Therapy	Randomised Control Trial, Wait-List Control.	7-week programme delivered via e-mail, pus therapist feedback and phone calls if needed.	No theory or model indicated in study protocol	Significant small (*d*=.1) to medium (*d*=.6) improvements on scores of stress, depression, anxiety and emotional exhaustion versus controls. The odds of recovery from clinical stress were significantly higher for participants in the intervention group versus those in the control. Similar recovery effects for depression and emotional exhaustion but not anxiety. Improvements more pronounced at 3-year follow-up (uncontrolled), ranging from *d*= 1.3 for anxiety to *d*=1.8 for stress. Significant maintenance of improvement was also found for measures of depression, emotional exhaustion, stress and anxiety.

Shirotsuki *et al.* (2017); n = 87 employees in Japanese companies	Self-help computerised cognitive behaviour therapy program with a supplement soft drink	Randomly allocated to a control group, cCBT, or cCBT with supplement drink.	Both CBT and CBT groups received six weekly instalments of a self-help CBT programme. One group consumed a drink containing 200 mg of L-carnosine every morning for the 6 weeks.	No theory or model indicated in study protocol	CBT group significantly improved on the POMS-TA (d = 0.37) and the CBT with drink group significantly improved on POMS-F (d = 0.60).
Smith (1987); n = 30 adult male juvenile counsellors	Computerized Self-Help Stress Coping Program	Not reported.	5-week computer programme based on cognitive learning theory	No theory indicated.	No differences between the groups on occupational stress or trait anxiety post intervention. However, decreases in personal strain and state anxiety were found along with increases in personal resources.
Thiart *et al.* (2015); *n* = 128 teachers	'*GET.ON Recovery'* programme, cognitive-behavioural methods	Randomised Control Trial, Wait-List Control.	6-week programme, delivered via website with weekly feedback from coach plus e-mail reminders	No theory or model indicated in study protocol	Significant large reduction in insomnia severity post-intervention (*d*=1.45) and at 6-month follow-up (*d*=1.43) versus wait-list controls. Significant improvements also on measures of rumination, worrying, sleep-efficiency, restorative sleep, recreational activities and recovery versus controls. Effect sizes ranged from *d*=.34 to *d*=.77 post-intervention and *d*=.34 to *d*=.99 at 6 -month follow-up. There was no impact on recovery mastery or absenteeism.
Umanodan *et al.* (2014); *n*=263 research and	Behavioural, Communication and Cognitive techniques	Randomised Control Trial, Wait-List Control.	7-week programme delivered via website with e-mails reminders/prompts	No theory or model indicated in study protocol, Self-efficacy	Significant increase on scores of knowledge only. No effect on measures of work performance; job satisfaction; social support; problem-solving; avoidance or

development staff in a manufacturing company				theory referenced in delivery of programme.	suppression. Further analysis excluding a 'dashed group' of participants (i.e. those that accessed the intervention material for only two days or less) indicated a significant impact on scores of problem-solving and knowledge about stress versus controls.
Wolever *et al.* (2012); *n* = 239 insurance carrier employees	*'Mindfulness at Work'* Mindfulness-based Intervention	Randomised Control Trial with four arms: In-person versus online mindfulness versus yoga group versus inactive control.	12-week mindfulness programme delivered via virtual classroom. No guidance/support indicated	No theory or model indicated in study protocol	Significant medium to small decreases in perceived stress ($\eta 2 = .013$) and sleep difficulty ($\eta 2 = .04$) and a significant increase in heart rhythm versus inactive controls for both mindfulness groups and for the yoga group. Heart rate coherence the only post-intervention difference between the two mindfulness groups. None of the interventions had any impact on mood, worker productivity, pain or blood pressure.
Yamagishi *et al*. (2008); *n* = 60 nurses	'Career Identity Training'	Randomised Control Trial, Wait-List Control.	60-minute programme delivered over 3 weeks via website, no guidance/support indicated	No theory or model indicated in study protocol	Knowledge of career identity increased in the intervention group. No impact on measures of job stress or mental health Mental workload, job control, vigour, and anxiety all significantly worsened in the control group; intervention may have served as a protective factor with regard to employee well-being
Yuan (2015); n = 321 employees	*Happy@Work* intervention programme based on Psychological Capital Development	Randomised to intervention or wait-list control.	4-week intervention, which consisted of four web-based training sessions based on Psychological Capital	No theory indicated.	Significant small to medium improvement on PsyCap levels after the intervention, not sustained at 1- and 3-month follow-up. Significant effect on work engagement (d = 0.235 after the intervention, lasted for 1-month and 3-month) and mental well-being

	.				(d = 0.34, d = 0.112 and d = 0.156 for post-, 1-, and 3-month follow up assessments). Intervention not effective in reducing depressive symptoms or improving life satisfaction.

Scoping Review of Qualitative Evaluations of Online Work-Stress Management Interventions (PRISMA Flow Chart)

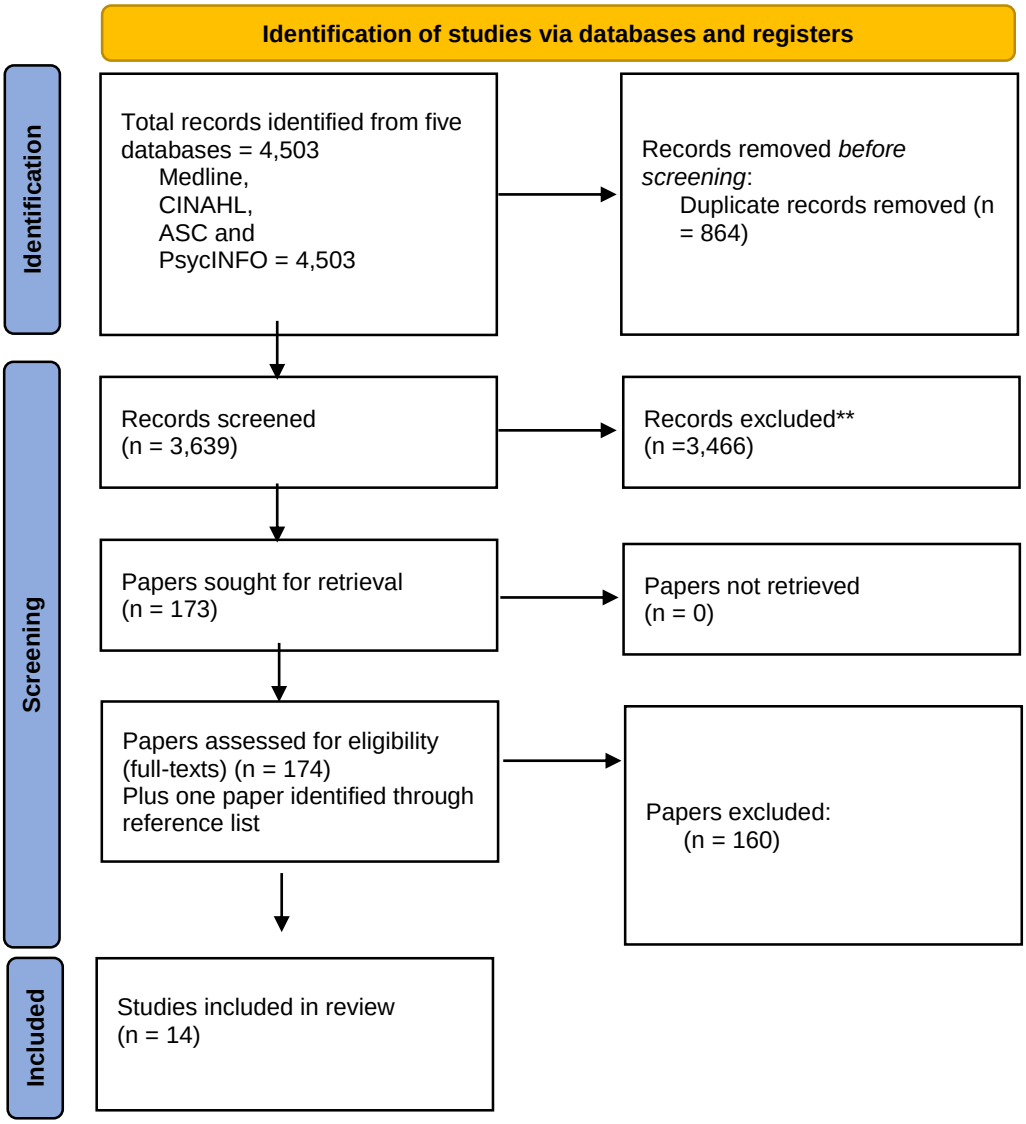


Table 28. Qualitative Studies of Workers' Experiences of Online Work-Stress Management Interventions

Author, Year	Country	Intervention	Methods; MMAT Score	Summary of Qualitative Findings
Asplund *et al.* (2019); n = 9, workers from a range of occupations	Sweden	Online CBT intervention	Individual semi-structured interviews; MMAT Score: ***	Six key themes relating to participants' experience of the intervention: content; advantages; disadvantages; guidance; commitment, and effects.
Blake *et al.* (2021); n = 42 health care trainees during Covid-19	United Kingdom	Online stress management intervention during Covid-19 based on positive psychology, informed by health policy and leadership models, aligned with the Five Ways to Wellbeing model	Mixed-methods – Survey collected quantitative data and individual semi-structured interviews; MMAT Score: ***	Three over–arching themes generated from analysis of interviews. Only one related to the app (digital support for well-being – comprised sub-themes of usability and engagement, learning and development, future development
Carolan and deVisser (2018); n = 18, workers from a range of organisations	United Kingdom	Online 'WorkGuru' intervention, a module programme based on cognitive behavioural therapy (CBT), positive psychology, mindfulness, and problem solving	Individual semi-structured interviews; MMAT Score: ***	The intervention was described by as convenient, flexible, and anonymous; attributes that were seen as being both facilitators and barriers to engagement in a workplace setting. Other facilitators included interactive and interesting content and design features such as progress trackers. The main barrier to engagement was a lack of time.
Deady *et al.* (2020); n = 26 apprentices (aged 18 – 30) took part in one of eight (90-min) focus groups. Participants explored the HeadGear app, took part in group discussions, and completed uMARS questionnaires.	Australia	Online HeadGear App, a smartphone application-centred on behavioural activation and mindfulness therapy. The main therapeutic component was a 30-days challenge in which users complete one "challenge" daily.	Mixed methods – quantitative data collected via surveys, qualitative data collected via open-ended interviews and focus groups; MMAT Score: ***	Key themes were positive overall impact on mental health, the significance of tailoring the app to apprentices specifically, importance of reminders, and failure to make use of the toolbox function. Views differed on technical difficulties, general usage of the app, and value of daily challenges; specifically, the mindfulness, mood monitoring, and action-planning/goal setting activities.

De Korte *et al.* (2018); n = 22 tech company employees participated in interviews, 15 employees participated in three focus groups, and 6 experts participated in one focus group.	Netherlands	Brightr, a mobile health app especially developed for workers at a high tech company to improve their health and well-being. The app continuously monitors worker's behaviour, with modules for mental resilience, sleep, physical activity, nutrition, and shift work.	Qualitative - Interviews and focus groups; MMAT Score: ***	Participants were enthusiastic about the app. Combined analysis of data from the three evaluation methods showed drivers and barriers for technology, user characteristics, context, privacy, and autonomy.
Eccles *et al.* (2021); n = 70, 'BroMatters' intervention recruited through random dialling, those in 'HardHat' were recruited through Green Shield. All participants at high risk of major depressive episode	Canada	Two interventions -BroMatters intervention was psychoeducational and CBT/self-help in nature; HardHat encompasses enhanced depression information, self-assessment tools, and nine work-focused CBT and problem-solving therapy (PST) sessions.	Individual semi-structured interviews; MMAT Score: ***	There were both personal and programme-level barriers to programme use. The three personal barriers included time, stress level, and the perception of depression prevention. Content, functionality, and dangers were the programme-level barriers.
Eklund *et al.* (2018); n = 15, university staff with administration/teaching functions	Sweden	Online stress management intervention based on range of theoretical models, including the Lazarus and Folkman (1984) model.	Mixed-methods - survey that collected quantitative and qualitative data. Qualitative data comprised responses to four open-ended questions. MMAT Score: **	Six categories were identified regarding acceptability and practicability: extensiveness, interference, clarity, flexibility, insights, and need for reminders.
Freund *et al.* (2022); n = 22, forestry workers, farmers and gardeners	Germany	Online guided intervention to prevent depression, based on the GET.ON online intervention and adapted to agriculturists.	Individual semi-structured interviews; MMAT: ***	Participants appeared to accept and be satisfied with the intervention. Analysis identified 71 determinants for acceptance and satisfaction across ten dimensions: performance expectancy, organisation, e-coach, usability, training content and structure, training usage, training outcome, financing, social influence, and behavioural intention. Many positive drivers for

				use were related to the e-coach guidance, while participants reported different needs in terms of content and usage.
Heyen *et al.* (2021); n = 42 completed questionnaires, first responders during Covid-19	Switzerland	Online mental health programme 'COAST': Covid Anxiety and Stress Resilience Training	Mixed-methods - survey that collected quantitative and qualitative data. Qualitative data comprised response to single open-ended question on optimising the programme; MMAT Score: *	Some participants reported difficulties using a web-based format or wanted more visualization of the content. One user was concerned about confidentiality, specifically with regard to work-related answers.
Muuraiskangas *et al.* (2016); n = 17 ICT staff who used the intervention and participated in interviews	Finland	Online intervention based on acceptance and commitment therapy (ACT), delivered via a mobile application	Mixed methods - survey that collected quantitative and qualitative data (open-ended questions), plus individual semi-structured interviews; MMAT Score: ***	Analysis of qualitative data found that participants did not integrate the activities of the intervention into their everyday activities in the workplace. The app was perceived as a toolkit for personal well-being that helped with stress relief. Barriers to participation in the intervention included a lack of time, lack of perceived need, and lack of perceived benefits.
Osman, Hamid and Singaram (2021); n = 47 health care professionals and trainees during Covid-19	South Africa	Online mindfulness intervention during Covid-19	Mixed methods - online questionnaire that collected quantitative data, open-ended questions before, during and after each of the four weekly sessions. Combined with Zoom focus groups; MMAT Score: ***	Analysis of the qualitative data generated themes relating to a sense of acquired control and empowerment through increased mindfulness
Parker *et al.* (2022); n = 10 university staff members during Covid-19	Australia	Online “VU Elevenses” programme, which provided 10 to 15–minute micro-interventions comprising lifestyle and well-being strategies to promote mental	Individual semi-structured interviews; MMAT Score: ***	Thematic analysis generated five higher-order themes: a positive program; facilitating behaviour change; supporting mental health and well-being; providing social connection, and organizational support.

		health via a meeting platform during Covid-19		
Ravalier *et al.* (2020); n = 15 social workers completed interviews, results based on nine who used intervention	United Kingdom	Web-based app HOW (Healthier Outcomes at Work) for social workers. Psychoeducation, Events, Communicate to Managers tool, and Vocational Assistant.	Mixed Methods PAR approach, with individual semi-structured interviews; MMAT Score: ***	One stop shop (comprehensive) and communication tool highly valued. Dissemination of app and concern about VRA - truly anonymous, data protected
Xu *et al.* (2021); n = 24 emergency department staff	Australia	Mindfulness smartphone application	Individual semi-structured interviews; MMAT Score: ***	Four main themes were identified: individuality in use of the app, perceived benefits and impacts on life, perceived barriers, and enablers to use.

Appendix E

Institiúid Teicneolaíochta Phort Láirge Waterford Institute of Technology

Port Láirge Éire.
Waterford, Ireland.
T: +353-51-302000
T: T: +353-51-302000

REF: 16/NUR/02 info@wit.ie www.wit.ie

11 th April, 2017.

Mr. Cathal Ryan, 14, John's Hill, Waterford.

Dear Cathal,

Thank you for submitting your amendments in relation to Phase 2 of your project 'SuRE

Project: Sustaining Resilience in Employment — Investigating Work-Related Stress and Enhancing Resilience in Older Health and Social Care Workers through an Online Digital Platform ' to the WIT Research Ethics Committee.

Based on the revised WIT ethical approval application form and supporting documentation, I am pleased to inform you that we now fully approve the conduct of this project.

We will convey this decision to Academic Council.

We wish you well in the work ahead.

Yours sincerely,

James O'Sullivan

Dr. James O'Sullivan,
Acting Chairperson,

WIT Research Ethics Committee

cc: Prof. John Wells

Dr. Michael Bergin

Waterford Institute of Technology

Cathal Ryan <cathal.ryan@postgrad.wit.ie>

Ethics Application

Lamb, Caroline < Caroline.Lamb2@hse.ie>
To: Cathal Ryan <cathal.ryan@postgrad.wit.ie>

10 August 2017 at 16:03

Cc: "Hackett, Majella" <Majella.Hackett@hse.ie>

Dear Cathal,

I have reviewed your ethics application and am happy to grant you **expedited ethical approval**. You will not need to present this study to the Research Ethics Committee as this constitutes full ethical approval we will send a letter confirming this.

You may commence your study on receipt of this email.

I would appreciate it if you would send a copy of your study to the Research Ethics Office on completion.

Good luck with your study.

[Quoted text hidden]

Waterford Institute of Technology

Cathal Ryan <cathal.ryan@postgrad.wit.ie>

Alison Harnett <alison.harnett@fedvol.ie> 8 August 2017 at 13:30

To: Alison Harnett <alison.harnett@fedvol.ie>, Cathal Ryan <cathal.ryan@postgrad.wit.ie>

Dear Cathal,

Just to confirm for you, all of the agencies below have now been contacted to ask if they wish to participate in the study. At a central level the proposal was considered and approved by an ethics committee of one of our members and the members in the South East may choose to work on the basis that your institute and one of ours has approved, or they may choose to consider in more detail themselves.

Some of the members close up for the summer, so there may be a delay in response from some while they are on leave. All members have been requested to contact you directly with their response. Best wishes

Alison

_____

From: Alison Harnett
Sent: 31 July 2017 13:45
To: Cathal Ryan
Subject: RE: Quick question

Many thanks Cathal

From: Cathal Ryan [mailto:cathal.ryan@postgrad.wit.ie]
Sent: 31 July 2017 13:44
To: Alison Harnett <alison.harnett@fedvol.ie>
Subject: Re: Quick question

[Quoted text hidden]
[Quoted text hidden]

Institiúid Teicneolaíochta Phort Láirge Waterford Institute of Technology

Port Láirge, Éire.
Waterford, Ireland.
r. +353-51-302000
T: +353-51-302000
info@wit.ie
www.wit.ie

REF: 16/NUR/02

14th February, 2018.

Dear Cathal,

Thank you for submitting your amended documentation in relation to your project

'SuRE Project: Sustaining Resilience in Employment — Investigating Work-Related Stress and Enhancing Resilience in Older Health and Social Care Workers through an Online Digital Platform ' to the WIT Research Ethics Committee.

Based on the revised WIT ethical approval application form, I am pleased to inform you that we now fully approve the conduct of this project — Phase 3.

We will convey this decision to Academic Council.

We wish you well in the work ahead.

Yours sincerely,

Michael Harrison

Dr. Michael Harrison,

Acting Chairperson,

WIT Research Ethics Committee

cc: Prof. John Wells

Dr. Michael Bergin

NATIONAL FEDERATION OF VOLUNTARY BODIES
Providing Services to People with Intellectual Disability

January 29th 2016.

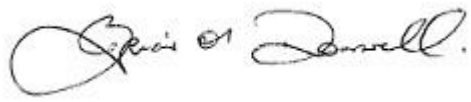
Re: Letter of Support- SuRE Project with Professor John Wells & Mr Cathal Ryan

To Whom It May Concern:

The National Federation of Voluntary Bodies has been collaborating with Professor John Wells, Head of School of Health Sciences at WIT, for the past number of years on the general theme of reducing stress in employment- namely the ROSE and DELAROSE projects. These European funded projects have allowed us to focus on the very important theme of employee well-being/stress reduction and to develop an online stress management tool which health and social care workers can access. In particular we are committed to supporting the participation of older persons in the workplace and identifying practices which can sustain their employment and employability.

We would therefore like to offer a letter of support to Professor Wells in relation to the SuRE project and its focus on supporting older employees and actions which promote workplaces that are fully inclusive and supportive of this age group.

Yours sincerely,



Brian O'Donnell

Chief Executive

Oranmore Business Park, Oranmore, Galway
Tel: 091-792316 Email: info@fedvol.ie Website: www.fedvol.ie
Company No. 330650 Charitable Status No: CHY 14080

Office of the
Nursing & Midwifery
Services Director

Nursing Midwifery Planning and Development
HSE South East,
Office Complex,
Kilcreene Hospital,
Kilkenny

9th March 2015

To: Professor John Wells, Head of the School of Health Sciences

Re: PhD scholarship - SuRE: Sustaining Resilience in Employment

---

Dear Professor Wells,

Thank you for inviting me to sit on the scientific committee that would oversee this research project and which will have such a big impact for employees in our current health and social services.

I am more than happy to take up the offer and would be happy to support the project in any way that I can. I have already spoken to HR in the HSE South, who are excited at the prospect of supporting the project and having HSE employees engage in it.

I look forward to working with you on this initiative and please do not hesitate to contact me if you require any further information in the interim.

Yours Sincerely

Mark White

Mr Mark White
NMPD Director
NMPD HSE-South East

Appendix F

Information Sheet

This survey explores the impact of work-related stress on staff in the health and social care sectors in the south-east of Ireland, conducted by researchers from Waterford Institute of Technology.

If you are at least 18 years old and work in the health or social care sector in Ireland you are invited to take part in this research study. If there is anything that you are not clear about we will be happy to explain it to you (please see contact details below).

The purpose of this survey is to understand the physical and psychological impact of work-related stress among workers in the health and social care sector in Ireland. In conducting this research we aim to gain a greater understanding of your own experiences and identify some of the challenges you may face in your profession. The findings will be used to develop more effective resources to help to health and social care workers manage their work-related stress.

Participation in this research is completely voluntary. You may choose not to participate at any stage of the research and you are free to omit any questions. However as your data is collected anonymously it will not be possible to remove it once your responses have been submitted.

If you decide to participate you will be asked to complete a set of questionnaires. The majority of questions in the survey are a tick-box type style and may take up to 15 minutes to complete in total. Your responses will be stored confidentially. The survey is anonymous and no identifiable information about you will be collected.

For more information, please contact Cathal Ryan cryan@wit.ie

Appendix G

The SuRE Project Survey

- Please do not write your name on the survey.
- You may skip questions that you do not wish to answer
- This survey may also be completed online (https://app.easyquest.com/q/Bc3n9)

Demographic Information

This is basic information which will not be used to identify you, only to guide the research. Please place a ✓in the most appropriate box.

1. Are you? ☐ Male ☐ Female ☐ Other (Please specify) _____

2. In what year were you born? _____ (Enter 4 Digit birth year; for example 1976)

3. Please describe your ethnicity _____

4. Please describe your nationality (e.g. Irish, British) _____

5. What is your current marital status?

☐ Married (living with spouse) ☐ Divorced ☐ Single (never married)
☐ Widowed ☐ Living with partner ☐ Separated
☐ Other Please Specify _____

6. Do you have children? ☐ Yes ☐ No
   If yes, please enter number _____

7. What is the highest level of education you completed?

Primary School Leaver ☐	Secondary School ☐	Certificate ☐
Diploma ☐	Degree ☐	Post – Graduate Diploma ☐
Post – Graduate Certificate ☐	Masters ☐	PhD ☐

8. What county do you live in? _____

9. What county do you work in? _____

10. How long is your daily commute to work (on average)? _____

11. What is your current occupation/area of work?

_____

_____

12. What is your current position/job title?

_____

_____

13. How many years have you worked in your current position?

_____

14. How many years (approx.) have you worked in the health or social care sector?

_____

15. What are your current working hours?

☐ Full time

☐ Part time

☐ Agency/Bank worker/Locum

The following items are about activities you might do during a typical day. Does your health limit you in these activities? If so, how much?			
	Yes, limited quite a lot	**Yes, limited a little**	**No, not limited at all**
Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf?			
Climbing several flights of stairs			

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?		
Accomplished less than you would like	☐ No	☐ Yes
Were limited in the kind of work or other activities	☐ No	☐ Yes

During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)? (Tick relevant box)				
Not at all	A Little Bit	Moderately	Quite a Bit	Extremely

In general, would you say that your health is? (Tick relevant box)				
Excellent	**Very Good**	**Good**	**Fair**	**Poor**

How much of the time during the past 4 weeks…						
	All of the time	**Most of the time**	**A good bit of the time**	**Some of the time**	**A little of the time**	**None of the time**
Did you have a lot of energy?						
Have you felt calm and peaceful?						

Have you felt downhearted and depressed?						

During the past 4 weeks, how much of the time has your physical health or emotion problems interfered with your social activities (like visiting with friends, relatives, etc.)?				
All of the time	**Most of the time**	**Some of the time**	**A little of the time**	**None of the time**

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as felling depressed or anxious)?				
Accomplished less that you would like	☐	Yes		☐ No
Didn't do work or other activities as carefully as usual	☐	Yes		☐ No

How steady is your work?				
Regular and Steady	**Seasonal**	**Frequent Layoffs**	**Both Seasonal and Frequent Layoffs**	**Other**

Sometimes people permanently lose jobs they want to keep. How likely is it that during the next couple of years you will lose your present job with your employer?			
Not at all likely	**Not too likely**	**Somewhat likely**	**Very likely**

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.					
0 = Never 1= Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often					
In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
In the last month, how often have you felt nervous and "stressed"?	0	1	2	3	4
In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
In the last month, how often have you felt that things were going your way?	0	1	2	3	4
In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Are there any comments or any information you would like to add regarding the stress or stressors you experience in the workplace?

_____

_____

_____

_____

_____

Have you accessed or do you current use any supports to help you manage or cope with work-related stress?

_____

_____

_____

_____

_____

If yes, what form did/does this support take? (Online, face-to-face, workplace training)

_____

_____

_____

_____

_____

Appendix H

Invitation/Information Sheet

Evaluation of the 'Certificate in Work-Related Stress'

This research explores the experiences of learners who have completed the online 'Certificate in Work-Related Stress'. The aim is to assess the extent to which the programme meets the needs and preferences of learners and to determine how the content and structure of the programme can be improved.

This research is conducted by researchers from the School of Health Sciences, Waterford Institute of Technology (Mr Cathal Ryan, Dr Michael Bergin and Professor John Wells) and has been approved by the Waterford Institute of Technology Research Ethics Committee.

We are writing to you because you have completed the 'Certificate in Work-Related Stress' and we would like to invite you to take part in this research study. If you decide to participate you will be asked to take part in an individual interview with a member of our research team. This interview will take place over the telephone or online via skype, depending on your preference. It is anticipated that the interview will last between 45 minutes and one hour (but normally no longer than 45 minutes). The interview will be audio-recorded, transcribed and analysed.

Participation in this research is completely voluntary. You may withdraw at any stage of the research, even after you have completed your interview. You are welcome to remove your data following the interview up until the point of data analysis. Please be advised that any disclosure on your part relating to unethical or unprofessional behaviour may be referred to the relevant authorities.

If there is anything that you are not clear about we will be happy to explain it to you. Your responses will be treated and stored confidentially in the School of Health Sciences. Only the research team will have access to the data. At the end of the research the results may be published in journals and conference presentations. No participant will be identifiable from any publications.

For more information, please contact Cathal Ryan cryan@wit.ie 056-302695

Informed Consent Form

Evaluation of the 'Certificate in the Management of Work-Related Stress'

This research explores the experiences of learners who have completed the online 'Certificate in the Management of Work-Related Stress'. The aim is to assess the extent to which the programme meets the needs and preferences of learners and determine how the content and structure of the programme can be improved.

Participation comprises an individual interview with a member of our research team. This interview will take place over the telephone or online via skype, depending on your preference. It is anticipated that the interview will last between 45 minutes and one hour. The interview will be audio-recorded, transcribed and analysed. Your responses will be treated and stored confidentially in the School of Health Sciences. Only the research team will have access to the data.

Participation in this research is completely voluntary. You may choose to withdraw at any stage of the research. You are welcome to remove your data following the interview up until the point of data analysis. At the end of the research the results may be published in journals and conference presentations. No participant will be identifiable from any publications.

By signing below, you are agreeing to the following (1) you have read and understood the Information Sheet, (2) questions about your participation in this study have been answered satisfactorily, (3) you are aware of the potential risks (if any), (4) you are taking part in this research study voluntarily and (5) you give your permission for your interview to be audio-recorded and analysed.

_____

Participant's Name (Printed)*

_____ _____

Participant's signature* Date

Appendix I

Schedule of Interview Questions

What did you want to gain from the Certificate?
Why did you choose an online programme and what did you expect from it?
Have you enrolled in or completed an online programme before?

How new was the information in the Certificate to you?
What do you feel you learnt from the Certificate?
How useful did you perceive the Certificate for your working life?
Do you feel that your management of stress has changed as a result of the Certificate?

How were your personal needs met by the Certificate?
How appropriate did you perceive the learning material in the Certificate?

Which part of the programme was most relevant to your work?
Which part of the programme did you perceive most irrelevant to your work?
How well could you implement what you learned in your workplace?
What learning material from the Certificate do you anticipate using in the future?

How user-friendly did you perceive the Certificate?
How appealing was the design of the website to you?

How supported did you feel during the programme?
What kind of support would you generally want from an online programme?
What kind of support would you ideally like to get from such a programme?
How comfortable were you with the delivery of the Certificate?

What did you like and what didn't you like about the programme?
Was there anything that encouraged or discouraged you from continui

Examples of Interview Transcripts

Extract A:

What benefits were there to you from completing the programme?

It was a mix. It was handy for me in personal way, I had to re-look at myself and my own lifestyle - so in two ways really. Then, you know, I see a lot of stress so it was good to get a grounding in it. I felt I was that bit more confident in dealing with it or just talking to people about. As I said I'd touched on some of this stuff before but years ago, so to get a grounding in it again, to have material that I could trust and was all there, I could rely on myself a bit more.

How useful was the information for you, did it change how you manage your stress?

For me I suppose the biggest difference it made personally was around the physical side of it and my own well-being. My sleep is irregular to say the least and I would be guilty of having a couple of lie-ins at the weekend which is not the best way so the sleep hygiene aspect just helped me re-focus on that and work towards it.

Ok that's interesting, so it was the physical side of it that was the biggest side of it for you?

Yeah I think so, not just the sleep either. I know that weight loss would help as well. I had a regular routine but the course helped me realise that that wasn't really working for me at all. I looked at reducing it from the three big meals to eating less amounts at regular intervals during the day. On the negative side, I would have a drink or two on my days and eat the less

healthy sugary foods. So it showed me I could make to my non-working lifestyle that would assist in becoming better at managing stress.

Was that your favourite part of the course?

The relaxation piece was my favourite part of it. Overall I'd say that was one that helped me the most and actually noticeably helped me to feel less stressed…It helped I think with minimising the amount of time that I feel stressed, and helps me to appreciate each small moment as it happens. I also found mindfulness helpful in reducing anxiety. That's one I'm continuing to use, just practicing refocusing my attention, and rather than following negative and worrying thoughts down a path of all possible outcomes, learning to recognise my thoughts for what they are and just let them go.

That sounds like you really got something from that?

Achieving work life balance is an on-going challenge. Not having any balance causes even more stress. The wheel of life tool is basic but actually very helpful as it gives a good indication of which areas in life responsibilities need to be improved upon. It's handy then to use that as a plan that can be put in place to address these. I intend to use this tool to identify areas of my life that need to be addressed.

I remember you writing about that in your assignments. In what way did it help you?

It helped I think with minimising the amount of time that I feel stressed, and to appreciate each small moment as it happens. Mindfulness might just be what I need to learn to be able to cope with life's demands although some practice will be required. It was interesting as well that noting that the mind wanders during mindfulness is in itself mindfulness. That really clicked with me.

Will you keep it up, do you think?

Yes, yeah because I also found that mindfulness acts as a preventative measure. I hope that mindfulness will help me to combat mind-wandering and the effects of losing concentration might have on me. It was helpful as well in reducing anxiety. I hope practicing mindfulness regularly will help to refocus my attention. I would also hope that rather than following a negative and worrying thought down a path of all possible outcomes, I can learn to recognise my thoughts for what they are and just let them go.

So relaxation was big part of it for you?

Well, one thing it helped me realise was that I have found is that simply laying on the couch, reading, or watching TV—while sometimes relaxing—isn't enough to produce the benefits of relaxation. I will need to actively practice a relaxation technique. I'd say that there is no single relaxation technique that is best for everyone. The right relaxation technique is the one that fits my lifestyle, and is able to focus my mind to achieve the level of relaxation. Alternating or combining different techniques provided the best results.

Ok it sounds like you got a lot from that?

Well one thing that it helped me realise was that simply laying on the couch, reading, or watching TV—while sometimes relaxing—isn't enough to produce the proper benefits of the relaxation response for me. There is a skill to it. I found that alternating or combining different techniques provides the best results.

And can I ask as well how user-friendly the website was? Had you done anything online before?

Yes, it was fine, I'm used to Moodle so it was grand and accessible from that point of view. I think there was an issue with Powerpoint with one the subjects at one stage, it was missing or something, but easily contactable and fixed.

There was a very nice flow between the different the parts, the subject….

The Units?

Yes, they led into each other very well.

And was there anything you didn't like or would have preferred?

I think I would have liked more online stuff, things like videos maybe. A Q and A session would have been good as well. You kind of do the course on your own I suppose, that's probably just the way that's set up. But maybe if I could interact with others or there was some kind of online lecture that I could log into every now and again, I would have liked that I think.

How new was the information in the Cert to you?

Well the cost of stress part was very interesting. It's more difficult to say about the well-being part but hopefully I will see the benefits over time. That said a lot of the information was new to me. I haven't much to feedback really, it was all very straightforward for me. My intention I suppose was to use it as more of resource – allow me to build up some knowledge but all access any of the information I might need.

Was there any aspect of the course that you didn't like?

Physical Activity was the only one I had kind of an issue with it – it wasn't really clear what I needed to do for it. I might have been rushing through it a bit to be honest as it was at the end of the first module so I was keen to get it done. I ended up having to re- do parts of it and go back to beginning again.

Can I ask why you signed you up? Like was it to manage your own stress or more for where you work?

For me it was both – I wanted to learn new information and learn new stuff about managing my own stress as well. But it was about managing stress in the workplace as well. It's definitely become a big issue now as well, especially around absenteeism as well. I suppose lots of elements juts came together for me to do the Cert at the time. Stress and resilience are big things now that have to be acknowledged and addressed now. Preventing stress if I could or really preventing the absenteeism aspect of it was the bigger thing. I wasn't comfortable dealing with it and knew nothing about counselling or medication or anything like that. I'm better informed now and think I can offer something in the workplace more broadly to. It's a start for me really. Practical understanding and simple things I can do.

And what about the Environment Centred module, was there anything in that helped you in particular?

Maybe the assertiveness one, that was a pretty useful to use and improve communication. Even just the idea that it's not appropriate to be assertive in all situations. Given all the different methods of assertiveness, I found it important to understand your own style before you begin making changes and any sudden use of assertiveness may be perceived as an act of aggression by others. There's also no guarantee of success, even when you use assertive communication styles appropriately, it takes time and practice.

I'm glad to hear that one did have some benefit for you…

If you've spent years being silent, becoming more assertive probably won't happen overnight.

Being assertive can also help boost self-esteem and earn others' respect which can help with stress management. Some people seem to be naturally assertive but people can learn to be more assertive. Having looked more closely at assertiveness, I think I might be more assertive

than I previously thought. In general, assertive people, well I think anyway, make great managers. They get things done by treating people with fairness and respect, and are treated by others the same way in return. This means that they are often well-liked and seen as leaders that people want to work with.

Extract B:

Has your management of stress changed as a result of completing the programme?

Well, I learned a lot from the programme. It took a while and a few reminders for me to get into it. I'm a manager of a service so really when we had a project or something on, everything else gets put on hold. But I managed to figure out a routine and set some time to get things done, which worked out, more or less in the end.

Were there aspects of the Cert that were less useful to you?

Not the course as such but more in terms of stress and staff, there are practical things I can't do much about that actually cause a lot of hassle, like the canteen is too small and there is not enough car parking. The psychosocial hazards so to speak are present too, you know like having no control of the volume of work that the organisation has to deal with. Mixed that in with the underfunding of the service to meet the demands can then there it gets excessive.

Ok, so it's limited in terms of bigger sectoral issue?

Yes, definitely. At the end of the day, there is little control of the volume of work that the organisation has to deal with and the service is underfunded to meet the demands. Staff have so autonomy due to a lack of opportunity to influence either the volume or the funding provided. There is regular formal supervision provided for some staff, but other staff receive little or no supervision.

But were there practical benefits that came from the programme?

Oh yes. One practical example I can give you is that I was able to help another colleague with issues with their stress management. I was able to guide them through difference areas of stress management. The common difficulty though that I identified was the imbalance between the workload of the organisation and our resources provided to meet the demand. We felt that it

would be important to attempt to influence the expectations both within the organisation and externally. Auditing that time available to meet the demands and expectations would have been a first step in increasing awareness of the problem. That would then be communicated internally and externally to referrers, funders and public representatives.

What about other areas? What about you personally?

I've more confidence now when team members verbalise their fears and concerns regarding changes, things like concerns about the impact of new changes on the day to day completion of their job and what, if any, positives and negatives they foresee the change bringing about. I'm happy to have team members verbalise what, if any, fears they have regarding the impact on them personally, fears around routine, security, possibly working with new people and the unknown. I can put in plans and protocols in place.

Which part of the programme was most relevant to your work?

I have become more reflective and use mindfulness to address these striving and perfectionist tendencies. This has led me to take less on and to be more accepting of myself as a human being with flaws and limitations like everyone else. Overall I am happy with the level of self-esteem in work and the affirmation I get from my colleagues.

They are good listeners and are very experienced so I have faith in their advice. The members of my department are also supportive and are aware that although I am an experience clinician and manager that I am not immune to stressor workplace frustration. De-briefing at this meeting is really re-assuring about the course of action I have taken and can enjoy my time off at the weekend.

Did it give you a new insight into yourself or stress management?

Yes, I think perhaps in a personal sense and in reflecting on my own goals and value. In work and life in general I display many aspects of high self-esteem and I am a confident person most

of the time! I give my opinion and am not slow to do so. I think I'm proud of what I achieved in work and in my personal life…my actions are assured and considered. I do not hesitate to pursue my goals and plans however I will not do so to the detriment of others, either in work or at home. I like to ensure everyone feels the credit of our achievements than take credit myself. This has served me well the majority of the time however there have been occasions in work when others have taken credit for my hard work and I found this very difficult.

Can you do anything about that? Like, how well could you implement what you learned in your workplace?

Well, unfortunately, I cannot influence whether there is enough staff available, so that the support or assistance can start immediately after discharge, although my boss often tries to put me under pressure concerning this. But even from doing the course being aware of this is a kind of coping and managing stress, because I learned I pressured but a lot of things I cannot control.

The culture thing, within the organisation…the organisation has been very slow to change. Ideas of new ways to doing things are often resisted, sabotaged and eventually meet a dead end. This has led to developments within my department, a relatively new department in the organisation, to remain underdeveloped and we're in constant threat of future cut backs. I think it would be fair to consider the lack of policies around health and being of employees as being unsupportive. There is access to an employee assistance programme and policies such as the dignity at work I would consider these as being reactive to crises.

May I ask, why did you choose an online programme and what did you expect from it?

Partly it was because I find the culture within the organisation to be unsupportive of me professionally. There is a significant politics, inter-disciplinary politics. The organisation has been very slow to change as well, because of that.

Stress amongst staff is taken but however it is often considered to be the difficulty of that particular employee rather than the service. I think I wanted to look at stress systematically and how to combat stressors. Currently absenteeism across the service is within norms for a healthcare organisation however a number of senior members of staff have had a significant amount of sick leave due to serious illness.

Do you think that would apply to other people in your organisation?

I feel that being in the healthcare industry may be a discourager to people seeking help for their own personal problems. I often get the impression from staff that they think they should be able to solve their own problems seeing as they are in the business of offering advice to others as to how to solve theirs. In a recent staff survey it was reported that staff often use annual leave days to alleviate the stress they are experiencing in their job. Definitely some staff I know would regard getting help for themselves as a sign of weakness or incompetency that they would not like their manager and colleagues.

Do you think you as one person can affect that?

I don't know, but I'd love to bring in a proactive, like a preventative approach to be building employees resilience to do the difficult jobs they have. In fairness our new health and wellbeing committee has been working towards creating a self-culture, self-care that promotes help seeking for personal problems. There is more openness recently in the employee body, staff discussing issues like parental dementia, childcare issues and poor treatment by government and public bodies. The majority of staff respond very positively to this and support their colleagues based on their own experience or knowledge.

How did you find the online side of things?

I hadn't done much online before, but obviously I use computers a lot in my day to day work and I'm tech-savvy enough to get the job done. I was interested in the area and thought it might

just a different and a handy way of doing it. I liked the combination of the file and the slides, it broke it up a bit for me. Not too bothered by videos and audio and thing like that, it's a course so I was more focused on that side of it.

And what about on a practical level, how did you find Moodle and website and all that?

Yeah, that was all very straightforward. A lot of my work is tech-based with emails and all that so I've no difficulty with using a smartphone or doing courses on the internet. Moodle was fine as well, the course was well laid out, easy to find everything and the next section. It was more my side of it, I kept forgetting the password, and then sometimes it would so long between log-ins I'd forget what section I did last. But online nowadays, it's second nature to most people, especially in management.

What kind of support would you generally or ideally want from an online programme?

I know how busy you are in your job, and that finding time for the Cert was difficult?

No it was fine, I would have preferred more reminders but thinking back on it, there were times when I was just too busy to even think about the Cert. There is that old thing of out of sight, out of mind, and that's really true when it comes to online study. I think if we had set up some kind of regular contact, though, would have been, been useful.

That said, it was very easy for me to email you, that kind of support suited me fine. There were technical issues for me and I understood the work and the assignments. It was more of case of making time and not forgetting that I was signed up to it. When there isn't someone checking in on you, or even just meeting or talking for long periods, the pressure is off and it gets easy to forget about. Especially for something like this when it's your thing and the consequences aren't there, you have to make them for yourself. I think having more contacts between us, I know it's not up to you to do that maybe I would have been more focused and kept up the pressure on myself.

Extract of References under node of 'Work-Life Balance':

<Files\\> - 1 references coded [1.86% Coverage]
Reference 1 - 1.86% Coverage
At the moment I am in maternity leave and very pleased with my situation. I work in a psychiatric clinic and try to help my clients in providing support in their familiar environment, so that life with a mental illness gets easier to handle. The hours are tough, I would have found it really difficult to commit to it all and complete the activities in time if I were still working.

<Files\\> - 3 references coded [5.99% Coverage]
Reference 1 - 1.86% Coverage

My home-work situation is that I am quite busy and have very little control of this. I do anticipate that things will become less demanding as some work I am currently doing is once off work that should end again soon enough. It was probably just bad timing on my part to try to take on this course at the same time.

Reference 2 - 1.23% Coverage
You know it's not that I had no interest, as I explained in the email, it's just the lack of time at the minute….

… I suppose the days that I do work, my long days really are long, and my days that I'm off, I find that I'm juggling kind of housework, day to days chores, and looking after my child, and I suppose I'm at an age now where she, I can't just sit here down now in front of the tv and I do my thing, she wants to be at the computer with me, whatever I'm doing, and I don't like leaving her do that either you I suppose, nobody…you know you want to read with her, colour with her…play with her in other ways, and you know I suppose I feel guilty when I'm working, when I'm not around that em, the days that I am around I want to give her my 100% attention.

Reference 3 - 2.90% Coverage
I suppose…and weekends as well, out of four I work at least two…looks it's just, look you want to balance the whole thing, family life, my husband works five days a week…so like he's only off at the weekends, so we only have two weekends a month together at best, so you know…

So you it all adds up and you those days are so vital for me as well, you know, to relax and recover and get myself right again for the next day.

<Files\\> - 2 references coded [5.32% Coverage]
Reference 1 - 1.57% Coverage

It was tough, I have to be honest. I remember times when I said that I was going to try my best to have as much of it into you by the end of the week…but you know it just didn't happen…I've had an awful year so far really, especially over the past few months & haven't had much of a chance to even look at the work for the cert. I'm sorry for always being so late with it.

Reference 2 - 3.75% Coverage
The long working hours can be extremely demanding. Starting the day at 8am and finishing at 9pm, and more often than not it could be after 9 when leaving work. It's all very tiring. It is a difficult task to give 100% for 13 hours but that's the responsibility that comes with the job…. Yeah, yeah, exactly, there is no work/life balance when working long hours. It's just go to go home and try to switch off and sleep, which can be difficult after a long day, and do it all over again the next day… There is very little control over working hours for nurses, as the majority do long days which benefit the patients in continuity of care.

<Files\\> - 1 reference coded [2.00% Coverage]
Reference 1 - 2.00% Coverage
Just couldn't engage due to sickness and work. I had too much on, my family weren't keen for me to do the course. I have a lot of stress going on and think I would have really benefitted from the course, but too much really to do it. It suited that I could put it off and the flexibility was there but ultimately I had to face to the facts.
<Files\\> - 1 reference coded [1.32% Coverage]
Reference 1 - 1.32% Coverage
I'm a manager of a service so really when we had a project or something on, everything else gets put on hold. But I managed to figure out a routine and get some time to get things done, which worked out, more or less in the end

<Files\\> - 2 references coded [4.70% Coverage]
Reference 1 – 2.12% Coverage
I had so many good intentions and the funny thing, I probably need more help than ever with my stress. I changed role right after signing up and effectively I'm working six days a week a moment. I found that I needed to set aside a couple of hours to really get into it, read the material, look things up and do the activities. Between work and tiredness and other responsibilities and just needing time off, I wasn't able to do it and it ended up being just every now and again that I was able to do it. I think I never got going with it in a proper way, and in the end it was just a scramble to get it done

Reference 2 - 2.58% Coverage
But after that I just had to say to myself, I'm really busy, I caring for my elderly father and managing ill health myself so why I am putting myself in this position now when I really don't need to.

<Files\\> - 1 reference coded [3.32% Coverage
Reference 1 - 3.32% Coverage
Well I was unwell, but the way the course is it was fine in the end – I could leave it for a good while and then just work my way back into it. It was handy that way, and your support – low key but that was prefect for me – just touch in with the odd email here and there and I didn't feel pressured into it that way. I was comfortable with it that way, it was ideal for me. I saw it more of a project type thing, where you'd be in and out of it for a while, rather that when you'd do a course in one big burst or something and you'd be under pressure.

Extract of References under node 'Supporting Others'

<Files\\> - 2 references coded [7.78% Coverage]
Reference 1 - 3.63% Coverage
One practical example that I can give you recently was that I was able to help another colleague with issues with their stress management. I was able to guide them through different areas of stress management.

Reference 2 - 3.27% Coverage
I've more confidence now when team members verbalise their fears and concerns about work or stress…I would encourage team members to verbalise what, if any, fears they have regarding the impact on them personally…fears around routine, security, possibly working with new people and the unknown. I can put formal plans and protocols in place.

<Files\\> - 1 reference coded [3.23% Coverage]
Reference 1 – 3.23% Coverage
The organisational one, I don't know. It was interesting to do and I learnt a lot from it but it's hard to see where I could put that into practice. You know, it's fine to evaluate your workplace, but a lot harder to change it. It did remind me that I've a great team around me and I'm very thankful for that.
<Files\\> - 1 reference coded [6.51% Coverage]
Reference 1 - 6.51% Coverage
It was great to approach in a structured way and more evidenced based way. You can google things obviously and sure there are plenty of videos and articles about stress, but I wanted something more concrete and bigger picture, so that I could say to others 'look this is what I've learned, this is what I'm doing, it might help you'…. Yes, definitely and I've shared a lot of that stuff with my colleagues as well.
<Files\\> - 1 reference coded [4.51% Coverage]
Reference 1 - 4.51% Coverage
Yes, and especially the information around doing a risk assessment and risk register. I had heard about these things but didn't know much about them so from that point of view the course was great. A lot of that kind of information was new to me and I found it really helpful to put into my own environment. I even used it for talks and was able to use in the office too

<Files\\> - 1 reference coded [4.59% Coverage]
Reference 1 - 4.59% Coverage
…the big issues within our organisation are in the areas of career development and progression; staff relationship and work load. I learned that while there isn't much practically I can do about that, I can help generate solutions like raising the issue with the department head, as an individual or at a meeting; or I can raise the issue at a national level with our representative organisations and trade unions

<Files\\> - 1 reference coded [3.51% Coverage]
Reference 1 - 3.51% Coverage
That was a great help to me because my job is stressful and it just gave me some direct help with buffering against that, and a much clearer understanding of what I'm up against. I think that's why I started with the second module (Environment-Centred Management) - the models and frameworks, like the Ten Category, and the Five- point model, and the legislation too. it was great to get that grounding and have that language then when it comes to understanding stress in the workplace and how the organisation adds to it.

Extract of References under node 'Content and Workload'

<Files\\> - 2 reference coded [6.34% Coverage]
Reference 1 [2.91% Coverage]

I changed role right after signing up and I'm effectively working six days a week. At first I did some bits of work but found I needed to set aside a couple of hours to really get into it, read the material, look things up and do the activities. Between work, tiredness and other responsibilities and just needing time off, I found that really tough to do.

Reference 2 [3.43% Coverage]

Yeah, you want to make the most of it…but you know that's not say that I don't have interest in it…like you know I know that it would benefit my massively if I were to spend more time working on something like this…concentrating on it, maybe nailing down 2 or 3 hours in the week that even if I could get half an hour one night, an hour another night, I think I'd get an awful lot out of that, even if I could break it down like that you know, it would be great for me

<Files\> - 1 reference coded [3.92% Coverage]
I really liked the module, you know, the videos of stress and the body was great, that personal well-being stuff was brilliant, I have to say. But after, the second module there was so much to do in that, em, I found it very time-consuming. There were a lot of tables and models and legislation in it... it just wasn't as relevant or snappy as the first one.

<Files\\> - 2 reference coded [6.32% Coverage]
Reference 1 [4.91% Coverage]

No, eh there was nothing I didn't really like it. Apart from I suppose the effort it takes the complete a learning programme. But every adult learner probably complains about that! I knew it was 20 credits but I suppose there was more to it than I realised. But that's the nature of it too, all adult learning like that, you have to put in the time. Even after doing the work, the eh work on procrastinating, I was still procrastinating. It's just the way these things are I think!

Reference 2 [1.42% Coverage]

My big dislike was time! But sure that's the nature of it. It takes time to do these things properly if you're going to get the benefit out of them. You don't, you're right, you don't really think about these properly when you're starting off, you just take a notion and sign up and off you go.

<Files\\> - 1 references coded [2.86% Coverage]
Yeah, you know, I suspect that those 9 -5 or more regular in their working hours, that they are able to manage this slightly better, it's the frontline staff, and unfortunately they are the ones who need it most/benefit the most…

Absolutely, absolutely…

It's kind of a catch 22 unfortunately…

<Files\\> - 1 reference coded [0.45% Coverage]

The second unit was very time consuming, I spent a lot more time than I had to give to be honest, just to keep pace with it.

<Files\\> - 1 reference coded [1.54% Coverage]
I found that I needed to set aside a couple of hours to really get into it, read the material, look things up and do the activities.

<Files\\> - 1 reference coded [6.31% Coverage]
I … just found it very textual and content heavy early on. I liked the first unit and the appearance of the course, especially that video, the one about stress and it goes though the different parts of the body. I liked the podcasts and workbooks that you sent me on as well. I think I'm a very visual learner, I like colour and I need to see things in graphs and pictures, neat and, ah, easy on the eye. Or it just suits me better I think. The ten or twelve pages of text, you know, they just felt dense to me and harder to work through

<Files\\> - 1 reference coded [2.53% Coverage]
There was a lot in it, you know. I think when I thought of an online course, it was going to be a lot less demanding, something I could dip in and out of and finished in a few weeks. That's probably what I would have preferred, if I'm being honest, but now that I've finished it I'm glad I did.

<Files\\A - 1 reference coded [5.13% Coverage]
Yes, I did a few online courses before. It wasn't that I wanted to do an online programme, it was the subject area that attracted me to it. I heard you talk about it that day in WIT and you mentioned that the course was running, and I thought I could benefit from it. Anything to help with the stress at the moment. I'd never done one like this before, you know where is just a kind a personal thing for me, something I was doing for myself. I had never completed one this big or this long before though, and I think that where I got caught out. I do lots of travel for work visiting different places, meetings, and short courses that way as well

Appendix J

J Occup Health 2017; 59: 1-30

Journal of Occupational Health

Review

Web-Based Interventions for the Management of Stress in the Workplace: Focus, Form, and Efficacy

Cathal Ryan[1], Michael Bergin[1], Trudie Chalder[2] and John SG Wells[3]

[1]Department of Nursing and Health Care, School of Health Sciences, Waterford Institute of Technology, [2]Institute of Psychiatry, Kings College London and [3]School of Health Sciences, Waterford Institute of Technology

Abstract: Objectives: This review sought to determine what is currently known about the focus, form, and efficacy of web-based interventions that aim to support the well-being of workers and enable them to manage their work-related stress. **Method:** A scoping review of the literature as this relates to web-based interventions for the management of work-related stress and supporting the psychological well-being of workers was conducted. **Results:** Forty-eight web-based interventions were identified and reviewed, the majority of which (n = 37) were "individual"-focused and utilized cognitive-behavioral techniques, relaxation exercises, mindfulness, or cognitive behavior therapy. Most interventions identified were provided via a website (n = 34) and were atheoretical in nature. **Conclusions:** There is some low-to-moderate quality evidence that "individual"-focused interventions are effective for supporting employee well-being and managing their work-related stress. There are few web-based interventions that target "organizational" or "individual/organization" interface factors, and there is limited support for their efficacy. A clear gap appears to exist between work-stress theory and its application in the design and development of web-based interventions for the management of work-related stress.
(J Occup Health 2017; 59: 1-30)
doi: 10.1539/joh.16-0227-RA

Key words: CBT, Mindfulness, Web-based interventions, Workplace Stress, Work-Stress Theory

Supporting employee well-being in the workplace is an increasingly important public health challenge[1]. Recent organizational trends have pointed to the emergence of progressively more challenging and dynamic working environments, attributable in part to economic globalization, the decline of traditional industries, and the growth of occupational sectors such as IT and service industries[2]. Issues associated with this changing landscape include pressure to upskill, job insecurity, role conflict, reduced employees leave and rest time, fewer rewards, and insufficient work-life balance[3].

Much of the current research with regard to worker stress interventions is marked by a distinct transition in focus from the traditional face-to-face format to web-based delivery modalities. Web-based behavioral health interventions are typically delivered through dedicated program websites, computer program, or smartphone application[4]. The benefits of web-based versus traditional face-to-face interventions include fewer constraints with regard to time and location, the potential to access a larger target group, and protection of participant anonymity, thereby reducing possible stigma with regard to seeking help for stress. An increasing number of studies have reported on the delivery and evaluation of web-based stress management interventions for workers. However, the literature has yet to be reviewed with regard to the focus and form of such interventions and their efficacy in the prevention and management of employee stress.

A considerable number of worker-directed stress management intervention studies have been published. A recent meta-review synthesized the findings of 23 systematic reviews, reporting 499 primary research studies on the efficacy of interventions for managing stress at work[5]. A seminal meta-analytic review[6] indicated that occupational stress management interventions are moderately effective in reducing stress in the work place, but that cognitive-behavioral and multimodal interventions were most effective, with medium average effect sizes of d = 0.68 and d = 0.51, respectively. Relaxation-based interventions were found to have a small average effect size (d = 0.35). The effect of organizational-directed interventions, however, was nonsignificant.

A later update of this review[7] applied more method-

Received September 21, 2016; Accepted February 25, 2017
Published online in J-STAGE ★★★★★.★
Correspondence to: C. Ryan, School of Health Sciences, Waterford Institute of Technology, Ireland (e-mail: cryan@wit.ie)

ologically stringent inclusion criteria (e.g., only controlled experimental studies with random participant assignment were included for review). Average effective sizes for cognitive-behavioral (d = 1.167) and relaxation-based interventions were larger (d = 0.497) than the previous study although they were found to be smaller for multimodal interventions (d = 0.239). Bhui and colleagues, however, caution against drawing conclusive comparisons with regard to the benefits of single intervention techniques, highlighting considerable heterogeneity of intervention type, mode of delivery, outcome measure, and target population[5]. These reviews do indicate, however, that workplace stress management interventions, particularly those incorporating cognitive-behavioral components, can be efficacious in improving employee well-being.

The Current Review

Scoping studies represent an increasingly prevalent method for the conduct of a broad search of the literature on a defined topic[8]. The framework for this review derives from that proposed by Arksey and O'Malley[9] and aims to describe and summarize in detail the current findings and range of research in a particular area of study. As such, this review sought to determine what is currently known about the focus, form, and efficacy of web-based interventions for the prevention and management of stress in the workplace. "Focus" was taken to refer to the target strategy and content of the interventions, while "form" was taken to refer to structure and delivery modality. Within the context of this study, "efficacy" referred to the reported study results in relation to participant outcomes and the methodological quality of the evidence under review.

Methods

The published literature was identified by searching the following electronic databases from inception to 18 April 2016:

- Academic Search Complete
- CINAHL
- PsycINFO
- Medline
- Web of Science

Key terms such as "Stress," "Strain," "Mental Health," "Well-being," "Occupation," "Job," "Employee," and "Worker," combined with the terms "digital," "web-based," "mobile," and "online" were searched. The following inclusion and exclusion criteria were applied:

Inclusion Criteria

- Interventions that aimed to reducing worker stress or improve mental well-being,
- Delivered via web-based modalities,
- Participants recruited from working populations, over 18 years of age, and
- Studies published in English.

Web-based interventions were defined as any intervention that was delivered via website, e-mail, or smartphone application. Interventions directed at full-time or part-time employed/self-employed working individuals only were included.

Exclusion Criteria

- Review papers, meta-analyses, or meta-synthesis,
- Non web-based interventions,
- Papers not published in English,
- Development, protocol, or cost-analysis papers,
- Participants not recruited from a working population, and
- Aimed at workers with a clinical psychiatric or mental health diagnosis.

Interventions delivered via stand-alone (i.e., non-web-based) computer programs were also excluded.

The initial search output returned 6,197 papers. Following title and abstract screening, 5,876 papers were removed due to duplication or not meeting inclusion criteria. The full texts of the remaining 321 papers were retrieved and screened, from which a further 271 papers were excluded after assessment. This left a total of 50 papers included in the final review, describing 48 studies (two papers reported 1-year follow-up data). One review author (CR) independently selected the studies to include in the review according to the inclusion and exclusion criteria. If there was any uncertainty concerning the inclusion of a study, this was discussed with the two other review authors (MB and JW), and a decision was agreed.

A search of the reference lists for additional references in all identified primary studies was also conducted. The reference lists of key reviews[5-7] were also searched. No additional papers that met inclusion criteria were identified through this process. The methodical quality of the reviewed evidence was evaluated utilizing principles of the GRADE approach[10] and the Cochrane collaboration "Risk of Bias" tool[11]. Data relating to study authors, sample characteristics, prevention level, intervention techniques, theoretical underpinning, research design, and delivery modality were extracted from each of these studies and charted (see Appendix).

Results

General Findings

Form The majority of interventions were primarily delivered via a website (34 of 48, 70.83%). Four interventions were delivered solely via a mobile device, while four utilized a combined website and mobile approach. Moreover, four interventions were delivered via a

"blended" format: three of which comprised cognitive behavior therapy (CBT) delivered via combined group and e-mailed/website sessions and one involved an eHealth module combined with occupational physician consultations. Two interventions delivered solely via e-mail were also identified. Support or guidance from program facilitators was delivered through various modalities including e-mail, text message, phone call, support groups, e-coach feedback, and online forum moderation. However, 17 studies did not indicate whether support or guidance from the program facilitators was provided. Excluding six programs that were delivered over 1-week period or less, mean intervention duration was 8.82 weeks, with a median of 7 weeks.

Focus To accurately characterize the included literature, the interventions described in these studies were categorized as "individual," "organizational," or "individual/organization interface" focused in terms of their target strategy, based on a categorization proposed by De Frank and Cooper[12]. "Individual-focused" interventions support employees experiencing stress symptoms, providing them with the knowledge and skills needed to cope effectively with their personal levels of stress. "Organizational" interventions address aspects of the working environment that may be stress inducing. They generally aim to create a less-stressful environment for employees. Finally, "organizational/individual interface" interventions aim to resolve issues as these relate to interactions between employees and their organization, such as role conflict and person-environment fit[13].

Forty-two interventions were classified as "individual" focused; three were classified as "organizational," while three interventions were found to target the "individual/organizational" interface. Thirty-eight interventions (79.17%) were evaluated through a randomized control trial; eight studies (16.67%) employed a noncontrolled pre-post experimental design; one study employed a nonrandomized control group; and one program was assessed qualitatively (see Appendix). The reported efficacy of these interventions in the context of their target strategy and primary content is now presented.

"Individual"-focused stress management interventions

The majority of interventions (42 of 48, 87.5%) utilized an "individual"-focused strategy. Of these, 1 comprised a web-based psycho-educational program, 27 were based on cognitive-behavioral and/or relaxation-based techniques, while 6 web-based CBT interventions were also identified. For the purposes of this review, interventions utilizing techniques based on the principles of the cognitive-behavioral method were considered separately from interventions that comprised CBT solely within a therapeutic approach. Moreover, four mindfulness-based interventions and four interventions in which multiple health behaviors, including stress management, were targeted as part of a broader health promotion program were also identified. Twelve of these studies (14-26) were considered to be of moderate methodological quality, with the remainder classified as low or very low in quality arising from significant limitations in study design or implementation.

Didactic stress management: Shimazu, Kawakami, Irimajiri, Sakamoto, and Amano[27] assessed the impact of a web-based psycho-education program with a sample of 225 white collar workers in a machinery construction company through a randomized control trial. The intervention had limited impact on participants' scores of self-efficacy, problem solving, stress, and job satisfaction. Stratified analysis of study data did reveal a significant positive impact of the intervention on the job satisfaction of male participants and on the self-efficacy of younger participants (i.e., aged <40 years) compared with waitlist controls.

Cognitive-behavioral and/or relaxation techniques: Twenty-seven studies were identified in which cognitive-behavioral and/or relaxation techniques comprised the principal intervention. These studies include 21 randomized controlled trials (RCTs), 16 of which supported the efficacy of these techniques, while 5 reported that a web-based intervention had only limited[26,28,29] or no impact[30,31] on measures of worker well-being or psychological stress and strain. Six noncontrolled cohort studies were also identified, each of which reported positive outcomes on employee well-being. Most studies were at serious risk of bias, with just seven considered to be of at least moderate methodological quality.

Two web-based intervention programs, *GET.ON Stress* and *GET.ON Recovery*, were evaluated through several randomized control trials and associated with significant medium to large reductions in worker's perceived stress. A combined mobile and computer-based *GET.ON Stress* program was trialed with a sample of 264 employees recruited via a health insurance company[14]. A significant large reduction in perceived stress was found for the intervention group postintervention (d = 0.83) and at 6-month follow-up (d = 1.02) compared with waitlist controls. This reduction was maintained at a 12-month follow-up (d = 1.83). Significant medium to large positive improvements were also made by the intervention group compared with controls (d = 0.4-0.75) on measures of mental health, work-related health, and stress-related skill postintervention and at 6-month follow-up (although there were no improvements on absenteeism or presentism).

GET.ON Stress was also evaluated in self-guided and adherence-focused guided formats in two other trials[15,16]. With regard to the self-guided format, significant medium to large reductions in perceived stress postintervention (d = 0.96) and 6-month follow-up (d = 0.65) were reported for participants in the intervention group versus waitlist

controls. Significant small to medium improvements were also made the intervention group on measures related to mental health and work skills and competences (d = 0.30-0.69) at both assessment points compared with controls. No improvements were made on measures of absenteeism, work engagement, or physical health-related quality of life. Similar positive improvements were also found for the guided intervention program, with medium to large reductions in perceived stress postintervention (d = 0.79) and 6-month follow-up (d = 0.85) reported for participants in the intervention group versus waitlist controls. Significant improvements were also made the intervention group on measures related to mental health, work-related health, and skills and competences related to emotional regulation at both assessment points compared with controls.

Three trials were conducted with teachers with work-related stress/insomnia and depressive symptoms, respectively. *GET.ON Recovery* was evaluated with 128 teachers with work strain and sleep problems[17]. A significant large reduction in insomnia severity was reported for intervention group participants postintervention (d = 1.45) and at 6-month follow-up (d = 1.43) versus waitlist controls. Significant improvements were also made on measures of rumination, worrying, sleep efficiency, restorative sleep, recreational activities, and recovery versus controls. Effect sizes ranged from small to large (d = 0.34-0.77) postintervention and at 6-month follow-up (d = 0.34-0.99). There was no impact on recovery mastery or absenteeism.

These findings were further replicated in a trial of an unguided (i.e., fully automated) version of *GET.ON Recovery*, again with a sample of teachers[32]. A significant large reduction in insomnia severity was again reported for intervention group participants postintervention (d = 1.37) versus waitlist controls. Moderate-to-large improvements versus controls were also found for mental health, sleep, perseverance cognitions, and recovery experience outcomes. These improvements remained stable at 6-month follow-up.

The web-based *Everything under Control* program was also trialed with a sample of 150 teachers with elevated depressive symptoms[33]. The intervention group reported significantly greater decreases in such symptoms postintervention compared waitlist controls, which was maintained at 3- and 6-month follow-up points. The magnitude of these differences were medium postintervention (d = 0.59) and small at 3-month (d = 0.37) and 6-month (d = 0.38) follow-up. Significant small to medium improvements were also made by the intervention group compared with controls on a range of secondary measures of stress, self-efficacy, quality of life, and worrying postintervention (d = 0.36-0.63), at 3-month (d = 0.38-0.62) and at 6-month (d = 0.33-0.54) follow-up. There were no significant improvements on measures of absenteeism or burnout at any point.

A divergence of interventions components were identified within the cognitive-behavioral sphere. This includes a web-based positive psychology program delivered to 147 insurance company employees over a 7-week period, which produced significant medium to large improvements on a range of measures including job satisfaction and quality of life (both d > 1), happiness (d = 0.93), emotional stress (d = 0.69), and mindfulness (d = 0.62) compared with waitlist controls[18]. Another intervention focused on building the four key components of psychological capital (i.e., hope, efficacy, optimism, and resilience) and was trialed with 384 employees from a broad cross-section of industries[34]. A small significant positive increase in psychological capital (d = 0.191) was found for the intervention group versus inactive control postinterventions (this was the only outcome measure).

Ly, Asplund, and Andersson[35] evaluated the efficacy of an "acceptance and commitment"-based smartphone application intervention with a sample of 73 midlevel sales managers and reported significant small to medium improvements were reported on scores of mood (d = 0.41) and perceived stress (d = 0.50) postintervention by those who accessed the application compared with waitlist controls.

A "blended" web-based intervention comprising an eHealth module and occupation physician support was evaluated with a sample 131 sick-listed employees[36]. The eHealth module comprised psycho-education, cognitive-behavioral exercises, pain and fatigue management, problem solving, and relapse prevention, while the physicians also received e-mailed decision-based aids based on principles of stepped collaborative care. It was found that participants who received the intervention returned to the work significantly more quickly than controls, while a significantly larger proportion also achieved remission 9 months postbaseline compared with controls although lasting return to work and treatment response did not differ between these two groups.

Several papers detailed the published results of a trial of online workplace mental health promotion for nurses and allied health professionals. Ketelaar, Nieuwenhuijsen, Gartner, Bolier, Smeets, and Sluiter[37] reported on a cluster RCT in which intervention group participants completed and received feedback on a worker health surveillance module and then either offered a range of online interventions (which targeted psychological well-being, depressive and panic symptoms, work-related stress, and problem drinking). Both the intervention and control groups improved in work functioning although there was no significant difference between the two. There were also no differences between these two groups at follow-up on scores of mental distress, impaired work functioning or impaired mental health. A smaller uncontrolled pre-post-trial was then conducted with 128 participants

who had comprised the waitlist control for this study[38]. Significant small improvements were reported for stress ($d = 0.23$) and for work functioning and work-related fatigue postintervention.

These studies were also part of a larger trial that included a third arm comprising access to an occupational physician[39]. The online interventions were compared with an occupational physician consultation in a cluster RCT[40] with both groups undertaking the work health surveillance module before assignment. Both groups improved in work functioning over time, with no significant differences between the two. Another study[41] also compared the work health surveillance module plus online interventions to a waitlist control. While there was no impact on worker's general well-being, depression, or anxiety scores, significant improvements in mental health and psychological well-being were reported versus control postintervention. With regard to mental health, effect sizes were medium ($d = 0.37$) at 3-month and small ($d = 0.28$) at 6-month follow-up, while they were medium in size at both follow-up points ($d = 0.43$ and $d = 0.50$, respectively) with regard to psychological well-being.

Four RCTs were identified in which the magnitude of study findings was not reported. These included two small trials of interventions delivered via mobile devices. A two-day mobile-phone intervention based on audio-visual relaxation experiences was found to significantly reduce anxiety and increased reported relaxation in Italian commuters[42], while a short stress inoculation training (SIT) program delivered on mobile devices over 4 weeks to oncology nurses produced significant reductions in state and trait anxiety and significant improvements in active coping skills and "denial" (i.e., behaving as if a stressor does not exist) postintervention compared with the control group[43].

A brief self-paced multimedia intervention trialed with a sample of 309 "tech" employees over 3 months resulted in significant "modest" improvements in knowledge and attitude to seeking help and a reduction of stress postintervention compared with controls[44] (although there were only marginal changes in work productivity and no change in mood, anxiety, and depression compared with the control group). Furthermore, Hasson, Anderberg, Theorell, and Arnetz[20] tested a web-based intervention tool with 303 IT and media workers in six Swedish companies. All study participants received access to an online health promotion tool, which provided real-time monitoring of perceived current health and stress status, a diary to record their stressors, and information about stress and health. However, the intervention group also received web-based cognitive exercises that included time management and relaxation techniques, cognitive reframing, and access to "chat" with other participants.

Significantly greater improvement was found for the intervention group compared with controls on perceived ability to manage stress, sleep quality, mental energy, concentration, and social support postintervention. There were also significant positive changes in several biological markers including DHEA-S (a steroid with neuroprotective effects), neuropeptide Y, chromogranin A, and tumor necrosis factor α.

Six noncontrolled studies of web-based cognitive-behavioral and/or relaxation techniques were also identified. All six studies reported positive outcomes; none stated effect sizes apart from one[38]. *Stress GYM*, a web-enhanced behavioral self-management program for stress in military personnel, was delivered to 142 officers and enlisted sailors[45]. The program produced a significant reduction in stress intensity, with a positive association between the number of modules completed and decrease in reported stress reported ($r = 0.21$).

Rao and Kemper[46] delivered an online guided imagery intervention to a sample of 273 health professionals. The intervention, which comprised three modules of autogenic training and guided imagery, produced significant improvements in participants' reported levels of perceived stress, anxiety, empathy, and self-efficacy postintervention.

Two studies[47,48] reported on the development and evaluation of a four-session program that aimed to enhance employees' psychological well-being. The first was delivered to 28 white collar workers. There were significant increases reported postintervention on well-being scores of environmental mastery, positive relationships with others, and self-acceptance. A significant improvement was also found for participants' anxiety although there was no improvement in depression, job satisfaction, or psycho-somatic symptoms. The intervention did not impact on three other subdomains of well-being, namely autonomy, personal growth, and purpose. A later study[48] comprised a process evaluation of this same web-based stress management program with a larger sample of 239 workers. Participants' psychological well-being significantly improved following the intervention although there were no changes in depression scores.

Ahtinen, Mattila, Valkkynen et al.[49] pilot tested *Oiva*, an "acceptance and commitment therapy" smartphone application with 15 university staff. Participants' scores of stress and life satisfaction were significantly improved postintervention although there was no effect on psychological flexibility.

Web-based CBT: Six studies of web-based CBT programs for workers were identified. Each of these was tested through a randomized control trial, with five studies supporting their efficacy to some extent. Effect sizes were reported in three studies; these ranged from small to medium in size, with one study[21] reporting large improvements in an uncontrolled long-term follow-up.

Three randomized control trials evaluated the delivery of CBT to workers via a blended approach. Mori, Tajima,

Kimura et al.[22] delivered web-based CBT to employees (168 Japanese system engineers) experiencing distress. Participants received a 2.5-h group education CBT session in the workplace and 1 month of online CBT-based homework exercises. The program had no significant impact on psychological distress, problem solving scores, or in the recognition of dysfunctional thinking compared with controls. A small significant improvement versus controls was observed in the intervention group's ability to transform thoughts postintervention (d = 0.26) and their ability to cope with stress at 6-month follow-up (d = 0.37).

Further analyses were then conducted with data from 73 participants with clinically significant levels of emotional distress at baseline. Participants with distress in the intervention group reported significantly lower psychological distress scores postintervention compared with similar participants in the control group with medium effect size (d = 0.61). Improvement was maintained at 6-month-follow-up (d = 0.60). Improvement was maintained when participants were further divided into homework completers and noncompleters and even accentuated at 6-month follow-up (d = 0.63 postintervention and d = 0.74 at follow-up).

A blended approach was also with a sample of 261 white collar workers in the workplace[23], in which a 3-h CBT training group was followed by three individualized e-mail sessions (comprising CBT homework exercises and feedback from occupational physicians and nurses). The intervention produced a significant decrease in depressive symptoms compared with controls, as well as enabling the intervention group to significantly improve on self-reported understanding of stress control skills. There was no impact on worker self-esteem.

Kimura, Mori, Tajima et al.[50] evaluated the efficacy of a 120-min group CBT class combined with 1 month of web-based CBT homework exercises with a sample of 215 private sector workers. The program produced a small significant increase in subjective work performance 3 months postintervention versus controls (d = 0.31) although there is no significant change following adjustment for baseline scores on two secondary outcomes of cognitive flexibility.

Imamura, Kawakami, Furukawa et al.[24] conducted a RCT of internet CBT with 381 workers. The intervention had a modest impact on worker well-being, with small significant decreases in depressive symptoms reported postintervention (d = 0.14) and at 6-month (d = 0.16) follow-up versus controls. Small significant improvements compared with controls were also made on scores of dysfunctional attitude, knowledge, and self-efficacy. There were no significant effects on psychological distress or problem solving. A 12-month follow-up[51] found that the effect of the intervention on scores of depression or distress was no maintained to this time point. However, the intervention may have been effective in preventing the occurrence of major depressive episode as there was a significantly lower incidence of such episodes reported for those in the intervention group versus the control group.

A CBT intervention delivered purely via e-mail was also trialed with 177 employees from a variety of occupations[21]. Significant medium to large improvements were made by the intervention group on scores of stress, depression, anxiety, and emotional exhaustion. However, these improvements were only small (d = 0.1) to medium (d = 0.6) in size compared with the control group, who also improved on all scores apart from depression. The odds of recovery from clinical stress were significantly higher for participants in the intervention group compared with those in the control, with similar recovery effects found for depression and emotional exhaustion but not anxiety.

Ninety-seven participants from the intervention group were traced at a 3-year follow-up. The gains made by this group from preintervention were more pronounced, ranging from d = 1.3 for anxiety to d = 1.8 for stress. Significant maintenance of improvement was also found on measures of depression, emotional exhaustion, stress, and anxiety. However, this 3-year follow-up was uncontrolled, and so it was not possible to determine the extent to which these improvements were solely attributable to the intervention.

One study of web-based CBT[52] reported no significant improvement compared with controls on scores of health, quality of life, or subjective work-related performance.

Mindfulness in the Workplace: Four web-based mindfulness interventions delivered in the workplace were identified. Mindfulness refers to a therapeutic technique that one attempts to focus awareness on the present moment and accepting one's feelings, thoughts, and bodily sensations. Three of these interventions were evaluated through randomized control trials, with one intervention assessed utilizing a noncontrolled cohort design. Support for the efficacy of mindfulness techniques was provided by all four studies although just one[19] was considered to be of moderate methodological quality, with the remainder classified as low[53,54] or very low[55] in quality. The magnitude of improvement following intervention compared with controls ranged from small to medium in two studies[19,54] and medium to large in one study[53]. Effect sizes were not reported in one study[55].

The *Mindfulness at Work* online and face-to-face mindfulness interventions were evaluated via a multiple arm RCT with a sample of 239 insurance carrier employees. The programs were also compared with therapeutic yoga and inactive controls for stress reduction in the workplace[19]. Both the online and face-to-face mindfulness groups reported significant medium-to-small decreases in perceived stress (η^2 = 0.13) and sleep difficulty (η^2 =

0.04) and a significant increase in heart rhythm versus inactive controls. Similar changes were also found for the yoga group. The online and in-person mindfulness interventions appeared to be equally effective, with increased heart rate coherence the only postintervention difference between the two groups. None of the interventions, however, had any impact on mood, worker productivity, pain, or blood pressure.

Aikens, Astin, Pelletier et al.[54] trialed the *Dow Mindful Resilience Program* with 89 employees of a chemical company. The program comprised abbreviated mindfulness-based stress reduction tailored to an occupational setting. The intervention group reported significantly higher ratings of mindfulness and resiliency and significantly lower perceived stress compared with waitlist control postintervention, with a medium average effect size of $d = 0.67$. These improvements were maintained at a 6-month follow-up.

A web-based mindfulness intervention *Stress Free Now* was evaluated with staff in a corporate call center[44]. The intervention was delivered over an 8-week period with participants randomized to one of the four groups. One group received the web-based intervention plus e-mail reminders (WSM), and another received the web-based intervention and participated in a 1-h weekly group meeting (WSM1). A third group received the web-based intervention and the same weekly meetings although three of these meetings were facilitated by a counselor or a social worker (WSM2). A fourth group comprised the waitlist control and received no interventions.

Significant improvement on all outcome measures of stress, burnout, and mindfulness were found postintervention for all intervention groups. There was no change in productivity or professional efficacy. Perceived stress was the only outcome to improve for the control group. Improvements ranged from medium to large in size ($d = 0.5$-0.8) compared with controls and were maintained 16-week follow-up, except for mindfulness in WSM2 group and professional efficacy and emotional role functioning in the WSM and WSM2 groups. Effect sizes were larger for participants who received group support than did not on all outcome measures except for productivity ($d = 0.8$ versus $d = 0.4$ at 8 weeks and $d = 0.7$ versus $d = 0.4$ at 16 weeks).

Kemper and Khirrallah[55] delivered a mind-body skill training program comprising 12 one-hour "modules" to 513 health professionals and trainees from a variety of disciplines. The modules targeted key skills of relaxation, mindfulness, guided imagery, and positive affect-generating meditation. Participants registered for and completed individual modules as they saw fit. Assessment measures were taken pre- and postcompletion of each individual module, with data analyzed from five modules completed by at least 100 registered learners. Significant improvements were found postmodule completion on scores of stress, mindfulness, empathy, and perspective taking. One module, "introduction to stress, resilience, and the relaxation response" was assessed for its impact on scores of stress, resilience, and relaxation. Significant improvements were found on participants' scores of stress after undertaking this module although there were no changes on the two other outcome measures.

Multiple Health-Behavior Interventions: Four studies were identified in which multiple health behaviors, including stress management, were targeted as part of a broader health promotion program. All four studies were considered to contain serious risk of bias and of low methodological quality. Two randomized control trials were conducted and reported no impact of a web-based intervention on worker mental health compared with controls[56,57]. Two web-based health promotion programs (*COACH* and *RealAge*) for older workers were also evaluated through a cluster RCT[58]. While positive changes were found for fruit and vegetable consumption, physical activity, and waist circumference, no improvements were made on any stress outcomes. Another study reported on the conduct of small non-RCT[59] to assess the impact of an internet-based program, called *BEST*, with a sample of 48 male Korean workers with metabolic syndrome. A significant reduction in health-related stress but not job stress was found postintervention compared with the control group. The magnitude of this difference was not reported.

"Individual/Organizational" Interface Interventions

Three studies that targeted the "individual-organizational" interface were identified. These three studies comprised one RCT, one noncontrolled study, and one qualitative study, each of which was considered to be of low methodological quality. There was limited evidence for the efficacy of such approaches.

Assertion in the Workplace, a 70-min web-based program, was tested utilizing a noncontrolled cohort design with 25 nurses working shift work[60]. While participants' knowledge of assertion was found to have increased significantly postintervention and at a 1-month follow-up, it had no impact on reported work-stress.

Yamagishi, Kobayashi, and Nakamura[61] assessed the efficacy of a 60-min web-based "career identity" training intervention for managing stress through a randomized control trial with 60 nurses. Although knowledge of career identity increased in the intervention group, there were no significant improvements on measures of job stress or mental health postintervention compared with controls. However, as measures such as mental workload, job control, vigor, and anxiety significantly worsened in the control group, the intervention may have served as a protective factor with regard to employee well-being.

Another study[62] reported on the efficacy of online mediated discussion forums as a stress management inter-

vention for 75 teachers over a period of 7 days. Forum posts were qualitatively analyzed, and an online survey was completed to assess impact. The forum was found to be an easy to follow resource and stimulated new ideas for coping with work-related stress, enhancing participants' confidence in managing stress.

"Organizational"-Level Interventions

Three organization-focused interventions were identified, which comprised the delivery of e-learning programs for managers. All three programs were evaluated through randomized control trials, two of which[63,64] reported no impact on worker stress and determined to be of low quality due to serious risk of bias. One moderate quality study[25] pilot tested the efficacy of an e-learning health promotion program for managers "Managing Employee Pressure at Work" in improving employee well-being. The study employed a cluster RCT design in which 60 managers (responsible for 424 employees) from NHS Mental Health service providers in the United Kingdom were randomized to either a control or an intervention group. A small significant positive effect on employee well-being was reported postintervention compared with controls although there was no change in psychological distress, supervisor relationships or support, or sickness absence.

Discussion

The majority of interventions reviewed here were "individual"-focused and -utilized cognitive-behavioral and/or relaxation-based techniques, mindfulness techniques, or web-based CBT. There was some low-to-moderate quality evidence to indicate that such interventions could contribute to positive psychological outcomes for employees, with large effect sizes following intervention compared with controls in some cases[14,15,17,18,21,53]. There were few positive outcomes reported for studies that targeted multiple health behaviors or utilized didactic stress management alone. Minimal support for the efficacy of interventions targeting the "organizational" or "individual/organizational" interface was also observed; however, there is a notable lack of primary research studies that evaluate web-based interventions that encompass these target strategies. Interventions targeted at employees with a clinical mental health condition or psychiatric diagnoses were excluded from this review.

Only thirteen studies reviewed here were considered to be of moderate methodological quality, with much of included research of low or very low quality and at serious risk of bias due to limitations in design and implementation. For example, just four studies blinded participants to their study condition, while only nine described procedures for concealing participant allocation to the researchers themselves. All of the reviewed studies relied on self-report measures, with just three utilizing objective measures such as biological markers to some extent as well. A lack of long-term follow-up was also problematic. While three studies administered follow-up measures to participant at least 1 year postintervention, only 11 conducted 6-month postintervention follow-up.

High rates of participant attrition were an undermining factor in many studies. Moreover, low levels of user adherence (i.e., failure to complete an intervention as prescribed by the researchers) are a common issue with web-based interventions[65] and were observed in many of studies reviewed here[25,28,37,52]. It may be that blended and guided programs encourage higher levels of user adherence than self-guided and automated programs. However, adherence data from the reviewed interventions were not always readily available. The sustained engagement of employees with web-based interventions is an issue that warrants further exploration. It is imperative that web-based intervention studies collect and report relevant psychosocial or intervention characteristics that may influence the adherence of users, and that efforts are directed toward determining which factors impact upon adherence to such interventions.

The fact that the body of evidence under review here was of generally low quality is perhaps unsurprising as web-based platforms are a relatively new modality for the delivery of worker-directed interventions. As such, many of the included studies were preliminary, of a small scale and uncontrolled, which may be expected as the feasibility and acceptability of web-based interventions are ascertained. More RCTs of higher methodological quality need to be conducted before firmer conclusions may be drawn with regard to the efficacy of web-based interventions for the management of work-related stress.

Only two studies compared web-based interventions directly to face-to-face stress management interventions with same content. Wolever et al.[19] found online and in-person mindfulness interventions to be equally as effective in reducing employee stress and sleep difficulty although Eisen et al.[26] reported limited impact of computer-based or in-person relaxation and time management program postinterventions. More research is required to determine whether web-based interventions are as effective as traditional face-to-face programs.

Most interventions were atheoretical (32 of 48, 66.67%). Just 16 referenced a specific theory or model with regard to the formulation or delivery of intervention content. The transactional model of stress[66] was the only stress-specific model identified. This was utilized in the design of four interventions, including the *GET.ON Stress* and *GET. ON Recovery* intervention programs, which were based on the transactional model and targeted key processes of problem solving and emotional regulation. *Stress GYM*[45] was also drawn from the transactional model. Furthermore, an organization-level intervention

delivered by Stansfeld et al.[25] that provided health service managers with an e-learning health promotion course was also based on the transactional model of stress. The intervention content was specifically focused on relationship and supervisory behaviors, with the aim of building management standards to improve employee well-being and reduce sickness absence.

Five interventions[26,27,43,56,57] that referenced social cognitive theory (SCT) were also identified, including one that delivered SIT on mobile devices to oncology nurses[43]. SIT derives from the work of Meichenbaum[67,68] and encompassed three phases. A conceptual phase educated participants on the transactional nature of stress, while a skill acquisition and rehearsal stage emphasized the development of emotional regulation, coping skills, and the management of maladaptive behaviors. Finally, the application phase sought to increase participant self-efficacy, in line with Bandura's SCT. One study[34] drew upon the theoretical foundation of psychological capital, namely hope, optimism, efficacy, and resilience, while the internet-based *BEST* program, a multicomponent intervention that targeted cardiovascular fitness and stress was modeled on the transtheoretical (stages of change) model of behavior change[59]. The transtheoretical model was also referenced in the delivery of the *RealAge* and *COACH* interventions[58].

Perhaps, it is notable that all seven studies that reported on an intervention drawn from the transactional model of stress were associated with significant improvements to some extent on a range of measures related to employee well-being, stress, or mental health (albeit the magnitude of such improvement versus controls was small in one study[25] and not reported in another[45]). While it is beyond the remit of this review to conclude whether such theory-based interventions are more effective than atheoretical programs, the delivery of more interventions drawing upon stress-specific theory would be valuable to investigate this issue more comprehensively.

In any case, it is evident that web-based interventions for worker stress that draw upon a stress-specific theoretical model remain the exception rather than the norm. This is perhaps surprising considering the multitude of work-stress models that currently exist, many of which are well validated and have been employed in occupational stress research for several decades now[69].

Conclusion

There is some low-to-moderate quality evidence that "individual"-focused web-based interventions utilizing cognitive-behavioral, relaxation, mindfulness techniques, or CBT are effective for supporting employee well-being and enabling them to manage their work-related stress. However, future high-quality studies utilizing these approaches are needed to draw firmer conclusions about their efficacy. There are few web-based interventions that target "organizational" or "individual/organization" interface factors and limited support for their efficacy.

Conflicts of Interest: The authors declare that there are no conflicts of interest.

References

1) Ridge M, Wells J, Denny M, Cunningham J, Chalder T. Developing a web-based stress management intervention for occupational support workers. J Ment Heal 2011; 20(2): 185-197.
2) Jones F, Burke RJ, Westman M. Work-life balance: A psychological perspective. New York: Psychology Press; 2013.
3) Bhagat RS, Segovis J, Nelson T. Work stress and coping in the era of globalization. New York: Routledge; 2016.
4) Wantland DJ, Portillo CJ, Holzemer WL, Slaughter R, McGhee EM. The effectiveness of Web-based vs. non-Web-based interventions: a meta-analysis of behavioral change outcomes. Journal of medical Internet research 2004; 6(4): e40.
5) Bhui KS, Dinos S, Stansfeld SA, White PD. A synthesis of the evidence for managing stress at work: a review of the reviews reporting on anxiety, depression, and absenteeism. Journal of environmental and public health 2012; 2012.
6) Van der Klink J, Blonk R, Schene AH, Van Dijk F. The benefits of interventions for work-related stress. American journal of public health 2001; 91(2): 270.
7) Richardson KM, Rothstein HR. Effects of occupational stress management intervention programs: a meta-analysis. Journal of occupational health psychology 2008; 13(1): 69.
8) Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. Implementation Science 2010; 5(1): 1.
9) Arksey H, O'Malley L. Scoping studies: towards a methodological framework. International Journal of Social Research Methodology 2005; 8(1): 19-32.
10) Oxman AD, Group GW. Grading quality of evidence and strength of recommendations. Bmj 2004; 328(19): 1490-1494.
11) Higgins JP, Altman DG, Gøtzsche PC, et al. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. Bmj 2011; 343: d5928.
12) DeFrank RS, Cooper CL. Worksite stress management interventions: Their effectiveness and conceptualisation. Journal of Managerial Psychology 1987; 2(1): 4-10.
13) Giga SI, Cooper CL, Faragher B. The development of a framework for a comprehensive approach to stress management interventions at work. International Journal of Stress Management 2003; 10(4): 280.
14) Heber E, Lehr D, Ebert DD, Berking M, Riper H. Web-Based and Mobile Stress Management Intervention for Employees: A Randomized Controlled Trial. Journal of medical Internet research 2016; 18(1).
15) Ebert DD, Heber E, Berking M, et al. Self-guided internet-based and mobile-based stress management for employees: results of a randomised controlled trial. Occupational and Envi-

ronmental Medicine 2016; 73(5): 315-323.
16) Ebert DD, Lehr D, Heber E, Riper H, Cuijpers P. Internet-and mobile-based stress management for employees with adherence-focused guidance: efficacy and mechanism of change. Scand J Work Environ Health 2016.
17) Thiart H, Lehr D, Ebert DD, Berking M, Riper H. Log in and breathe out: internet-based recovery training for sleepless employees with work-related strain—results of a randomized controlled trial. Scand J Work Environ Health 2015; 41(2): 164-174.
18) Feicht T, Wittmann M, Jose G, Mock A, von Hirschhausen E, Esch T. Evaluation of a seven-week web-based happiness training to improve psychological well-being, reduce stress, and enhance mindfulness and flourishing: a randomized controlled occupational health study. Evidence-based complementary and alternative medicine: eCAM 2013; 2013: 676953.
19) Wolever RQ, Bobinet KJ, McCabe K, et al. Effective and viable mind-body stress reduction in the workplace: A randomized controlled trial. Journal of Occupational Health Psychology 2012; 17(2): 246-258.
20) Hasson D, Anderberg UM, Theorell T, Arnetz BB. Psychophysiological effects of a web-based stress management system: A prospective, randomized controlled intervention study of IT and media workers [ISRCTN54254861]. BMC Public Health 2005; 5: 78-14.
21) Ruwaard J, Lange A, Bouwman M, Broeksteeg J, Schrieken B. E‐Mailed standardized cognitive behavioural treatment of work‐related stress: A randomized controlled trial. Cognitive behaviour therapy 2007; 36(3): 179-192.
22) Mori M, Tajima M. A web-based training program using cognitive behavioral therapy to alleviate psychological distress among employees: randomized controlled pilot trial. ★ 2014; 3(4): e70.
23) Kojima R, Fujisawa D, Tajima M, et al. Efficacy of cognitive behavioral therapy training using brief e-mail sessions in the workplace: a controlled clinical trial. Industrial health 2010; 48(4): 495-502.
24) Imamura K, Kawakami N, Furukawa TA, et al. Effects of an internet-based cognitive behavioral therapy (iCBT) program in Manga format on improving subthreshold depressive symptoms among healthy workers: a randomized controlled trial. PloS one 2014; 9(5): e97167.
25) Stansfeld SA, Kerry S, Chandola T, et al. Pilot study of a cluster randomised trial of a guided e-learning health promotion intervention for managers based on management standards for the improvement of employee well-being and reduction of sickness absence: GEM Study. BMJ open 2015; 5(10): e007981-e.
26) Umanodan R, Shimazu A, Minami M, Kawakami N. Effects of computer-based stress management training on psychological well-being and work performance in japanese employees: a cluster randomized controlled trial. Industrial health 2014; 52 (6): 480-491.
27) Shimazu A, Kawakami N, Irimajiri H, Sakamoto M, Amano S. Effects of web-based psychoeducation on self-efficacy, problem solving behavior, stress responses and job satisfaction among workers: A controlled clinical trial. Journal of occupational health 2005; 47(5): 405-413.
28) Eisen KP, Allen GJ, Bollash M, Pescatello LS. Stress management in the workplace: A comparison of a computer-based and an in-person stress-management intervention. Computers in Human Behavior 2008; 24(2): 486-496.
29) Geraedts AS, Kleiboer AM, Twisk J, Wiezer NM, van Mechelen W, Cuijpers P. Long-term results of a Web-based guided self-help intervention for employees with depressive symptoms: Randomized controlled trial. Journal of medical Internet research 2014; 16(7): 14-28.
30) Abbott J-A, Klein B, Hamilton C, Rosenthal A. The Impact of Online Resilience Training for Sales Managers on Wellbeing and Work Performance. E-Journal of Applied Psychology 2009; 5(1): 89-95.
31) Schell E, Theorell T, Hasson D, Arnetz B, Saraste H. Impact of a Web-Based Stress Management and Health Promotion Program on Neck-Shoulder-Back Pain in Knowledge Workers? 12 Month Prospective Controlled Follow-Up. Journal of Occupational & Environmental Medicine 2008; 50(6): 667-676.
32) Ebert DD, Lehr D, Smit F, et al. Efficacy and cost-effectiveness of minimal guided and unguided internet-based mobile supported stress-management in employees with occupational stress: a three-armed randomised controlled trial. BMC Public Health 2014; 14: 11.
33) Ebert DD, Lehr D, Boß L, et al. Efficacy of an internet-based problem-solving training for teachers: Results of a randomized controlled trial. Scandinavian Journal of Work, Environment & Health 2014; 40(6): 582-596.
34) Luthans F, Avey JB, Patera JL. Experimental analysis of a web-based training intervention to develop positive psychological capital. Academy of Management Learning & Education 2008; 7(2): 209-221.
35) Ly KH, Asplund K, Andersson G. Stress management for middle managers via an acceptance and commitment-based smartphone application: A randomized controlled trial. Internet Interventions 2014; 1(3): 95-101.
36) Volker D, Zijlstra-Vlasveld MC, Anema JR, et al. Effectiveness of a Blended Web-Based Intervention on Return to Work for Sick-Listed Employees With Common Mental Disorders: Results of a Cluster Randomized Controlled Trial. Journal of medical Internet research 2015; 17(5): e116.
37) Ketelaar SM, Nieuwenhuijsen K, Gärtner FR, Bolier L, Smeets O, Sluiter JK. Effect of an e-mental health approach to workers' health surveillance versus control group on work functioning of hospital employees: a cluster-RCT. PLoS ONE 2013; 8(9): 1-11.
38) Ketelaar SM, Nieuwenhuijsen K, Bolier L, Smeets O, Sluiter JK. Improving Work Functioning and Mental Health of Health Care Employees Using an E-Mental Health Approach to Workers' Health Surveillance: Pretest-Posttest Study. Safety and Health at Work 2014; 5(4): 216-221.
39) Gärtner FR, Ketelaar SM, Smeets O, et al. The Mental Vitality

@ Work study: design of a randomized controlled trial on the effect of a workers' health surveillance mental module for nurses and allied health professionals. BMC Public Health 2011; 11 (Suppl 4): 290-302.

40) Ketelaar SM, Nieuwenhuijsen K, Gärtner FR, Bolier L, Smeets O, Sluiter JK. Mental Vitality@ Work: The effectiveness of a mental module for workers' health surveillance for nurses and allied health professionals, comparing two approaches in a cluster-randomised controlled trial. International archives of occupational and environmental health 2014; 87 (5): 527-538.

41) Bolier L, Ketelaar SM, Nieuwenhuijsen K, Smeets O, Gärtner FR, Sluiter JK. Workplace mental health promotion online to enhance well-being of nurses and allied health professionals: A cluster-randomized controlled trial. Internet Interventions 2014; 1(4): 196-204.

42) Riva G, Preziosa A, Grassi A, Villani D. Stress management using UMTS cellular phones: a controlled trial. Studies in Health Technology & Informatics 2006; 119: 461-463.

43) Villani D, Grassi A, Cognetta C, Toniolo D, Cipresso P, Riva G. Self-help stress management training through mobile phones: An experience with oncology nurses. Psychological Services 2013; 10(3): 315.

44) Billings DW, Cook RF, Hendrickson A, Dove DC. A Web-based approach to managing stress and mood disorders in the workforce. Journal of Occupational & Environmental Medicine 2008; 50(8): 960-968.

45) Williams A, Hagerty BM, Brasington SJ, Clem JB, Williams DA. Stress Gym: Feasibility of Deploying a Web-Enhanced Behavioral Self-Management Program for Stress in a Military Setting. Military Medicine 2010; 175(7): 487-493.

46) Rao N, Kemper KJ. The Feasibility and Effectiveness of Online Guided Imagery Training for Health Professionals. Journal of evidence-based complementary & alternative medicine 2016; 22(1): 54-58.

47) Kawai K, Yamazaki Y, Nakayama K. Development and formative evaluation of a Web-based stress management program to promote psychological well-being. Japanese Journal of Health and Human Ecology 2007; 73(4): 137-152.

48) Kawai K, Yamazaki Y, Nakayama K. Process evaluation of a web-based stress management program to promote psychological well-being in a sample of white-collar workers in Japan. Industrial health 2010; 48(3): 265-274.

49) Ahtinen A, Mattila E, Välkkynen P, et al. Mobile Mental Wellness Training for Stress Management: Feasibility and Design Implications Based on a One-Month Field Study. JMIR mHealth and uHealth 2013; 1(2): e11.

50) Kimura R, Mori M, Tajima M, et al. Effect of a brief training program based on cognitive behavioral therapy in improving work performance: A randomized controlled trial. Journal of occupational health 2015; 57(2): 169-178.

51) Imamura K, Kawakami N, Furukawa T, et al. Does Internet-based cognitive behavioral therapy (iCBT) prevent major depressive episode for workers? A 12-month follow-up of a randomized controlled trial. Psychological medicine 2015; 45 (09): 1907-1917.

52) Phillips R, Schneider J, Molosankwe I, et al. Randomized controlled trial of computerized cognitive behavioural therapy for depressive symptoms: effectiveness and costs of a workplace intervention. Psychological medicine 2014; 44(4): 741-752.

53) Allexandre D, Bernstein AM, Walker E, Hunter J, Roizen MF, Morledge TJ. A Web-Based Mindfulness Stress Management Program in a Corporate Call Center: A Randomized Clinical Trial to Evaluate the Added Benefit of Onsite Group Support. Journal of Occupational and Environmental Medicine 2016; 58(3): 254.

54) Aikens KA, Astin J, Pelletier KR, et al. Mindfulness goes to work: Impact of an online workplace intervention. Journal of Occupational and Environmental Medicine 2014; 56(7): 721-731.

55) Kemper KJ, Khirallah M. Acute Effects of Online Mind-Body Skills Training on Resilience, Mindfulness, and Empathy. Journal of evidence-based complementary & alternative medicine 2015; 20(4): 247-253.

56) Cook RF, Billings DW, Hersch RK, Back AS, Hendrickson A. A field test of web-based workplace health promotion program to improve dietary practices, reduce stress, and increase physical activity: Randomized controlled trial. Journal of medical Internet research 2007; 9(2): 1-14.

57) Cook RF, Hersch RK, Schlossberg D, Leaf SL. A Web-based health promotion program for older workers: Randomized controlled trial. Journal of medical Internet research 2015; 17 (3).

58) Hughes SL, Seymour RB, Campbell RT, Shaw JW, Fabiyi C, Sokas R. Comparison of Two Health-Promotion Programs for Older Workers. American Journal of Public Health 2011; 101 (5): 883-890.

59) Kim C-J, Schlenk EA, Kang S-W, Park J-B. Effects of an internet-based lifestyle intervention on cardio-metabolic risks and stress in Korean workers with metabolic syndrome: A controlled trial. Patient Education & Counseling 2015; 98(1): 111-119.

60) Yamagishi M, Kobayashi T, Kobayashi T, Nagami M, Shimazu A, Kageyama T. Effect of web-based assertion training for stress management of Japanese nurses. Journal of Nursing Management 2007; 15(6): 603-607.

61) Yamagishi M, Kobayashi T, Nakamura Y. Effects of Web-based Career Identity Training for Stress Management among Japanese Nurses: A Randomized Control Trial. Journal of occupational health 2008; 50(2): 191-193.

62) Leung SS, Chiang VC, Chui Yy, Lee AC, Mak Yw. Feasibility and potentials of online support for stress management among secondary school teachers. Stress and Health 2011; 27 (3): e282-e286.

63) Kawakami N, Kobayashi Y, Takao S, Tsutsumi A. Effects of web-based supervisor training on supervisor support and psychological distress among workers: a randomized controlled trial. Preventive Medicine 2005; 41(2): 471-478.

64) Kawakami N, Takao S, Kobayashi Y, Tsutsumi A. Effects of web-based supervisor training on job stressors and psychologi-

cal distress among workers: a workplace-based randomized controlled trial. Journal of occupational health 2006; 48(1): 28-34.
65) Eysenbach G. The law of attrition. Journal of medical Internet research 2005; 7(1): e11.
66) Lazarus RS, Folkman S. Stress, appraisal, and coping. New York: Springer publishing; 1984.
67) Meichenbaum D. Cognitive behaviour modification. Cognitive Behaviour Therapy 1977; 6(4): 185-192.
68) Meichenbaum D. Stress inoculation training. New York: Pergamon; 1985.
69) Mark GM, Smith AP. Stress models: A review and suggested new direction. Occupational health psychology 2008; 3: 111-144.

International Journal of Nursing Studies 72 (2017) 42–52

Contents lists available at ScienceDirect

International Journal of Nursing Studies

journal homepage: www.elsevier.com/locate/ijns

Review

Valuable yet Vulnerable—A review of the challenges encountered by older nurses in the workplace

C. Ryan[a,*], M. Bergin[b], J.S Wells[c]

[a] Department of Nursing and Healthcare, Waterford Institute of Technology, Ireland
[b] Department of Nursing and Healthcare, Waterford Institute of Technology, Ireland
[c] School of Health Sciences, Waterford Institute of Technology, Ireland

ARTICLE INFO

Keywords:
Older nurses
Ageing nurses
Stress
Challenges
Well-being
Ageing workforce

ABSTRACT

Objective: As the global nursing workforce ages, developing a comprehensive understanding of the experiences, needs and values specific to older nurses is increasingly significant. This paper reviews the evidence with regard to the specific challenges encountered by older nurses in the workplace.
Design: A scoping review of the published literature was conducted using the electronic databases Medline, CINAHL, PsycINFO, Science Direct and Google Scholar. A total of 20 papers were included in this review, most of which were qualitative (n = 14). Three quantitative studies were identified (including one study which combined a physical exam with survey methods) as well as three mixed method studies.
Results: The challenges faced by older nurses in their practice are synthesised across three primary domains: Nursing and the ageing body; Recognition and support of the older nurse and Demands associated with middle-age.
Conclusion: As older nurses form a substantial proportion of the healthcare workforce in many countries, the development and implementation of strategies to address these challenges is of utmost importance.

What is already known about the topic?

- Older nurses are a significant and growing proportion of the global nursing workforce.
- In recent years more research has focused on profiling the experiences of older nurses in workplace.

What this paper adds

- This review finds that older nurses struggle with natural physical and cognitive declines as they age, as that musculoskeletal injury at work is a significant challenge.
- Older nurses gain valuable skills and knowledge through years of experience; however this is not always recognised by colleagues.
- Middle-age demands such as home-life responsibilities, personal health issues and caring for elderly parents are additional burdens often faced by older nurses.
- There is a lack of agreed terminology and age criteria to define older nurses and older workers in general.

1. Introduction

The global nursing workforce is ageing (Wells and Norman, 2009). In 2015 an estimated 50% of registered nurses in the United States were aged 50 or older (Budden et al., 2016). Similar trends are observed in Canada, where 38.9% of the nursing workforce are aged over 50 (Canadian Institute for Health Information, 2016); in Australia, where 37.3% are aged over 50 (Australian Institute for Health and Welfare, 2015) and in the United Kingdom, where 34.5% of National Health Service (NHS) nurses are aged between 45 and 54 and 14.3% are aged over 55 (Royal College of Nursing, 2016).

Many countries are now facing a previously un-encountered situation in which older nurses represent a significant and growing proportion of the healthcare workforce (Stichler, 2013). The working life of nurses has gradually increased over time. For example, 'Baby Boomer' nurses in the United States are currently delaying retirement (Auerbach et al., 2014). Whilst it is unclear why these nurses delay retirement it would appear to arise from a combination of health and lifestyle advances enabling such nurses to continue to work. Other factors may include nurses retaining a sense of vocation and satisfaction from their work, social trends such as having children later in life and economic

* Corresponding author at: O'Connell Bianconi Building, Cork Road Campus, Waterford Institute of Technology, Ireland.
E-mail address: cryan@wit.ie (C. Ryan).

http://dx.doi.org/10.1016/j.ijnurstu.2017.04.006
Received 9 January 2017; Received in revised form 11 April 2017; Accepted 12 April 2017

reasons such as a desire for a better quality of life in retirement (Auerbach et al., 2014).

Political factors are also a consideration as many OECD (Organisation for Economic Co-operation and Development) countries intend to raise the age at which workers are entitled to access government-funded pensions. In the United Kingdom, for example, the age at which workers may access the state pension will be 66 years by 2020, with further plans to increase this to 67 by 2028 (Duffield et al., 2015). Understanding the challenges older nurses may face in practice is therefore of importance in order to facilitate the development of effective strategies to support their well-being and productivity in the workplace. This paper addresses a key gap in the literature by reviewing the evidence as this relates to the specific challenges encountered by older nurses in the workplace.

2. Background-Stress in nursing

Nursing is an inherently stressful occupation (Clegg, 2001; McVicar, 2003; Wells, 2011), the demands of which are well-documented (Johnston et al., 2013). Nurses require significant technical skills and expertise and must cope with numerous challenges including a heavy workload; interpersonal conflict; the necessity of shift work and the emotional impact of caring for sick and dying patients (Happell et al., 2013). The scope of nursing practice also frequently changes, meaning that nurses are often faced with the difficulty of assuming additional responsibilities in the workplace or negotiating the impact of organisational change arising from economic and political pressures (Oulton, 2006).

Previously much of what was known about the experience of being an older nurse derived from broader work on the natural ageing process, the stressors inherent to nursing as a profession and research into older workers in general (Collins et al., 2012). Research into older nurses specifically focused on issues related to their retention in the workplace and the identification of strategies which may encourage them to remain in practice (Letvak, 2002; Moseley et al., 2008; Storey et al., 2009). Recently, however, more attention has been paid to investigating challenges and issues specific to the older working nurse.

3. Method

A scoping review of the published literature was undertaken using a framework described by Arksey and O'Malley (2005). A systematic literature search using the electronic databases Medline, CINAHL, PsycINFO, Science Direct and Google Scholar was undertaken. Keywords including "older" or "ageing" nurses were searched. Studies published from the year 2000 to 2016 only were retrieved.

The following inclusion criteria were applied:

- Studies which described challenges reported by older nurse in their practice;
- Published in English between the years 2000 and 2016;
- Studies that included older or ageing nurses providing direct patient care and
- Studies which utilised qualitative, quantitative or mixed methods study designs.

Papers were excluded if they focused solely on the retention of older nurses; retirement issues; intention-to-leave nursing or return to practice strategies or included nurse managers or human resource managers only. Discussion and review papers, papers published in a language other than English or papers published before the year 2000 were also excluded.

4. Results

The initial literature search returned a total of 5997 papers from all databases. From these, the abstracts of 292 papers were screened for relevance to the review and 115 full-texts were read and checked against the inclusion criteria. The reference lists of these studies were also searched for additional relevant papers. A total of 20 papers were included in this review. Most studies were qualitative (n = 14). Three quantitative studies were identified, including one study which combined a physical exam with survey methods. Three mixed method studies were also included.

The Mixed Method Appraisal Tool (MMAT) version 2011 (Pluye et al., 2011) was used to assess the quality of the included studies. The tool outlines four criteria for assessing the quality of quantitative and qualitative research studies, with scores ranging from 25% for one criterion met to 100% for all criteria met. Mixed methods studies are assessed using both the qualitative and quantitative components of the tool. All twenty studies reviewed here fulfilled most of the quality assessment criteria, with seven fulfilling all four criteria; nine fulfilling three criteria and four fulfilling two criteria. The authors; location; sample; design; MMAT score and key findings of each study are presented in Table A1 (see Appendix A).

The challenges encountered by older nurses in the workplace may be considered across three primary domains: Nursing and the ageing body; Recognition and support of the older nurse and Demands associated with middle-age. The following sections synthesises the evidence in relation to each of these domains.

5. Nursing and the ageing body

Physical Demands of Nursing: Nursing is a physically strenuous job, involving tasks such as the manual handling and lifting of patients; working long shifts; lengthy periods of standing and walking and administering medications (Collins-McNeil et al., 2012). Coping with such demands becomes significantly more challenging as nurses age due to declines in sensory ability; stamina; flexibility; aerobic capacity and muscle strength as part of the natural ageing process (Keller, 2010; Phillips and Miltner, 2015).

Physical age-related factors were highlighted as one of the primary challenges older nurses faced in their practice in a study by Fragar and Depczynski (2011) who interviewed eighty Australian nurses and allied health professionals aged over 50. These nurses described how they experienced declines in their vision and hearing; reduced strength and flexibility; persistent mental fatigue and sleep issues as they aged. These impacted their ability to cope with the physical demands of providing patient care such as administering medications, patient handling and spending long periods of time standing, walking or sitting.

Difficulties arising from reduced stamina and tiredness in the workplace emerged as a significant issue in another study of Australian nurses aged between 40 and 60 years (Gabrielle et al., 2008) who likened their physical ageing process to series of losses, with each loss signalling a decline in physical ability. Spiva et al., 2011 identified an enduring stress and frustration arising from the fast pace of work, physical care demands and a lack of energy as major themes in interviews with 18 nurses aged between 55 and 67 in the United States. A further qualitative study with 10 New Zealand nurses aged over 60 (Squire, 2008) found that such nurses struggled with sensory declines and an increased need for recovery from work as they got older. Interestingly, the nurses in this study also indicated that they did not perceive that they had a disability or that these declines impacted their ability to perform their duties.

Shift work is often required of the older nurse, and presents several challenges relating to long periods at work (shifts of twelve hours or more are increasingly common across Europe), working several days consecutively and the requirement of being 'on-call' (Dall'Ora et al., 2015; Keller, 2010). Older nurses report that shift work becomes more difficult to cope with as they age (Letvak, 2003a; Mion et al., 2006; Spiva et al., 2011) and that it impacts sleep, recovery needs and mental performance (Durosaiye et al., 2016).

The impact of shift work on older nurses was explored via an online survey of 3273 nurses aged over 50 by Clendon and Walker (2015). Approximately one-third of the nurses in this study indicated that shift work suited them and that they could cope with it; though a similar proportion (over 30%) reported that they would rather not work shifts and that it affected their health negatively. In addition, 26% reported that shift work was too disruptive and tiring while 21% were worried that fatigue as a consequence of shift work resulted in mistakes in their practice. An analysis of 1250 comments left by participants revealed that shift work had a negative impact on their health and social functioning, specifically with regard to missing family and social engagements, maintaining good health and recovering from work. Shift work was also reported to become more challenging as these nurses aged and that it disrupted sleep patterns, with subsequent fatigue causing mistakes in practice and patient care.

Cognitive Declines: Older nurses face challenges in relation to changes to their cognitive functioning, manifested primarily through declines in memory and recall, attention and reaction time. Although cognitive declines may be more easily accommodated than physical declines or injuries, older nurses report that they can impact several aspects of their duties such as keeping pace with paper-work and e-mails; administering medications; interpreting patient results and analysing statistical information (Fragar and Depczynski, 2011).

Ward-Smith et al. (2007), in a study of 'Baby Boomer' paediatric nurses (i.e. those born between 1946 and 1964), identified that the changing nature of nursing posed a challenge to older nurses by requiring the development of new skills and an upgrading of expertise (such as using computer technology). Older nurses in a study conducted by Spiva et al. (2011) reported struggling with mental deficits and in particular declines in their memory. These deficits were exacerbated by change in the workplace in terms of technological advances and the need to develop new skills. Coping with change at procedural levels (e.g. assuming new duties) and organisational levels (system restructuring) is also reported to be exacting on the older nurse. Krichbaum et al. (2007) for example, refer to 'complexity compression' in which nurses assume additional unplanned responsibilities in addition to their current workloads.

Durosaiye et al. (2016) conducted a focus group with six older NHS nurses in the United Kingdom who reported that their cognitive acuity diminished as they got older. Such declines, though not easily recognisable, had negative implications for their concentration, focus and time management at work and were exacerbated by work and environmental demands they faced on the ward. Another focus group study with 84 NHS nurses aged over 50 in the United Kingdom (Andrews et al., 2005) identified mental 'slowing up' as a significant source of stress for this group which affected their employment-related decision-making.

'Nursing through pain and injury': In addition to struggling with the physical demands of providing direct patient care while coping with the ageing process, older nurses also report struggling with chronic pain and musculoskeletal injuries at work. Cameron et al., 2008 surveyed 303 Canadian nurses aged 45–63 years and found that 57% experienced job-related lower back pain or discomfort and 51% reported neck pain. Over one-third reported shoulder/back, thigh/knee, ankle/foot pain in the previous 12 months. Of those with lower back pain, 32% felt it interfered with their ability to work somewhat and nearly 20% felt it greatly interfered with ability to work. Almost half of those with thigh/knee or ankle foot problems said it interfered somewhat with ability to work. Interviews were also conducted with 35 of the nurses in this study, where it was found that 63% of those aged 45–55 and 70% of those aged over 56 had experienced a musculoskeletal disorder at work. Pain and injury at work had significant implications for these nurses, with most having to take time off and 15% unable to return to work. Injury also had a financial impact, affected work practices and caused these nurses to feel guilty about leaving work to others.

The risk of experiencing a musculoskeletal disorder or injury at work appears to increase as nurse's age. Heiden et al., 2013 for example, conducted physical exams with 273 German nurses aged between 21 and 65 and found that the prevalence of a musculoskeletal disorder in those aged 45 and older was 32.7%, compared to 12.7% in those aged between 35 and 44 and 5.5% in those aged less than 35 years. A larger study by Clendon and Walker (2013a) surveyed 3273 nurses aged over 50 in New Zealand. Although over 80% of those surveyed reported no problem conducting usual activities and were not anxious or depressed, over one-third reported moderate pain or discomfort; with levels of pain/discomfort increasing with age and highest in those aged between 61 and 70 years. Analysis of comments revealed that the physical demands of nursing (e.g. patient handling, giving medication) plus sensory declines, injury and chronic pain had a negative health impact on these older nurses.

A survey of 308 registered nurses aged over 50 years in the United States found that 23.4% had experienced a job-related injury in the past five years, while 35.5% reported the presence of a current job-related health problem (Letvak, 2005). A survey by Letvak et al., 2013 of 1171 nurses, 26% of whom were aged over 50, found that older nurses had a 12% higher prevalence of health problems, higher body mass index, higher average productivity loss and higher average pain levels than their younger colleagues. Friedrich et al., 2011 conducted two sets of focus groups with registered hospital nurses; one with nurses aged over 62 and one with nurses aged between 55 and 62. All were still in active practice. Although the data was mostly consistent between the two groups with regard to factors which inspire nurses to remain in active practice, the physical demands of nursing and fear of retirement due to musculoskeletal injury were a more prominent challenge for those in the younger focus group than the older. Those in the younger group expressed a much greater need to move to less pressured and less physically demanding roles in order to remain in nursing.

Exhaustion, pain and injury can significantly impair older nurse's ability to fulfil their caring duties efficiently (Stichler, 2013). The experience of being an older nurse working through pain and injury was explored by Letvak (2009) who conducted focus groups with 14 nurses aged over 50 with a history of musculoskeletal pain and/or depression. Participants revealed how they struggled with pain and physical exhaustion on a daily basis. These nurses also alluded to how their practice had slowed in response to these struggles and that they had concerns with regard to safety implications for patient care as a result of reduced reaction time and struggling with sustaining concentration when tired.

6. Recognition and support of the older nurse

The positive attributes of the older nurse were referred to in several studies. Older nurses are skilled and experienced, and describe a sense of empowerment through their maturity in addition to an increased confidence in their abilities and knowledge (Gabrielle et al., 2008; Spiva et al., 2011). Nursing offered meaningful quality work by providing autonomy, enjoyment, a sense of contribution, intellectual stimulation and diversity to older nurses (Squire, 2008). Eleven perioperative nurses aged between 50 and 63 who participated in a focus group study conducted by (Letvak, 2003a) considered themselves not as older but as experienced and respected nurses.

Older nurses believe that their wisdom and expertise, in conjunction with a structured and supportive working environment, can compensate for aged-related physical and cognitive declines (Letvak, 2009). However, older nurses often perceive a lack of recognition of their value from colleagues and that the positive aspects of being an older nurse are frequently ignored or underplayed (Andrews et al., 2005; Mion et al., 2006).

Generational differences can emerge within the nursing workplace (Kupperschmidt, 2006). Letvak (2003b) conducted focus groups with 14 female staff nurses aged 55–62. They described developing skills sets that younger nurses may not have, such as the ability to establish a

meaningful rapport with patients and their relatives. These older nurses also said they enjoyed being role models in the workplace and the experience of working alongside younger nurses.

Frustration can arise for older nurses at work when these abilities are not appreciated by their younger colleagues, and especially when younger colleagues fail to take their advice (Spiva et al., 2011). Differences in attitude and work ethic have also been described (Letvak, 2003a). For example, younger nurses were reported to be less committed to their work (e.g. less willing to endure challenging working conditions) and more career or financially focused than their older colleagues (Camerino et al., 2006; Letvak, 2003b).

Older nurses can also experience bullying in the workplace (Longo, 2013) or be subject to positive or negative stereotyping. Some older nurses indicate that they can be perceived as less capable because they have not progressed beyond staff nurse level (Durosaiye et al., 2016). However, others describe how patients appreciate receiving care from older nurses as they were perceived to be more competent and experienced (Letvak, 2003b).

Positive interpersonal communication and supportive relationships in the workplace are highly valued by older nurses (Fitzgerald, 2007). Nevertheless, older nurses report difficulties with regard to the level of administrative and organisational support they receive (Gabrielle et al., 2008; Letvak, 2009; Mion et al., 2006). Clendon and Walker (2015) explored perceptions of flexible working with 46 nurses and nurse practitioners aged over 50 and identified a sense of frustration arising from the nurse's interactions with their organisation. The nurses in this study related how they had been committed and loyal to both their colleagues and workplace throughout their careers; however, though they were required to be flexible in their own work practices, they did not receive similar flexibility or accommodation of their needs from their organisation in return.

The need to support older nurses in the workplace also emerged as major finding from focus groups conducted by Mion et al. (2006), three of which were conducted with older nurses aged between 44 and 73; one with nurses aged from 22 to 29 and one with nurse managers. Findings were aggregated and it was highlighted that colleagues should be aware of the challenges older nurses may face when delivering patient care, such as declines in physical or cognitive ability, health issues, pain or injury and make accommodations for these.

Older nurses place a strong value on feedback but tend to be more sensitive to criticism in their practice (Fragar and Depczynski, 2011). Rigby and O'Connor (2012) reported that older nurses experience emotional stress when their working environment is changed without consultation. The failure of colleagues to recognise and account for the fact that older nurses may experience certain difficulties in the conduct of their duties (e.g. coping with pain and tiredness) can be a source of frustration and discontent; though Letvak (2003b) found that older nurses mostly had positive relationships with their managers and were satisfied with the level of support they received.

7. Demands associated with middle-age

Difficulties specific to middle-age can place a strain on older working nurses (Phillips and Miltner, 2015). Coping with the emotional acceptance of ageing can prove psychologically taxing. In this regard, middle age also marks the typical onset of several health-related challenges such as weight gain, chronic disease and insomnia (Letvak, 2005) as well the physical and cognitive declines discussed previously.

Gabrielle et al. (2008) found that older nurses can struggle to manage demands outside of the workplace and, in particular, the issue of balancing work-life commitments. The concept of the 'neglected-self' was raised as an issue by older nurses in this study. They reported pressure to adopt a selfless attitude and ignore their own health and recovery needs in order to keep pace with demands arising from both home life and their workplace.

Working through pain and ill-health can be debilitating for older nurses and exacerbate their experience of chronic mental and physical fatigue (Letvak, 2009). Fragar and Depczynski (2011) describe how older nurses find it difficult to balance work and family commitments and stay engaged and positive at work. Nurses in this study also alluded to the challenge of emotionally accepting that they are getting older, particularly as they were providing care for older adults and as such were confronted with issues of ageing and mortality.

The requirement of shift work can be increasingly problematic within the context of middle-age as it generates issues with regard to a lack of time through working irregular hours and limited flexibility with regard to starting and finishing work (Clendon and Walker, 2015; Fragar and Depczynski, 2011). Older nurses also report assuming additional carer roles outside of the workplace, for example, caring for ageing parents (eldercare) or caring for their own families (Andrews et al., 2005; Mion et al., 2006). Indeed, assuming additional caring responsibilities are identified as a prominent factor in why older nurses chose to leave the workforce (Hayes et al., 2012).

Gender issues are a factor for consideration here (Squire, 2008). The nursing workforce is predominantly female (Rajacich et al., 2013) and women aged 45 to 54 years are consistently shown to have higher levels of work-related stress, anxiety and depression when compared to other age cohorts (Health and Safety Executive, 2016). Older female nurses tend to assume responsibility for many additional domestic duties within the home, and allude to struggling with a lack of energy for completing such tasks, particularly ones which involve physical components (Gabrielle et al., 2008). Undertaking multiple professional and personal roles can lead to increased physical and emotional strain in older female workers (Kenney, 2000; Stewart et al., 2000) as they are susceptible to hormone changes arising from the menopause (Fitzgerald, 2007). This in turn can produce symptoms such as sleep disturbance and fatigue.

8. Age, stress and job satisfaction

The extent to which levels of stress and job satisfaction differ between older and younger nurses is difficult to ascertain. Some studies report higher job satisfaction amongst older nurses (Blythe et al., 2008; Kovner et al., 2007; Norman et al., 2005; Wieck et al., 2010). Generational research indicates less burnout (Cho et al., 2006; Wilson et al., 2008); less intention to resign from work (Leiter et al., 2009); higher job satisfaction (Widger et al., 2006) and less distress and better mental wellbeing (Leiter et al., 2010; Letvak et al., 2013) among 'Baby Boomer' nurses (i.e. those born between 1946 and 1964) in comparison to younger cohorts (such as 'Millennials' and 'Generation X'). However, other studies indicate higher levels of stress and strain in older nurses compared to their younger colleagues (e.g. Ernst et al., 2004; Kirkcaldy and Martin, 2000; Landa et al., 2008; Moseley et al., 2008; Santos et al., 2003).

The absence of large-scale longitudinal research restricts the extent to which a definite conclusion may be drawn here. However, it may be the case that a 'healthy worker' or 'survivor' effect is present in the context of older working nurses. Nurses who experience chronic stress or burnout in the workplace are more likely to leave the profession, move to a less demanding position or retire due to ill-health (Shah, 2009). Heiden et al. (2013) suggest that the prevalence and impact of musculoskeletal injury among older nurses may be underestimated as those most severely affected may have left the workforce early. As such, older nurses currently in practice may represent a particularly stress-tolerant cohort of the workforce, due perhaps to developing more effective coping strategies or possessing more resilient personality traits (Griffiths et al., 2009). This may account for the fact that whilst turnover and intention to leave the profession is quite high in nursing compared to other occupations, and higher still among younger nurses it is less so amongst older nurses (Camerino et al., 2006; Hayes et al., 2012; Norman et al., 2005). However, it should be borne in mind that nursing is a global profession and so older nurses may experience

differing levels of occupational stress and satisfaction depending on the individual workplaces, organisation, cultural, economic or political context in which they work.

9. Discussion

The findings of this review are consistent with previous studies indicating that organisationally directed strategies are needed to support older nurses and facilitate their retention in the workplace (Armstrong-Stassen and Ursel, 2009; Cohen, 2006; Graham et al., 2014; Moseley et al., 2008; Twigg and McCullough, 2014). However, it is notable that the reviewed literature lacks consistency with regard to a settled definition of what constitutes the 'older nurse'. Indeed this lack of agreement is reflective of the broader literature on age and employment generally and appears to result from international differences in employment and social protection practices. In the United States, for example, the Age Discrimination in Employment Act (ADEA) prohibits discrimination against workers aged 40 years or older, so several researchers have employed this as an arbitrary cut-off point for defining older workers (Ng and Feldman, 2008).

Within the reviewed literature many studies use the term 'older' or 'ageing' nurse (Cameron et al., 2008; Gabrielle et al., 2008; Letvak, 2003b; Longo, 2013; Norman et al., 2005; Storey et al., 2009). However, terms such as 'mature', 'experienced', 'seasoned' and 'valuable' are also used (Fitzgerald, 2007; Friedrich et al., 2011; Mion et al., 2006). This inconsistency is significant for several reasons. Firstly, there are differences with regard to the social implications of the specific terminology employed. For example, terms such as 'mature' and 'seasoned' would imply that such workers may be expert, knowledgeable and resilient or possess advanced abilities. In contrast, terms such as 'older' or 'ageing' could imply that these nurses are of advanced years, out-dated in knowledge and currently within a process of becoming restricted in ability or usefulness.

Friedrich et al. (2011) have argued that the term 'older' may be too ambiguous and could refer to a wide range of age groupings. This is certainly evidenced here, with nine studies defining an 'older' nurse as aged over 50 years of age (Andrews et al., 2005; Clendon and Walker, 2013a, 2013b, 2015; Fragar and Depczynski, 2011; Letvak, 2002, 2003a, 2005; Letvak et al., 2013) though two used over 45 years (Cameron et al., 2008; Heiden et al., 2013), one used over 46 years (Mion et al., 2006); one used 40–60 years (Gabrielle et al., 2008); three used over 55 years (Friedrich et al., 2011; Letvak, 2003b; Spiva et al., 2011) and one used over 60 years (Squire, 2008). Furthermore, three studies did not specify an age criteria for the older nurse (Durosaiye et al., 2016; Rigby and O'Connor, 2012; Ward-Smith et al., 2007). This lack of consistency is problematic as the experience of the process of ageing varies from nurse to nurse and the use of a wide age range may not accurately reflect differences in the impact of specific challenges (such as difficulties with sustaining attention or caring for elderly parents) on nurses aged in their forties, fifties, and sixties or older.

Notably, 70% of the studies in this review were purely qualitative in nature, articulating the experiences of older nurses in the workplace and identifying the particular challenges they face. Thus whilst the studies provide exemplars of the experiences of 'older' nurses, their utility generally may be limited. Only six studies employed quantitative measures which would facilitate a more generalizable interpretation. More large-scale quantitative research therefore would be valuable to ascertain the extent to which the prevalence and impact of the challenges identified through this review affect the wider nursing workforce; not only across different age cohorts but also in different countries, organisations and care settings.

There is an identifiable trend within the reviewed literature that attends to the 'vulnerable' aspects of ageing in relation to older nurses. Considerably less focus is on the positive experiences and value of older nurses (such as, for example, enhanced expertise, maturity and empowerment through years of providing direct patient care). In this context it is worthy to note Benner's conceptualisation of the 'expert nurse', which posits that nurses develop expert skills and an understanding of quality patient care through a combination of experience over time and a strong educational base (Benner, 1982).

Benner proposes that nurses develop in stages from a novice level to expert (at which, it is argued, they possess considerable experience, an intuitive understanding of clinical situations and an ability to perform flexibly and proficiently in the workplace). In this regard, older nurses represent a highly valuable cohort of the healthcare workforce in terms of their expertise, clinical abilities and interpersonal skills. Indeed, the negative impact on service delivery of the premature retirement of the older nursing cohort has been described recently (Wells and White, 2014).

This review would suggest that organisational directives tailored to older nurses should place a value on their service; respect their abilities and expertise; emphasise team-work in clinical practice; recognise the impact of a demanding working environment upon them and provide flexible working options. Supportive management should be aware that older nurses may be more vulnerable to specific challenges, such as reduced physical and mental stamina or working through pain or injury, but not conceptualise this as meaning that they do not have a significant value to the service.

Efforts should be directed towards the development and evaluation of organisational practices and policies to address these issues. In addition, further research of a more generalizable nature is needed, particularly as this relates to the 'added value' of older nurses to clinical services rather than overly focusing on the negative impacts of ageing.

10. Conclusion

Older nurses are skilled, productive and experienced workers. However, they are also a potentially vulnerable cohort of the healthcare workforce that may need workplace accommodations if they are to contribute fully to effective service delivery. Nursing is physically and emotionally demanding work. These demands can be exacerbated by physical and cognitive declines experienced by older nurses as part of the normal ageing process. Demands related to middle and later age, a lack of recognition of the value of older nurses in terms of increased maturity and expertise and a failure of colleagues and organisations to support them have been identified in this review. However, meaningful discussion of how one might support this important cohort of professionals is hampered by a lack of definitional agreement and an over focus on the negatives of ageing.

Identifying and addressing these issues is of importance bearing in mind how significant a proportion of the workforce in many western countries older nurses now are. As the nursing workforce ages, strategies to retain and support older nurses in the workplace need to be identified, tested and implemented.

Appendix A

Table A1
Study Design and Key Findings.

Authors; Location	Sample	Study Design; MMAT Score	Key Findings
Andrews et al. (2005); United Kingdom	84 nurses aged over 50 whom work/worked in the NHS, plus 18 stakeholders (e.g. trade unions, professional bodies).	Qualitative: Face to face or telephone semi-structured interviews; MMAT Score:****	Explored employment-related decision making of nurses aged over 50. • Identified 'Push' factors: Pace of Technological Change and Stress (i.e. exhaustion; short staffed workplace, lack of stamina and physical and mental 'slowing up'- need to be aware of different needs of older nurses). • 'Pull' factors were Flexible Hours (important for supportive working environment, promotion of CPD, awareness of caring duties outside of workplace) and Financial Incentives (i.e. low income, need to earn full pension, may be sole household earner).
Cameron et al. (2008); Canada	303 hospital-based registered nurses, aged 45–63.	Mixed methods: 303 completed questionnaire, 35 completed interviews (25 were aged 44–55, 10 aged 56–63). MMAT Score: ***	Questionnaire Findings: 57% experienced job-related lower back pain or discomfort in previous 12 months; 51% reported neck pain and over one-third reported shoulder/back, thigh/knee, ankle/foot pain in previous 12 months. Risk factors of working 12-hour or rotating shifts, inadequate sleep, little perceived control and more frequent patient handling were related to increased frequency of pain/discomfort. Of those with lower back pain, 32% felt it interfered with ability to work somewhat, nearly 20% felt it greatly interfered with ability to work. Almost half of those with thigh/knee or ankle foot problems said it interfered somewhat with ability to work. Interview findings: 63% of those aged 45-55 and 70% of those aged over 56 had experienced a musculoskeletal disorder at work. Two themes emerged as cause: patient handling and dealing patients who were mentally ill or experiencing agitation/confusion. Most had to take time off, 15% could not return to work. Injury had financial impact, affected work practices and caused guilt about leaving work to others. Nurses in this sample felt that younger workers took better care of themselves, while the impact of shift work was a cause of concern.
Clendon & Walker (2013); New Zealand	3,273 nurses aged over 50. 84.9% registered nurses, 8.04% enrolled nurses Less than 1% were midwives or nurse practitioners. 4.7% were male.	Mixed Methods–Online survey plus analysis of comments; MMAT Score:***	Older females nurses were significantly healthier compared to New Zealand women of same age in general population. Over 80% had no problem conducting usual activities and were not anxious or depressed. Approx. one-third reported moderate pain or discomfort, with levels of pain/discomfort increasing with age and highest in 61-70 age groups. As nurses got older they tended to move to more casual/flexible hours in order to cope with challenges of the workplace. Analysis of comments revealed that the physical demands (e.g. patient handling, giving medication) of nursing plus sensory declines, injury and chronic pain had a negative health impact on older nurses.
Clendon & Walker (2015) New Zealand	3,273 nurses aged over 50. 84.9% registered nurses, 8.04% enrolled nurses Less than 1% were midwives or nurse practitioners. 4.7% were male.	Mixed Methods – Online survey plus analysis of comments –1250 comments relating to shift work; MMAT Score:***	Explored older nurses' perception of shift work. Approx. one-third indicated shift work suited them and that they could cope with it, while over 30% reported that they would rather not work shifts and that it affected their health negatively. Over 20% said it was too disruptive and tiring and were worried about making mistakes due to tiredness from shift work. Comments relating to shift and impact on health/social functioning identified impact on • Family/social relationships (missed out on events, feeling isolated); • Physical/mental health (disrupted sleep patterns which caused fatigue and mistakes in practice, difficulty with living healthily); • Scheduling practices (good scheduling impacted ability to cope and their health); • Decreasing tolerance (shift work more challenging as they get older) and • Coping mechanisms (changing to part-time/casual work, different area of practice, planning healthy

(continued on next page)

Table A1 *(continued)*

Authors; Location	Sample	Study Design; MMAT Score	Key Findings
			lifestyle).
Clendon & Walker (2015); New Zealand	46 registered and enrolled nurses and nurse practitioners, aged over 50.	Qualitative- Focus groups or individual interviews; MMAT Score: *** *	Explored older nurses' perception of flexible working: Identified five related themes: • Finding the balance • Personal stories (need to work flexibly due to family commitments, financial reasons or health-related reasons/fatigue) • Frustration/Barriers (experienced frustration when request for flexible working not met – obstructive procedural issues such as annual leave or minimum hours worked) • Solutions • Facilitating Factors – identified that older nurses are committed to colleagues and workplace, effort and loyalty should be should be acknowledged. Experienced frustration that nurses have to be flexible but organisation is not flexible in return.
Durosaiye et al. (2015); United Kingdom	Study one was a preliminary study with 10 NHS staff in managerial positions from different backgrounds including HR managers and older nurses. Study two comprised a focus group with ten older nurses (age/gender not specified)	Qualitative- In-depth focus groups; MMAT Score:**	Findings from the focus group indicated that working with on the ward was most challenging for the older nurse, with physical and cognitive demands most prominent (related to moving and handling patients, caring for very sick patients). Reported the stereotype that they were less able if they had not progressed beyond staff nurse. Fast pace of work was challenging-nurses experienced less mobility and independence due to age/disability which causes difficulties relating to reduced team productivity. Lack of access and time for CPD was also an issue. Job Demands had greatest impact on physical and cognitive personal constructs. Nurses experienced reduced cognitive acuity with age which was not always recognised. Shift work also impacted sleep, recovery needs and mental performance. Environmental demands impacted physical, cognitive and sensory constructs of older nurses.
Fragar & Depcynski (2011); Australia	80 nurses and allied health professionals aged over 50 from rural settings, 4 males.	Qualitative- Focus group interviews; MMAT Score:***	Identified challenges at work for older health workers and aged-related factors which contributed to them. Specific tasks and challenges were hospital and community ward tasks (e.g. reading communications, administering medications, manual handling, shift work, long periods of standing, sitting or walking, driving and conducting home visits); computer work and participating in education programmes. Challenges spanning work tasks and setting were mental and physical demands of work; coping with change; emotional impact of getting older; not achieving personal standards/goals or those of others; balancing work/family commitments and staying engaged and positive at work. Aged-related factors were declines in vision and hearing; reduced strength and flexibility; tiredness and mental fatigue; stiffness, pain and injury; sleep issues; deterioration in concentration and ability to learn, coping with stress, dealing with ageing and longer time to complete work.
Friedrich et al. (2011); United States	Two-phase study. Phase One: 13 registered hospital nurses aged over 62. Phase Two: 12 registered hospital nurses aged from 55 to 62 years	Qualitative – Focus group interviews; MMAT Score:***	Four themes emerged in phase one which inspire nurses to remain in active practice: • Attitudes and Experience (appreciation of learning, wealth of experience, culture of workplace and love of nursing) • Retention Factors (includes both retention strategies such as flexible hours and less physical challenges at work) • Needs of Older Nurse (exercise mind and body, finances, camaraderie at work • Unique contribution (sharing of experience and making a difference) Findings of phase two were consistent with data from phase one. However, there were differences in retention factors. Nurses in phase two more worried about retiring due to musculoskeletal injury and expressed greater need to move to less physical and less

(continued on next page)

Table A1 *(continued)*

Authors; Location	Sample	Study Design; MMAT Score	Key Findings
			pressured positions in order to stay in the workplace.
Gabrielle et al. (2008); Australia	12 nurses aged 40–60 in hospital/community settings, all female.	Qualitative: Semi-structured interviews face to face or via telephone (one via instant messaging); MMAT Score:****	Explored health and ageing concerns and self-care strategies of older nurses. Two themes emerged 'Aches and Pains of Nursing' • Neglected-self • Physical changes (menopause, losses due to ageing) • Living with pain (10 of 12 had neck, shoulder or back pain due to nursing – re-injury a constant threat). • Tiredness 'Evolving self' – Changes in eating and exercise habits had positive benefits. Adaption to ageing – benefits such as maturity and confidence in abilities.
Heiden et al. (2013); Germany	273 hospital nurses aged 21 to 63 completed a physical exam, 85% of whom were female, 35.9% aged over 45 years. 263 completed exam and survey, 165 completed survey only, 9 completed exam only.	Quantitative cross-sectional design, Physical exam plus survey; MMAT Score:****	Investigated association between age, musculoskeletal disorders (MSD) and physical job demands in nurses. 32.7% of those aged 45 and older had a musculoskeletal disorder, with a significantly higher prevalence of among those aged over 45 compared to younger cohorts. High levels of physical job demands increased risk of MSD in middle age cohort (35-44 years) but not older or younger cohorts.
Letvak (2003a); United States	14 perioperative nurses aged 50-62 years	Qualitative- In depth interviews; MMAT Score:***	Explored health and ageing concerns and self-care strategies of older nurses. Two themes emerged Explored the experience of being an older perioperative (PO) nurse. Three themes emerged: • Growing old in the operating room- reported a love of the job, that PO nurses had a special status/ uniqueness and much variety in work. Not 'older' but more experienced and respected. Reported loss of endurance; less energy; shift work was more difficult and mental slips/slowness on the job. 5/14 reported a work-related injury. • Interpersonal/Organisational Concerns- Stress related to being on call and scheduling which interferes with sleep and could cause hazard at work. Shift work/weekend call more difficult, while co-workers also cause of stress-need for team. Also had to cope with cultural change of surgical technologist in OR- skills of older nurse underappreciated though positive relationships were possible. • Worries about the future – staff shortage, education of new nurses, developing age gap, generational difference (attitude of younger nurses).
Letvak (2003b); United States	11 female staff hospital nurses aged 55 to 62	Qualitative – in-depth interviews; MMAT Score:***	Explored the experience of being an older nurse Four themes emerged: • Because we care (retain love for nursing, sense of dedication and commitment) • Carry their load (confident in ability and empowered to care) • Relational workplace – Highlighted generational differences in the workplace. Older nurses enjoyed being role models, being sought after for expertise and challenge of working with younger nurses. Reported that patients were more critical now but also that they appreciated having a more experienced nurse • Organisational Relationships- most reported positive relationships with managers and that they appreciated feedback and support. Expressed concerns about staff shortage, financial worries, difficulties with work hours (night work) and the future of profession.
Letvak (2005); United States	308 registered nurses, aged over 50. 96% were female. Range of locations (47% hospital based).	Quantitative descriptive- Survey; MMAT Score:**	Nurses with higher job satisfaction, higher control over practice, and lower job demands had higher physical health, while higher job demands predicted lower mental health. 23.4% had experienced a job-related injury in the past five years (needle-stick and back problems most

(continued on next page)

Table A1 *(continued)*

Authors; Location	Sample	Study Design; MMAT Score	Key Findings
			common), while 35.5% reported a job-related health problem: back pain, anxiety and depression were most common. Those with higher workplace demands and who were non-white and hospital-based were more likely to suffer an injury.
Letvak (2009); United States	14 registered nurses aged 50-65 with a history of depression and or musculoskeletal pain.	Qualitative- In-depth interviews (two per participant – face to face and telephone follow-up); MMAT Score:****	Hurting at Work: Lived experience of the older nurse. 4 major themes emerged: • Daily Struggle- each experienced pain on a daily basis, physical (exhaustion after shift work) and emotional drain (experience of sadness) of work. Inner strength and courage required to work through pain. Reported retention of a love for bedside nursing. • Practice has changed- work more slowly, longer time to complete tasks, reaction time has decreased even in emergency. Patient safety concerns due to time to intervene and difficulties with sustaining concentration. • Coping Style- Positive coping involved changing schedule; sharing trouble; receiving support from home and seek assistance from colleagues for practice. Negative coping involved weight gain, calling in sick and taking extra time to recover. • Team support- supportive relationship and acknowledgment of when in pain very important to older nurses. Administrative support can be lacking (patients are prioritised). Need to recognise experience of older nurse and express compassion.
Letvak (2013); United States	1,171 registered nurses, 91% female, 26% aged over 50.	Quantitative descriptive – Cross sectional survey design; MMAT Score: ***	Compared differences in health, productivity and quality of care between older and younger nurses. Older nurses had significantly higher Body Mass Index, average pain levels and average productivity loss than younger nurses. They also had a 12% higher prevalence of health problems and significantly more health problems than younger nurses. Mental well-being was also significantly better compared to younger nurses.
Mion et al. (2006); United States	26 nurses aged 22–73	Qualitative- Focus Groups. Three groups comprised older nurses aged 46 to 73; one group comprised nurses aged 22-29 years. Another focus group with 7 nurse managers also conducted. MMAT Score: **	Focus groups identified contributions of older nurses, potential roles or functions for older nurses, barriers to continued employment, and facilitators to continued employment. Findings were aggregated, four themes emerged; • Worth of the Older Nurse: older nurses were committed and knowledgeable, had much life experience and were empathic and understanding. Provide mentoring and leadership role. • Generational issues: Different values acknowledged by both. Older more committed to unit, more accepting of change, more experience. Conflict based on perks received by older nurses versus physical declines. • Role of Ageing Nurse: new roles needed for older nurses to utilise their clinical skills • Support me as Ageing Nurse: Important to understand reality of ageing nurse and challenges they face such as physical declines, stamina, disease, eldercare, shift work).
Spiva et al. (2011); United States	18 nurses in direct patient care aged 55 to 67. 17 were female, 1 was male.	Qualitative: Semi-structured interviews; MMAT Score:****	Participants described experience of being an older beside nurse and identified ways that influence older nurses to continue practice. Findings resulted in three constitutive patterns and eight themes: • Attribution: Professional growth in skills and confidence (connection/empathy with patients, calmness, commitment, work ethic. Generational differences-younger nurses should listen more, lack of respect for experience) and Passion and love for nursing. • Enduring stress and frustration: Physical and Mental work demands (work demands, lack of energy, fast pace, emotionally draining, memory

(continued on next page)

Table A1 *(continued)*

Authors; Location	Sample	Study Design; MMAT Score	Key Findings
			declines, dealing with own deficits); Patient acuity and patient load; Constant change and Time Constraints (electronic records, new skills, lack of time, make it harder to deliver patient care) • Enhancements needed to continue- Work environment and Organisational enhancements (change physical layout-need for support, education, teamwork. 12 hour shifts are demanding. Supportive and understanding administration- need to understand demands of patient care and needs of older nurses.
Squire (2008); New Zealand	10 registered nurses aged over 60, all female.	Qualitative- In-depth interviews; MMAT Score:****	Explore the lived experiences and their meaning for older nurses: Five main themes emerged: • Changing nature of work – Nursing role has expanded into community, cultural change, biomedical technology advances, much expertise required (new or up-grading of skills), development of specialist nursing roles. • Meaning of Work-nursing still offers meaningful quality work- nurses highlighted importance of autonomy, enjoyment, contribution, intellectual stimulation, diversity. Reported an interest in teaching/mentoring role and that they retained fitness/energy. • Social role of women- difficulties with re-entering workforce, traditional carer roles (eldercare), managing stereotypes of women working • Work and the ageing body- did not perceived they had a disability/unable to work but did experience sensory changes, a need to move into different settings and a greater need for recovery. Musculoskeletal issues were more common and several had their own health concerns. • Ethic of Care- experienced contrast between biomedical/business model of care and the need for empathy, connectedness, emotional feeling and protecting vulnerable patients.
Rigby & O'Connor (2012); Australia and England	Care home and inpatient hospice centres: 9 in England and 7 in Australia. Anonymised – number and gender of participants not specified- older nurses (mostly female, two male staff included).	Qualitative- informal discussions with staff; MMAT Score: **	Explored impact of physical working environment on older nurses Reported that physical and emotional stressors were becoming more stressful due to patient needs being more complex and poor quality of work conditions Nurses struggled with their own health concerns: several reported back and shoulder pain from years of work. Physical environment caused emotional stress (e.g. making changes in working environment without consultation, working in a medicalised environment).
Ward-Smith et al. (2007); United States	33 Older paediatric nurses ('Baby Boom' generation – born between 1946 and 1964)	Qualitative- Focus groups; MMAT Score: ***	Identify characteristics that enabled them to provide care and describe practices that would enable them to continue in their position. Each group identified that they appreciated the atmosphere and culture of the organisation they worked for. Physical demands, specifically 12 hour shifts, were identified as the most challenged aspect of the job (those with 10 years or less tenure at their hospital highlighted both physical and mental demands as most challenging). Increased use of computer technology was identified as stressful. Assistance with stress management, coping support, help in caring for both children and aging parents, benefit flexibility were identified as important.

References

Andrews, J., Manthorpe, J., Watson, R., 2005. Employment transitions for older nurses: a qualitative study. J. Adv. Nurs. 51 (3), 298–306. http://dx.doi.org/10.1111/j. 1365-2648.2005.03501.x.

Arksey, H., O'Malley, L., 2005. Scoping studies: towards a methodological framework. Int. J. Soc. Res. Methodol. 8 (1), 19–32.

Armstrong-Stassen, M., Ursel, N.D., 2009. Perceived organizational support, career satisfaction, and the retention of older workers. J. Occup. Organiz. Psychol. 82 (1), 201–220.

Auerbach, D.I., Buerhaus, P.I., Staiger, D.O., 2014. Registered nurses are delaying retirement, a shift that has contributed to recent growth in the nurse workforce. Health Aff. (Millwood) 33 (8), 1474–1480.

Australian Institute for Health, Welfare, 2015. Nursing and Midwifery Workforce 2015: Data and Additional Material. Retrieved from http://www.aihw.gov.au/workforce/nursing-and-midwifery/additional/.

Benner, P., 1982. From novice to expert. AJN The Am. J. Nurs. 82 (3), 402–407.

Blythe, J., Baumann, A., Zeytinoglu, I.U., Denton, M., Akhtar-Danesh, N., Davies, S., Kolotylo, C., 2008. Nursing generations in the contemporary workplace. Public

Personnel Manag. 37 (2), 137–159.
Budden, J.S., Moulton, P., Harper, P., Harper, K.J., Bruennel, M.L., Smiley, R., 2016. The 2015 national nursing workforce study. J. Nurs. Regul. 7 (1), S1–S90. http://dx.doi.org/10.1016/S2155-8256(16)31054-7.
Camerino, D., Conway, P.M., Van der Heijden, B.I.J., Estryn-Behar, M., Consonni, D., Gould, D., Hasselhorn, H.M., 2006. Low-perceived work ability, ageing and intention to leave nursing: a comparison among 10 European countries. J. Adv. Nurs. 56 (5), 542–552.
Cameron, S.J., Armstrong-Stassen, M., Kane, D., Moro, F.B., 2008. Musculoskeletal problems experienced by older nurses in hospital settings. Paper Presented at the Nursing Forum.
Canadian Institute for Health Information, 2016. Regulated Nurses. pp. 2016 Retrieved from Ottawa, ON.
Cho, J., Laschinger, H.S., Wong, C., 2006. Workplace empowerment, work engagement and organizational commitment of new graduate nurses. Nurs. Leadersh. – Acad. Can. Execut. Nurses 19 (3), 43.
Clegg, A., 2001. Occupational stress in nursing: a review of the literature. J. Nurs. Manag. 9 (2), 101–106.
Clendon, J., Walker, L., 2013a. The health of nurses aged over 50 in New Zealand. Contemp. Nurse 45 (1), 85–94.
Clendon, J., Walker, L., 2013b. Nurses aged over 50 years and their experiences of shift work. J. Nurs. Manag. 21 (7), 903–913.
Clendon, J., Walker, L., 2015. Nurses aged over 50 and their perceptions of flexible working. J. Nurs. Manag. 24 (3), 336–346.
Cohen, J.D., 2006. The aging nursing workforce: how to retain experienced nurses. J. Healthc. Manag. 51 (4), 233.
Collins-McNeil, J., Sharpe, D., Benbow, D., 2012. Aging workforce: retaining valuable nurses. Nurs. Manag. (Harrow) 43 (3), 50–54.
Dall'Ora, C., Griffiths, P., Ball, J., Simon, M., Aiken, L.H., 2015. Association of 12 h shifts and nurses' job satisfaction, burnout and intention to leave: findings from a cross-sectional study of 12 European countries. BMJ Open 5 (9), e008331.
Duffield, C., Graham, E., Donoghue, J., Griffiths, R., Bichel-Findlay, J., Dimitrelis, S., 2015. Why older nurses leave the workforce and the implications of them staying. J. Clin. Nurs. 24 (5–6), 824–831.
Durosaiye, I.O., Hadjri, K., Liyanage, C.L., 2016. Identifying challenging job and environmental demands of older nurses within the national health service. HERD: Health Environ. Res. Des. J. 9 (3), 82–105.
Ernst, M.E., Franco, M., Messmer, P.R., Gonzalez, J.L., 2004. Nurses' job satisfaction, stress, and recognition in a pediatric setting. Pediatr. Nurs. 30 (3), 219.
Fitzgerald, D.C., 2007. Aging, experienced nurses: their value and needs. Contemp. Nurse: J. Aust. Nurs. Prof. 24 (2), 237–243. http://dx.doi.org/10.5172/conu.2007.24.2.237.
Fragar, L.J., Depczynski, J.C., 2011. Beyond 50. challenges at work for older nurses and allied health workers in rural Australia: a thematic analysis of focus group discussions. BMC Health Serv. Res. 11 (1) (1).
Friedrich, L.A., Prasun, M.A., Henderson, L., Taft, L., 2011. Being a seasoned nurse in active practice. J. Nurs. Manag. 19 (7), 897–905. http://dx.doi.org/10.1111/j.1365-2834.2011.01294.x.
Gabrielle, S., Jackson, D., Mannix, J., 2008. Older women nurses: health, ageing concerns and self-care strategies. J. Adv. Nurs. 61 (3), 316–325.
Graham, E., Donoghue, J., Duffield, C., Griffiths, R., Bichel-Findlay, J., Dimitrelis, S., 2014. Why do older RNs keep working? J. Nurs. Adm. 44 (11), 591–597.
Griffiths, A., Knight, A., Mahudin, M.N.D., 2009. Ageing, Work-Related Stress and Health: Reviewing the Evidence .
Happell, B., Reid-Searl, K., Dwyer, T., Caperchione, C.M., Gaskin, C.J., Burke, K.J., 2013. How nurses cope with occupational stress outside their workplaces. Collegian 20 (3), 195–199.
Hayes, L.J., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., North, N., 2012. Nurse turnover: a literature review? An update. Int. J. Nurs. Stud. 49 (7), 887–905.
Health and Safety Executive, 2016. Work Related Stress, Anxiety and Depression Statistics in Great Britain 2016. Retrieved from http://www.hse.gov.uk/STATISTICS/causdis/stress/stress.pdf.
Heiden, B., Weigl, M., Angerer, P., Müller, A., 2013. Association of age and physical job demands with musculoskeletal disorders in nurses. Appl. Ergon. 44 (4), 652–658.
Keller, S.M., 2010. The aging nurse. Workplace Health Saf. 58 (10), 437.
Kenney, J.W., 2000. Women's 'inner-balance': a comparison of stressors, personality traits and health problems by age groups. J. Adv. Nurs. 31 (3), 639–650.
Kirkcaldy, B.D., Martin, T., 2000. Job stress and satisfaction among nurses: individual differences. Stress Health 16 (2), 77–89.
Kovner, C.T., Brewer, C.S., Cheng, Y., Djukic, M., 2007. Work attitudes of older RNs policy. Policy Politics Nurs. Pract. 8 (2), 107–119.
Krichbaum, K., Diemert, C., Jacox, L., Jones, A., Koenig, P., Mueller, C., Disch, J., 2007. Complexity compression: nurses under fire. Paper Presented at the Nursing Forum.
Kupperschmidt, B., 2006. Addressing multigenerational conflict: mutual respect and carefronting as strategy. Online J. Issues Nurs. 11 (2).
Landa, J.M.A., López-Zafra, E., Martos, M.P.B., del Carmen Aguilar-Luzón, M., 2008. The relationship between emotional intelligence, occupational stress and health in nurses: a questionnaire survey. Int. J. Nurs. Stud. 45 (6), 888–901.
Leiter, M.P., Jackson, N.J., Shaughnessy, K., 2009. Contrasting burnout, turnover intention, control, value congruence and knowledge sharing between Baby Boomers and Generation X. J. Nurs. Manag. 17 (1), 100–109.
Leiter, M.P., Price, S.L., Spence Laschinger, H.K., 2010. Generational differences in distress, attitudes and incivility among nurses. J. Nurs. Manag. 18 (8), 970–980.
Letvak, S., Ruhm, C., Gupta, S., 2013. Differences in health, productivity and quality of care in younger and older nurses. J. Nurs. Manag. 21 (7), 914–921.
Letvak, S., 2002. Retaining the older nurse. J. Nurs. Adm. 32 (7/8), 387–392.
Letvak, S., 2003a. The experience of being an older perioperative nurse. AORN J. 78 (4), 635–649. http://dx.doi.org/10.1016/S0001-2092(06)60670-4.
Letvak, S., 2003b. The experience of being an older staff nurse. West. J. Nurs. Res. 25 (1), 45–56.
Letvak, S., 2005. Health and safety of older nurses. Nurs. Outlook 53 (2), 66–72.
Letvak, S., 2009. Hurting at work: the lived experience of older nurses. Int. J. Human Caring 13 (4), 9.
Longo, J., 2013. Bullying and the older nurse. J. Nurs. Manag. 21 (7), 950–955.
McVicar, A., 2003. Workplace stress in nursing: a literature review. J. Adv. Nurs. 44 (6), 633–642.
Mion, L.C., Hazel, C., Cap, M., Fusilero, J., Podmore, M.L., Szweda, C., 2006. Retaining and recruiting mature experienced nurses: a multicomponent organizational strategy. J. Nurs. Adm. 36 (3), 148–154.
Moseley, A., Jeffers, L., Paterson, J., 2008. The retention of the older nursing workforce: a literature review exploring factors that influence the retention and turnover of older nurses. Contemp. Nurse 30 (1), 46–56.
Ng, T.W., Feldman, D.C., 2008. The relationship of age to ten dimensions of job performance. J. Appl. Psychol. 93 (2), 392.
Norman, L.D., Donelan, K., Buerhaus, P.I., Willis, G., 2005. The older nurse in the workplace: does age matter? Nurs. Econ. 23 (6), 282.
Oulton, J.A., 2006. The global nursing shortage: an overview of issues and actions. Policy Politics Nurs. Pract. 7 (Suppl. 3), 34S–39S.
Phillips, J.A., Miltner, R., 2015. Work hazards for an aging nursing workforce. J. Nurs. Manag. 23 (6), 803–812.
Pluye, P., Robert, E., Cargo, M., Bartlett, G., O'Cathain, A., Griffiths, F., Rousseau, M.C., 2011. Proposal: A Mixed Methods Appraisal Tool for Systematic Mixed Studies Reviews. (Retrieved from http://mixedmethodsappraisaltoolpublic.pbworks.com/w/page/24607821/FrontPage.
Rajacich, D., Kane, D., Williston, C., Cameron, S., 2013. If they do call you a nurse, it is always a male nurse: experiences of men in the nursing profession. Paper Presented at the Nursing Forum.
Rigby, J., O'Connor, M., 2012. Retaining older staff members in care homes and hospices in England and Australia: the impact of environment. Int. J. Palliat. Nurs. 18 (5).
Royal College of Nursing, 2016. Unheeded Warnings: Health Care in Crisis The UK Nursing Labour Market Review 2016. Retrieved from London.
Santos, S.R., Simon, S.D., Carroll, C.A., Bainbridge, L., Cox, K.S., Cunningham, M., Ott, L., 2003. A four-site study of stress, strain, and coping for inpatient registered nurses: baby boomer nurses bearing the burden of care. J. Nurs. Adm. 33 (4), 243–250.
Shah, D., 2009. Healthy worker effect phenomenon. Indian J. Occup. Environ. Med. 13 (2), 77.
Spiva, L., Hart, P., McVay, F., 2011. Discovering ways that influence the older nurse to continue bedside practice. Nurs. Res. Pract. 2011.
Squire, M.O., 2008. The Experiences of Older Women Participating in the Workforce .
Stewart, D., Ahmad, F., Cheung, A., Bergman, B., Dell, D., 2000. Women physicians and stress. J. Women's Health Gend.-based Med. 9 (2), 185–190.
Stichler, J.F., 2013. Healthy work environments for the ageing nursing workforce. J. Nurs. Manag. 21 (7), 956–963.
Storey, C., Cheater, F., Ford, J., Leese, B., 2009. Retaining older nurses in primary care and the community. J. Adv. Nurs. 65 (7), 1400–1411.
Twigg, D., McCullough, K., 2014. Nurse retention: a review of strategies to create and enhance positive practice environments in clinical settings. Int. J. Nurs. Stud. 51 (1), 85–92.
Ward-Smith, P., Hunt, C., Smith, J.B., Teasley, S.L., Carroll, C.A., Sexton, K., 2007. Issues and opportunities for retaining experienced nurses at the bedside. J. Nurs. Adm. 37 (11), 485–487.
Wells, Norman, I.J., 2009. The 'Greying'of Europe–Reflections on the state of nursing and nurse education in Europe. Nurse Educ. Today 29 (8), 811–815.
Wells, White, M., 2014. The impact of the economic crisis and austerity on the nursing and midwifery professions in the Republic of Ireland–'boom','bust'and retrenchment. J. Res. Nurs. 19 (7–8), 562–577.
Wells, 2011. The impact of stress amongst health professionals. J. Ment. Health 20 (2), 111–114.
Widger, K., Pye, C., Cranley, L., Wilson-Keates, B., Squires, M., Tourangeau, A., 2006. Generational differences in acute care nurses. Nurs. Leadersh. (Toronto, Ont.) 20 (1), 49–61.
Wieck, K.L., Dols, J., Landrum, P., 2010. Retention priorities for the intergenerational nurse workforce. Paper Presented at the Nursing Forum.
Wilson, B., Squires, M., Widger, K., Cranley, L., Tourangeau, A., 2008. Job satisfaction among a multigenerational nursing workforce. J. Nurs. Manag. 16 (6), 716–723.

Int.J. Behav. Med.
DOI 10.1007/s12529-017-9678-8

Theoretical Perspectives of Adherence to Web-Based Interventions: a Scoping Review

Cathal Ryan[1] · Michael Bergin[1] · John SG Wells[2]

Abstract
Purpose The purpose of this paper is to review the literature as this relates to theoretical perspectives of adherence to web-based interventions, drawing upon empirical evidence from the fields of psychology, business, information technology and health care.
Methods A scoping review of the literature utilising principles outlined by Arksey and O'Malley was undertaken.
Results Several relevant theoretical perspectives have emerged, eight of which are charted and discussed in this review. These are the Internet Intervention Model, Persuasive Systems Design, the 'PERMA' framework, the Support Accountability Model, the Model of User Engagement, the Technology Acceptance Model, the Unified Theory of Acceptance and Use of IT and the Conceptual Model of User Engagement.
Conclusions The findings of the review indicate that an interdisciplinary approach, incorporating a range of technological, environmental and individual factors, may be needed in order to comprehensively explain user adherence to web-based interventions.

✉ Cathal Ryan
cryan@wit.ie

Michael Bergin
mbergin@wit.ie

John SG Wells
jswells@wit.ie

[1] Department of Nursing and Health Care, School of Health Sciences, Waterford Institute of Technology, Waterford, Ireland

[2] School of Health Sciences, Waterford Institute of Technology, Waterford, Ireland

Published online: 20 July 2017

Keywords Web-based interventions · Adherence · Engagement · Theory · Model · Framework

Introduction

The potential of web-based interventions to improve public health across a range of domains, such as alcohol consumption [1], weight loss [2], substance abuse [3] and mental well-being [4] is increasingly recognised. However, it is well-established that interventions delivered via web-based modalities are susceptible to low levels of adherence by their users [5–8]. This is problematic as low adherence is associated with reduced intervention efficacy [9–11].

Recent years have seen increased efforts to develop a theoretical understanding of adherence and to incorporate features which may increase adherence into the design and delivery of web-based interventions [5]. The value of theoretical models in this context is that they facilitate an efficient synthesis of existing evidence and enable determinants of adherence to web-based interventions to be identified, targeted and subsequently refined [12]. Intervention components relevant to adherence could then be subsequently tailored to a range of different populations and settings [13]. This would be particularly useful in the case of web-based interventions due to their potential to reach a wide range of users [11]. To date, there has been no review of the literature as this relates to theoretical perspectives of adherence to web-based interventions. This paper addresses that gap.

User Determinants of Adherence to Web-Based Interventions

Though several studies have attempted to identify demographic characteristics which may explain why some users adhere to

a web-based programme while others do not engage at all, few consistent patterns have emerged [14]. There is, however, some evidence to indicate that older users and highly educated females are most likely to adhere to web-based programmes [15–18]. Systematic reviews have also considered the impact of programme features on user adherence. Schubart et al. [19] for example found that the frequency of user contact with a clinician, perceived personal relevance of an intervention and an individually tailored approach were associated with increased user adherence to web-based interventions for chronic ill health conditions. Brouwer et al. [20] reported that peer and counsellor support, regular intervention updates and email and phone interaction enhanced adherence. Other features such as dialogue support and the frequency of programme updates have also been associated with user adherence [17]. A recent review of both quantitative and qualitative literature as this relates to predictors of adherence to online psychological interventions [21] reported that gender, treatment expectancy, time and personalised content were all associated with adherence (although most variables investigated were not predictive). While it would appear that demographic, psychological and technological factors are associated with adherence to web-based interventions, much of these findings are contradictory and too preliminary to draw firm conclusions.

Conceptualising Adherence to Web-Based Interventions

A seminal paper by Gunther Eysenbach [6] entitled the 'Law of Attrition' was among the first to argue the case for a systematic study of adherence to web-based interventions. A core premise of this paper was that adherence to web-based interventions is typically low and that the level of engagement with such programmes is largely dependent on the user themselves. Discontinuation tends to be quite easy and with little sanction.

Eysenbach highlighted the importance of Rogers' [22] 'Diffusion of Innovation' theory as a key underlying framework for explaining continued use of a web-based intervention. 'Diffusion of Innovation' asserts that adoption and usage of a web-based programme are predicated on several factors such as compatibility, benefits to the user and complexity. Eysenbach detailed a range of factors arising from this model which are proposed to influence non-usage attrition, including 'Push' factors [cues such as reminders and social support] and participant variables [e.g. educational attainment or socio-economic status]. Such factors have been shown to be associated with the adherence of users to interventions [17, 19, 23]. However, a limitation may be the failure to attend to the role of individual user characteristics (e.g. motivation to engage) with regard to adherence. These have been shown to assume a pertinent role [24].

Cavanagh [25], drawing upon Eysenbach's [6] early work, describes adherence as the active use of an intervention as prescribed by those delivering the programme. Significantly, Eysenbach also clarified the difference between 'non-usage attrition' (i.e. users who fail to complete a programme as prescribed) and 'drop-out attrition' where users fail to complete a study protocol. This clarification was a noteworthy advance as it facilitated a more organised study of the factors underlying adherence to an intervention as opposed to those related to study drop-out.

Another concept related to adherence and highly relevant within the context of this review is that of engagement, which Cavanagh [25] described as efforts by a user to start and continue with an intervention. However, this definition of engagement is not consistently observed across the literature. Thus, a recent systematic review of engagement with digital behaviour change interventions [13] identified two distinct conceptualisations within the literature: engagement as a mental state of 'flow' (i.e. the level of user enjoyment or attention in the use of an interactive technology) and engagement as a behaviour, which focuses on the frequency, depth or duration of intervention usage.

The following review does not seek to identify conceptual frameworks which relate to the concept of 'drop-out attrition' as outlined by Eysenbach [6] in terms of the failure of participants to follow a research protocol, such as completing follow-up measures in a study. It focuses rather on the concepts of adherence and engagement, which in this context are broadly considered to refer to the sustained usage of an intervention or using an intervention as prescribed by those delivering the programme, congruent with conceptualisations as outlined by Cavanagh [25] and Perski et al. [13].

Methods

Scoping studies are a prevalent method for the conduct of a broad search of the literature on a defined topic [26]. The framework for this scoping review is based on that described by Arksey and O'Malley [27], which charts and summarises a range of research in a particular area of study. Specifically, this review seeks to identify, describe and evaluate key theoretical perspectives which are relevant to understanding adherence to web-based behavioural and psychological interventions.

Defining Terms

'Theoretical perspectives' for the purposes of this review are defined as any type of organising structure attempts to explain the key concepts and variables with regard to user adherence to web-based interventions and the relationships between those variables. The definition is guided by the work of Maxwell [28] on research design and encompasses a range of terms including theories, models and conceptual frameworks. 'Web-based interventions' are defined as programmes

delivered online through technological platforms such as email, website, computer programme or smartphone application.

Database Search

The published literature was identified by searching the following electronic databases from inception to 30 September 2016:

- PsycINFO
- PsycARTICLES
- Medline
- Science Direct Key

Terms such as 'adherence", "engagement", "compliance", "attrition" and "usage" were combined with the terms "web-based", "online", "digital" and "technology". The following inclusion and exclusion criteria were applied:

Inclusion criteria:

- Describes a theory, model or framework
- Relevant to understanding 'adherence', in terms of usage to at least some extent or as prescribed by the delivers or
- 'Engagement' in a behavioural context, in relation to usage of web-based interventions in terms of frequency, duration or depth of use
- Delivered via 'web-based' modalities
- Published in English

Web-based interventions were defined as any intervention delivered via a website, email or smartphone application.

Exclusion criteria:

- Non web-based interventions
- Papers not published in English
- Theoretical perspectives of behaviour change or programme design without reference to adherence or engagement
- Focused solely on adherence to a research protocol (e.g. completion of follow-up measures)

The initial search output returned 3864 papers. Following title and abstract screening, 2394 papers were removed due to duplication or not meeting inclusion criteria. The full texts of the remaining 1470 papers were retrieved and screened, from which, a further 1362 papers were excluded after assessment. This left a total of 8 papers included in the final review, articulating eight theoretical perspectives. One review author independently selected the studies to include in the review according to the inclusion and exclusion criteria. If there was any uncertainty concerning the inclusion of a study, this was discussed with the two other review authors and a decision was agreed.

Results

Eight theoretical perspectives were identified from this literature search. These were the Internet Intervention Model, Persuasive Systems Design, the PERMA framework, the Supportive Accountability Model, the Model of User Engagement, the Technology Acceptance Model, the Unified Theory of Acceptance and Use of IT and the Conceptual Model of User Engagement. The central components, disciplinary underpinnings and conceptualisations of adherence or otherwise as these relate to each of these theories and models are outlined in Table 1. The following section of this paper describes and compares these theories in terms of their conceptual origins, central propositions and relevant empirical applications. The relative merits of these models and implications for both future research and current delivery of web-based interventions are then discussed.

The Internet Intervention Model

The Internet Intervention Model [29] is considered one of the earliest attempts to model mechanisms of behaviour change as this relates to web-based health interventions [45]. The model proposes that behaviour change and maintenance develop through a series of nine non-linear steps, in which a user (who may be influenced by environmental factors) affects website use and adherence, which are themselves impacted by support and website characteristics. Website use leads to behaviour change and symptom improvement through various mechanisms of change. Behaviour change is sustained by treatment maintenance.

Although the model is essentially focused on mechanisms of behaviour change in a web-based context, it incorporates components which are relevant to developing a systematic understanding of user adherence to web-based interventions. Adherence forms a central aspect of the website use component of the model and is determined by a combination of user characteristics (e.g. motivation to engage), environmental factors (e.g. family encourages use), website elements (e.g. simple, clear and engaging design) and support (e.g. communication with a clinician). These factors are proposed to indirectly influence behaviour change via increased adherence.

The Internet Intervention Model is a cohesive theoretical perspective which focuses on how user, environmental, website and support variables operate and interrelate in the context of adherence to web-based interventions. The development of the model represented a significant progression from the prevailing fragmented literature which had primarily sought to identify individual predictors of adherence without

Table 1 Theoretical perspectives of adherence

Model/theory	Discipline	Description of model	Conceptualisation of adherence
Internet Intervention Model, Ritterband et al. [29]	Behavioural medicine	Behaviour change is produced and maintained through non-linear nine steps. The user, influenced by environmental factors, affects website use and adherence, which is influenced by support and website characteristics. Website use leads to behaviour change and symptom improvement through various mechanisms of change. The improvements are sustained via treatment maintenance.	Adherence forms a central aspect of the model and in particular 'website use' (actual utilisation of the intervention) and is determined by a combination of user characteristics (e.g. motivation to engage); environmental factors (e.g. family encourage use); website elements (e.g. simple, clear and engaging design) and support (e.g. communication with a clinician). These factors are proposed to indirectly influence behaviour change via increased adherence.
Persuasive Systems Design (PSD) Model, Oinas-Kukkonen and Harijumaa [30]	Persuasive technology, information technology (behaviour change support systems)	Conceptualises the role of technology in behaviour and attitude change. Four key persuasive features, namely Primary Task Support (supporting the user to carry out the primary task); Dialogue Support (degree of feedback provided to users); System Credibility (how credible a system is in terms of, for example, trustworthiness, expertise and authority) and Social Support (motivating users through social influence). Proposes seven postulates in system design: that information technology is always available and should be open, incremental; unobtrusive, useful and easy to use; that the system must foster user commitment and cognitive consistency and that persuasion can occur via direct and indirect routes. Three key concepts in user context—'intent' (i.e. objective of a web-based intervention), 'event' (i.e. context and characteristics of the target users and 'strategy' (i.e. the route and message of an intervention).	Persuasive Systems Design is primarily a model of behaviour change though it has been used successfully to predict adherence to web-based interventions (adherence defined as the proportion of participants that use and keep using the intervention in the desired way)
'PERMA' Framework Ludden et al. [31]	Multiple theoretical underpinnings but draws primarily from the fields of Persuasive Technology, Positive Psychology and Information Technology	Proposes that effective, appealing and compelling design can increase adherence to web-based interventions. Five components purported to be relevant to the design of web-based interventions are positive emotion, engagement, relationships, meaning and accomplishment (PERMA). Three strategies which may increase adherence are proposed: 'personalisation'; 'ambient information' and 'use of metaphor'. Personalisation refers to tailored messages, effective system design and providing user control; ambient information refers to a flow of content order to foster a desire to continue accessing a web-based programme while use of metaphor emphasises the importance of abstract concepts such as accomplishment, challenge and perseverance.	Describes a framework can be applied to the design of web-based interventions in order to increase adherence. Adherence per se is not operationally defined though the authors refer to the issue of nonadherence, whereby 'many people do not follow a treatment online as it was intended by the therapist'. Engagement is integrated into the model in line with Seligman's well-being theory as an element which can have a positive impact on participant well-being.

Table 1 (continued)

Model/theory	Discipline	Description of model	Conceptualisation of adherence
Model of User Engagement Short et al. [32]	Health psychology, though the model is built on research stemming from multiple strands including social psychology, persuasive technology, information technology and business	Draws upon the Elaboration Likelihood Model [33], Persuasive Systems Design [30], the Internet Intervention Model [34] and the Conceptual Model of User Engagement [35] to model the impact of individual, environmental and design components on adherence to web-based interventions [36]. Environmental factors such as time, access and online features (i.e. the tone, feel and function of the programme) influence individual factors such as user expectations, internet self-efficacy, affect and expectations. These in turn impact upon intervention factors such as usability and persuasiveness. Individual characteristics such as personal relevance, demographic variables and current and past health behaviours are also proposed to shape intervention engagement.	Not expressly a model of adherence but rather of engagement. Engagement in the context of this model is defined as 'the quality of a user experience, characterised by increased attention, positive affect, sensory and intellectual satisfaction and mastery'. Sustained engagement results when an intervention is perceived by the user as usable, relevant, interactive, motivating and persuasive.
Supportive Accountability Model Mohr et al. [37]	Derived from the fields of social and organisational psychology and computer-mediated communication	Proposes that adherence to eHealth interventions is influenced by seven key human support factors, namely 'accountability', 'social presence', 'expectations', 'performance monitoring', 'goal setting' and 'legitimacy'. The impact of these factors is in turn moderated by user motivation and computer-mediated communication. Adherence is highest when the user feels accountable to a coach who is perceived as expert, trustworthy and caring.	Adherence is defined here as the use of the eHealth intervention over time and has been operationalized in a variety of ways such as the number of logins, time on site, the number of modules completed and the number of characters typed into the site.
Technology Acceptance Model (TAM) Davis [38]	Psychology (adapted from the Theory of Reasoned Action) and information systems design	Adoption and usage of a technological platform are predicated on the attitude of the user towards the programme. Draws on Theory of Reasoned Action [39] and identifies two key determinants of attitude, namely perceived usefulness, which independently determines behavioural intention, and perceived ease of use, which impacts perceived usefulness.	Not expressly a model of adherence to web-based interventions, it is likely to be of significant relevance here is due to its focus on explaining the adoption and sustained usage of a technological programme.
Unified Theory of Acceptance and Use of IT (UTAUT) Venkatesh et al. [40]	Psychology and information systems design (integrates numerous well-established models in these fields including the Technology Acceptance Model (TAM) [10] and diffusion of innovation (DOI) into one cohesive model)	Integrates eight social cognitive theories into four key constructs which explain acceptance and use of IT. These constructs are 'performance expectancy' (the degree to which an individual believes that the system will help him or her to attain gains in job performance), 'effort expectancy' (the degree of ease associated with the use of the system), 'social influence' (the degree to which an individual perceives that important others believe he or she should use the new systems) and 'facilitating conditions' (perceptions of the resources and support available to perform a behaviour). These constructs are	As with the Technology Acceptance Model, UTAUT is not expressly a model of adherence though is highly relevant as focused on the adoption and sustained usage of a technological programme.

Table 1 (continued)

Model/theory	Discipline	Description of model	Conceptualisation of adherence
		moderated to varying extents by age, gender and voluntariness of use and serve as direct determinants of acceptance and usage behaviour.	
Conceptual Model of User Engagement O'Brien and Toms [35]	Information systems design: Incorporates a range of theories, including Flow Theory [41], Aesthetics [42], Play Theory [43] and Information Interaction Theory [44] into a cohesive model	Proposes four stages of user engagement and the relevant attributes associated with each stage. At the first stage, 'Point of Engagement', variables such as novelty, aesthetics, interest and motivation are considered key, while the 'Engagement' phase is also influenced by these variables plus control, feedback, positive and negative affect, challenge and connectedness. The model also proposes a 'Disengagement' stage which is influenced by user demands, affect, time and usability, and a 're-engagement' stage, which may be short- or long term and may occur more than once during use.	Essentially, a model of engagement rather than adherence. Engagement is defined as 'a category of user experience characterised by attributes of challenge, positive affect, durability, aesthetic and sensory appeal, attention, feedback, variety/novelty, interactivity, and perceived user control'.

reference to a wider psycho-social framework [45]. While there is limited empirical investigation of the efficacy of the overall model in terms of predicting adherence, there is empirical evidence that the various factors described within a website usage component of the model (i.e. user characteristics, environmental factors, website elements and support) are associated with user adherence to web-based health interventions [7, 19, 20, 34].

Persuasive Technology

The emergence of the field of persuasive technology can be traced to the early work of BJ Fogg [46, 47] who proposed that interactive technological systems can serve to influence the behaviour and attitudes of users in their own right. Fogg suggested that persuasive technologies operate in three ways: as tools which facilitate the ease of completing tasks, as media which provide content to users and as social actors which create social relationships with and between users.

A triadic behavioural model [48] was later proposed which detailed three key determinants of human behaviour that have a special relevance to persuasive technology, namely motivation, ability and triggers. The model suggests that a 'trade off' occurs between motivation and ability and that a sufficient level of both in the presence of effective triggers is needed to produce a behaviour. Fogg also detailed key elements associated with these three factors such as time, money, social acceptance, effort and pleasure. While persuasive technology is primarily focused on the role of technology for behaviour change, two frameworks (Persuasive Systems Design and 'PERMA') have emerged from the field which are relevant in explaining adherence to web-based programmes and are therefore reviewed here [49].

PSD Model

Persuasive Systems Design is a conceptual framework and process model outlined by Oinas-Kukkonen and Harijumaa [30] which seeks to clarify the role technology itself may play in changing behaviour and attitudes. The framework is underpinned by seven core 'postulates' in systems design. These are that information technology is always available and should be open, incremental, unobtrusive, useful and easy to use; that the system must foster user commitment and cognitive consistency and that persuasion can occur via direct and indirect routes (i.e. through careful consideration by the user and/or by simple cues).

The framework accounts for both the impact of context on the user and the technological design of the intervention in changing behaviour and maintaining adherence. With regard to context, three key concepts have emerged—'intent', 'event' and 'strategy'. 'Intent' refers to the specified primary objective of a web-based intervention (i.e. the desired behavioural or psychological changes), while 'event' refers to the context and characteristics of the target users and the technological modalities harnessed. Finally, 'strategy' is taken to encompass the route and message of an intervention, including theoretical basis and the source and style of intervention.

Although the framework is conceptual by nature, practical applications are also incorporated. To this end, a comprehensive

taxonomy, including implementation examples, of four key persuasive feature qualities are outlined within the framework, namely Primary Task Support (supporting the user to carry out their primary task), Dialogue Support (the degree of feedback provided to users), System Credibility (how credible a system is in terms of, for example, trustworthiness, expertise and authority) and Social Support (motivating users through social influence). These four qualities relate to 28 design guidelines, which are derived in part from Fogg's [47] functional triad.

As with the Internet Intervention Model, Persuasive Systems Design is primarily a model of behaviour change that offers a practical guidance in terms of explaining adherence to web-based interventions [50]. A systematic review by Kelders et al. [17] found that differences in intervention characteristics and persuasive technology (e.g. increased interaction with a counsellor, the frequency of intended usage, more frequent programme updates and more extensive employment of dialogue support) were predictive of adherence to web-based interventions.

'PERMA' Design Framework

The 'PERMA' framework incorporates the theoretical foundations of Pohlmeyer's [51] 'Well-being Matrix' and Seligman's [52] 'Well-being Theory' and is built on the premise that effective, appealing and compelling design can increase adherence to web-based interventions [31]. The framework comprises five components purported to be relevant to the design of web-based interventions and which impact on user adherence. These components are positive emotion, engagement, relationships, meaning and accomplishment. The development of the framework arose from a need to translate a research focus on identifying user needs and persuasive techniques into effective design guidelines that could enable the deliverer of a web-based intervention to shape the experience of the target users.

In line with the 'PERMA' framework, three strategies which may increase adherence are proposed: 'personalisation', 'ambient information' and 'use of metaphor'. Personalisation suggests that the impact of design on adherence can be imparted through the delivery of tailored messages, effective system design and providing user control (i.e. providing users with a flexible design that can be tailored to match their preferences). 'Ambient Information' refers to an approach that acknowledges that users may be overburdened with information and persuasive messages and that the flow of content should be tailored in order to foster a desire to continue accessing a web-based programme. Finally, 'Use of Metaphor' emphasises the importance of abstract concepts such as accomplishment, challenge and perseverance, and that providing a personally meaningful and engaging programme may increase user motivation to follow an intervention and thus increase their programme adherence.

The predictive utility of the 'PERMA' framework in terms of increasing adherence has yet to be tested empirically. However, the value of the framework would appear to lie in its focus on both users' personal needs and persuasive design, through the integration of practical guidelines for shaping the experience of the target user.

Model of User Engagement

The Model of User Engagement with online behaviour change interventions proposed by Short et al. [32] is the result of an amalgamation of several theoretical perspectives into one unified model. The model draws upon the Elaboration Likelihood Model [33]; Persuasive Systems Design [30]; the Internet Intervention Model [29] and the Conceptual Model of User Engagement [35]. As such it unifies increasing empirical evidence that individual, environmental and design components impact upon adherence to web-based interventions [36]. Short and colleagues assert that comprehensive web-based intervention development must account for engaging the user and should do so holistically (i.e. encompass a wider perspective beyond the individual characteristics of the user). The proposed model is reciprocal in nature and incorporates environmental, individual and intervention components which interact with and influence each other and subsequently impact upon user engagement.

Environmental factors such as time, access and online features (i.e. the tone, feel and function of the programme) influence individual factors such as user expectations, internet self-efficacy, affect and expectations. These in turn impact upon intervention factors such as usability and persuasiveness. Individual characteristics such as personal relevance, demographic variables and current and past health behaviours are also proposed to shape intervention engagement. As such, sustained engagement results when an intervention is perceived by the user as usable, relevant, interactive, motivating and persuasive.

Importantly, the model also suggests that disengagement from an online intervention may occur as a result of negative emotions, failure to match user expectations and a lack of perceived usability or usefulness. Positive emotions may also encourage disengagement. For example, users may become satisfied with what they have achieved and may not feel the need to adhere to the online programme any further.

The strength of this model is that while there has been much focus on theorising mechanisms of behaviour change in the context of web-based interventions, this model is perhaps the first to specifically conceptualise sustained user engagement with such programmes. As such, it addresses a key research gap. Although the model is yet to be operationally tested, Short and colleagues assert that it is congruent with existing behaviour change theories, drawing upon an

established body of literature in fields such as social psychology and information technology.

Supportive Accountability Model

The Supportive Accountability Model is a conceptual framework of the role of human support in enhancing adherence to eHealth interventions [37]. Considerable evidence points to the value of support in fostering adherence and the effectiveness of web-based interventions [53–55] though much of this research is not guided by a clear theoretical model. The model, drawing from the fields of motivational theory, computer-mediated communication and organisational psychology, proposes that adherence to eHealth interventions is influenced by seven key human support factors; namely 'accountability'; 'social presence';' expectations'; 'performance monitoring'; 'goal setting' and 'legitimacy'. The impact of these factors is in turn moderated by user motivation and computer-mediated communication.

Supportive Accountability proposes that adherence to web-based interventions will be higher if user feels accountable to a coach with requisite expertise and who is perceived to be trustworthy and caring. Clearly defined goals and benefits, reciprocity and a strong therapeutic bond are also essential factors for promoting adherence. Preliminary empirical evidence supports the utility of the model, with significantly greater adherence reported for participants who received a web-based intervention for depressive symptoms with support provided compared to participants who received a self-directed programme [56]. Similar support for the model has also been reported in other studies with cancer survivors [57], patient with multiple sclerosis [58], in trials for weight management [39] and in interventions for depression [59] and stress management [60].

Information Systems Design

Three models, namely the Technology Acceptance Model [38], the Unified Theory of Acceptance and Use of IT [40] and the Conceptual Model of User Engagement with Technology [35] were identified from the fields of information systems design, business and computing. Meaningful implications for understanding adherence to web-based interventions may be garnered from this body of research and their potential relevance in terms of presenting a theoretical foundation of adherence to web-based interventions is considered here.

Technology Acceptance Model [TAM]

The Technology Acceptance Model [38] purports that the intended adoption and continued use of a technological platform is predicated on the attitude of the user towards the programme. TAM is adapted from the Theory of Reasoned Action [61]. The model identifies two key determinants of attitude; namely perceived usefulness, which independently determines behavioural intention; and perceived ease of use, which itself impacts upon perceived usefulness. Several modifications of the model have been outlined, most notably perhaps TAM-2 [62] which removed the attitude construct and incorporated subjective norms [i.e. perceived social pressures on an individual to engage in a behaviour], which is proposed to directly influence perceived usefulness and behavioural intention.

A meta-analysis of 88 studies by King and He [63] identified TAM as a 'complete mediating model', in that the impact of perceived ease of use was primarily through perceived usefulness, which itself was found to have a profound influence on behavioural intention. Reviews by Yarbrough and Smith [64] and Holden and Karsh [65] on clinician use of health IT also support the utility of the model. These reviews indicate that IT systems need to be perceived to be both easy to use and capable of facilitating the achievement of desired outcome in order for users to accept and consistently engage with them. Other meta-analytic reviews [66, 67] also support the predictive power of the mode. However, they do suggest that while the core strength of the model may lie in its parsimony and easily understood nature, this may also be a significant limitation. For example, more effort is needed to identify additional moderating variables, such as perceived control and self-efficacy. These may have an external impact on perceived usefulness and ease of use [41] and to understand how the model may operate in different contexts and settings. In addition, the utility of model in predicting adherence to or sustained usage of web-based behavioural interventions is yet to be evaluated.

Unified Theory of Acceptance and Use of IT

The Unified Theory of IT Acceptance (UTAUT) aims to explain individual intention to use a technological platform and their subsequent usage behaviour [40]. This theory emerged from the well-established field of information systems research, amalgamating several competing theoretical models within this field into one unified perspective. The model integrates eight social cognitive theories into four key constructs - 'performance expectancy'; 'effort expectancy'; 'social influence' and 'facilitating conditions'. These constructs are moderated to varying extents by age, gender and voluntariness of use and serve as direct determinants of acceptance and usage behaviour.

Empirical applications of UTAUT with regard to mobile communications, banking and education fields are numerous [42]. Two meta-analytic reviews have provided somewhat conflicting evidence for the strength and robustness of the

model. Taiwo and Downe [43] reviewed 37 studies which used UTAUT and found that while the relationship between performance expectancy and behavioural intention was strong, the relationships between behavioural intention and the constructs 'effort expectancy', 'social influence' and 'facilitating conditions' were much weaker. A later review by Khecine et al. [44] included 74 empirical studies, and found that the strength of four central constructs of UTAUT in predicting behavioural intention to use a technological platform ranged from medium to large in size, while the relationship between intention and usage was itself medium was in size. These reviews supported the premise that users are more likely to use a technological platform if they perceive that it will improve their productivity, efficiency and effectiveness on a regular basis.

UTAUT has been updated and extended several times with additional constructs added. Murugesh-Warren et al. [68] for example, applied the extended UTAUT-2 to a focus on healthcare, incorporating 17 additional mechanisms such as 'outcome expectance', 'support 'and 'usage enjoyment'. However, these numerous extensions have resulted in the model becoming quite convoluted and lacking parsimony. In addition, the model has yet to be applied to web-based behavioural or psychological intervention. Therefore, the robustness of the model in this domain is untested.

Conceptual Model of User Engagement with Technology

The Conceptual Model of User Engagement with Technology [35] synthesises various theoretical perspectives and empirical research within the information systems field into a single conceptual model of user engagement. Incorporated into the formulation of this model are key features from Flow Theory [69], Aesthetics [70], Play Theory [71] and Information Interaction Theory [72] combined with findings from research into consumer behaviour, web searching and educational software. The model utilises a holistic framework, taking into account not only individual user cognitions but also programme design and content.

The model proposes four stages of user engagement and the relevant attributes associated with each stage. At the first stage, 'Point of Engagement', variables such as novelty, aesthetics, interest and motivation are considered key to engagement, while the 'Engagement' phase is also influenced by these variables plus control, feedback, positive and negative affect, challenge and connectedness. The model also proposes a 'Disengagement' stage which is influenced by user demands, affect, time and usability, and a 'Re-engagement' stage, which may be short- or long term and may occur more than once during the use of the technology platform.

The conceptual model derives from a considerable volume of research on user engagement with technology, a field from which numerous behavioural models have emerged (see [73] for a review). A qualitative evaluation of middle-aged males' user engagement with a web-based health intervention [74] found that personal attributes (i.e. motives and goals) and intervention materials (usability and control) were associated with user engagement. Positive and negative experiences were guided by initial expectations, indicating the importance of managing user outcome expectations in order to improve engagement and retention to web-based interventions. Components of the model have also been applied to understanding engagement with online information retrieval [75], digital media [76] and video game environments [77].

The stages of engagement process proposed within the model differentiate it from other frameworks reviewed here, and although this is yet to be empirically tested within the domain of health-related behaviour change, it may have practical implications for those delivering web-based interventions.

Discussion

Adherence is a complex and multi-faceted concept. In this regard, two important findings have emerged from this review. Firstly, a cohesive and robust theoretical framework of adherence should address a multitude of integrating factors, including environmental, technological and support variables, as well as individual user demographics and psychological characteristics. In order to achieve this, an interdisciplinary approach incorporating empirical findings and best practices from different fields of research such as information systems design, business, psychology and eHealth is needed [78].

Secondly, it is notable that there is a lack of agreement in the literature with regard to conceptualisation of adherence and related models and theories such as engagement and 'non-usage' attrition [2, 79]. Though behavioural conceptualisations of engagement [13] are closely related to adherence, it is important to note that they should not be considered identical. Guetler et al. [80] for example distinguished between engagement (described as the frequency and duration of involvement with an intervention) and non-usage attrition (defined as the point at which users had stopped using the intervention altogether).

Donkin and Glozier [81], however, referred to engagement as the level of persistence with an intervention, in terms of the extent to which individuals completed the intervention or required modules. Furthermore, Donkin et al. [82] question the validity of relying on exposure or usage of an intervention as a type of proxy measure for engagement and note that it is not strictly correct to assume that greater adherence equates to a more engaged user. As such, while this review identifies the key theoretical perspectives relevant to explaining adherence to web-based interventions, there is an equal need to develop

agreed conceptualisation and frameworks of engagement and clarify the boundary between the two concepts [83, 84]. Caution should therefore be exercised when considering the relevance of specific models of engagement, such as the Conceptual Model of User Engagement, in explaining adherence to web-based interventions.

This lack of consensus is perhaps unsurprising considering that the various research strands draw upon multiple disciplines, ranging from social and health psychology, information technology, business and marketing. Indeed, within the field of health-related behaviour change alone, numerous overarching terms are in use, including eHealth [37], mHealth, digital health behaviour change interventions [84], behavioural information technology [48] and health behaviour change support systems [85]. The diversity of terminology and underpinning theory makes it difficult to unify the current body of research.

The strength of this review is that models from wider fields such as information technology are considered as they have specifically focused on both adoption and continued use of digital platforms. In this context, therefore, this review may now facilitate a greater co-ordination of future research that goes beyond the traditional theory boundaries as this relates to adherence to treatment protocols and interventions and encourage a more comprehensive and wider examination with regards to theory development and its applied value.

It is significant that the Supportive Accountability Model [37] was the only model identified through this review which specifically sought to explain sustained adherence to web-based interventions. The Internet Intervention Model and the persuasive technology frameworks are primarily models of behaviour change which incorporate components relevant to explaining usage of web-based interventions. The Model of User Engagement [32] is perhaps the most comprehensive model identified, as it draws upon a range of models, including the Elaboration Likelihood Model [33], Persuasive Systems Design [30], the Internet Intervention Model [29] and the Conceptual Model of User Engagement [35]. As such, it spans several disciplines including social psychology, information technology and persuasive technology. However, it is conceptually focused on engagement [described by Short and colleagues as the quality of a user's interaction with web-based programme] and not specifically adherence or 'non-usage attrition' in line with the conceptualisations articulated by Eysenbach [6].

Several models reviewed here are largely untested and as such, their validity as cohesive frameworks is unknown. While it is beyond the scope of this review to systematically examine the empirical evidence underpinning each of these theories/models, it is evident that the field is in a state of development [5] and that some models (e.g. Technology Acceptance Model, UTAUT and Persuasive Systems Design) have been more rigorously tested than others (e.g. the Model of User Engagement). This is especially significant considering that an increasing body of evidence associates greater adherence with improved intervention outcomes. There is now a need to test these frameworks, identify what factors need to be considered and how to target them, and understand in what context they are most useful in relation to adherence.

A further issue to be addressed is that adherence data from web-based interventions are not always readily reported or even collected. Comprehensive analysis tends not to be conducted and studies which report adherence data as well as outcomes (e.g. [86, 87]) remain the exception rather than the norm. Often, it is only differences in demographic or psychosocial characteristics between adherers and non-adherers that are reported [6]. The reasons for this are unclear. It may be because adherence is assumed to be embedded within the programme itself or that user confidence or motivation with regard to using a web-based programme is taken for granted. However, it may be because there is a lack of agreement in terms of the definition and measurement of key concepts such as engagement, adherence and attrition [21].

An effective theory or model of adherence should operate in conjunction with an empirically supported model of behaviour change and technology design [45]. The purported benefits of web-based interventions versus other formats in terms of reduced costs, wider reach, ease of access [in terms of time and location] and the prevention of stigma may be undermined if only a minority of the target population engage meaningfully with the programme and adhere to it as required. As such, the development of useful and comprehensive models of user adherence is essential to ensure that the added value of web-based interventions are maximised.

Conclusion

Much research has sought to explore the concept of user adherence to web-based interventions. This scoping review identified and described eight theoretical perspectives relevant to understanding adherence to web-based interventions, namely the Internet Intervention Model, Persuasive Systems Design, the 'PERMA' framework, the Support Accountability Model, the Model of User Engagement, the Technology Acceptance Model, the Unified Theory of Acceptance and Use of IT and the Conceptual Model of User Engagement. An interdisciplinary approach, incorporating a range of technological, environmental and individual factors may be needed in order to comprehensively model user adherence to web-based interventions. Further evaluation is also required in order to determine the extent to which the core proposals of these theoretical perspectives are supported by empirical evidence.

Compliance with Ethical Standards

Funding This review was funded through the Waterford Institute of Technology PhD Scholarship Programme.

Conflict of Interest The authors declare that they have no conflict of interest.

References

1. Bewick BM, Trusler K, Barkham M, Hill AJ, Cahill J, Mulhern B. The effectiveness of web-based interventions designed to decrease alcohol consumption—a systematic review. Prev Med. 2008;47(1): 17–26.
2. Neve M, Morgan PJ, Jones P, Collins C. Effectiveness of web-based interventions in achieving weight loss and weight loss maintenance in overweight and obese adults: a systematic review with meta-analysis. Obes Rev. 2010;11(4):306–21.
3. Copeland J, Martin G. Web-based interventions for substance use disorders: a qualitative review. J Subst Abus Treat. 2004;26(2): 109–16.
4. Powell J, Hamborg T, Stallard N, Burls A, McSorley J, Bennett K, et al. Effectiveness of a web-based cognitive-behavioral tool to improve mental well-being in the general population: randomized controlled trial. J Med Internet Res. 2013;15(1):e2.
5. Murray E, White IR, Varagunam M, Godfrey C, Khadjesari Z, McCambridge J. Attrition revisited: adherence and retention in a web-based alcohol trial. J Med Internet Res. 2013;15(8):83–93.
6. Eysenbach G. The law of attrition. J Med Internet Res. 2005;7(1):e11.
7. Kelders SM, Kok RN, Ossebaard HC, Van Gemert-Pijnen JE. Persuasive system design does matter: a systematic review of adherence to web-based interventions. J Med Internet Res. 2012;14(6):e152.
8. Wangberg SC, Bergmo TS, Johnsen J. Adherence in internet-based interventions. Patient Prefer Adherence. 2008;2:57–65.
9. Vandelanotte C, Müller AM, Short CE, Hingle M, Nathan N, Williams SL, et al. Past, present, and future of eHealth and mHealth research to improve physical activity and dietary behaviors. J Nutr Educ Behav. 2016;48(3):219–28. e1.
10. Prestwich A, Sniehotta FF, Whittington C, Dombrowski SU, Rogers L, Michie S. Does theory influence the effectiveness of health behavior interventions? Meta-analysis. Am Psychol Assoc; 2014.
11. Wantland DJ, Portillo CJ, Holzemer WL, Slaughter R, McGhee EM. The effectiveness of Web-based vs. non-Web-based interventions: a meta-analysis of behavioral change outcomes. J Med Internet Res. 2004;6(4):e40.
12. Michie S, Johnston M, Francis J, Hardeman W, Eccles M. From theory to intervention: mapping theoretically derived behavioural determinants to behaviour change techniques. Appl Psychol. 2008;57(4):660–80.
13. Perski O, Blandford A, West R, Michie S. Conceptualising engagement with digital behaviour change interventions: a systematic review using principles from critical interpretive synthesis. Transl Behav Med. 2016:1–14.
14. Postel MG, de Haan HA, ter Huurne ED, van der Palen J, Becker ES, de Jong CAJ. Attrition in web-based treatment for problem drinkers. J Med Internet Res. 2011;13(4):e117-e.
15. Neil A, Batterham P, Christensen H, Bennett K, Griffiths K. Predictors of adherence by adolescents to a cognitive behavior therapy website in school and community-based settings. J Med Internet Res. 2009;11(1):e6.
16. Rothert K, Strecher VJ, Doyle LA, Caplan WM, Joyce JS, Jimison HB, et al. Web-based weight management programs in an integrated health care setting: a randomized, controlled trial. Obesity. 2006;14(2):266–72.
17. Kelders SM, Van Gemert-Pijnen JE, Werkman A, Nijland N, Seydel ER. Effectiveness of a Web-based intervention aimed at healthy dietary and physical activity behavior: a randomized controlled trial about users and usage. J Med Internet Res. 2011;13(2):e32.
18. Balmford J, Borland R, Benda P. Patterns of use of an automated interactive personalized coaching program for smoking cessation. J Med Internet Res. 2008;10(5):e54.
19. Schubart JR, Stuckey HL, Ganeshamoorthy A, Sciamanna CN. Chronic health conditions and internet behavioral interventions: a review of factors to enhance user engagement. CIN: Comput Inform Nurs. 2011;29(2):81–92.
20. Brouwer W, Kroeze W, Crutzen R, de Nooijer J, de Vries NK, Brug J, et al. Which intervention characteristics are related to more exposure to internet-delivered healthy lifestyle promotion interventions? A systematic review. J Med Internet Res. 2011;13(1):e2.
21. Beatty L, Binnion C. A systematic review of predictors of, and reasons for, adherence to online psychological interventions. Int J Behav Med. 2016;23(6):776–94.
22. Rogers Everett M. Diffusion of innovations. New York. 1995;12.
23. Christensen H, Griffiths KM, Farrer L. Adherence in internet interventions for anxiety and depression: systematic review. J Med Internet Res. 2009;11(2):e13.
24. Christensen H, Mackinnon A. The law of attrition revisited. J Med Internet Res. 2006;8(3):e20.
25. Cavanagh K. Turn on, tune in and [don't] drop out: engagement, adherence, attrition, and alliance with internet-based interventions. In: Bennett-Levy J, Richards DA, Farrand P, Christensen H, Griffiths KM, Kavanaugh DJ, et al., editors. Oxford guide to low intensity CBT interventions. Oxford guides in cognitive behavioural therapy. New York: Oxford University Press; 2010. p. 227–33.
26. Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. Implement Sci. 2010;5(1):69.
27. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8(1):19–32.
28. Maxwell JA. Qualitative research design: an interactive approach. Thousand Oaks: Sage publications; 2012.
29. Ritterband LM, Thorndike FP, Cox DJ, Kovatchev BP, Gonder-Frederick LA. A behavior change model for internet interventions. Ann Behav Med. 2009;38(1):18–27.
30. Oinas-Kukkonen H, Harjumaa M. Persuasive systems design: key issues, process model, and system features. Commun Assoc Inf Syst. 2009;24(1):28.
31. Ludden GDS, van Rompay TJL, Kelders SM, van Gemert-Pijnen JEWC. How to increase reach and adherence of web-based interventions: a design research viewpoint. J Med Internet Res. 2015;17(7):e172-e.
32. Short CE, Rebar AL, Plotnikoff RC, Vandelanotte C. Designing engaging online behaviour change interventions: a proposed model of user engagement. Eur Health Psychol. 2015;17(1):32–8.
33. Petty RE, Cacioppo JT. The elaboration likelihood model of persuasion. Communication and persuasion: Springer; 1986. p. 1–24.
34. Beatty L, Binnion C. A systematic review of predictors of, and reasons for, adherence to online psychological interventions. Int J behav Med. 2016;23(6):776–94.
35. O'Brien HL, Toms EG. What is user engagement? A conceptual framework for defining user engagement with technology. J Am Soc Inf Sci Technol. 2008;59(6):938–55.
36. Crutzen R, Cyr D, de Vries NK. Bringing loyalty to E-health: theory validation using three internet-delivered interventions. J Med Internet Res. 2011;13(3):107–17.

37. Mohr D, Cuijpers P, Lehman K. Supportive accountability: a model for providing human support to enhance adherence to eHealth interventions. J Med Internet Res. 2011;13(1):e30.
38. Davis FD Jr. A technology acceptance model for empirically testing new end-user information systems: theory and results. Cambridge: Massachusetts Institute of Technology; 1986.
39. Dennison L, Morrison L, Lloyd S, Phillips D, Stuart B, Williams S, et al. Does brief telephone support improve engagement with a web-based weight management intervention? Randomized controlled trial. J Med Internet Res. 2014;16(3):e95.
40. Venkatesh V, Morris MG, Davis GB, Davis FD. User acceptance of information technology: toward a unified view. MIS Q. 2003:425–78.
41. Sun H, Zhang P. Causal relationships between perceived enjoyment and perceived ease of use: an alternative approach. J Assoc Inf Syst. 2006;7(9):24.
42. Attuquayefio S, Addo H. Review of studies with UTAUT as conceptual framework. Eur Sci J, ESJ. 2014;10(8).
43. Taiwo AA, DOWNE AG. The theory of user acceptance and use of technology (UTAUT): a meta-analytic review of empirical findings. J Theor Appl Inf Technol. 2013;49(1).
44. Khechine H, Lakhal S, Ndjambou P. A meta-analysis of the UTAUT model: eleven years later. Can J Adm Sci/Rev Can Sci Adm. 2016;33(2):138–52.
45. Farrer LM, Griffiths KM, Christensen H, Mackinnon AJ, Batterham PJ. Predictors of adherence and outcome in internet-based cognitive behavior therapy delivered in a telephone counseling setting. Cogn Ther Res. 2014;38(3):358–67.
46. Fogg BJ. Persuasive technologies. Commun ACM. 1999;42(5):27–9.
47. Fogg BJ. Persuasive technology: using computers to change what we think and do. Ubiquity. 2002;2002:5.
48. Fogg BJ, editor A behavior model for persuasive design. Proceedings of the 4th international Conference on Persuasive Technology; 2009: ACM.
49. Wildeboer G, Kelders SM, van Gemert-Pijnen JEWC. The relationship between persuasive technology principles, adherence and effect of web-based interventions for mental health: a meta-analysis. Int J Med Inform. 2016;96:71–85.
50. Wildeboer L. Does the number of persuasive technology principles used in web-based interventions concerning mental health affect the effectiveness: a meta-analysis: University of Twente; 2015.
51. Pohlmeyer A. Design for happiness. Interfaces. 2012;92(8–11).
52. Seligman ME. Flourish: a visionary new understanding of happiness and well-being. Policy. 2011;27(3):60–1.
53. Titov N, Dear BF, Johnston L, Lorian C, Zou J, Wootton B, et al. Improving adherence and clinical outcomes in self- guided internet treatment for anxiety and depression: randomised controlled trial. PLoS ONE. 2013;8(7).
54. Furmark T, Carlbring P, Hedman E, Sonnenstein A, Clevberger P, Bohman B, et al. Guided and unguided self-help for social anxiety disorder: randomised controlled trial. Br J Psychiatry. 2009;195(5):440–7.
55. Alfonsson S, Olsson E, Linderman S, Winnerhed S, Hursti T. Is online treatment adherence affected by presentation and therapist support? A randomized controlled trial. Comput Hum Behav. 2016;60:550–8.
56. Mohr DC, Duffecy J, Ho J, Kwasny M, Cai X, Burns MN, et al. A randomized controlled trial evaluating a manualized telecoaching protocol for improving adherence to a web-based intervention for the treatment of depression. PLoS One. 2013;8(8):1–9.
57. Duffecy J, Sanford S, Wagner L, Begale M, Nawacki E, Mohr DC. Project onward: an innovative e-health intervention for cancer survivors. Psycho-Oncology. 2013;22(4):947–51.
58. Pilutti L, Dlugonski D, Sandroff B, Klaren R, Motl R. Randomized controlled trial of a behavioral intervention targeting symptoms and physical activity in multiple sclerosis. Mult Scler J. 2014;20(5):594–601.
59. Schueller SM, Mohr DC, editors. Initial field trial of a coach-supported web-based depression treatment. Proceedings of the 9th International Conference on Pervasive Computing Technologies for Healthcare; 2015: ICST [Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering].
60. Zarski A-C, Lehr D, Berking M, Riper H, Cuijpers P, Ebert DD. Adherence to internet-based mobile-supported stress management: a pooled analysis of individual participant data from three randomized controlled trials. J Med Internet Res. 2016;18(6).
61. Fishbein M, Ajzen I. Belief, attitude, intention, and behavior: an introduction to theory and research. Reading: Addison-Wesley; 1975.
62. Venkatesh V, Davis FD. A theoretical extension of the technology acceptance model: four longitudinal field studies. Manag Sci. 2000;46(2):186–204.
63. King WR, He J. A meta-analysis of the technology acceptance model. Inf Manag. 2006;43(6):740–55.
64. Yarbrough AK, Smith TB. Technology acceptance among physicians: a new take on TAM. Med Care Res Rev. 2007;64(6):650–72.
65. Holden RJ, Karsh B-T. The technology acceptance model: its past and its future in health care. J Biomed Inform. 2010;43(1):159–72.
66. Ma Q, Liu L. The technology acceptance model: a meta-analysis of empirical findings. J Organ End User Comput [JOEUC]. 2004;16(1):59–72.
67. Yousafzai SY, Foxall GR, Pallister JG. Technology acceptance: a meta-analysis of the TAM: part 1. J Model Manag. 2007;2(3):251–80.
68. Murugesh-Warren A, Dubb S, Sudbury D, Nnajiuba U, Abdel-Gadir S, Caris J. An extension of the UTAUT 2 with a focus of age in healthcare: what do different ages want? Int J Integrat Care [IJIC]. 2015;15:1–3.
69. Csikszentmihalyi M. Flow and the psychology of discovery and invention. Harper Collins: New York; 1996.
70. Beardsley MC. Some persistent issues in aesthetics. The aesthetic point of view: selected essays 1982:285–7.
71. Stephenson W. The play theory of mass communication. New Brunswick: Transaction Publishers; 1964.
72. Toms EG. Information interaction: providing a framework for information architecture. J Assoc Inf Sci Technol. 2002;53(10):855–62.
73. O'Brien H. Theoretical perspectives on user engagement. In: O'Brien H, Cairns P, editors. Why engagement matters: cross-disciplinary perspectives and innovations on user engagement with digital media. New York: Springer Publishing Company, Incorporated; 2016. p. 1–26.
74. Short CE, Vandelanotte C, Dixon MW, Rosenkranz R, Caperchione C, Hooker C, et al. Examining participant engagement in an information technology-based physical activity and nutrition intervention for men: the manup randomized controlled trial. JMIR Res protoc. 2014;3(1):e2.
75. O'Brien HL, Toms EG. Examining the generalizability of the User Engagement Scale (UES) in exploratory search. Inf Process Manag. 2013;49(5):1092–107.
76. O'Brien H, Cairns P. Why engagement matters: cross-disciplinary perspectives and innovations on user engagement with digital media. New York: Springer Publishing Company, Incorporated; 2016.
77. Wiebe EN, Lamb A, Hardy M, Sharek D. Measuring engagement in video game-based environments: investigation of the user engagement scale. Comput Hum Behav. 2014;32:123–32.
78. van Gemert-Pijnen JE, Nijland N, van Limburg M, Ossebaard HC, Kelders SM, Eysenbach G, et al. A holistic framework to improve the uptake and impact of eHealth technologies. J Med Internet Res. 2011;13(4):e111.

79. Stegemann SK, Weg R, Ebenfeld L, Thiart H, Berking M, Funk B. Towards measuring user engagement in internet interventions for common mental disorders. In: Proceedings of the HCI 2012, the 26th BCS Conference on Human Computer Interaction, Birmingham, 12–14 September 2012. p. 1–4. Available from http://ewic.bcs.org/. Accessed 12 Dec 2016.
80. Guertler D, Vandelanotte C, Kirwan M, Duncan MJ. Engagement and nonusage attrition with a free physical activity promotion program: the case of 10,000 steps Australia. J Med Internet Res. 2015;17(7):e176-e.
81. Donkin L, Glozier N. Motivators and motivations to persist with online psychological interventions: a qualitative study of treatment completers. J Med Internet Res. 2012;14(3):284–95.
82. Donkin L, Hickie IB, Christensen H, Naismith SL, Neal B, Cockayne NL, et al. Rethinking the dose-response relationship between usage and outcome in an online intervention for depression: randomized controlled trial. J Med Internet Res. 2013;15(10):e231.
83. Alfonsson, S. Treatment adherence in internet-based CBT. The effects of presentation, support and motivation. PhD [dissertation]. Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine. Uppsala: Acta Universitatis Upsaliensis; 2016. Available from: Uppsala universitetsbibliotek.
84. Yardley L, Spring BJ, Riper H, Morrison LG, Crane DH, Curtis K, et al. Understanding and promoting effective engagement with digital behavior change interventions. Am J Prev Med. 2016;51(5):833–42.
85. Kelders SM, Oinas-Kukkonen H, Oörni A, van Gemert-Pijnen JE. Health behavior change support systems as a research discipline; a viewpoint. Int J Med Inform. 2016;96:3–10.
86. Sundström C, Gajecki M, Johansson M, Blankers M, Sinadinovic K, Stenhund-Gens E, et al. Guided and unguided internet-based treatment for problematic alcohol use—a randomized controlled pilot trial. PLoS One. 2016;11(7):e0157817.
87. Johansson M, Sinadinovic K, Hammarberg A, Sundström C, Hermansson U, Andreasson S, et al. Web-based self-help for problematic alcohol use: a large naturalistic study. Int J Behav Med. 2016:1–11.

Work-related stress and well-being of direct care workers in intellectual disability services: a scoping review of the literature

Cathal Ryan[1], Michael Bergin[2] and John S.G. Wells[3]

[1]Department of Nursing and Health Care, School of Health Sciences, Waterford Institute of Technology, Ireland; [2]Head of Department of Applied Arts, School of Humanities, Waterford Institute of Technology, Ireland; [3]Head of School of Health Sciences, Waterford Institute of Technology, Ireland

Background: Understanding the nature of work-related stress and burnout among intellectual disability care staff is important to protect the well-being of these workers and encourage their retention in the sector. Though reviews of specific aspects of this literature have been conducted no article has sought to fully chart the range and nature of this research.
Objective: This article addresses this gap by synthesizing the findings of such research with consideration to the future implications for protecting the well-being of care workers.
Methods: A scoping review of the published literature was undertaken using a framework described in a previous article.
Results: The findings of this review are presented thematically across six primary categories: challenging behavior; reciprocity; coping and stress; role issues; individual differences; and settings. A seventh theme, namely the positive aspects of intellectual disability care work was also identified through this process and is discussed.
Conclusion: Occupational stress and strain is an internationally experienced issue in this sector. Challenging behavior and inequality in the relationships between staff and their clients, their colleagues, and their organization appear to exert a significant impact on the stress and well-being of workers in this sector. Excessive workplace demands, a low level of control, and a lack of support have been shown to be related to higher levels of stress and burnout among intellectual disability care workers.

Keywords: Burnout, well-being, stress, learning disability, intellectual disability, intellectual development disorder

Background

Professional staff who provide direct care and support to persons with an intellectual disability (ID) comprise a valuable component of the social economy (Wells *et al.* 2011). Commonly identified challenges of working in intellectual disability care sector include low income (Chung and Corbett 1998, Conradie *et al.* 2017, Hatton and Emerson 1993); a lack of training (Hussein 2017), the perceived low status of workers (Vassos and Nankervis, 2012) and long contracted hours (Hatton *et al.* 1999; Judd *et al.* 2017). Care staff have also highlighted problems relating to a lack of decision-making; endangerment of physical health and safety issues; and pressure and uncertainty of employment (Corrigan 1993, Rose and Cleary 2007). These are in addition to issues such as the challenging behavior of the service users; unrealistic expectations from family members of service users; and a lack of teamwork and communication between staff members and superiors (Mascha 2007, Ineland *et al.* 2018).

A number of reviews of specific aspects of this literature have been conducted. For example, Hastings (2002) reviewed the literature as it related to the relationship between staff stress and exposure to challenging behavior; identifying that negative staff emotional reactions may mediate this relationship. White *et al.* (2006) considered recent trends in the literature, while Skirrow and Hatton (2007) reviewed the literature as it related to levels and correlates of burnout of among care workers of adults with intellectual disability. Disley *et al.* (2009) discussed six studies which found that perceived inequality in working relationships was associated with increased burnout; absenteeism: and intention to leave in intellectual disability care workers. Devereux *et al.* (2009) reviewed the application of

Correspondence to: Cathal Ryan, Department of Nursing and Health Care, School of Health Sciences, Waterford Institute of Technology, Ireland. Email: cryan@wit.ie

DOI 10.1080/20473869.2019.1582907

theories of work-related stress within intellectual disability research, while Thompson and Rose (2011) reviewed the impact of organizational climate upon burnout among those who work with persons with intellectual disability. Finally, Rose (2011) reviewed the literature with regard to staff psychological factors and their relationship to client outcomes in residential care. To date, however no article has sought to fully synthesize this research and chart the state of the art of the literature as it stands. Thus, the focus of this article was to determine what is currently known about the work-related stress, burnout, and well-being of direct care workers in intellectual disability services.

Methods

A scoping review framework was employed as the methodological tool for this study. The aims of this review fell broadly in line with that described by Daudt *et al.*(2013); i.e. to 'map the literature on a particular topic or research area and provide an opportunity to identify key concepts, gaps in the research; and types and sources of evidence to inform practice, policy-making, and research' (pg. 44). The review process was based upon the following five steps espoused by Arksey and O'Malley (2005):

Stage 1: identifying the research question.

Scoping reviews typically seek to answer a broad question through a specified scope of inquiry (Arksey and O'Malley 2005). The processes of identifying the research question for this review was quite iterative and was developed throughout the review process as the authors becomes increasingly familiar with the literature. The research question that was addressed by this review was: what is currently known about the work-related stress, burnout, and well-being of direct care workers in intellectual disability services? As such, the aim of this review was chart the range and nature of this research and synthesize thematically the findings with consideration to the implications for protecting the well-being of care workers. With regard to stress and well-being, we took a broad approach and focused on studies which explored or investigated both potential causes and manifestations of stress, including but not limited to relationship issues; ill-health and/or injury; negative staff perception of their environment; reported challenges; and coping strategies and symptoms of emotional strain, (e.g. angry outbursts, defensiveness, lack of sleep, decreased exercise, and social isolation). However, we also acknowledged that work and stress can produce beneficial outcomes (e.g. achieving results, learning new skills, and fostering a sense of purpose) and so incorporated these within the scope of our review. With regard to burnout, we focused on the definition proposed by Maslach *et al.* (1986) as a psychological syndrome which emerges as a result of exposure to chronic stress and characterized it by the three domains emotional exhaustion, depersonalization, and a lack of personal accomplishment.

Stage 2: identifying relevant studies.

Scoping reviews, in contrast to more stringent or narrow systematic reviews, tend to focus on identifying all relevant literature in a particular area and so include a range of study designs. In to that end, a systematic literature search was conducted by searching the following electronic databases from 1 January 1990 to 1 February 2018:

- Academic Search Complete
- CINAHL
- PsycINFO
- Medline
- Web of Science

The start date of 1990 was chosen to ensure that the scope of the review was relatively recent. Variations of the following search terms were combined to identify papers for review: 'Burnout;' 'Well-being;' 'Stress;' 'Learning disability;' 'Intellectual disability;' 'Intellectual development disorder;' 'Mental retardation;' 'Care staff;' 'Carer;' and 'Support worker'. Studies which included staff working in secure and community services for people with intellectual disabilities were included. Similarly, studies which examined more than one client group (e.g. intellectual disability and brain injury) were included only if the majority of participants were working with persons with intellectual disabilities. The following inclusion and exclusion criteria were applied:

Inclusion criteria

- Participants working in services for people with intellectual disabilities, including residential, hospital, secure institutional, community, and day care services;
- The majority of participants were working with persons with intellectual disabilities;
- Participants recruited from working populations, over 18 years of age; and
- Papers published in English.

Exclusion criteria

- Review papers, meta-analyses, or meta-synthesis,
- Papers not published in English, and
- Participants not recruited from working populations or not working with persons with intellectual disabilities.

Stage 3: study selection.

The initial search output returned 11,388 articles. Following title and abstract screening 9611 articles were removed due to not meeting inclusion criteria or duplication. The full texts of the remaining articles were retrieved and screened, from which 1177 papers were excluded after further assessment. This left a total

of 53 articles that were included in the final review. One review author (CR) independently selected the studies to include in the review according to the inclusion and exclusion criteria. A search of the reference lists for additional references in all identified primary studies was also conducted. The reference lists of key reviews were also searched. A total of 23 additional articles that met inclusion criteria were identified through this process and are included in this review. The final review therefore included a total of 84 papers, describing 85 studies.

Stage 4: charting the data.

As with the process of identifying the research question, this part of the review was quite iterative as a descriptive analytical approach was taken to charting the literature. This involved firstly conducting a practical overview of the research, in which information relation to the study authors; participants; country; design; research aim; and findings were extracted and is charted in Table 1. This was then followed by a type of thematic review of the literature, which is detailed in the results section of this paper.

Stage 5: Collating, summarizing, and reporting the results.

The aim of the final stage of this review was to provide an overview of all available evidence as it related to the work-related stress and well-being of direct care workers in intellectual disability services. These findings are presented thematically across six primary categories: challenging behavior; reciprocity; coping and stress; role issues; individual differences; and settings. These themes were generated during the process of charting and analyzing the data and are presented in the following section. A seventh theme, namely the positive aspects of providing care and support to persons with an intellectual disability, was also identified through this process and is detailed at the end of this section of the article.

Results

A total of 78 articles, describing 79 studies, were included in the final review. The majority of the studies utilized cross-sectional correlational designs, though two longitudinal studies were also identified and included. Two studies used mixed methods research while one comprised a purely qualitative study. Most of the participants were recruited from either residential (43%) or community care settings (39%). A small number were recruited from a mix of hospital and community settings (10%), or residential and community settings (9%). One hospital-based study, one study based at summer camp, and one study situated in a social welfare center were also included.

In terms of describing participants, a range of job titles (including, for e.g. disability support workers; direct care workers/staff; intellectual disability workers; hospital staff; staff in developmental/learning disability services, and residential care staff) were used by the study authors. In addition seven studies recruited registered intellectual disability nurses exclusively. For the sake of clarity and consistency, we utilized the terms 'staff' and 'direct care workers' to refer to such participants in the remaining of this article.

Challenging behavior

Much research has investigated the relationship between exposure to challenging behavior and staff well-being within the intellectual disability sector. Two distinct strands have emerged to date. On the one hand, several studies have reported a direct relationship between exposure to challenging behavior, including violence and aggression, and increased levels of staff stress and burnout in intellectual disability services (e.g. Chung and Harding 2009, Freeman 1994, Judd *et al.*2017, Vassos and Nankervis 2012). Exposure to challenging behavior from clients is related to increased staff anxiety (Jenkins *et al.* 1997), work stress (Gingi 2012, Hatton *et al.* 1995), and burnout; including emotional exhaustion (Lundström *et al.* 2007; Ko *et al.* 2012, Smyth *et al.*2015) and negative physical and emotional responses among staff (Kile 2014, Koritsas *et al.* 2010, Raczka 2005). Kozak *et al.* (2013) for example, in a sample of care workers in a residential facility found a significant association between personal burnout and perceived stress due to client aggression, while Jenkins *et al.* (1997) identified that staff who worked in community based houses where clients displayed challenging behaviors were found to be more anxious; felt less supported; were less clear about the identification of risky situations; and reported lower job satisfaction compared to staff in houses with no reported challenging behaviors.

Although challenging behavior is a frequently cited source of stress for those engaged in intellectual disability care work, the relationship between challenging behavior and worker stress and burnout is not unequivocal and a number of variables may mediate it (Hastings 2002, Howard and Hegarty, 2003; Mills and Rose 2011, Shead *et al.* 2016). Howard *et al.* (2009), for example, found that the relationship between exposure to physical violence and burnout was moderated by self-efficacy, in that as self-efficacy increased the strength of this relationship decreased, while higher self-efficacy for dealing with aggression was associated with increased personal accomplishment. The following section reviews a body of research that has focused on the identification of variables which may moderate or mediate the relationship between exposure to challenging behavior and staff well-being. These include

Table 1. Study Authors; Design and Key Findings.

Authors, methods, and sample	Country	Study Title	Summary of findings
Aitken and Schloss (1994); Quantitative, $n = 150$.	Australia	Occupational stress and burnout amongst staff working with people with an intellectual disability.	Burnout and stress found to be higher in institutional settings compared to community settings.
Alexander and Hegarty (2000); Quantitative, $n = 13$.	United Kingdom	Measuring staff burnout in a community home.	Both staff groups reported moderate stress/burnout; Senior staff higher in emotional exhaustion and depersonalization. Day care reported shortage of staff; medical problems (back pain); shift work; morale; working with others, and feeling 'always on'. Senior staff reported demands; bad attitude; medical administration; staff issues; autonomy; and demands from others. Colleagues/supervision were main source of support.
Bailey *et al*. (2006); Quantitative, $n = 27$.	United Kingdom	The response to challenging behavior by care staff: emotional responses, attributions of cause, and observations of practice.	Care staff's internal, stable and uncontrollable attribution of challenging behaviour (including self-injury) related to negative emotion responses. Did not support Weiner's (1988) model of attribution. Clear relationships were not found between the care staff attributions, emotions, optimism, willingness to help, and observed helping behaviours.
Blumenthal *et al*. (1999); Quantitative, $n = 106$.	United Kingdom	Role clarity, perception of the organization and burnout amongst support workers in residential homes for people with intellectual disability: a comparison between a National Health Service trust and a charitable company.	Constructed a measure of role clarity and perception of the organization, and the use of the Maslach Burnout Inventory (MBI). Most support workers regarded their role as being clear and their levels of burnout to be comparable with UK nursing norms. Charity staff were more likely to view their organization positively and rated their emotional exhaustion as significantly lower than NHS trust staff.
Bromley and Emerson (1995); Quantitative, $n = 70$.	United Kingdom	Beliefs and emotional reactions of care staff working with people with challenging behavior.	Significant proportion of colleagues reported to display emotional reactions such as sadness, despair, anger, annoyance, fear, and disgust to episodes of challenging behaviour The 'daily grind' of caring, difficulty in understanding the person's behaviour, the unpredictability of the behaviour, and the apparent absence of an effective way forward most stressful aspects. Causes of challenging behaviour attributed to internal psychological, broad environmental, and behavioural and medical factors.
Chung *et al*. (1996); Quantitative, $n = 26$.	United Kingdom	Relating staff burnout to clients with challenging behaviour in people with a learning difficulty: Pilot study 2.	Burnout among care workers more related to management issues at work rather than client issues.
Chung and Corbett (1998); Quantitative, $n = 26$	United Kingdom	The burnout of nursing staff working with challenging behaviour clients in hospital-based bungalows and a community unit.	Nurses in hospital-based units experienced more severe challenging behaviour, complained more, were less satisfied with pay, experienced less client contact, were more likely to feel their training was inadequate, and experienced more emotional exhaustion and depersonalisation than those based in community units.
Chung and Harding (2009); Quantitative, $n = 103$.	United Kingdom	Investigating burnout and psychological well-being of staff working with people with intellectual	Higher neuroticism predicted higher levels of emotional exhaustion and lower personal accomplishment.

(*Continued*)

Table 1 *(Continued)*

Authors, methods, and sample	Country	Study Title	Summary of findings
		disabilities and challenging behavior: the role of personality	Converse found for extraversion. Higher conscientiousness predicted higher levels of depersonalization (moderated by agreeableness) while neuroticism and extraversion moderated the relationship between challenging behaviour and personal accomplishment.
Conradie *et al*. (2017); Quantitative, $n = 89$.	South Africa	A profile of perceived stress factors among nursing staff working with intellectually disabled in-patients at the Free State Psychiatric Complex, South Africa.	The occupational stressors identified by this cohort were workload and long hours; lack of decision-making; underpayment; endangerment of physical health and safety issues; pressure; uncertainty of employment; responsibility; and perceiving that their skills/training not appreciated.
Corrigan (1993); Quantitative, $n = 322$.	United States	Staff stressors at a developmental center and state hospital.	Factor analysis of stress revealed lack of admin control and practice related stress. Opposition to behavior therapy predicted job stress Difference in stress by job category – higher in nurses, developmental specialists, and psychiatric technicians.
Dagnan *et al*. (1998); Quantitative, $n = 40$.	United Kingdom	Care staff responses to people with learning disabilities and challenging behavior: A cognitive—emotional analysis.	Those working with people with challenging behavior more likely to evaluate the person more positively and report they would be more likely to offer extra effort in helping. Helping behavior best predicted by optimism, which was best predicted by negative emotion which was best predicted by the attribution of controllability.
Devereux*et al.* (2009a) Quantitative; $n = 96$.	United Kingdom	Social support and coping as mediators or moderators of the impact of work stressors on burnout in intellectual disability support staff.	Social support at work moderated relationship between workplace demands and personal accomplishment. Higher demands related to greater emotional exhaustion (partially mediated by 'wishful thinking'. Practical coping did not effect relationship but was predictive of personal accomplishment. Longitudinal analysis did not find that perceived work demands, wishful thinking, or practical coping predicted emotional exhaustion over time.
Dilworth *et al*. (2011); Quantitative, $n = 43$ care managers and $n = 139$ care staff.	United Kingdom	Factors relating to staff attributions of control over challenging behavior.	Challenging behavior attributed as being less under personal control if the organisation was of better quality. Attributions of control lower if staff displayed positive attitudes towards the client, the physical and social environment was appropriate and the overall approach to delivering care seemed well-structured. No relationship between attributions of control and ability of the individual or the overall level of challenging behavior.
Dyer and Quine (1998); Quantitative, $n = 80$.	United Kingdom	Predictors of job satisfaction and burnout among the direct care staff of a community learning disability service.	Role conflict; role ambiguity; and role overload as prominent demands placed upon staff in an NHS learning disability service. Lack of participation in decision-making as a significant demand placed encountered by staff in a learning disability service.
Edwards and Miltenberger (1991); Quantitative, $n = 125$.	United States	Burnout among staff members at community residential facilities for persons with mental retardation.	Moderate degree of burnout reported by both direct care workers and supervisors.

(*Continued*)

Table 1 *(Continued)*

Authors, methods, and sample	Country	Study Title	Summary of findings
			Supervisors reported higher burnout (greater emo exhaustion) and less personal accomplishment.
Freeman (1994); Quantitative, $n = 89$ from Time 1–2; $n = 71$ from Time 2–3.	United Kingdom	The differential impact on carers dealing with clients with challenging behaviours.	Carers socialised in a traditional setting responded to challenging behaviours by becoming more negative in their attitudes towards clients. Strain related directly to challenging behaviours and unrelated to attitudes which remained positive.
Ford and Honnor (2000); Quantitative, $n = 115$.	Australia	Job satisfaction of community residential staff serving individuals with severe intellectual disabilities.	Staff held moderately favourable views toward their jobs, with work satisfaction reported in interactions with residents and families, the nature of the work itself, and supportive relationships with coworkers. Involvement in decision-making, opportunities for advancement, feelings of isolation, utilization of skills, and lack of feedback on performance were reported as challenges. Little relationship between demographics and job satisfaction.
Figueiredo-Ferraz *et al.* (2012); Quantitative, $n = 422$; Longitudinal with one year follow up (2015), $n = 372$	Spain	Influence of some psychosocial factors on mobbing and its consequences among employees working with people with intellectual disabilities.	Mobbing – interpersonal aggression and intention to harm between workers. Role clarity and social support at work can play a role in preventing mobbing, while role ambiguity can encourage it. Significant consequences for employee health (psychosomatic well-being and predicts absenteeism). Longitudinal study found that mobbing had a longer term impact on depressive symptoms – significantly higher depressive symptoms at Time 2 compared to those who did not experience at Time 1 or 2 or just a Time 2.
Gil-Monte (2012); Quantitative, $n = 700$.	Spain	The influence of guilt on the relationship between burnout and depression.	Guilt defined as unpleasant/remorseful feeling associated with violating a moral standard. Guilt found to moderate relationship between depersonalisation and depression, may have role in burnout process.
Gingi (2012); Quantitative, $n = 127$.	South Africa	Responses of nurses to violence from adults with ID in an in-patient psychiatric facility.	Inclusion criteria was involved or having witnesses violence directed at a nurse. Response distributed across avoidance, introversion, and hyperarousal, 82.75% of the nurses in this sample fitted the symptoms of Post Traumatic Stress Disorder. Over 80% scored moderately to very highly on scores of resilience.
Gray-Stanley and Muramatsu (2011); Quantitative, $n = 323$.	United States	Stress, burnout, and social and personal resources among direct care workers in community ID.	Work-overload, limited participation in decision making, and client disability care associated with increased burnout. Low social support related to increased burnout when workload was high. Internal control beliefs reduced feeling of burnout when participation in decision making was limited (reverse for external control beliefs).
Gray and Muramatsu (2013); Quantitative, $n = 323$ (follow-up)	United States	When the job has lost its appeal: intention to quit in direct care workers.	Increased social support associated with lower intention to quit. Relationship between control and intention to quit moderated by lack of participation in decision making.
Harries et al. (2015); Quantitative, $n = 97$	Australia	Evaluation of the Work Safety and Psychosocial Wellbeing of	The JDCS model components did not all predict any single wellbeing

(*Continued*)

Table 1 *(Continued)*

Authors, methods, and sample	Country	Study Title	Summary of findings
		Disability Support Participants experienced significantly higher personal and work-related burnout but significantly lower client-related burnout compared to population norms.	measure. However they each predicted individual aspects of burnout and job satisfaction. Well-being measures were associated with safety performance. The negative impact of Role Conflict were effectively moderated by support for personal and work-related burnout and job satisfaction.
Hatton and Emerson (1993); Quantitative, $n = 64$.	United Kingdom	Organizational predictors of perceived staff stress, satisfaction, and intended turnover in a service for people with multiple disabilities.	Support from other staff (mainly supervisory), job variety, perceived organization, democracy, goodness of fit b/n attitude and aims of staff and those of organization, staff development, and income.
Hatton *et al.* (1995); Quantitative, $n = 68$	United Kingdom	Stressors, coping strategies, and stress-related outcomes among direct care staff in staffed houses for people with learning disabilities.	Work stress predicted by emotional impact of work, violent behavior, and wishful thinking. General distress related to conflict of work with personal/family life. Stress, uncertainty with tasks, and limited opportunity for advancement all had a high impact on work stress.
Hatton *et al.* (1999); Quantitative, $n = 450$.	United Kingdom	Factors associated with staff stress and work satisfaction in services for people with intellectual disability.	Wishful thinking; work-home conflict and role ambiguity predicted stress. Job strain related to wishful thinking, lack of support, alternative commitment, role ambiguity, low status of job, and longer hours. Satisfaction related to low status of work, support from colleagues and supervisors; alternative commitment; and older staff age.
Hatton *et al.* (2001); Quantitative, $n = 450$ (as previous).	United Kingdom	Factors associated with intended staff turnover and job search behavior in services for people with intellectual disability.	Work satisfaction, job strain, younger staff age and subjective labor conditions were directly associated with intended turnover. The same factors, with the exception of younger staff age, were also directly associated with job search behavior.
Hensel (2012, 2014); Quantitative, $n = 926$ and $n = 42$ matched pairs.	Canada	The mediating effect of severity of client aggression on burnout between hospital inpatient and community residential staff who support adults with intellectual disabilities.	2012 article found that nearly all reported exposure to aggression in previous six months. Aggression related to burnout (emotional exhaustion and depersonalization). 2014 study found hospital staff experienced more severe aggression and were more emotionally exhausted than community staff. Partially mediating effect of severity of aggression in hospital and community – more severe, more emotionally exhausted.
Hickey (2014); Quantitative, $n = 1570$.	Canada	Prosocial motivation, stress, and burnout among direct support workers.	Prosocial motivation may moderate or buffer against burnout among direct care workers. Depersonalization scores lower for staff with high motivation, this was especially pronounced in cases where staff had high emotional exhaustion. Depersonalization higher among staff with high role boundary stress in case of low motivation. Increased role ambiguity stress associated with lower personal accomplishment in case of lower motivation.
Howard and Hegarty (2003); Qualitative, $n = 6$	United Kingdom	Violent Incidents and Staff Stress Content analysis of semi-structured interviews identified seven key themes relating to The physical force of violence.	Staff reactions to violence; Acceptance of violence; The importance of support; Coping strategies used by staff; Effect of violence on the relationship

(*Continued*)

Table 1 *(Continued)*

Authors, methods, and sample	Country	Study Title	Summary of findings
			between staff and students and Mediators of the staff reaction to violence.
Howard, Rose and Levenson, (2009); Quantitative, $n = 44$ in medium security and $n = 38$ in community services.	United Kingdom	The psychological impact of violence on staff working with adults with intellectual disabilities.	Lower fear of violence and higher self-efficacy in medium secure staff. Burnout related to increased exposure to physical violence and reduced staff support. Higher threat of violence related to lower fear. Higher support related to lower emotional exhaustion; higher self-efficacy related to higher personal accomplishment. More physical/verbal aggression related to increased emotional exhaustion, verbal aggression also related to reduced personal accomplishment. Physical violence related to burnout but self-efficacy moderated relationship.
Hussein (2017); $n = 196$ who provided both qualitative and quantitative responses.	Australia	Perspective of support challenges in rural versus urban workers for adults with ID (medical, health, and support workers).	Only 23.7% felt they had adequate training. Lack of services and poor carer health were triggers for institutionalization.
Ineland *et al.*; Quantitative, $n = 333$.	Sweden	Sources of job satisfaction in intellectual disability services: a comparative analysis of experiences among human service professionals in schools, social services, and public health care in Sweden.	Majority experienced heavy workload and psychological strain, though majority also experience high job satisfaction (plurality). Sources of stress were target group; social environment, social relations, professional core mission; and results/outcomes. Content analysis revealed that sources of job satisfaction irrespective of organization, is categorized in five different core categories; target group, social rewards, social relations, professional core mission, and results/outcomes.
Ito *et al.* (1999); Quantitative, $n = 3774$	Japan	Burnout among direct-care staff members of facilities for persons with mental retardation in Japan.	Burnout higher among direct care staff compared to facility director or middle managers. Burnout was lower among staff who felt that they could consult supervisors about work or personal problems compared to those who felt they could not.
Jenkins *et al.* (1997); Quantitative, $n = 78$.	United Kingdom	Psychological correlates of well-being in direct care staff in services for children with intellectual disabilities and challenging behaviour.	Higher anxiety among staff working in houses where clients had challenging behaviors – also felt less supported, less clear about identifying risky situations and lower job satisfaction. No difference in demand or depression. Challenging Behavior emerged as the best predictor of anxiety, with job demands second best predictor. Together, these accounted for 21% of the variance. Depression was the best predictor of staff support.
Judd *et al.* (2017); Qualitative, $n = 12$.	Australia	Workplace stress, burnout, and coping: a qualitative study of the experiences of Australian disability support workers.	Theme of balance identified, relation to positive, and negative experiences of work, managing periods of imbalance and strategies to reclaim balance. Rewards included seeing client develop new skills and express appreciation for work. Challenges were challenging behavior, low income, and limited decision making power. Sought support and developed own strategies to manage.
Jenkins, Rose and Lovell (1997) Quantitative, $n = 78$	United Kingdom	Psychological well-being of staff working with people who have challenging behaviour Higher anxiety among staff working in	No difference in demand or depression. Challenging Behaviour emerged as the best predictor of anxiety, with Job Demands

(*Continued*)

Table 1 *(Continued)*

Authors, methods, and sample	Country	Study Title	Summary of findings
		houses where clients had challenging behaviours – also felt less supported, less clear about identifying risky situations and lower job satisfaction.	second best predictor. Together, these accounted for 21% of the variance. Depression was the best predictor of Staff Support.
Kile (2014); Quantitative, $n = 222$.	United States	Relationship among relational coping and reciprocity in direct care staffing services for adults with developmental disabilities and challenging behavior.	Low to moderate levels of burnout found. Challenging behaviour related to higher emotional exhaustion and depersonalisation. Emotion-focused coping was related to emotional exhaustion and depersonalisation. Problem focused coping related to increased personal accomplishment. Relationship-focused most effective; related to higher personal accomplishment. Emotional exhaustion related to lack of reciprocity (across clients, colleagues, and organization). Inequity within the org related to all three burnout measures. Relationship between challenging behavior and burnout weaker when staff felt they had invested more in clients and organization than the reverse.
Ko *et al*. (2012); Quantitative, $n = 169$.	Canada	Burnout in summer camp workers for ID	Frequent exposure to severe aggression was related to higher levels of emotional exhaustion and lower personal accomplishment.
Koritsas *et al*. (2010); Qualitative, $n = 11$; Quantitative, $n = 191$.	Australia	Exposure to challenging behavior and support worker/house supervisor well-being.	Qualitative research found awareness of triggers for challenging and that staff implemented strategies to manage (mostly reactive). Most were exposed to CB (almost half had experienced injury; over half had seen injury in others). Depression related to reduced decision latitude, lower education, and exposure to challenging behaviour. Stress was predicted by exposure to challenging behaviour, lower education, and decision latitude. Emotional exhaustion associated with higher psychological job demands and more exposure to challenging behaviour. Personal accomplishment increased as decision latitude increased
Kowalski *et al*. (2010); Quantitative, $n = 175$.	Germany	Associations between emotional exhaustion, social capital, workload, and latitude in decision-making among professionals working with people with disabilities.	Workload, latitude in decision-making and being of a male gender were all significant predictors of emotional exhaustion in this study. The strongest inter-correlations between professional experience, age, and job tenure. Social capital was inversely correlated with emotional exhaustion; the lower the social capital in the organization perceived by an employee, the higher the emotional exhaustion.
Kozak *et al*. (2013); Quantitative, $n = 409$.	Germany	Psychosocial work-related predictors and consequences of personal burnout among staff working with people with intellectual disabilities.	Personal burnout related to work-privacy conflict, emotional demands, role conflict, job insecurity, and feedback (49%). Higher burnout related to higher intention to leave and stress symptoms. Lower burnout related to job satisfaction, good health, and higher life satisfaction.
Kurz *et al*. (2014); Quantitative, $n = 128$	United States	Mediating the relation between workplace stressors and distress in ID support staff: Comparison	Psychological flexibility (defined as 'Willingness to experience difficult thoughts and emotions, and to

(*Continued*)

Table 1 *(Continued)*

Authors, methods, and sample	Country	Study Title	Summary of findings
		between the roles of psychological inflexibility and coping styles.	relinquish one's efforts to control the same' mediated the impact of workplace demands on psychological distress.
Lahana *et al.* (2017); Quantitative, $n = 180$.	Greece	Burnout among nurses working in social welfare centres for the disabled.	Burnout levels were found to be high. Marital status, routine, and supervisor relationship and professional experienced related to emotional exhaustion and depersonalization.
Langdon *et al.* (2007); Quantitative, $n = 27$.	United Kingdom	Staff working with people who have intellectual disabilities within secure hospitals: expressed emotion and its relationship to burnout, stress and coping.	Relationship with colleagues was associated with all three dimensions of burnout syndrome. Quality of relations with supervisors affected both Emotional Exhaustion and Personal Achievement. Sixty three percent coded as having high expressed emotion. These participants reported significantly higher levels of depersonalization and lower levels of personal accomplishment.
Lee *et al.* (2009); Quantitative, $n = 1243$.	Taiwan	Extrinsic high-effort and low-reward conditions at work among institutional staff caring for people with intellectual disabilities in Taiwan.	15% - low effort/low reward; 35.9% - low effort/high reward;17.9% - high effort/high reward; 31.1% - high effort/low reward. Perceived job support, control, demands, and stress related to high effort/low reward at work.
Lernihan and Sweeney (2010); Quantitative, $n = 69$	Ireland	Measuring levels of burnout among care workers.	Thirty percent reported moderate to high emotional exhaustion, most did not report high depersonalization. Two-thirds higher in personal accomplishment. Emotional exhaustion significantly higher in residential compared to day care staff.
Leyin and Wakerly (2007)	United Kingdom	Staff support, staff stress and job satisfaction in working with people with learning disabilities and challenging behaviors.	Overall support was relatively high for both formal and informal supports, only the informal supports from colleagues were negatively correlated with ratings of work-related stress. Levels of stress could not be inferred from overall ratings of job satisfaction or vice versa. Identified a potentially vulnerable group of staff who reported relatively high job satisfaction but also some degree of stress.
Lin *et al.* (2009); Quantitative, $n = 46$ (23 native and 23 non-native)	Taiwan	Job strain and determinants in staff working in institutions for people with intellectual disabilities in Taiwan: a test of the job demand-control-support model.	Native workers had higher burnout (personal and work-related). Job satisfaction slightly higher among foreign compared to native workers (non-significant).
Lundström *et al.* (2007); Quantitative, $n = 112$.	Sweden	Personality impact on experiences of strain among staff exposed to violence in care of people with intellectual disabilities.	No evidence of direct influence of personality variables on exposure to violence. Personality dimensions of harm avoidance and self-directedness were related to increased burnout, tedium, emotional exhaustion, and depersonalization.
Lundström *et al.* (2007); Quantitative, $n = 120$.	Sweden	Prevalence of violence and its relation to caregivers' demographics and emotional reactions – an explorative study of caregivers working in group homes for persons with learning disabilities.	Thirty one percent exposed to violence during the preceding year with physical violence most common. Daytime work was the only independent factor in a regression model predicting violence towards the caregivers. Of those exposed to violence; violent incidents occurred several times a week (41%) while 24% (7.5% of all caregivers) reported daily exposure to violence. Seventy three

(*Continued*)

Table 1 *(Continued)*

Authors, methods, and sample	Country	Study Title	Summary of findings
			percent of caregivers reported that the violent incidents were only managed by internal discussions with colleagues. Only two (5.4%) of the exposed caregivers reported personal support from the manager. The most frequently reported types of emotional reactions to violence were feelings of powerlessness, insufficiency, and anger.
Lunsky *et al*. (2014); Quantitative, $n = 926$.	Canada	Perceptions of positive contributions and burnout in community developmental disability workers.	Factor analysis identified two factors: General positive contributions and positive work motivation. Positive work motivation associated with higher levels of personal accomplishment. Lend support to the idea of need to consider both positive and negative aspects of work life.
Mascha (2007); Quantitative, $n = 36$	United Kingdom	Staff morale in day care centres for adults with intellectual disabilities.	High levels of job satisfaction, moderate levels of emotional exhaustion, and personal accomplishment. Wishful thinking related to lower levels of role clarity and more emotional exhaustion, as well as lower levels of lack of personal accomplishment. Staff who were satisfied with supervision reported higher role clarity and job satisfaction and lower levels of intended turnover and emotional exhaustion. Emotional exhaustion also highly associated with lower levels of satisfaction with support, role clarity, and overall job satisfaction. Role clarity and job satisfaction related to satisfaction with support and negatively related to intended turnover.
Mitchell and Hastings (2001); Quantitative, $n = 83$.	United States	Coping, burnout, and emotion in staff working in community services for people with challenging behaviors.	Adaptive coping more frequent than maladaptive coping when faced with challenging behavior. Disengagement, adaptive coping and emotional reaction to aggressive behaviour predicted burnout. Negative emotional reaction to aggressive behaviour predicted emotional exhaustion and depersonalization.
Mills and Rose (2011); Quantitative, $n = 78$.	United Kingdom	The relationship between challenging behavior, burnout, and cognitive variables in staff working with people who have intellectual disabilities.	Relationship between challenging behavior and burnout mediated by 'fear of potential assault'. Higher challenging behaviour related to greater fear of assault. Greater fear of assault and challenging behavior related to increased burnout (on all measures). Cognitive variables of consequence carer/control carer/ emotional representation related to burnout. 'Fear of assault' mediated the relationship between aggressive behavior and emotional exhaustion and depersonalization. 'Emotional representation' mediated relationship between CB and depersonalization.
Mutkins *et al*. (2011); Quantitative, $n = 80$.	Australia	Stress, depression, workplace, and social supports and burnout in intellectual disability support staff.	Depression and lower perceived organisational support related to higher worse emotional exhaustion and depersonalization. Less social support related to lower

(*Continued*)

Table 1 *(Continued)*

Authors, methods, and sample	Country	Study Title	Summary of findings
			personal accomplishment. Satisfaction with social support moderated between psychological stress and burnout.
Outar and Rose (2017); Quantitative, $n = 70$.	United Kingdom	Is there a relationship between role identity, work demands, and burnout in direct care staff working with individuals with intellectual disability.	Demands related to emotional exhaustion and depersonalization; role identity related to personal accomplishment and self-determination.
Robertson *et al.* (2005); Quantitative, $n = 157$.	United Kingdom	Staff stress and morale in community-based settings for people with intellectual disabilities and challenging behavior: a brief report.	Congregate settings not associated with higher levels of stress. Overall, over a quarter of staff reached criterion on the General Health Questionnaire-12 for experiencing emotional distress and over a third were likely to actively seek new employment in the next year. The greatest perceived sources of stress were lack of resources and lack of staff support. The lowest level of satisfaction was with the rate of pay. Those in non-congregate settings reported greater perceived stress due to lack of procedures to deal with challenging behaviour.
Rose (1993); Quantitative, $n = 112$.	United Kingdom	Stress and staff in residential settings: the move from hospital to the community.	Hospital and group home staff reported similar, relatively high levels of strain. Community unit group reported significantly lower levels of strain.
Rose (1999); Quantitative, $n = 216$.	United Kingdom	Stress and residential staff who work with people who have an intellectual disability: a factor analytic study.	Development of a questionnaire and collection of data.
Rose and Schelewa-Davies (1997); Quantitative, $n = 29$.	United Kingdom	The relationship between staff stress and team climate in residential services.	Team climate, namely greater support for innovation, and task orientation (commitment to high performance) associated with reduced staff stress.
Rose *et al.* (2003); Quantitative, $n = 131$.	United Kingdom	Staff who work with people who have intellectual disabilities: the importance of personality.	Higher demands and lower support linked to poorer psychological well-being. Higher neuroticism and lower extraversion related to higher stress. Practical coping not related to work strain, though wishful thinking related to higher stress. Neuroticism and wishful thinking moderated relationship between demands and higher stress.
Rose *et al.* (2004); Two quantitative studies, $n = 101$ and 99, respectively.	United Kingdom	Negative emotional reactions to challenging behaviour and staff burnout (replication studies of a previous study by Mitchell and Hastings,2001).	Supported the previous study though no causal links identified. Both studies found relationship between negation emotional reaction to challenging behaviour and emotional exhaustion and depersonalization (not personal accomplishment).
Rose and Rose (2005); Quantitative, $n = 107$.	United Kingdom	Staff in services for people with intellectual disabilities: the impact of stress on attributions of challenging behavior.	Although staff reported high stress levels and moderate burnout, this did not appear to have any relationship to their reporting of thoughts and feelings, and propensity to help regarding challenging behavior in study vignettes.
Rose *et al.* (2006); Quantitative, $n = 72$.	United Kingdom	Attitudes of direct care staff towards external professionals, team climate, and psychological well-being: a pilot study.	Care staff attitudes towards professionals and levels of team climate related to psychological well-being.
Rose and Cleary (2007); Quantitative, $n = 87$.	United Kingdom	Care staff perceptions of challenging behavior and fear of assault.	Investigated fear of assault in relation to exposure to challenging behavior. The extent to which a social

(*Continued*)

Table 1 *(Continued)*

Authors, methods, and sample	Country	Study Title	Summary of findings
			psychological model of fear of assault could be generalised to care staff was tested. Staff exposed to more challenging behavior had high a fear of assault.
Rose *et al*. (2010); Quantitative, *n* = 242.	United Kingdom	Reciprocity and burnout in direct care staff.	'Under benefit' in relationships with service users, colleagues, and the organisation related to emotional exhaustion. 'Under benefit' in organisational and staff relationships related to increased depersonalization.
Rose *et al*. (2013); Quantitative, *n* = 78.	United Kingdom	Client characteristics, organizational variables, and burnout in care staff: The mediating role of fear of assault.	Relationship between challenging behavior and emotional exhaustion fully mediated by fear of assault. Relationship between emotional exhaustion and experienced safety also fully mediated by fear of assault.
Rose, Jones and Fletcher (1998) Quantitative, *n* = 33	United Kingdom	Investigating the relationship between stress and worker behaviour. Residential group homes were classified as `low stress' and four as 'high stress'. Staff in the high stress homes reported greater demands and less support than those in the low stress homes.	Higher levels of interaction were found between staff and residents in low stress houses, whereas activities in higher-stress group homes appeared to be more community oriented.
Shaddock *et al*. (1998); Quantitative, *n* = 173.	Australia	Factors associated with burnout in workers in residential facilities for people with an intellectual disability.	Association between the burnout and variables such as religious affiliation, personal relationships, perceived skill levels, job satisfaction, case-loads, decision-making, and social support. Significant associations were found between burnout scores and some demographic variables. Low burnout scores were associated with some features of the work situation.
Shead *et al*. (2016); Quantitative, *n* = 86.	United Kingdom	Investigating predictors and moderators of burnout in staff working in services for people with intellectual disabilities: the role of emotional intelligence, exposure to violence, and self-efficacy.	Exposure to violence and low self-efficacy predicted emotional exhaustion and depersonalization. Self-efficacy moderated the relationship between exposure to violence, emotional exhaustion, and depersonalization.
Smithson-Sims (1996); Quantitative, *n* = 105.	United Kingdom	Coping and stress: unqualified direct-care staff working with challenging behaviour clients in learning disability residential settings.	Both emotion- and problem-focused coping strategies used when dealing with the demands of the workplace. Significant association between use of problem-focused coping strategies and lower levels of stress and incidence of stress caseness. Also significant association between use of predominantly emotion-focused coping strategies and higher levels of stress and incidence of stress caseness.
Smyth *et al*. (2015); Quantitative, *n* = 138.	United Kingdom	An analysis of stress, burnout, and work commitment among disability support staff in the UK.	Exposure to challenging behavior was associated with perceived stress and emotional exhaustion. Perceived stress and burnout were associated with work commitment. Frequency and severity of aggressive/destructive behavior predicted depersonalization. Greater perceived stress was a predictor of depersonalization and emotional exhaustion.
Stube (2016); Quantitative, *n* = 201.	United States	The prediction of staff burnout indicators in IDD community services by staff depression, work functioning, and working alliance.	Depressions, working alliance, and work functioning all related to difference aspect of burnout (no interaction effect for working alliance)

(*Continued*)

Table 1 *(Continued)*

Authors, methods, and sample	Country	Study Title	Summary of findings
			Depression predicted all burnout measures (emotional exhaustion strongest). Work functioning predicted emo exhaustion and depersonalization (depersonalization strongest). Working alliance predicted depersonalization (best predictor of personal accomplishment).
Tartakovsky *et al*. (2013); Quantitative, $n = 222$.	Israel	Staff members of community services for people with intellectual disability and severe mental illness: values, attitudes, and burnout.	Higher preference for self-transcendence values and a lower preference for the self-enhancement values associated with a lower level of depersonalization and a higher sense of professional accomplishment. A more positive attitude toward empowerment, a higher sense of similarity, and a more negative attitude toward exclusion associated with lower burnout.
Thomas and Rose (2010); Quantitative, $n = 102$.	United Kingdom	The relationship between reciprocity and the emotional and behavioral responses of staff.	A lack of reciprocity in care staff relationships related to burnout. Emotional exhaustion and depersonalization were also found to be related to negative affect, positive emotion, optimism, and helping behaviors; while personal accomplishment was related to negative mood, positive emotion, optimism, and helping behaviour.
Van Dierendonck, Schaufeli and Buunk (1996); Quantitative, $n = 301$ ($n = 189$ in care of mentally disabled)	Netherlands	Inequity Among Human Service Professionals: Measurement and Relation to Burnout Majority of professionals felt under-benefited in relation with recipients as well as in relation with their organization.	Inequity was curvilinearly related to burnout. Staff who felt over-benefited experienced more burnout than colleagues who felt under-benefited.
Van Dierendonck, Schaufeli and Buunk, (2001); Quantitative, $n = 245$ ($n = 125$ in care of mentally disabled)	Netherlands	Burnout and inequity among human service professionals; A longitudinal study. Inequity affected the central component of burnout (emotional exhaustion).	This relationship was curvilinear. Feeling more deprived and feeling more advantaged resulted in higher future emotional exhaustion levels. No longitudinal relation between inequity and depersonalization.
Vassos and Nankervis (2012); Quantitative, $n = 108$.	Australian	Investigating the importance of various individual, interpersonal, organisational, and demographic variables when predicting job burnout in disability support workers.	Challenging behavior (interpersonal), workload (individual), supervisor support (individual), work-home conflict (individual), job feedback (individual), role ambiguity (organisational), low job status (organisational), role conflict (organisational), gender (demographic), and work hours (demographic) all predicted one or more of the facets of burnout.
Vassos (2013); Quantitative, $n = 258$.	Australia	Engagement and burnout is disability support staff as predicted by JDR model.	Role ambiguity related to all three measures of engagement and burnout. Accounted for most unique variance in three scores of engagement and PA. Resources (job feedback) related to engagement and all burnout measures. First to explore engagement at work.
Vassos *et al*. (2017); Quantitative, $n = 325$.	Australia	Can the JDR-S model predict stress in disability workers?	High workload, low control, and low colleague support related to higher burnout and lower engagement. High support and increased control reduced the impact of workload on these variables.
Wanless and Jahoda (2002); Quantitative, $n = 38$.	United Kingdom	Responses of staff towards people with mild to moderate intellectual disability who behave aggressively: a cognitive emotional analysis.	More negative emotions to real aggression versus hypothetical vignettes. Failed to support Weiner's model of aggression.

negative staff attributions of and reactions to challenging behavior; self-efficacy; support; and training.

Negative staff reactions to challenging behavior

Mitchell and Hastings (2001) found that negative emotional reactions to aggressive behavior predicted emotional exhaustion and depersonalization. Depersonalization was predicted by depressive and angry responses to such behavior, while emotional exhaustion was predicted by both depressive and angry responses and coping through disengagement. Higher personal achievement was predicted by low use of disengagement coping and higher use of adaptive coping; though this link was not causal. Rose *et al.* (2004) replicated these findings through two studies which explored the relationship between negative emotional reactions to challenging behavior and burnout among disability support workers. Their first study found that both depressive/angry emotional responses and fearful/anxious emotional responses were associated with increased depersonalization and emotional exhaustion. Their second study replicated the finding that negative emotional reactions to challenging behavior predicted emotional exhaustion and depersonalization.

Increased exposure to challenging behavior is associated with increased 'fear of assault' on the part of care workers, which may exacerbate the negative effects of exposure to violence in the workplace (Rose and Cleary, 2007). Mills and Rose (2011) found that the relationship between challenging behavior and burnout was mediated by 'fear of potential assault. Higher levels of challenging behavior were related to increased fear of assault, which in turn was associated with increased emotional exhaustion, depersonalization, and less personal accomplishment. The cognitive variables of 'consequence carer' and 'control carer' (i.e. the extent to which staff believe challenging behavior will elicit negative consequences for themselves or client) and emotional representation (i.e. the extent to which challenging behavior may elicit negative emotion in the carer) were also related to higher burnout. 'Fear of potential assault' mediated the relationship between aggressive behavior and emotional exhaustion and depersonalization, while 'emotional representation' mediated the relationship between challenging behavior and depersonalization. A later study (Rose *et al*. 2013) which included data from this study, found that 'fear of potential assault' fully mediated the relationship between challenging behavior and emotional exhaustion and the relationship between emotional exhaustion and 'experienced safety' (an organizational variable) among direct care workers.

Attribution of challenging behavior

Staff perceptions of the cause of challenging behavior have been linked to negative emotional outcomes (Bromley and Emerson 1995, Dagnan *et al.*1998, Phillips and Rose, 2010). Snow *et al.* (2007) identified that higher levels of emotional exhaustion were related to less attributions of stable behavior while Stanley and Standen (2000) found that staff experienced greater negative emotions in response to aggression, which they considered to be controllable as opposed to self-harm, and was not as related to burnout. The function and type of behavior is also relevant here (Dilworth *et al.* 2011). Rose and Rose (2005) for example explored the impact of staff attributions of challenging behavior using Weiner's (1988) model of helping behavior. This model posits that staff attributions of challenging behavior as internal, stable, and controllable will elicit more negative responses from such staff and a reduced tendency to help. Though this study did find that a stable attribution of challenging behavior was associated with increased negative emotion, the model was poorly supported and had limited explanatory power, highlighting the complexity of the relationship between challenging behavior and the well-being of care workers. Two later studies (Bailey *et al.* 2006, Wanless and Jahoda 2002) also failed to find support for this model, although Bailey *et al.* (2006) did identify that internal, stable, and uncontrollable attributions of challenging behavior (including self-injury) were related to negative emotion responses among their sample.

Severity of challenging behavior

Finally, Hensel *et al.* (2012) found nearly all of their sample of care workers in hospital and community intellectual disability settings were exposure to aggression from clients in the previous six months, which was related to increased burnout (specifically emotional exhaustion and depersonalization). A follow up of this research (Hensel *et al.* 2014) examined the mediating effect of severity and perceived self-efficacy through matched pair analyses. Hospital staff experienced more severe aggression from clients, which partially mediated the relationship between exposure to aggression and increased emotional exhaustion.

Reciprocity

Reciprocity refers to relative investments and outcomes in social relationships (Adams 1965). Inequity in social relationships with clients, colleagues, and their organization (in terms of a discrepancy between the support or effort people want and what they receive) have been identified as significant sources of stress for professional care staff within the intellectual disability sector (e.g. Kile 2014, Thomas and Rose 2010). Disley *et al.* (2009) reviewed the available evidence in relation to the impact of inequity on staff stress, including three studies which exclusively surveyed staff in the intellectual disability field. Van Yperen *et al.* (1992) found

that 37% of ID nurses felt often or regularly 'under-benefitted' (i.e. receiving less effort from clients than desired) in their relationship with service users, which was related to all three dimensions of burnout. A later replication of this study (Van Yperen 1995) also identified that inequity between staff and the organization was related to depersonalization and emotional exhaustion, which was also related to higher intention to quit. Two later studies (Thomas and Rose 2010, Rose *et al.* 2010) also found that a lack of reciprocity in the relationships care staff had with the service users, their work colleagues and their organization was found to be related to increased levels of burnout.

Interestingly van Dierendonck (1996) found that staff who felt that services users contributed more to their relationship reported higher burnout than those who felt the service users contributed less. Similar findings were reported for staff relationships with their organization. These findings were supported by a later longitudinal study conducted van Dierendonck *et al.* (2001) which found that staff who felt under or over-benefitted at the start of the study reported greater burnout one year on; though interestingly at the end of the study those who felt under-benefitted at start were less emotionally exhausted than those who perceived their relationship to be equal. Similarly Kile (2014) also found the relationship between challenging behavior and burnout was weaker when staff perceived that they had invested more in their relationships with clients and their organization than their clients and organization had invested in them. It may be the case therefore that staff who are burnt-out perceive that they contribute less effort to their relationship with services users and their organizations than they receive.

Coping and stress

A particular strength of the literature included in this review is that much of the research is underpinned by validated work-stress theories (Devereux *et al.* 2009b). Two findings are notable in this regard. Firstly, several studies have indicated that coping styles of direct care workers (e.g. problem-solving, emotion-focused, or wishful thinking) are associated with perceived stress and well-being (Hatton *et al.* 1995, 1999, Mitchell and Hastings 2001). Secondly, in line with established work-stress theories such as the Job-Demand-Control Model (JDC; Karasek 1979) excessive workplace demands, a low level control, and a lack of support have been shown to be related to higher levels of stress and burnout among intellectual disability care workers (Rose 1993; Elliot and Rose 1997; Dyer and Quine, 1998; Rose *et al.* 1998, Rose 1999; Hatton *et al.* 1999, Innstrand *et al.* 2004, Harries *et al.* 2015, Stube 2016).

Demands, control, and support

Increased workload is predictive of greater emotional exhaustion and depersonalization (Gardner and Rose 1994, Gray-Stanley and Muramatsu 2011, Kowalski *et al.* 2010 , Vassos and Nankervis 2012). Vassos *et al.* (2017) found that the combination of a high workload, low control, and low colleague support were related to higher burnout and lower engagement among care workers. However increased job control and colleague support were found to reduce the negative impact of workload on staff burnout and engagement.

A lack of influence over work decisions is linked with higher emotional exhaustion and decreased personal accomplishment (Hatton and Emerson 1993, Ford and Honnor 2000, Gray-Stanley and Muramatsu 2011, Gray and Muramatsu, 2013). Dyer and Quine (1998) identified a lack of participation in decision-making as a significant demand encountered by care workers in a learning disability service, while Corrigan (1993) identified a lack of administrative control as a prominent stressor in a study of care workers at developmental and state hospitals. Koritsas *et al.* (2010) reported that increased depression and stress and lower personal accomplishment were associated with reduced decision latitude, while emotional exhaustion associated with higher psychological job demands. Judd *et al.* (2017) identified limited decision-making power as a challenge of working in this sector and that staff often sought support to help them manage their stress. Rose *et al.* (2006) found that active participation in decision making related to improved psychological well-being, while Kowalski *et al.* (2010) reported that greater latitude in decision making was associated with reduced emotional exhaustion.

Support from supervisors and colleagues can exert a meaningful impact on the stress and burnout experienced by direct care staff in the intellectual disability sector (Dyer and Quine 1998, Harris and Rose 2002, Howard *et al.* (2009), Leyin and Wakerly 2007, Lahana *et al.* 2017, Robertson *et al.* 2005, Rose and Cleary 2007). Ito *et al.* (1999) examined the experience of burnout of care workers in a Japanese national study. Lower burnout scores were found for staff who had supervisors available for consultation about work or personal problems compared to staff who felt they did not. Rose and Schelewa-Davies (1997) found that 'team climate' (namely support for innovation and commitment to high performance) was associated with reduced staff stress, while Devereux *et al.* (2009a) reported that social support at work could moderate the relationship between workplace demands and personal accomplishment. Hatton and Emerson (1993) identified that support from other staff, perceived organizational democracy and a good 'fit' between the attitude and aims of staff and those of the organization were predictive of perceived stress, job satisfaction, overall life satisfaction, and intention to leave the organization. A

later study by Hatton *et al.* (1999) found that job strain was related to a lack of staff support, while work satisfaction was associated with support from staff and colleagues. Finally, Mutkins *et al.* (2011) found that lower perceived organizational support was related to increased symptoms of burnout (specifically greater emotional exhaustion and depersonalization). Decreased social support was related to lower personal accomplishment, while satisfaction with social support was found to moderate the relationship between stress and burnout.

Coping styles and stress

Research evidence also suggests that the coping styles of direct care workers (e.g. problem-solving, emotion-focused, or wishful thinking) are associated with perceived stress and well-being (Hatton *et al.* 1995, 1999, Kile, 2014, Mitchell and Hastings 2001). Devereux *et al.* (2009a) explored the impact of coping styles on the relationship between workplace demands and burnout with a sample of care workers over a 22 month period. Higher demands were found to be related to increased emotional exhaustion, which was partially mediated by 'wishful thinking', a coping style characterized by a focus on what may be pleasing to imagine rather than rationality or available evidence. Practical coping did not effect this relationship but was predictive of personal accomplishment. Longitudinal analysis did not find that perceived work demands, wishful thinking, or practical coping predicted emotional exhaustion over time.

Two additional studies (Hatton *et al.* 1995, 1999) found that wishful thinking was associated with increased job stress and job strain among disability workers, while Rose *et al.* (2003) identified that the use of practical coping was not related to worker stress though wishful thinking was associated with poorer psychological well-being. Wishful thinking was also found to moderate the relationship between demands and stress (higher use of wishful thinking of a coping strategy was associated with poorer psychological well-being in the case of higher demands). Smithson-Sims (1996) explored the coping strategies of care workers in a learning disability setting. Problem-focused coping was related to lower levels of stress and reduced incidence of stress, while emotion-focused coping was related to higher perceived stress. Gil-Monte (2012) found that guilt (frequently defined in an intellectual disability setting as negative thoughts about other staff and negative/cynical way they treated them) was found to moderate the relationship between depersonalization and depression and may have role in burnout.

Role issues

In line with Devereux et al.'s (2009b) analysis of person-environment fit, role issues such as ambiguity and conflict have been shown to play a part in the work-related stress experienced by direct care workers in the intellectual disability field (Dyer and Quine 1998; Harris and Rose 2002, Lin *et al.* 2009). Lee *et al.* (2009) explored the impact of effort and reward at work through a national study of intellectual disability care workers in Taiwan. Nearly one-third of workers were identified as working in a 'high effort-low reward' position which was related to poorer perceived job support and control and higher levels of job demands and stress. Hatton and Emerson (1993) found that the closer the 'fit' between the attitudes and aims of staff and their organization was predictive of perceived stress, job satisfaction, overall life satisfaction, and likelihood of a worker leaving their position.

Role ambiguity is related to work-related stress and strain (Hatton *et al.* 1995; 1999). Gil-Monte and Piero (1998) found that role ambiguity and self-confidence were predictive of personal accomplishment, with self-confidence moderating this relationship. Role conflict was predictive of emotional exhaustion, a finding replicated by Vassos *et al*. (2012), who also identified that work-home conflict was related to emotional exhaustion and depersonalization. A later study (Vassos *et al.* 2013) identified that role ambiguity was related to all three measures of burnout and engagement, and was the strongest predictor of personal accomplishment.

Similar to the relationship between staff support and burnout, those who report satisfaction with the supervision levels provided to them also report higher levels of role clarity and job satisfaction and lower levels of intended turnover (Mascha 2007). Role clarity was also positively related to job satisfaction and negatively related to intended turnover. Figueiredo-Ferraz *et al.* (2012) found that role clarity and social support at work can play a role in preventing 'mobbing' (i.e. interpersonal aggression between workers) while role ambiguity may encourage it. Mobbing was found to be related to negative employee health outcomes and of intended absenteeism. The long-term negative impact of mobbing on the depressive symptoms among such workers was also indicated in a longitudinal study (Figueiredo-Ferraz *et al.* 2015). Kozak *et al.* (2013) reported that job insecurity and role conflict were predictive of personal levels of burnout, a finding replicated by Robertson *et al.* (2015).

Direct care workers versus supervisors

Edwards and Miltenberger (1991) found greater levels of emotional exhaustion and reduced personal accomplishment among supervisors compared to direct care workers in community residential setting, while Alexander and Hegarty (2000) also found higher stress levels among senior staff members compared to direct care workers in a community home. For day care workers, issues included a shortage of staff, medical

problems, shift work, morale, team issues, and the feeling that they were 'always on'. For senior staff stressors were demands, bad attitude, medical administration, staff issues, autonomy, and demands from others. Colleagues were the reported main source of support. Similarly Rose *et al.* (2000) found that managers experienced more pressure and anxiety, had less support, and reported more sources of stress than direct care workers in group homes for persons with intellectual disability. Responsibility and relationships with others was found to be more of an issue for managers than direct care workers. In contrast Ito *et al.* (1999), through their national survey of intellectual disability workers in Japan, found that burnout higher among direct care staff compared to facility director or middle managers.

Setting

A limited number of studies compared staff stress and well-being across different care settings, with some evidence to indicate poorer staff outcomes in residential and institutional settings. Aitken and Schloss (1994), for example found that stress levels among staff were higher in an institutional setting compared to community setting, while Chung and Corbett (1998) reported that intellectual disability nurses in hospital-based units experienced more severe challenging behavior, complained more, were less satisfied with pay, engaged in less client contact, were more likely to feel their training was inadequate, and experienced more emotional exhaustion and depersonalization than those based in community units. Regression analysis indicated however that this may be due more to management issues rather than client issues; a replication of a previous finding made by the authors in an earlier pilot study (Chung *et al.* 1996). Rose (1993) found that levels of occupational stress and strain were significantly higher in hospital and group home staff compared to those working in a community unit setting, though a later study (Rose *et al.* 1994) found no difference in reported stress between group and community unit staff. Howard *et al.* (2009) found that staff in medium-secure services was exposed to more violence than staff in community services, though staff in the medium security facility had a lower fear of violence and higher self-efficacy for managing difficult behavior. Blumenthal *et al.*(1999) found that charity staff were more likely to view their organization positively and rated their emotional exhaustion as significantly lower than NHS trust staff in disability services. Lernihan and Sweeney (2010) found that residential staff experienced significantly levels of emotional exhaustion than day staff working with clients with learning and communication disabilities.

Individual differences and stress

There is some (mixed) evidence that gender is related to stress. Kozak et al. (2013) found that females had higher levels of stress, though Vassos *et al.* (2012) reported that males were more stressed and Kowalski *et al.* (2010) reported that male staff were four times more likely to be at risk of emotional exhaustion. This study also highlighted that workers aged between 30–39 experienced higher levels of burnout than younger staff, while Hatton et al. (1999) found that older age was related to higher levels of work stress. Vassos and Nankervis (2012) found that full-time workers experienced more burnout than part-time workers, though Devereux *et al.* (2009a) reported that part-time workers scored lower on personal accomplishment. Lin *et al.* (2009) found native workers in a Taiwanese institution for persons with intellectual disability experienced greater burnout compared to foreign workers. Finally Shaddock *et al.* (1998) found that burnout scores were related to demographic variables (e.g. practice of religion was associated with low burnout scores) and some features of the work situation (e.g. job satisfaction and lower burnout).

There is some evidence that personality is a factor in the experience of stress and burnout in this sector (Suls and Martin 2005). Rose *et al.* (2003) found that higher neuroticism and lower extraversion were related to poorer psychological well-being among intellectual disability workers. Higher neuroticism was linked to poorer well-being in the case of high job demands. Chung and Harding (2009) found that high neuroticism predicted high levels of emotional exhaustion and lower personal accomplishment, with the converse found for extraversion. Higher conscientiousness predicted higher levels of depersonalization (this was moderated by agreeableness) while neuroticism and extraversion moderated the relationship between challenging behavior and personal accomplishment. Finally, Lundström *et al.* (2007) found that personality dimensions of harm avoidance and self-directedness (e.g. pessimism, worrying, shyness, fatigue, irresponsibility and ill-discipline, and a lack of impulsive control) were related to burnout, tedium, emotional exhaustion, and depersonalization among intellectual disability care workers.

Positive aspects of intellectual disability care work

An important finding that also emerged from this review was that staff engaged in intellectual disability care work report both positive and negative aspects of their professional practice (Hastings and Horne, 2004), including the development of new skills and abilities by clients; the achievement of developmental milestones, and the expression of appreciation from clients, their families, and their organization (Mascha 2007). Lunsky *et al.* (2014) for example found that positive work motivation was associated with high levels of personal accomplishment and both positive and negative aspects of working life in this sector should be considered.

Positive aspects of intellectual disability care work may have an important role in enabling workers to balance of buffer against the negative aspects of their workplace.

Rose *et al.*(2000) found that managers in a group home setting experienced greater job satisfaction than direct care workers despite reporting greater pressure and anxiety, and more sources of stress. Indeed intellectual disability care workers may experience high levels of job satisfaction and work-related stress simultaneously (Leyin and Wakerly 2007). For example, Ineland *et al.* explored sources of job satisfaction among Swedish care workers through quantitative and qualitative analysis of survey data. Content analysis of open-ended data (reported in Sauer 2017) highlighted the concept of plurality - although the majority of staff experienced a heavy workload and psychological strain, they also experienced high job satisfaction.

Hickey (2014) suggests that prosocial motivation (i.e. altruistic behavior) may moderate or buffer against job stress and burnout among direct care workers. It was identified that depersonalization was lower for staff with high levels of prosocial (altruistic) motivation and especially so in cases where staff had high levels of emotional exhaustion. Finally, Judd *et al.* (2017) investigated perceptions of both challenging and enjoyable aspects of care work through a smaller qualitative study with direct care workers. Among the rewards of such work reported by staff were seeing clients develop new skills and express an appreciation for the work of staff. The theme of 'balance' was also identified by the study authors, in which staff experience periods of imbalance when the positive aspects of the job are outweighed by the negative aspects of their work (i.e. the emotionally and physically draining aspects of their work, including challenging client behavior, earning a low income, and having limited power to make decisions).

Conclusion

The results of this scoping review highlight that a complex and varied literature has emerged from this field over the past two decades. With regard to efforts to protecting the well-being of staff in the sector, we draw three key conclusion from these results. Firstly, while it is clear that exposure to challenging behavior is a notable source of stress for those engaged in work with people with intellectual disability, several mediating variables have also been identified. Indeed negative staff reactions (such as 'fear of assault'); low self-efficacy for managing challenging behaviors; the severity of such behavior; and staff understanding of the causes of challenging behaviors are all significant here. The necessity of delivering effective training for staff in the analysis and management of challenging behavior is therefore further evidenced by this review and would therefore appear to be an essential stress mitigation skill for staff in the sector. Similarly, inequality in the relationships between staff and their clients, their colleagues, and their organization appears to exert a significant impact on the stress and well-being of workers in this sector. Clearly there is a need to identify ways in which reciprocity in such relationships can be maintained or restored.

Secondly, enabling direct care workers to identifying maladaptive coping styles (such as wishful thinking) and replace them with more appropriate and effective strategies may also be a valuable avenue of support. Finally, it is also clear that excessive workplace demands, a low level control and a lack of support have been shown to be related to higher levels of stress and burnout among intellectual disability care workers. This is supportive of the central premise of the Job Demand-Control Model (Karasek 1979).While such work may be inherently demanding and challenging, there is certainly much that may be done to provide workers with increased flexibility and latitude in the workplace (if desired); as well as appropriate levels of support from managers and colleagues. Regular feedback from supervisors and colleagues, for example. may contribute to reduced burnout (Kozak *et al.* 2013). This is also the case with role issues such as conflict and ambiguity at work, which is perhaps a neglected area when it comes to the management of the work-related stress experienced by direct care workers in the intellectual disability field. Promoting congruence of 'fit' between the attitudes and aims of staff and their organization is predictive of the levels of perceived stress and job satisfaction such workers experience and the likelihood of them leaving their position.

In addition, there is some evidence to suggest that those who work in secure residential or institutional settings experience more stress and burnout than those in community settings. The impact of individual difference variables such as gender and age are less clear, however, as the evidence base is more limited and at times conflicted. While additional research may provide more definite conclusions, it is unclear at present how this may actually impact the management of stressor issues.

In line with the framework for the conduct of the scoping review articulated by Arksey and O'Malley (2005), which argues that weight should not be given to certain studies or designs in the overall findings, this review did not seek to assess the quality of the included research. However it is important to acknowledge that much of the research reviewed here was correlational in nature and that there are limitations to such designs (e.g. Grimes and Schulz 2002). Correlational research explores relationships between variables at specific point in time and cannot provide an indication of the

causal direction of such relationships. In addition to quality of data obtained from survey research can be undermined by an unrepresentative sample and demand characteristics.

Finally it is worthy to note the international aspect of this reviewed literature. Though most of the included studies (50%) were conducted in the United Kingdom, several were also conducted in Australia (11.8%), and the USA (10.5%), as well as Spain, Canada, Sweden, South Africa, Germany, Greece, Ireland, and Israel, while national studies have also been conducted in Japan and Taiwan. This diversity of countries reflects the fact that professional care work for persons with intellectual disabilities is a global profession. It also demonstrates that the occupational stress and strain experienced by such workers is an internationally experienced issue in the sector and not culturally specific. Protecting the well-being of workers in the intellectual disabled care sector is important if they are to provide quality care and support to service users. From a staff retention point of view, it should be a significant priority for health and social care policy makers and for service provider organizations.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This article was funded through the Waterford Institute of Technology Postgraduate Scholarship Fund.

ORCID

Cathal Ryan http://orcid.org/0000-0003-0813-1139
John S.G. Wells http://orcid.org/0000-0002-9560-8945

References

Adams, J. S. 1965. Inequity in social exchange. In: *Advances in experimental social psychology*. Academic Press Inc, Vol. 2, pp. 267–299.

Aitken, C. J. and Schloss, J. A. 1994. Occupational stress and burnout amongst staff working with people with an intellectual disability. *Behavioural Interventions*, *9*, 225–234.

Alexander, M. and Hegarty, J. R. 2000. Measuring staff burnout in a community home. *The British Journal of Development Disabilities*, *46*, 51–62.

Arksey, H. and O'Malley, L. 2005. Scoping studies: towards a methodological framework. *International journal of social research methodology*, 8, 19–32.

Bailey, B. A., Hare, D. J., Hatton, C. and Limb, K. 2006. The response to challenging behaviour by care staff: emotional responses, attributions of cause and observations of practice. *Journal of Intellectual Disability Research*, 50,199–211.

Blumenthal, S., Lavender, T. and Hewson, S. 1999.. Role clarity, perception of the organization and burnout amongst support workers in residential homes for people with intellectual disability: a comparison between a National Health Service trust and a charitable company. *Occupational Health and Industrial Medicine*, 1, 28.

Bromley, J. and Emerson, E. 1995. Beliefs and emotional reactions of care staff working with people with challenging behaviour. *Journal of Intellectual Disability Research*, *39*, 341–352.

Chung, M. C., Corbett, J. and Cumella, S. 1996. Relating staff burnout to clients with challenging behaviour in people with a learning difficulty: pilot study 2. *European Journal of Psychiatry*, 10, 155–166.

Chung, M. C. and Corbett, J. 1998. The burnout of nursing staff working with challenging behaviour clients in hospital-based bungalows and a community unit. *International Journal of Nursing Studies*, *35*, 56–64.

Chung, M. C. and Harding, C. 2009. Investigating burnout and psychological well-being of staff working with people with intellectual disabilities and challenging behaviour: the role of personality. *Journal of Applied Research in Intellectual Disabilities*, *22*, 549–560.

Conradie, M., Erwee, D., Serfontein, I., Visser, M., Calitz, F. J. and Joubert, G. 2017. A profile of perceived stress factors among nursing staff working with intellectually disabled in-patients at the Free State Psychiatric Complex, South Africa. *Curationis*, *40*(1), 1–8.

Corrigan, P. W. 1993. Staff stressors at a developmental center and state hospital. *Mental Retardation*, *31*, 234.

Dagnan, D., Trower, P. and Smith, R.1998. Care staff responses to people with learning disabilities and challenging behaviour: a cognitive—emotional analysis. *British Journal of Clinical Psychology*, *37*, 59–68.

Daudt, H. M., van Mossel, C. and Scott, S. J. 2013. Enhancing the scoping study methodology: a large, inter-professional team's experience with Arksey and O'Malley's framework. *BMC medical research methodology*, *13*, 48.

Devereux, J. M., Hastings, R. P., Noone, S. J., Firth, A. and Totsika, V. 2009a. Social support and coping as mediators or moderators of the impact of work stressors on burnout in intellectual disability support staff. *Research in developmental disabilities*, *30*, 367–377.

Devereux, J., Hastings, R. and Noone, S. 2009b. Staff stress and burnout in intellectual disability services: work stress theory and its application. *Journal of Applied Research in Intellectual Disabilities*, *22*, 561–573.

Dilworth, J. A., Phillips, N. and Rose, J. 2011. Factors relating to staff attributions of control over challenging behaviour. *Journal of Applied Research in Intellectual Disabilities*, *24*, 29–38.

Disley, P., Hatton, C., & Dagnan, D. (2009). Applying equity theory to staff working with individuals with intellectual disabilities. *Journal of Intellectual and Developmental Disability*, *34*, 55–66.

Dyer, S. and Quine, L. (1998). Predictors of job satisfaction and burnout among the direct care staff of a community learning disability service. *Journal of Applied Research in Intellectual Disabilities*, *11*, 320–332.

Edwards, P. and Miltenberger, R. (1991). Burnout among staff members at community residential facilities for persons with mental retardation. *Mental Retardation.29(3), 125 –128.*

Elliott, J. L., & Rose, J. (1997). An investigation of stress experienced by managers of community homes for people with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, *10*, 48–53.

Figueiredo-Ferraz, H., Gil-Monte, P. R., Grau-Alberola, E., Llorca-Pellicer, M., & García-Juesas, J. A. (2012). Influence of some psychosocial factors on mobbing and its consequences among employees working with people with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, *25*, 455–463.

Figueiredo-Ferraz, H., Gil-Monte, P. R., & Olivares-Faúndez, V. E. (2015). Influence of mobbing (workplace bullying) on depressive symptoms: a longitudinal study among employees working with people with intellectual disabilities. *Journal of intellectual disability research*, *59*, 39–47.

Freeman, M. (1994). The differential impact on carers dealing with clients with challenging behaviours. *Journal of community & applied social psychology*, *4*, 181–187.

Ford, J., & Honnor, J. (2000). Job satisfaction of community residential staff serving individuals with severe intellectual disabilities. *Journal of Intellectual and Developmental Disability*, *25*, 343–362.

Gil-Monte, P. R. (2012). The influence of guilt on the relationship between burnout and depression. *European Psychologist*, *17*, 231–236.

Gingi, P. (2012). *Factors associated with the psychological response of nurses' victims of inpatients violence in a psychiatric facility*

for adults with intellectual disability In Cape Town. PhD. University of the Western Cape.
Gray-Stanley, J. A., & Muramatsu, N. (2011). Work stress, burnout, and social and personal resources among direct care workers. *Research in developmental disabilities*, *32*, 1065–1074.
Gray, J. A., & Muramatsu, N. (2013). When the job has lost its appeal: intentions to quit among direct care workers. *Journal of Intellectual and Developmental Disability*, *38*, 124–133.
Grimes, D. A., & Schulz, K. F. (2002). Descriptive studies: what they can and cannot do. *The Lancet*, *359*, 145–149.
Harries, J., Ng, K. Y. Y., Wilson, L., Kirby, N., & Ford, J. (2015). Evaluation of the work safety and psychosocial wellbeing of disability support workers. *The Australasian Journal of Organisational Psychology*, *8, E9*.
Harris, P., & Rose, J. (2002). Measuring staff support in services for people with intellectual disability: the Staff Support and Satisfaction Questionnaire, Version 2. *Journal of intellectual disability research*, *46*(2), 151–157.
Hastings, R. P. (2002). Do challenging behaviors affect staff psychological well-being? Issues of causality and mechanism. *American Journal on Mental Retardation*, *107*, 455–467.
Hastings, R., and Horne, S. (2004). Positive perceptions held by support staff in community mental retardation services. *American Journal on Mental Retardation*, *109*(1), 53–62.
Hatton, C., & Emerson, E. (1993). Organizational predictors of perceived staff stress, satisfaction, and intended turnover in a service for people with multiple disabilities. *Mental retardation*, *31*, 388.
Hatton, C., Brown, R., Caine, A., & Emerson, E. (1995). Stressors, coping strategies and stress-related outcomes among direct care staff in staffed houses for people with learning disabilities. *Mental Handicap Research*, *8*, 252–271.
Hatton, C., Emerson, E., Rivers, M., Mason, H., Mason, L., Swarbrick, R., & Alborz, A. (1999). Factors associated with staff stress and work satisfaction in services for people with intellectual disability. *Journal of Intellectual Disability Research*, *43*, 253–267.
Hatton, C., Emerson, E., Rivers, M., Mason, H., Swarbrick, R., Mason, L., & Alborz, A. (2001). Factors associated with intended staff turnover and job search behaviour in services for people with intellectual disability. *Journal of Intellectual Disability Research*, *45*, 258–270.
Hensel, J. M., Lunsky, Y., & Dewa, C. S. (2012). Exposure to client aggression and burnout among community staff who support adults with intellectual disabilities in Ontario, Canada. *Journal of Intellectual Disability Research*, 56, 910–915.
Hensel, J. M., Lunsky, Y., & Dewa, C. S. (2014). The mediating effect of severity of client aggression on burnout between hospital inpatient and community residential staff who support adults with intellectual disabilities. *Journal of clinical nursing*, *23*, 1332–1341.
Hickey, R. (2014). Prosocial motivation, stress and burnout among direct support workers. *Journal of Applied Research in Intellectual Disabilities*, *27*, 134–144.
Howard, R., & Hegarty, J. R. (2003). Violent incidents and staff stress. *The British Journal of Development Disabilities*, *49*, 3–21.
Howard, R., Rose, J., & Levenson, V. (2009). The psychological impact of violence on staff working with adults with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, 22, 538–548.
Hussein, S. (2017). The English social care workforce: the vexed question of low wages and stress. In: *The Routledge Handbook of Social Care Work Around the World*. London: Routledge. Vol. 43, 421–430.
Ineland, J., Molin, M., & Sauer, L. (2018). Handling plurality and dealing with difficult work experiences. A comparative study of human service professionals' work with individuals with intellectual disabilities. *Journal of Policy and Practice in Intellectual Disabilities*, 15, 36–42.
Innstrand, S. T., Espnes, G. A., & Mykletun, R. (2004). Job stress, burnout and job satisfaction: an intervention study for staff working with people with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, *17*, 119–126.
Ito, H., Kurita, H., & Shiiya, J. (1999). Burnout among direct-care staff members of facilities for persons with mental retardation in Japan. *Mental Retardation*, *37*, 477–481.
Jenkins, R., Rose, J., & Lovell, C. (1997). Psychological well-being of staff working with people who have challenging behaviour. *Journal of Intellectual Disability Research*, *41*(6), 502–511.
Judd, M. J., Dorozenko, K. P., & Breen, L. J. (2017). Workplace stress, burnout and coping: a qualitative study of the experiences of Australian disability support workers. *Health & social care in the community*, *25*, 1109–1117.
Karasek Jr., R. A. (1979). Job demands, job decision latitude, and mental strain: implications for job redesign. *Administrative science quarterly*, *24*(2):285–308.
Kile, A. C. (2014). *Relationship among relational coping and reciprocity in direct care staffing services for adults with developmental disabilities and challenging behavior*. PhD. Fielding Graduate University.
Ko, C., Lunsky, Y., Hensel, J., & Dewa, C. S. (2012). Burnout among summer camp staff supporting people with intellectual disability and aggression. *Intellectual and developmental disabilities*, *50*, 479–485.
Koritsas, S., Iacono, T., Carling-Jenkins, R., & Chan, J. (2010). *Exposure to challenging behaviour and support worker/house supervisor well-being*. Melbourne: The Centre for Developmental Disability Health Victoria.
Kowalski, C., Driller, E., Ernstmann, N., Alich, S., Karbach, U., Ommen, O., Schulz-Nieswandt F, and Pfaff, H. (2010). Associations between emotional exhaustion, social capital, workload, and latitude in decision-making among professionals working with people with disabilities. *Research in developmental disabilities*, *31*, 470–479.
Kozak, A., Kersten, M., Schillmöller, Z., & Nienhaus, A. (2013). Psychosocial work-related predictors and consequences of personal burnout among staff working with people with intellectual disabilities. *Research in developmental disabilities*, *34*, 102–115.
Kurz, A. S., Bethay, J. S., & Ladner-Graham, J. M. (2014). Mediating the relation between workplace stressors and distress in ID support staff: comparison between the roles of psychological inflexibility and coping styles. *Research in developmental disabilities*, *35*, 2359–2370.
Lahana, E., Papadopoulou, K., Roumeliotou, O., Tsounis, A., Sarafis, P., & Niakas, D. (2017). Burnout among nurses working in social welfare centers for the disabled. *BMC nursing*, *16*, 15.
Langdon, P. E., Yágüez, L., & Kuipers, E. (2007). Staff working with people who have intellectual disabilities within secure hospitals: expressed emotion and its relationship to burnout, stress and coping. *Journal of Intellectual Disabilities*, *11*, 343–357.
Lee, T. N., Lin, J. D., Yen, C. F., Loh, C. H., Hsu, S. W., Tang, C. C., Wu J.L., Fang W.H. and Chu, C. M. (2009). Extrinsic high-effort and low-reward conditions at work among institutional staff caring for people with intellectual disabilities in Taiwan. *Research in developmental disabilities*, 30, 284–293.
Lernihan, E., & Sweeney, J. (2010). Measuring levels of burnout among care workers. *Learning Disability Practice (through 2013)*, *13*, 27.
Leyin, A., & Wakerly, E. (2007). Staff support, staff stress and job satisfaction in working with people with learning disabilities and challenging behaviours. *Tizard Learning Disability Review*, *12*, 31–41.
Lin, J. D., Lee, T. N., Yen, C. F., Loh, C. H., Hsu, S. W., Wu, J. L., & Chu, C. M. (2009). Job strain and determinants in staff working in institutions for people with intellectual disabilities in Taiwan: a test of the job demand-control-support model. *Research in Developmental Disabilities*, *30*, 146–157.
Lundström, M., Graneheim, U. H., Eisemann, M., Richter, J., & Åström, S. (2007a). Personality impact on experiences of strain among staff exposed to violence in care of people with intellectual disabilities. *Journal of Policy and Practice in Intellectual Disabilities*, *4*, 30–39.
Lundström, M., Saveman, B. I., Eisemann, M., & Åström, S. (2007b). Prevalence of violence and its relation to caregivers' demographics and emotional reactions–an explorative study of caregivers working in group homes for persons with learning disabilities. *Scandinavian Journal of Caring Sciences*, *21*, 84–90.
Lunsky, Y., Hastings, R. P., Hensel, J., Arenovich, T., & Dewa, C. S. (2014). Perceptions of positive contributions and burnout in community developmental disability workers. *Intellectual and developmental disabilities*, *52*, 249–257.
Maslach, C., Jackson, S. E., Leiter, M. P., Schaufeli, W. B., & Schwab, R. L. (1986). *Maslach burnout inventory*. Vol. *21*.Palo Alto, CA: Consulting Psychologists Press. pp. 3463–3464.
Mascha, K. (2007). Staff morale in day care centres for adults with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, 20, 191–199.
Mills, S., & Rose, J. (2011). The relationship between challenging behaviour, burnout and cognitive variables in staff working with people who have intellectual disabilities. *Journal of Intellectual Disability Research*, *55*, 844–857.

Mitchell, G., & Hastings, R. P. (2001). Coping, burnout, and emotion in staff working in community services for people with challenging behaviors. *American Journal on Mental Retardation*, *106*, 448–459.

Mutkins, E., Brown, R. F., & Thorsteinsson, E. B. (2011). Stress, depression, workplace and social supports and burnout in intellectual disability support staff. *Journal of Intellectual Disability Research*, *55*, 500–510.

Outar, C., & Rose, J. (2017). Is there a relationship between role identity, work demands, and burnout in direct care staff working with individuals with intellectual disability? *Journal of Intellectual & Developmental Disability*, *42*, 123–130.

Phillips, N., & Rose, J. (2010). Predicting placement breakdown: individual and environmental factors associated with the success or failure of community residential placements for adults with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, 23, 201–213.

Raczka, R. (2005). A focus group enquiry into stress experienced by staff working with people with challenging behaviours. *Journal of Intellectual Disabilities*, 9, 167–177.

Robertson, J., Hatton, C., Felce, D., Meek, A., Carr, D., Knapp, M., Hallam, A., Emerson, E., Pinkney, L., Caesar, M. and Lowe, K. (2005). Staff stress and morale in community-based settings for people with intellectual disabilities and challenging behaviour: a brief report. *Journal of Applied Research in Intellectual Disabilities*, *18*, 271–277.

Rose, J. (1993). Stress and staff in residential settings: the move from hospital to the community. *Mental Handicap Research*, 6, 312–332.

Rose, J. (1997). Stress & stress management among residential care staff. *Tizard Learning Disability Review*, *2*, 8–15.

Rose, J. (1999). Stress and residential staff who work with people who have an intellectual disability: a factor analytic study. *Journal of Intellectual Disability Research*, *43*, 268–278.

Rose, J. (2011). How do staff psychological factors influence outcomes for people with developmental and intellectual disability in residential services? *Current Opinion in Psychiatry*, *24*, 403–407.

Rose, J., Ahuja, A. K., & Jones, C. (2006). Attitudes of direct care staff towards external professionals, team climate and psychological wellbeing: a pilot study. *Journal of Intellectual Disabilities*, *10*, 105–120.

Rose, J. L., & Cleary, A. (2007). Care staff perceptions of challenging behaviour and fear of assault. *Journal of intellectual and developmental disability*, *32*, 153–-161.

Rose, J., David, G., & Jones, C. (2003). Staff who work with people who have intellectual disabilities: the importance of personality. *Journal of Applied Research in Intellectual Disabilities*, *16*, 267–277.

Rose, D., Horne, S., Rose, J. L., & Hastings, R. P. (2004). Negative emotional reactions to challenging behaviour and staff burnout: two replication studies. *Journal of Applied Research in Intellectual Disabilities*, *17*, 219–223.

Rose, J., Jones, C., & Elliott, J. (2000). Differences in stress levels between managers and direct care staff in group homes. *Journal of Applied Research in Intellectual Disabilities*, *13*, 276–282

Rose, J., Jones, F., & Fletcher, B. (1998). Investigating the relationship between stress and worker behaviour. *Journal of Intellectual Disability Research*, *42*(2), 163–172.

Rose, J., Madurai, T., Thomas, K., Duffy, B., & Oyebode, J. (2010). Reciprocity and burnout in direct care staff. *Clinical Psychology & Psychotherapy*, *17*, 455–462.

Rose, J., Mills, S., Silva, D., & Thompson, L. (2013). Client characteristics, organizational variables and burnout in care staff: the mediating role of fear of assault. *Research in developmental disabilities*, *34*, 940–947.

Rose, J., Mullan, E., & Fletcher, B. (1994). An examination of the relationship between staff behaviour and stress levels in residential care. *Mental Handicap Research*, *7*, 312–327.

Rose, D., & Rose, J. (2005). Staff in services for people with intellectual disabilities: the impact of stress on attributions of challenging behaviour. *Journal of Intellectual Disability Research*, *49*, 827–838.

Rose, J., & Schelewa-Davies, D. (1997). The relationship between staff stress and team climate in residential services. *Journal of Learning Disabilities for Nursing, Health, and Social Care*, *1*, 19–-24.

Shaddock, A. J., Hill, M., & Van Limbeek, C. A. H. (1998). Factors associated with burnout in workers in residential facilities for people with an intellectual disability. *Journal of Intellectual and Developmental Disability*, *23*, 309–318.

Shead, J., Scott, H., & Rose, J. (2016). Investigating predictors and moderators of burnout in staff working in services for people with intellectual disabilities: the role of emotional intelligence, exposure to violence, and self-efficacy. *International Journal of Developmental Disabilities*, *62*, 224–233.

Skirrow, P., & Hatton, C. (2007). 'Burnout' amongst direct care workers in services for adults with intellectual disabilities: a systematic review of research findings and initial normative data. *Journal of Applied Research in Intellectual Disabilities*, *20*, 131–144.

Stanley, B., & Standen, P. J. (2000). Carers' attributions for challenging behaviour. *British Journal of Clinical Psychology*, *39*, 157–168.

Stube, J. E. (2016). *The prediction of staff burnout indicators in IDD community services by staff depression, work functioning, and working alliance*. PhD. The Pennsylvania State University.

Smithson-Sims, P. (1996). *Coping and stress: unqualified direct-care staff working with challenging behaviour clients in learning disability residential settings*. PhD.

Smyth, E., Healy, O., & Lydon, S. (2015). An analysis of stress, burnout, and work commitment among disability support staff in the UK. *Research in developmental disabilities*, *47*, 297–305.

Snow, E., Langdon, P. E., & Reynolds, S. (2007). Care staff attributions toward self-injurious behaviour exhibited by adults with intellectual disabilities. *Journal of Intellectual Disabilities*, 11, 47–63.

Suls, J., & Martin, R. (2005). The daily life of the garden-variety neurotic: reactivity, stressor exposure, mood spillover, and maladaptive coping. *Journal of personality*, *73*, 1485–1510.

Tartakovsky, E., Gafter-Shor, A., & Perelman-Hayim, M. (2013). Staff members of community services for people with intellectual disability and severe mental illness: values, attitudes, and burnout. *Research in developmental disabilities*, *34*, 3807–3821.

Thomas, C., & Rose, J. (2010). The relationship between reciprocity and the emotional and behavioural responses of staff. *Journal of Applied Research in Intellectual Disabilities*, *23*, 167–178.

Thompson, L., & Rose, J. (2011). Does organizational climate impact upon burnout in staff who work with people with intellectual disabilities? A systematic review of the literature. *Journal of Intellectual Disabilities*, *15*, 177–193.

Van Dierendonck, D., Schaufeli, W. B., & Buunk, B. P. (1996). Inequity among human service professionals: Measurement and relation to burnout. *Basic and Applied Social Psychology*, *18*(4), 429–451.

Van Dierendonck, D., Schaufeli, W. B., & Buunk, B. P. (2001). Burnout and inequity among human service professionals: a longitudinal study. *Journal of occupational health psychology*, *6*, 43.

Van Yperen, N. W. (1995). Communal orientation and the burnout syndrome among nurses: a replication and extension. *Journal of Applied Social Psychology*, *26*, 338–354.

Van Yperen, N. W., Buunk, B. P., & Schaufeli, W. B. (1992). Communal orientation and the burnout syndrome among nurses 1. *Journal of Applied Social Psychology*, *22*, 173–189.

Vassos, M. V., & Nankervis, K. L. (2012). Investigating the importance of various individual, interpersonal, organisational and demographic variables when predicting job burnout in disability support workers. *Research in Developmental Disabilities*, *33*, 1780–1791.

Vassos, M., Nankervis, K., Skerry, T., & Lante, K. (2013). Work engagement and job burnout within the disability support worker population. *Research in developmental disabilities*, *34*(11), 3884–3895.

Vassos, M., Nankervis, K., Skerry, T., & Lante, K. (2017). Can the job demand-control-(support) model predict disability support worker burnout and work engagement? *Journal of Intellectual & Developmental Disability*, *27*(2):1–11.

Wanless, L. K., & Jahoda, A. (2002). Responses of staff towards people with mild to moderate intellectual disability who behave aggressively: a cognitive emotional analysis. *Journal of Intellectual Disability Research*, *46*, 507–516.

Weiner, B. (1988). Attribution theory and attributional therapy: some theoretical observations and suggestions. *British Journal of Clinical Psychology*, 27, 99–104.

Wells, J., Denny, M., & Cunningham, J. (2011). Work related stress and European policy–a comparative exploration of contextual stressors in the rehabilitation sector in five European countries. *Journal of mental Health*, *20*, 165–173.

White, P., Edwards, N., & Townsend-White, C. (2006). Stress and burnout amongst professional carers of people with intellectual disability: another health inequity. *Current opinion in psychiatry*, *19*, 502–507.

Ageing in the nursing workforce – a global challenge in an Irish context

C. Ryan[1] MSc, BA (Hons), M. Bergin[2] RN, PhD, MMedSc, BSc(Hons), M. White[3] RN, PhD, MBS, MSc & J.S.G. Wells[4] RN, PhD, MSc, BA(Hons), PGDip(ED)

1 PhD Scholar, Lecturer, Department of Nursing and Health Care, School of Health Sciences, **2** Head, Department of Applied Arts, School of Humanities, **4** Head, School of Health Sciences, Waterford Institute of Technology, Waterford, Ireland, **3** Director, Nursing & Midwifery Planning & Development, HSE South, Kilkenny, Ireland

RYAN C., BERGIN M., WHITE M. & WELLS J.S.G. (2018) Ageing in the nursing workforce – a global challenge in an Irish context. *International Nursing Review* **00**, 1–8

Background: The 2008 financial crisis exacerbated an already mounting workforce challenge faced by most health services in the western world, namely the recruitment and retention of qualified nurses.
Aim: This paper examines two additional challenges of relevance to workforce planning in health care, an ageing nursing workforce and reliance upon migrant nurses to solve short-term workforce issues.
Methods: Using Ireland as a case exemplar of these issues, this paper argues that policy makers and service providers should seek not only to address the challenge of retaining trained newly qualified and younger nurses but also focus on supporting older nurses and migrant nurses to remain within the workforce.
Findings: The findings of this paper highlight the need for workforce planners, policy makers and service providers to take account of an ageing nursing workforce and reliance on foreign-trained nurses as a solution to short-term planning difficulties.
Conclusion: Failure to address this need is likely to lead to significant workforce difficulties for health services into the future and undermine current efforts to increase the number and long-term retention of qualified nursing staff.
Implications for Nursing Policy: Policy makers and service providers should focus on the retention of trained older nurses as an important element of workforce planning.

Keywords: Ageing, Health Economics, Health Services Research, Migrant Nurses, Nursing, Nursing Workforce, Nursing Policy, Professional Development, Retention Workforce Issues

Correspondence address: Cathal Ryan, Department of Nursing and Health Care, School of Health Sciences, Bianconi Building, Cork Road Campus, Waterford Institute of Technology, Waterford, Ireland; Tel: 0035351302242; E-mail: cryan@wit.ie.

Funding
This paper was funded through the Waterford Institute of Technology Postgraduate Scholarship Fund.
Conflict of interest
No conflict of interest has been declared by the authors.

Introduction

In 2008, the Irish economy experienced a dramatic and sudden deterioration in its fiscal position consequent of the global economic collapse, necessitating an European Union/International Monetary Fund financial 'bailout' (Wells & White 2014). As a condition of this bailout gross government spending on health care was cut by 16.8% in 2011. Coupled with an employment moratorium in all public services introduced in March 2009, this resource cut contributed to a drop of over 13% in the nursing workforce employed in the public health service in Ireland by 2013, leaving it more reliant on an ageing and aged nurse demographic (Wells & White 2014).

Recent years, however, have seen a recovery in the Irish economy. GDP per capita in the final quarter of 2016 reached €66 639, an increase of just over 50% from the final quarter of 2011 (Central Statistics Office (CSO) 2017a,b). Gradual pay restoration for public sector workers (including nurses) has also commenced accompanied by a lifting of the employment moratorium in relation to the employment of new nurses. These have been coupled with additional measures such as increased pay for student nurses, reductions in compulsory social insurance payments, education bursaries for new nursing recruits and fewer temporary and more permanent contracts of employment for nurses.

These changes are anticipated by the Irish government to boost the recruitment and retention of nurses within the Irish healthcare system (Health Service Executive (HSE) 2016). The reality however is somewhat different. With an ageing nursing workforce (Department of Health, 2017), the continued emigration of Irish nurses and a potential return to high levels of non-EU nurse immigration there are significant workforce challenges on the horizon in the coming years. It is to these issues that we now turn.

The ageing nursing workforce

Although there is limited consensus within the literature with regard to a settled criteria to define 'older' or 'ageing' workers (Feldman et al. 2015), it is clear that a significant proportion of the nursing workforce in Ireland has entered or is approaching the later stages of their professional working careers. Recent data from the Health Service Executive (HSE) – the body charged with the management of the Irish public healthcare system – indicates that nearly 65% of all nurses in the Republic of Ireland are aged over 40 and more than 30% are aged over 50 (Health Service Executive 2017). Furthermore, just over 60% of staff nurses are aged over 40 while nearly a third (28.5%) are over 50. The trend is evident across the wider HSE workforce, of whom nearly 65% are aged over 40, with just 21% under 35 years of age.

The 'greying' of the nursing workforce is not isolated to Ireland and indeed has been an established global trend for some time (Wells & Norman 2009). Thus, the ageing of the nurse workforce in the United States has been identified as a significant issue since 2000 (Buerhaus et al. 2000), where it is currently estimated that 50% of registered nurses are aged over 50. Similarly 37.5% of Australian nurses; 38.9% of Canadian nurses and 22.3% of Japanese nurses are aged over 50, while in the United Kingdom 34.5% of nurses employed by the National Health Service (NHS) are aged between 45 and 54 and 14.3% are aged over 55 (Royal College of Nursing, 2016 Japanese Nursing Association 2017; Canadian Institute for Health Information 2017; Nursing and Midwifery Board of Australia 2017). The lack of significant recruitment of younger people into the nursing profession and the time lag between recruitment and entry into service means that there is an increased need to keep older nurses within the workforce (Wells & White 2014).

As a result of this need, there is a growing body of research outlining the specific challenges faced by older nurses within clinical services (Ryan et al. 2017). Thus, the recognized challenges faced by older nurses in the workplace relate to the physical strain of providing direct patient care in a fast paced environment, which tends to be exacerbated by a high prevalence of musculoskeletal injury, natural physical decline and the requirement to do shift work (Gabrielle et al. 2008; Phillips & Miltner 2015; Fragar & Depczynski 2011). Further reported challenges include a lack of recognition of the skills and experience of the older nurse, inadequate support from colleagues and managers, inter-generational conflict and midlife demands such as home-life responsibilities, caring for elderly relatives and maintaining personal health and well-being (Clendon & Walker 2016; Fitzgerald 2007; Letvak 2002; Mion et al. 2006). Bearing in mind the level of these challenges with associated potential costs in terms of service adaptations, possible sick leave and fall off in efficient delivery of direct patient care the question of the benefit of retention needs to be addressed.

A positive rationale for the retention of older nurses within the workforce

Managing the demands of an ageing nursing workforce is a prominent challenge for public health services globally. Strategies to support and retain older nurses must therefore be incorporated into national workforce planning and workplace well-being polices and initiatives (Armstrong-Stassen & Schlosser 2010; Cohen 2006). There is a need to develop organizations which value the contribution and the well-being of older nurses, highlight greater understanding of their

unique set of needs and provide the requisite training and the interventions to support them at work (Leese et al. 2009). A failure to address this challenge promptly is likely to underpin significant workforce difficulties for health services in the future. Supporting older nurses to remain in the workforce, therefore, should be a key policy priority for three reasons.

Firstly, it should be noted that an ageing nursing workforce is not necessarily a negative phenomenon. Older nurses are skilled, knowledgeable and experienced and as such represent a valuable cohort of the health service workforce (Benner 1982). The traditional scope of practice of the registered nurse has changed significantly in recent years, with registered nurses required to develop and maintain an expert knowledge base, complex decision-making skills and expanded clinical competencies to meet the demands of practice (Iglehart 2013). This is evidenced specifically by the movement towards more advanced practice roles including, for example, 'Clinical Nurse Specialist'; 'Expert Nurses'; 'Advanced Nurse Practitioner' and 'Nurse Consultant' (Fairman et al. 2011). Within the context of an ageing nursing workforce in Ireland, for example, this is significant as nearly one-third of Nurse Managers and Nurse Specialists respectively are aged over 50 (Health Service Executive 2017). The retirement of such highly skilled and experienced workers represents a significant loss to an already under-resourced public health service (Wells & White 2014).

Secondly, like many Westernized countries, the population of Ireland is ageing rapidly. The proportion of the population aged over 60 increased from 15.3% in 2006 to 18.4% in 2016 and is projected to increase to 23% by 2026 (Central Statistics Office, 2016). As such, there is likely to be an increased demand for health and social care services to meet the needs of an older population. Retaining older nurses will be essential to avoid a nursing shortage, maintain a necessary balance of skills and experience in the workforce and protect patient safety (Palese & Watson 2014). Indeed, bearing in mind the investment costs associated with training nurse's retention of older nurses becomes an essential outcome in terms of justification of the training investment (Li & Jones, 2013; Roche et al., 2015).

Thirdly, most OECD (Organisation for Economic Co-operation and Development) countries are raising their minimum age for retirement. The number of OECD countries with an age of retirement of over 65 is set to nearly double by 2054 (OECD, 2015). Furthermore, the normal retirement age for new entrants to the workforce in 2014 is anticipated to increase on average by between 1.5 and 2.3 years from its current point (OECD 2015), while in over half of OECD countries, this increase will be an average of 3 years. Within an Irish context, though a statutory mandatory age for retirement only applies to certain public sector occupations, the age at which workers are eligible for a state pension will increase to 67 years in 2021 and 68 years by 2028 (McKay 2013). Thus, in the light of these three factors, supporting and retaining older nurses in the health service clearly assumes an additional importance.

Approaches to the retention of the older nurse

Increasing evidence points to the value of multi-faceted efforts, incorporating a combination of financial, social and health-related factors, to support and retain older nurses at work (Dietrich Leurer et al. 2007; Rosenfeld 2007; Storey et al. 2009). Indeed, financial factors are often the key determinant of older nurses' decision to leave the workplace (Duffield et al. 2015) and pay and pension reform which reward older nurses identified as significant incentives to remain at work (Andrews et al. 2005). However, the fragility of economic recovery in countries such as Ireland (and the economic uncertainty engendered by the UK Brexit) underpinned by complex public service pay agreements (Work Relations Commission 2017); under-funded public health services and highly scrutinized health service recruitment (Health Service Executive 2016) would suggest that the potential for such incentivizing fiscal reform is in reality limited.

In the short-term retention strategies which emphasise the psychosocial well-being of older nurses may perhaps be more feasible (Ryan et al. 2017; Twigg & McCullough 2014). Such efforts can focus on recognizing the achievements and expertise of older nurses (Cohen 2006; Letvak 2002), providing greater autonomy (through more empowered, expanded or flexible roles), limiting the negative impact of shift work and providing more ergonomically amenable workplaces (Duffield et al. 2015; Kirgan & Golembeski 2010; Storey et al. 2009). In addition, managers should seek to develop and implement personal development plans that are flexible tailored to the individual nurse, particularly with regard to further education and training opportunities (Andrews et al. 2005; Armstrong-Stassen et al. 2014; Mion et al. 2006; Moseley et al. 2008).

The 'Drift-Away' generation

Compounding the challenge of building a sustainable and efficient health services in a number of countries is the sustained failure of such services to recruit and retain adequate numbers of younger graduate nurses (Wells & Norman 2009; Wells & White 2014). In Ireland, the introduction of the employment moratorium, in which no new graduate nurses were actively recruited over a six year period from 2009 to 2015, was preceded by a period of sustained emigration of

Irish nurses from 2000 to 2010. While recruitment campaigns seeking to attract nurses and midwives working in the United Kingdom and further afield to return to work in Ireland have been launched in the last two years, their success has been limited. For example, the recent 'Bring Them Home' campaign launched by the HSE in July 2015, which offered a relocation package (including tax-free relocation expenses, funded post graduate education and credit for gained experience) recruited just 88 nurses to date. Although the domestic career pathways pursued by Irish trained nurses are largely unknown, data from the Nursing and Midwifery Board of Ireland (NMBI) indicates that high levels of nurse emigration continued through and beyond this moratorium period.

Verification figures (i.e. the number of requests from nurses in Ireland for a 'Certificate of Current Professional Status' from NMBI to register abroad) have remained consistently high since 2000 to 2017, peaking at 5623 in 2008 (see Fig. 1). Although these requests only signify the intentions of nurses and midwives to travel abroad, the number of verification requests regularly exceed Ireland's current annual training capacity of 1570 undergraduate pre-registration training places. Further evidence is provided by a series of Irish Nursing and Midwifery Organisation (INMO) surveys, the most recent of which indicates that 78.1% of graduate nurses were considering emigrating; unsatisfactory pay, staffing levels and working conditions were identified as the major reasons for leaving the Irish public health service (Irish Nurses and Midwifery Organisation 2017).

Among the popular destinations for Irish nurses are Australia and the United Kingdom, followed by Canada, the United States and other EU countries. The impact of 'Brexit' (that is the UK's withdrawal from the European Union) on the attractiveness of the UK as a destination for Irish nursing graduates is difficult to ascertain, particularly as Brexit has yet to actually happen at the time of writing. Requests made by Irish nurses to register with the UK's Nursing and Midwifery Council have fallen consistently in recent years, from 963 in 2013 to just 480 in 2016 (Nursing and Midwifery Council, 2017). Nevertheless, the challenges facing Ireland as are even more pronounced in the United Kingdom. A current NHS nursing shortage of almost 24,000 is likely to be exacerbated by 'Brexit' as indicated by a 96% drop in the number of applications from EU nurses to register there, in a context in which over half of the current NHS workforce will be eligible to retire in 2020 (McKee 2018; Moore 2017). In addition, a drop of over 25% in applications from British students to train as nurses has been attributed to the abolition of NHS nursing bursaries (Orr 2017) thereby further exacerbating what is already a workforce crisis.

Non-EU nurse immigration – the solution of choice?

Nursing is a global profession of which international migration has become a fundamental feature (Wells & Norman 2009). Recent figures indicate that across the OECD '23' foreign-trained nurses comprise on average 5.9% of the nursing workforce, rising to 6% and 7.5% in the United States and Canada, respectively; 12.7% in the United Kingdom; 16% in Australia and 24.3% in New Zealand (OECD, 2015).

A reliance on foreign-trained nurses (and in particular those from a non-EU background) was very much characteristic of public health service recruitment in Ireland from the beginning of 2000, with 35% of new recruits in the health service from the years 2000-2010 comprising nurses trained in non-EU countries (Humphries et al. 2012). The viability of this reliance, which was very much the solution of choice for short-term planning issues, imploded with the advent of the economic crash in 2008. Verification figures indicate that

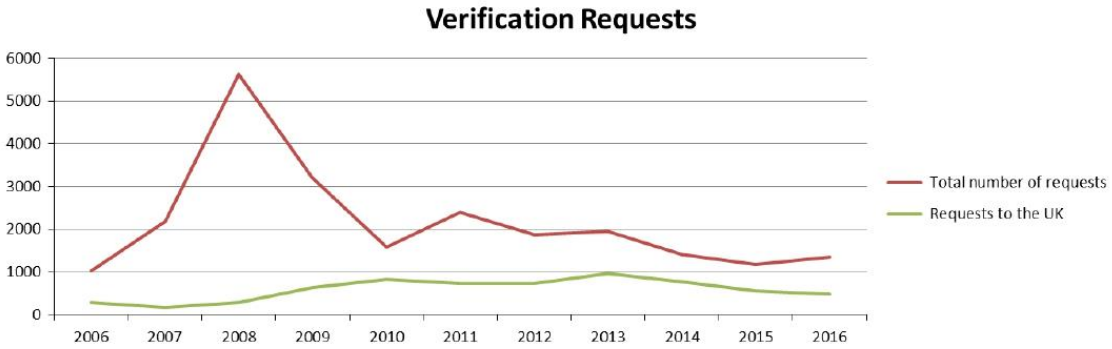


Fig. 1 Verification requests to Nursing and Midwifery Board of Ireland for Certificate of Current Professional Status.

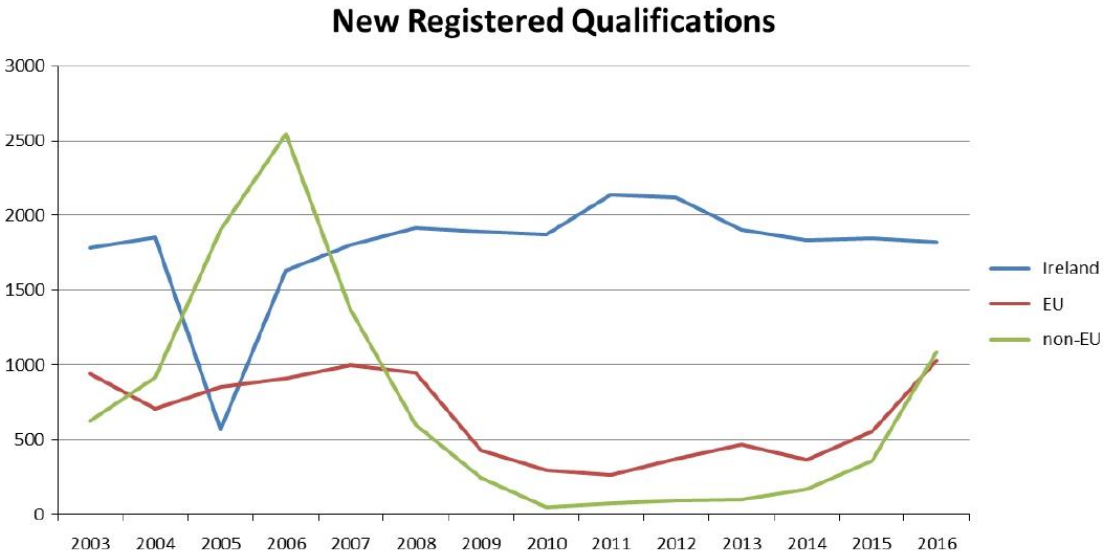


Fig. 2 New registrations of foreign nurse in Ireland.

approximately 29% of nurses who entered Ireland to work from 2000 to 2008 then applied to leave from 2008 to 2010 (An Bord Altranais, 2011). The number of foreign nurses registering with NMBI to work in the Republic of Ireland subsequently collapsed to between just 70 and 90 nurses a year from 2010 to 2013 (Fig. 2).

As remarkable however is the recovery in non-EU foreign recruitment that has occurred with the 1000% increase in the number of newly registered non-EU trained nurses in Ireland from 2013 to 2016. This sudden jump suggests that Ireland has re-assumed its reliance on foreign-trained registered nurses and midwives. It is likely that non-EU nurses will re-establish their position as a sizable and significant cohort of nurses in the public health service in Ireland and contribute a major part of the nursing workforce recovery. These figures also reflect national trends in immigration, which peaked at 151 000 in 2007, decreased to just 41 800 in 2010 and has since steadily risen to 69 300 in 2015 (Central Statistics Office, 2016). The 'new' need for nurse immigration is evidenced by the fact the nursing and midwifery professions are identified as 'Highly Skilled' occupations eligible for special employment permits in Ireland (Department of Justice, 2017).

Implications for nursing and health policy

Non-EU nurse emigration from Ireland during the economic crash is evidence that it cannot be guaranteed that foreign-trained nurses will remain in Ireland long-term; thus, their recruitment cannot be considered a comprehensive solution to short-term human resource difficulties. The challenge lies therefore in retaining these nurses in the workforce; a challenge that is made notably more difficult by the lack of data as these relate to the experiences of these nurses once they enter the health service. Intensive recruitment of foreign nurses also raises the question of cultural competency and ensuring that healthcare professionals possess the ability to provide direct patient care within a health service that may embody very different social norms, rules or expectations to that in which they previously practiced (Wells & Norman 2009).

The available literature on the experiences of migrant nurses in Ireland reveals that they face challenges relating to their perceived ability to provide quality care, loneliness and insufficient pay and poor working conditions (Humphries et al. 2012). Migrant nurses also need for time to adapt to different working and cultural practices and to build their confidence and resilience at work (Cummins 2009). Gender issues are also factor, with female migrant workers potentially encountering the 'double burden' of racist and sexist discrimination and difficulties with maintaining a work-life balance or separation from family (Pillinger 2006). Other issues include difficulties with accessing to further education and training and promotion prospects (Migrant Rights Council of

Ireland 2012). Such findings were identified more broadly through an integrative review of the literature (Kawi & Xu 2009) which highlighted inequality, communication issues, cultural differences, a lack of support, inadequate orientation and differences in orientation as the key barriers to adjustment encountered by international nurses.

Some significant advances have been made in addressing some of these issues, such as the Employment Permits Amendment Act 2014 (Department of Justice, 2017). An increased number of national and independent organizations, such as the Immigrant Council of Ireland, now advocate on behalf of migrant workers in Ireland. Of further note is the introduction of initiatives such as that launched by the Department of Social Protection in January 2017, which enables EU and non-EU workers to return home and still receive maternity benefit for up to 6 weeks and paternity benefit for 2 weeks. Initiatives such as these are likely to be significant in improving the retention of foreign-trained nurses in Ireland. As with older nurses (indeed these groups may not be mutually exclusive), such nurses will be integral to preventing further staff shortages and maintaining a sufficient balance of skills and experience in the workforce in the coming years.

Conclusion

The challenges of retaining older nurses and migrant nurses in the public health service are not specific to Ireland but rather are reflective of international trends. The struggle for Ireland to develop a more self-sufficient nursing workforce is likely to persist until issues relating to under-resourcing and inadequate pay and working conditions are addressed. The findings of this paper highlight the need for workforce planners, policy makers and service providers to take account of an ageing nursing workforce and reliance on foreign-trained nurses as a solution to short-term planning difficulties. Policy makers should focus on the retention of trained older nurses as an important element of workforce planning. Failure to do so is likely to underpin significant workforce difficulties for public health services into the future.

Author contributions

Data collection: MW; CR
Data analysis: CR, MB, JSGW
Manuscript writing: CR, MB, MW, JSGW

References

An Bord Altranais (2011) *Annual Report: An Bord Altranais Report of the Year 2011.* Available at: https://www.nmbi.ie/What-We-Do/Our-Role/Annual-reports (accessed 02 November 2017).

Andrews, J., Manthorpe, J. & Watson, R. (2005) Employment transitions for older nurses: a qualitative study. *Journal of Advanced Nursing*, **51** (3), 298–306.

Armstrong-Stassen, M. & Schlosser, F. (2010) When hospitals provide HR practices tailored to older nurses, will older nurses stay? It may depend on their supervisor. *Human Resource Management Journal*, **20** (4), 375–390.

Armstrong-Stassen, M., Cameron, S., Rajacich, D. & Freeman, M. (2014) Do nurse managers understand how to retain seasoned nurses? Perceptions of nurse managers and direct-care nurses of valued human resource practices. *Nursing Economics*, **32** (4), 211.

Benner, P. (1982) From novice to expert. *The American Journal of Nursing*, **82** (3), 402–407.

Buerhaus, P.I., Staiger, D.O. & Auerbach, D.I. (2000) Implications of an aging registered nurse workforce. *JAMA*, **283** (22), 2948–2954.

Canadian Institute for Health Information (2017) *Regulated Nurses, 2016.* Available at: https://www.cihi.ca/en/regulated-nurses-2016 (accessed 11 November 2017).

Central Statistics Office (CSO) (2016) Census of Population 2016 - Profile 3 An Age Profile of Ireland. Available at https://www.cso.ie/en/releasesandpublications/ep/p-cp3oy/cp3/. (accessed 16 February 2018).

Central Statistics Office (CSO) (2017a) *Population* [Date File]. Available at: http://www.cso.ie/en/statistics/population/ (accessed 03 November 2017).

Central Statistics Office (CSO) (2017b) *Gross Domestic Product.* [Date File]. Available at: http://www.cso.ie/indicators/default.aspx?id=1NQQ32A (accessed 03 November 2017).

Clendon, J. & Walker, L. (2016) The juxtaposition of ageing and nursing: the challenges and enablers of continuing to work in the latter stages of a nursing career. *Journal of Advanced Nursing*, **72** (5), 1065–1074.

Cohen, J.D. (2006) The aging nursing workforce: how to retain experienced nurses. *Journal of Healthcare Management*, **51** (4), 233.

Cummins, T. (2009) Migrant nurses' perceptions and attitudes of integration into the perioperative setting. *Journal of Advanced Nursing*, **65** (8), 1611–1616.

Department of Health (2017) *Working Together for Health: A National Strategic Framework for Health Workforce Planning (Draft for Consultation).* Department of Health, Dublin, Ireland.

Department of Justice (2017). Critical *Skills Employment Permits.* Available at: https://dbei.gov.ie/en/What-We-Do/Workplace-and-Skills/EmploymentPermits/Permit-Types/Critical-Skills-Employment-Permit/ (accessed 10 January 2018).

Dietrich Leurer, M., Donnelly, G. & Domm, E. (2007) Nurse retention strategies: advice from experienced registered nurses. *Journal of Health Organization and Management*, **21** (3), 307–319.

Duffield, C., et al. (2015) Why older nurses leave the workforce and the implications of them staying. *Journal of Clinical Nursing*, **24** (5–6), 824–831.

Fairman, J.A., Rowe, J.W., Hassmiller, S. & Shalala, D.E. (2011) Broadening the scope of nursing practice. *New England Journal of Medicine*, **364** (3), 193–196.

Feldman, H.R., et al. (2015) Hitting the nursing faculty shortage head on: strategies to recruit, retain, and develop nursing faculty. *Journal of Professional Nursing*, **31** (3), 170–178.

Fitzgerald, D.C. (2007) Aging, experienced nurses: their value and needs. *Contemporary Nurse*, **24** (2), 237–243.

Fragar, L.J. & Depczynski, J.C. (2011) Beyond 50. Challenges at work for older nurses and allied health workers in rural Australia: a thematic analysis of focus group discussions. *BMC Health Services Research*, **11** (1), 42.

Gabrielle, S., Jackson, D. & Mannix, J. (2008) Older women nurses: health, ageing concerns and self-care strategies. *Journal of Advanced Nursing*, **61** (3), 316–325.

Health Service Executive (HSE) (2016) *Health Services People Strategy 2015-2018: Leaders in People Services*. Available at: http://www.hse.ie/eng/staff/Resources/hrstrategiesreports/peoplestrategy.pdf (accessed 04 December 2017).

Health Service Executive (HSE) (2017) *Our People/Our Workforce - Public Health Service – 2016*. Available at: http://www.hse.ie/eng/staff/Resources/OurWorkforce/Public-Health-Service-Workforce-Profile-at-December-2016.pdf (accessed 13 October 2017).

Humphries, N., Brugha, R. & McGee, H. (2012) Nurse migration and health workforce planning: Ireland as illustrative of international challenges. *Health Policy*, **107** (1), 44–53.

Iglehart, J.K. (2013) Expanding the role of advanced nurse practitioners – risks and rewards. *New England Journal of Medicine*, **368**, 1935–1941.

Irish Nurses and Midwifery Organisation (INMO) (2017) *Nursing and Midwifery Internship Student Survey 2017*. Available at: https://www.inmo.ie/Home/Index/217/12905 (accessed 19 February 2018).

Japanese Nursing Association (2017) *Nursing Statistics*. [Date File]. Available at: https://www.nurse.or.jp/jna/english/statistics/index.html (accessed 11 November 2017).

Kawi, J. & Xu, Y. (2009) Facilitators and barriers to adjustment of international nurses: an integrative review. *International Nursing Review*, **56** (2), 174–183.

Kirgan, M. & Golembeski, S. (2010) Retaining an aging workforce by giving voice to older and experienced nurses. *Nurse Leader*, **8** (1), 34–36.

Leese, B., Storey, C. & Cheater, F. (2009) Retaining primary and community nurses over the age of 50 years: the views of managers. *Journal of Nursing Management*, **17** (8), 975–985.

Letvak, S. (2002) Retaining the older nurse. *Journal of Nursing Administration*, **32** (7/8), 387–392.

Li, Y.I.N. & Jones, C.B. (2013) A literature review of nursing turnover costs. *Journal of nursing management*, **21** (3), 405–418.

McKay, D. (2013) The changing state age for pension, contractual retirement ages and the impact on employers. *Accountancy Plus*, **03**, 16–17.

McKee, M. (2018) Empty promises. What will Brexit really mean for nurses and the British National Health Service? *International Journal of Nursing Studies*, **77**, 3–5.

Migrant Rights Council of Ireland (MRCI) (2012) Who Cares? The Experience of Migrant Care Workers in Ireland. Available at: https://www.mrci.ie/2012/?cat=11 (accessed 17 January 2017).

Mion, L.C., et al. (2006) Retaining and recruiting mature experienced nurses: a multicomponent organizational strategy. *Journal of Nursing Administration*, **36** (3), 148–154.

Moore, A. (2017) Nursing shortages: how bad will it get? *Nursing Standard*, **31** (37), 26–28.

Moseley, A., Jeffers, L. & Paterson, J. (2008) The retention of the older nursing workforce: a literature review exploring factors that influence the retention and turnover of older nurses. *Contemporary Nurse*, **30** (1), 46–56.

Nursing and Midwifery Board of Australia (2017) *Nursing and Midwifery Board of Australia: Registrant Data*. [Date File]. Available at: http://www.nursingmidwiferyboard.gov.au/About/Statistics.aspx (accessed 11 November 2017).

Nursing and Midwifery Council (2017) *Registration Statistics*. [Date File]. Available at: https://www.nmc.org.uk/about-us/reports-and-accounts/registration-statistics/ (accessed 22 November 2017).

OECD (2015) *Pensions at a Glance 2015: OECD and G20 Indicators*. OECD Publishing, Paris.

Orr, D. (2017) The latest Brexit shockwave – a 96% drop in EU nursing applications. *The Guardian*. Available at: https://www.theguardian.com/commentisfree/2017/jun/13/nursing-uk-crisis-brexitworse-nhs (accessed 21 February 2018).

Palese, A. & Watson, R. (2014) Nurse staffing and education in Europe: if not now, when? *The Lancet*, **383** (9931), 1789–1790.

Phillips, J.A. & Miltner, R. (2015) Work hazards for an aging nursing workforce. *Journal of Nursing Management*, **23** (6), 803–812.

Pillinger, J. (2006) *An Introduction to the Situation and Experience of Women Migrant Workers in Ireland*. The Equality Authority, Dublin.

Roche, M.A., Duffield, C.M., Homer, C., Buchan, J. & Dimitrelis, S. (2015) The rate and cost of nurse turnover in Australia. *Collegian*, **22** (4), 353–358.

Rosenfeld, P. (2007) Workplace practices for retaining older hospital nurses: implications from a study of nurses with eldercare responsibilities. *Policy, Politics, & Nursing Practice*, **8** (2), 120–129.

Royal College of Nursing (2016) *Unheeded Warnings: Health Care in Crisis The UK Nursing Labour Market Review 2016*. Available at: https://www.rcn.org.uk/professional-development/publications/pub-005779 (accessed 04 November 2017).

Ryan, C., Bergin, M. & Wells, J.S. (2017) Valuable yet vulnerable—a review of the challenges encountered by older nurses in the workplace. *International Journal of Nursing Studies*, **72**, 42–52.

Storey, C., Cheater, F., Ford, J. & Leese, B. (2009) Retention of nurses in the primary and community care workforce after the age of 50 years: database analysis and literature review. *Journal of Advanced Nursing*, **65** (8), 1596–1605.

Twigg, D. & McCullough, K. (2014) Nurse retention: a review of strategies to create and enhance positive practice environments in clinical settings. *International Journal of Nursing Studies*, **51** (1), 85–92.

Wells, J.S. & Norman, I.J. (2009) The 'greying'of Europe–reflections on the state of nursing and nurse education in Europe. *Nurse Education Today*, **29** (8), 811–815.

Wells, J. & White, M. (2014) The impact of the economic crisis and austerity on the nursing and midwifery professions in the Republic of Ireland–'boom', 'bust' and retrenchment. *Journal of Research in Nursing*, **19** (7–8), 562–577.

Workplace Relations Commission (2017) *Public Service Stability Agreement: 2018 – 2020*. Available at: http://www.lrc.ie/en/newsmedia/Workplace_Relations_Notices/Public_Service_Stability_Agreement_20182020.html (accessed 13 January 2018).