UNIVERSITY OF SOUTHAMPTON

FACULTY OF SOCIAL AND HUMAN SCIENCES

Psychology

Volume 1 of 1

Associations between mindfulness, post-traumatic stress and compassion fatigue in healthcare professionals

by

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Thesis for the degree of Doctor of Clinical Psychology

May 2015

UNIVERSITY OF SOUTHAMPTON

ABSTRACT

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ASSOCIATIONS BETWEEN MINDFULNESS, POST-TRAUMATIC STRESS AND COMPASSION FATIGUE IN HEALTHCARE PROFESSIONALS

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Firstly, a literature review was conducted in order to explore the effectiveness of mindfulness based stress reduction (MBSR) for the psychological well-being of healthcare professionals, whilst considering the impact on patient satisfaction and effective patient care. Evidence was found to support the beneficial effects of MBSR for a number of aspects of psychological well-being including depression, stress and burnout. However large variations in intervention and measures used resulted in a lack of meaningful comparison across studies. In addition, the effectiveness of MBSR for post-traumatic stress disorder (PTSD) and compassion fatigue (CF) within this population has not been addressed in the literature, prompting the need for future investigation.

The empirical paper investigated associations between dispositional levels of mindfulness, post-traumatic stress (PTS) and CF within healthcare professionals. In addition, the role of shame in the maintenance of PTS led to an exploration of the mediating role of self compassion in the relationship between mindfulness and PTS and CF. Results indicated that mindfulness predicts lower levels of PTS and CF, with self compassion mediating the relationship between mindfulness and PTS, however this mediation effect was not observed in the relationship between mindfulness and CF. The results of this study suggest that mindfulness may be an important and effective intervention for increasing resilience to PTS and CF amongst healthcare staff.

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DECLARATION OF AUTHORSHIP

I, Katherine Woolf

declare that this thesis and the work presented in it are my own and has been generated by me as a result of my own original research.

Associations between mindfulness, post-traumatic stress and compassion fatigue in healthcare professionals

I confirm that:

1 This work was done wholly or mainly while in candidature for a research degree at this University;
2 Where any part of this thesis has previously been submitted for a degree or any other qualification at this University of any other institution, this has been clearly stated;
3 Where I have consulted the published work of others, this is always clearly attributed;
4 Where I have quoted from the work of others, the course if always given. With the exception of such quotations, this thesis is entirely my own work;
5 I have acknowledged all main sources of help;
6 Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7 None of this work has been published before submission

Signed……...
Date……

Acknowledgements

I would like to thank everyone who has helped and supported me throughout the process of writing this thesis.

Firstly, I would like to thank everyone who participated in the online survey. Without your interest and time this thesis would not have been possible. I would also like to thank everyone who took the time to share the survey with their friends and colleagues on social media sites and through word of mouth. Thank you also to Greta Westwood at Portsmouth Hospitals NHS Trust and James Gagg at Musgrove Park Hospital for supporting me with ethics approval and recruitment.

Thank you to my supervisor, Matt Garner for all your support, guidance and patience throughout this process.

Finally, thank you to Mark, my family, my friends and my wonderful course mates for supporting me through the ups and downs of writing this thesis and for being there for me every step of the way.

Chapter 1: Systematic Literature Review

The impact of mindfulness on the psychological well-being of healthcare professionals working in a physical health setting.

1.1 Introduction

1.1.1 Mindfulness based stress reduction

Mindfulness is conceptualised as a state of awareness, and has been defined as 'paying attention, on purpose, in the present moment and non-judgmentally to the unfolding of experience moment by moment' (Kabat-Zinn, 2003, p145). The intentions of mindful practice, as outlined by Epstein (1999), are to act with awareness and compassion in response to ones experiences within their immediate environment. Jon Kabat-Zinn adapted mindfulness concepts originally discussed within Buddhist traditions and formulated them into a structured Mindfulness Based Stress Reduction course (MBSR), focusing initially on the management of physical health conditions (Kabat-Zinn, 1982). Mindfulness Based Cognitive Therapy (MBCT) (Segal, Williams & Teasdale, 2002) has also been developed through the incorporation of MBSR and cognitive therapy, and has been used within clinical populations, initially developed for the treatment of depression. MBSR differs from MBCT in its lack of specificity for particular conditions and has a more generic application, allowing for the investigation of its benefits for a range of populations. MBSR consists traditionally of an 8 week course, with each session lasting 2.5 hours and includes home practice and a full day retreat. Participants are taught a variety of exercises including body and breath meditations and the development of loving kindness directed towards oneself and others. Attentional awareness is a key concept within mindful practice, in which future worry and past rumination are replaced with present moment awareness in order to tackle the experience of living

on 'automatic pilot'. Rumination and worry have been linked with a number of mental health problems including depression (Kuyken, Watkins, Holden & Cook, 2006) and post-traumatic stress disorder (PTSD) (Michael, Halligan, Clark & Ehlers, 2006), with the reduction of rumination being found to mediate the effects of an MBSR course on levels of depression (Mckim, 2008). This highlights the role that mindfulness can play in tackling the processes which may underlie many mental health conditions. In addition, compassion, loving kindness and a non-judgmental stance is encouraged within mindful practice, targeting feelings of shame and self criticism (Gilbert, Baldwin, Irons, Baccus & Palmer, 2006).

Since its initial development by Kabat-Zinn, MBSR has gained an evidence base to support its use in non-clinical populations, including caregivers (Oken et al, 2010), military personnel (Stanley, Schaldach, Kiyonaga & Jha, 2011) and healthcare professionals (Abeni, et al, 2014). Khoury, Sharma, Rush & Fournier (2015) conducted a meta-analysis investigating the efficacy of MBSR for healthy individuals, finding that MBSR reduced stress, depression, anxiety and distress and increased quality of life amongst non-clinical populations. A comprehensive review of the literature regarding the impact of MBSR on psychological well-being is beyond the scope of this review, however several literature reviews have been carried out which demonstrate the effectiveness of MBSR for the treatment of a number of mental health problems (Praissman, 2008; Fjorback, Arendt, Ornbol, Fink & Walach, 2011; Hoffmann, S., Sawyer, A., Witt, A., Oh, D. 2010).

1.1.2 Psychological well-being amongst healthcare professionals

Psychological well-being is a term which has been used widely in the literature and has been defined by Deci & Ryan (2008) as positive affective states, alongside optimal functioning within ones external world. In addition, Huppert (2009) defined psychological well-being as "lives going well. It is the combination of feeling good and functioning effectively" (p137). Psychological well-being may therefore be considered to consist of two key aspects, positive mental health along-side an ability to function effectively within ones environment. However Dodge, Daly, Huyton & Sanders (2012) highlight that the concept of well-being is extremely complex, with a number of alternative theories emerging in the literature in order to attempt to define this construct. They propose an alternative resource focused definition of well-being,

stating that it is the "balance point between an individual's resource pool and the challenges faced" (p 230). Well-being is therefore defined in a number of ways within the literature, highlighting the complexity of this construct. However for the purposes of this review, well-being will be explored amongst healthcare professionals with reference to the absence of negative affective states and the presence of positive affective states. Therefore, whilst 'well-being' may hold a much wider definition, this review has focused on aspects of mental health which may fall within the definition of well-being.

Effective delivery of care within the health service calls for skilled, dedicated professionals who are attracted to the prospect of working within the helping profession; however the stressors associated with working in such a profession threaten staff retention and satisfaction rates (Fenton, 2011). In 2009, the Royal College of Nursing revealed that 42% of nurses state that patient care is compromised at least one day a week due to under staffing, 61% feeling that their workload is too heavy and 55% state that they are unable to provide the expected standards of care. Kakunje (2011) has supported these claims, finding that healthcare professionals are frequently faced with large caseloads, excessive working hours and significant amounts of pressure. In addition, Dahlin, Joneborg & Runeson (2005) investigated sources of stress amongst medical students, reporting factors such as a 'non-supportive climate', 'lack of feedback' 'worries about endurance/competence' and 'pedagogical shortcomings' as key contributors to feelings of stress and depression. Montgomery (2014) argues that the medical education is the basis from which many of the struggles of the healthcare profession, particularly burnout and medical error, are formed. He states that collaboration is often overshadowed by performance and competitiveness, and highlighted research by Ishak et al (2009) which has found levels of burnout to be between 28-45% amongst medical students.

The term 'burnout' has been used widely within this population, and has been defined by Maslach & Jackson (1981) as emotional exhaustion, depersonalization and reduced personal accomplishment due to a stressful and demanding working environment. Burnout is a condition which has been found to be very prevalent amongst healthcare workers (Embriaco, Papazian, Kentish-Barnes, Pochard, Azoulay, 2007; Greenglass, Burke & Fiksenbaum, 2001; Romani & Ashkar, 2014) and has been labeled as a key mediator between organisational culture and quality of care

(Montgomery, Todorova, Baban & Panagopoulou, 2013). Suner-Soler et al (2014) considered the impact of burnout on a number of work related variables amongst a sample of 11,530 healthcare professionals. They found that emotional exhaustion was associated with absenteeism, intention to quit, personal deterioration and family deterioration, and depersonalization was associated with self perceived errors. The negative effects of burnout has also been supported by Greenglass, Burke & Fiksenbaum (2001), who found that emotional exhaustion led to cynicism, which was negatively associated with professional efficacy amongst nurses. In addition, West et al (2006) reported that low levels of quality of life and empathy and high levels of depression and burnout are associated with a higher number of self perceived errors in healthcare professionals.

Furthermore, healthcare professionals are particularly vulnerable to suffering from a traumatic stress reaction, including PTSD and compassion fatigue/secondary traumatic stress. An individual may suffer from PTSD following the witnessing of a traumatic experience inflicted on another individual. As a result, healthcare professionals are particularly vulnerable to PTSD, with Laposa and Alden (2001) finding that 20% of emergency room personnel meet PTSD symptom criteria, including re-experiencing the traumatic event, hyper-arousal, avoidance of trauma related stimuli and negative thoughts and mood. In addition, the terms compassion fatigue and secondary traumatic stress have been used within the healthcare population to refer to a trauma response within a helping role. The terms compassion fatigue and secondary traumatic stress, which are used interchangeably in the literature (Simpson & Starkey, 2006), have been discussed with regards to a consideration of their overlap with related concepts including burnout and PTSD. Sabo (2011) highlights the struggle within compassion fatigue/secondary traumatic stress to engage in an empathic therapeutic relationship, with Figley (1995) emphasising the relational component to these traumatic stress reactions. In addition, Valent (2002) outlined the responses of compassion fatigue and secondary traumatic stress as a sense of burden, depletion and self concern. In contrast to PTSD, the literature therefore highlights the relational aspect of compassion fatigue/secondary traumatic stress, and the impact of trauma exposure on an individual's ability to undertake a caring role. Portnoy (2011) has highlighted the contrast between burnout and compassion fatigue/secondary traumatic stress, stating that the latter are more pervasive and include symptoms which overlap with

PTSD, including feeling on edge, difficulty sleeping and intrusive images. In addition, Bale (2008) highlights the often sudden emergence of compassion fatigue/secondary traumatic stress symptoms in contrast to a gradual emergence of burnout symptoms. Similarly to PTSD, secondary traumatic stress reactions have been found to be highly prevalent within the healthcare population (Beck, 2011), highlighting the importance of an investigation into the prevention and treatment of these aspects of well-being in healthcare staff.

The literature suggests high levels of personal and financial costs associated with the healthcare profession. Stress and burnout amongst staff leads to poor quality of life, as well as absenteeism, dissatisfaction, high turnover and errors in patient care. These factors have far reaching consequences, especially at a time in which the NHS is under pressure to provide high quality care with a reducing budget (Laford, Arora, Charlesworth & McKeon, 2014). It is therefore important to develop effective interventions which can focus on the treatment and prevention of stress and burnout in healthcare professionals, in order to ensure the maintenance of their well-being, their patients and the services in which they work.

1.1.3 MBSR applied to healthcare professionals

The literature highlights the importance of interventions focused on targeting stress and burnout amongst healthcare professionals if the personal and financial costs of the job are to be managed. Marine, Routsalainen & Verbeek (2006) conducted a review investigating the impact of a number of interventions on work place stress and burnout, including cognitive behavioural therapy, relaxation, music making, therapeutic massage, attitude change and communication, problem solving and changes in work organisation. They concluded that there is little support for the long term effectiveness of these existing interventions, highlighting the need for additional literature reviews which evaluate the effectiveness of alternative interventions for healthcare workers.

Given the effectiveness of MBSR for a range of conditions as well as the high levels of stress, burnout and trauma amongst healthcare professionals, an investigation into the use of MBSR for healthcare professionals is relevant in order to consider its application within this population. If the well-being of healthcare

workers is prioritised, factors associated with the effectiveness of the NHS such as staff retention and patient care may also be positively affected, given the literature suggesting a link between burnout and reduced effectiveness amongst staff (West et al, 2006). This highlights the importance of a thorough literature review, which considers the effectiveness of MBSR in managing the psychological well-being of healthcare workers, especially given the failure of many existing stress management interventions. Should the literature suggest that MBSR is an effective intervention for this population, we may draw conclusions as to the reasonable applications of mindfulness into the training of healthcare professionals in order to increase resilience and protect against the risks associated with the job.

1.1.4 Aims of the review

The aim of this review is to evaluate and report on the empirical literature relevant to the following question: Are mindfulness interventions effective in the management of psychological well-being amongst healthcare professionals and healthcare students? The term well-being has been used within this review to refer to a number of aspects of mental health associated with various affective states including burnout, stress, PTSD, compassion fatigue, psychological distress, empathy, quality of life and compassion. Whilst well-being may expand to additional factors not investigated within this review and it is not inclusive of all aspects of psychological well-being, those constructs which are being investigated fall within the definition of well-being discussed in the literature. In addition, the impact of reduced well-being on job satisfaction and patient care has been highlighted in the literature presented above, and will therefore be considered in this review when investigating the effectiveness of MBSR. This review focused solely on physical healthcare workers and did not focus on the experiences on mental health workers. Whilst their working environments overlap in many areas such as excessive job demands and large caseloads (Evans et al, 2006) they may also vary in a number of ways, such as their placement within hospitals versus community sites and the patient presentations that they manage. As a result, in order to ensure a detailed and accurate account, it is not appropriate to combine both mental and physical healthcare professionals within the confines of this review. Given the literature, which highlights the importance of increased awareness and development of an effective intervention for staff working

in physical health services, it was decided that this would form the focus of the current review.

In 2009, Irving, Dobkin & Park conducted a literature review investigating the effectiveness of MBSR for healthcare professionals coping and stress levels. They included 10 papers, published between 1998 and 2007 including both student and qualified healthcare professionals. In recent years, mindfulness has gained attention as an effective intervention in non-clinical populations, resulting in a number of studies being carried out with healthcare professionals post 2009. As a result, the literature investigating the use of MBSR with healthcare professionals has moved on considerably, prompting the need for a review which considers the most recent literature in this area. The current literature review extends the research presented by Irving et al (2009) by including an additional 13 papers published since their review, allowing for consideration of the data obtained post 2007. In addition, Irving et al (2009) do not include information related to their search terms in their report, and fail to provide a brief description of all selected studies. This report therefore presents a more reader informed review of the literature up to 2014, focusing specifically on healthcare professionals working in a physical health setting.

1.2 Method

1.2.1 Identification of literature

1.2.1.1 Inclusion criteria

Studies presented in this review were required to include an active mindfulness intervention as opposed to a cross sectional investigation. They were required to have used quantitative analysis either alone or alongside qualitative analysis, and to have included at least one of the following outcome variables: psychological distress, stress, burnout, compassion fatigue, post-traumatic stress disorder (PTSD), empathy, job satisfaction, patient care, quality of life and compassion. Given the literature suggesting that burnout may have its roots in medical training, both qualified healthcare professionals and those currently in

training were included in the review. In addition, due to a lack of research looking at MBSR within the healthcare profession, pilot studies were accepted, providing they met the intervention criteria and a high quality standard, and for the same reasons both randomised controlled and non-controlled studies were accepted. In addition, only articles published in English were included.

1.2.1.2 Exclusion criteria

Studies excluded from this review include literature reviews, studies which focused solely on qualitative analysis and correlational studies which did not include an active intervention. In order to ensure a high quality standard, unpublished dissertations were excluded from the review. In addition, studies in which the mindfulness component only formed a small aspect of the intervention and was combined with a number of other interventions were excluded. For example Mealer et al (2014) conducted an intervention which consisted of 2 hours of mindfulness practice, however also included written exposure therapy, membership to a gym and event triggered counseling. Studies that were not carried out on a healthcare population working directly in patient care within a physical health setting were also excluded (see Figure 1).

1.2.1.3 Location of literature

A search was conducted using 3 different internet databases (Web of Science, PsychINFO and PubMed). Papers were searched for relevant themes dating from January 1970 to present. Titles were screened for relevance and a number of papers excluded at this stage. Those studies which appeared to be applicable were then examined at the abstract level and if relevant the full text was accessed for further inspection. Reference lists were also examined for relevant articles and full texts were accessed through the same online databases.

The same search was entered into all three databases in order to yield the results. The search terms were divided into three main concepts: (a) mindfulness; (b) healthcare professionals; (c) well-being. Mindfulness was searched using the key terms (mindful* OR MBSR OR MBCT). Healthcare professionals was searched using

the key terms (healthcare professionals OR nurses OR doctors) and well-being was searched using the key terms (compassion fatigue OR PTSD OR trauma OR job satisfaction OR life satisfaction OR stress OR fatigue OR burnout OR depression OR quality of life OR anxiety). The term medic* was excluded from the search as it generated a significantly greater number of papers which was beyond the scope of this review. In order to ensure that this was not excluding relevant reviews related to 'paramedic', this was entered into the search terms and yielded no relevant studies in addition to those already identified.

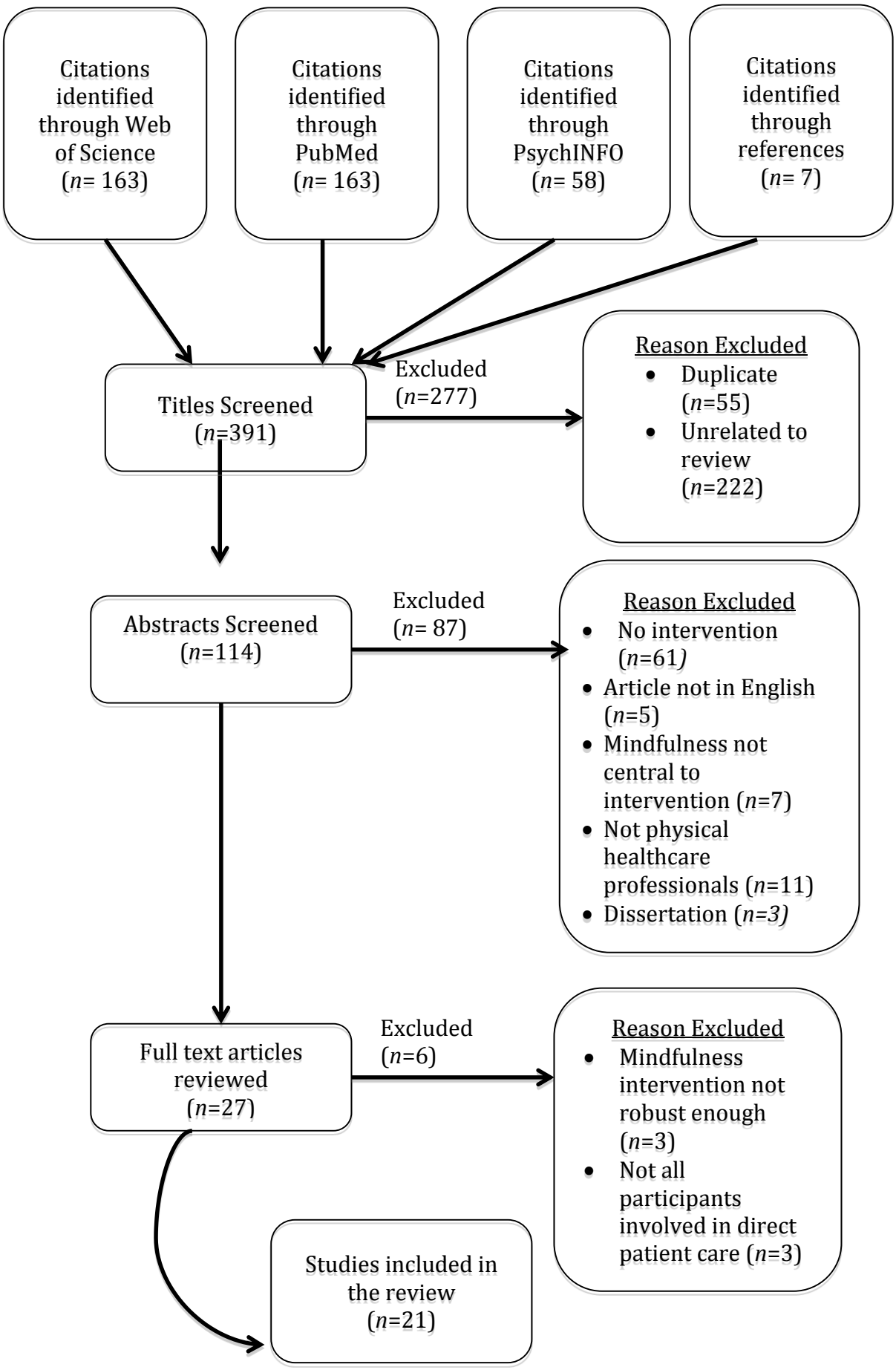
1.2.2 Literature search results

Search results are presented graphically in Figure 1. Three databases were searched in order to identify the literature presented in this review: Web of Science, PubMed and PsychoINFO, yielding 163, 58 and 163 results respectively. Examination of the reference lists revealed 7 additional studies which were relevant to the current review and had not been identified within the three searches conducted. Initial title screening of the 391 papers led to the exclusion of 277 citations. Abstract screening of the remaining 114 studies led to the exclusion of a further 87 citations. Of the remaining 27 studies, consideration of the full paper resulted in the exclusion of a further 6, resulting in 21 papers being included in the final review.

1.2.3 Information extracted

The following information was extracted from each study: (a) intervention characteristics including length and content; (b) sample characteristics, including sample size and occupation; (c) outcome measures used; (d) randomization and control group characteristics; (e) significant within group effects; (f) significant group x time interactions.

Figure 1: *Graphical representation of literature search results*



1.3 Overview of results

1.3.1 Overview

Studies were categorized into qualified healthcare professionals and healthcare students. Twelve of the studies presented in this review are conducted on qualified professionals, and nine are carried out with healthcare students. Within the literature presented with healthcare professionals, participants include hematologists, nurses, primary care physicians, academic healthcare employees, nurses, physicians, psychologists, social workers, counselors, midwives and oncology healthcare workers. Four of the studies carried out with qualified healthcare professionals used a full 8 week MBSR intervention, whilst the remaining eight used an adapted intervention of varying intensities. Of the nine studies presented with healthcare students, participants consisted of podiatrists, occupational therapists, physical therapists, physician assistants, student nurses and medical students. Four of these studies used an 8 week MBSR intervention, with the remaining five using a brief version to form the intervention condition. The studies discussed investigate the impact of mindfulness on a number of outcomes. The question presented in this review is concerned with the impact of mindfulness on healthcare professional's well-being. This has been conceptualised as consisting of a number of constructs including psychological distress, stress, burnout, compassion fatigue, PTSD, empathy, job satisfaction, patient care, quality of life and compassion. Sixteen studies measured psychological distress, six studies measured stress, eleven studies measured burnout, six studies measured empathy, two measured job satisfaction, three measured patient care, four measured quality of life and four measured compassion.

1.3.2 Measures used

Table 1 below outlines the measures used for each of the constructs being investigated.

Table 1: *Measures used for each construct being investigated*

Construct	**Measures used**
Psychological Distress	1. Profile of Mood States (McNair, D.M., Lorr, M., & Droppleman, 1971) 2. Symptoms Checklist 90-Revised (Derogatis, 1994) 3. Center for Epidemiologic Studies Depression Scale (Radloff, 1977) 4. Short Form 12 Version 2 Health Survey (Ware, Kosinski & Keller, 1996) 5. Brief Symptom Inventory (Derogatis & Melisaratos, 1983) 6. General Health Questionnaire-12 (Goldberg, 1978) 7. Depression and Anxiety Stress Scale (Lovibond & Lovibond, 1995) 8. Beck Depression Inventory (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) 9. Burns Anxiety Inventory (Burns & Eidelson, 1998) 10. Self Rating Anxiety Scale (Zung, 1971) 11. Self Rating Depression Scale (Zung, 1965) 12. Psychosocial Wellbeing Index Short Form (Grossi et al, 2006) 13. State Trait Anxiety Inventory (Speilberger, Gorsuch, Lushene, Vagg & Jacobs, 1983) 14. Hopkins Symptom Checklist (Parloff, Kelman & Frank, 1954)
Stress	1. The 13-item Perceived Medical School Stress Scale (Vitalano, Russo, Carr & Heerwagen, 1984) 2. Overall Health States Profile 3. Stress Symptom Checklist 4. Derogatis Stress Profile (Derogatis, 1984) 5. Perceived Stress Scale-14 (Cohen, Kamarck & Mermelstein, 1983)
Burnout	1. Maslach Burnout Inventory (Maslach & Jackson, 1981) 2. Copenhagen Burnout Inventory (Kristensen, Borritz, Villadsen & Christensen, 2005) 3. Professional Quality of Life Scale- Burnout subscale (Stamm & Figley, 2009)
Empathy	1. Jefferson Scale of Physician Empathy (Hojat et al, 2001), 2. Interpersonal Reactivity Index (Davis, 1983) 3. Caring Efficacy Scale (Coates, 1997). 4. Empathy Construct Rating Scale (LaMonica, 1981)
Job satisfaction	1. The Intrinsic Job satisfaction Scale (Koeske, Kirk, Koeske & Rautkis, 1994) 2. Attitude Posture Scale
Patient care	1. The Hospital Consumer Assessment of Healthcare Providers Systems (Centers for Medicare & Medicaid Services, 2005) 2. Physician Belief Scale (Ashworth, Williamson & Montano, 1984) 3. Time Pressure Scale
Quality of life	1. Satisfaction Profile (Majani & Callegari, 1998) 2. Subjective Wellbeing Scale (Moum, Naess, Sorensen, Tambs & Holmen, 1990) 3. Satisfaction With Life Scale (Diener, Emmons, Larsen & Griffin)
Compassion	1. Santa Clara Brief Compassion Scale (Hwang, Plante & Lackey, 2008) 2. The Self Compassion Scale (Neff, 2003a) 3. Professional Quality of Life Scale- Compassion satisfaction subscale

1.4. Results

Results are presented in narrative and tabular form. Studies are divided into qualified healthcare professionals (see table 2) and healthcare students (see table 3). Within these, each construct of well-being discussed in the literature is outlined in turn. In addition, effect sizes are reported in tables 4 and 5 for all studies in which the necessary data was provided. Table 4 provides effects sizes for studies with qualified healthcare professionals and table 5 provides effect sizes for studies with healthcare students.

1.4.1 Qualified Healthcare professionals

1.4.1.1. Psychological Distress

For the purposes of this review the term psychological distress has been used to refer to general mental health including depression and anxiety. Nine studies examined psychological distress amongst qualified healthcare professionals (Cohen-Katz, Wiley, Capuano, Baker & Shapiro, 2005; Shapiro, Astin, Bishop & Cordova , 2005; Krasner et al, 2009; Pipe, Bortz & Dueck, 2009; Goodman & Schorling, 2012; Bazarko, Cate, Azocar & Kreitzer, 2013; Fortney, Lucherband, Zakletskaia, Zgierska & Rakel, 2013; Foureur, Besley, Burton, Yu & Crisp, 2013; Moody et al, 2013). Six of these found that MBSR was effective in the reduction of psychological distress, however three failed to find significant changes in levels of psychological distress pre to post intervention. Of those that found that MBSR was effective, two used a full 8 week MBSR intervention, with the remaining four using abbreviated interventions. Amongst those which found that MBSR was not effective in the reduction of psychological distress, two used full 8 week mindfulness interventions and one used an abbreviated intervention.

Krasner and colleagues (2009) found significant improvements on the Profile of Mood States following an 8 week MBSR intervention with a 10 month maintenance phase, with gains on all subscales apart from tension and confusion being maintained at a 3 month follow up. In a shorter 4 week MBSR intervention, Pipe and colleagues (2009) found significant improvements in 9 subscales of the Symptom Checklist 90

Revised for the intervention group in comparison to no significant improvements on any of the subscales for the control group. Goodman & Schorling (2012) supported the findings presented above, reporting significant improvements pre to post intervention in measures of mental health, as measured on the Short Form-12, following an 8 week MBSR course. In a contrasting approach to intervention, Bazarko and colleagues (2013) delivered an MBSR intervention using group telephone sessions, and found significant improvements on the Short Form-12, with gains being maintained at 4 months post intervention. Fortney and colleagues (2013) supported the potential benefits of an abbreviated intervention for psychological distress, finding significant improvements in psychological distress following an MBSR intervention consisting of 18 hours training across a non-residential weekend immersion plus 2 follow up evenings. Foureur and colleagues (2013) also delivered an abbreviated MBSR intervention, implementing a one day mindfulness workshop, and providing a CD for participants to continue practice for 20 minutes a day over an 8 week period. They found significant reductions on the General Health Questionnaire-12 and the Depression Anxiety and Stress Scale post intervention. In addition, qualitative data revealed that participants felt more relaxed and more able to deal with feeling overwhelmed at work.

However in contrast to the studies presented above, a number of studies failed to find significant reductions in psychological distress. Cohen-Katz and colleagues (2005) found that scores on the Brief Symptom Inventory demonstrated no significant between or within group differences pre to post intervention following an 8 week MBSR intervention, and whilst the results did demonstrate a downwards trend, this was observed in both the treatment and control groups. Shapiro and colleagues (2005) also failed to find significant reductions in scores on the Brief Symptom Inventory pre to post intervention in an 8 week MBSR controlled study. In addition, Moody and colleagues (2013) found that depression scores showed no significant changes pre to post intervention within an abbreviated MBSR intervention group, and no significant differences between the intervention and control group. However depression scores were nearly absent at baseline and post intervention suggesting this may have been due to floor effects on the measure. Whilst this study suggested that MBSR was not effective in the management of psychological distress, qualitative data analysis revealed six key themes including increased inner peace,

calm and joy and decreased anxiety. Participants reported being more able to put aside worrisome thoughts and reported increased anger management.

The literature investigating the impact of MBSR for the reduction of psychological distress in qualified healthcare professionals suggests that both full and abbreviated MBSR interventions may be effective for the treatment of this aspect of well-being. However three studies have failed to find quantitative evidence for the effectiveness of MBSR for the reduction of psychological distress. Of those that failed to find significant effects, two used a full 8 week MBSR intervention, suggesting that it may not be the abbreviated nature of the intervention which is resulting in a lack of efficacy. However Moody and colleagues (2013) found qualitative data which supported the effectiveness of the intervention despite a lack of significant change in the quantitative analysis, suggesting that perhaps the questionnaires used may not have accurately captured changes in levels of psychological distress.

1.4.1.2 Stress

Three studies investigated the effectiveness of MBSR in the reduction of stress amongst qualified healthcare professionals (Shapiro, Astin, Bishop & Cordova, 2005; Bazarko et al, 2013; Moody et al, 2013). Two of these found that MBSR was effective in the reduction of stress, however one failed to find significant quantitative changes in levels of stress pre to post intervention. Of those that found that MBSR was effective, one used a full 8 week mindfulness intervention, and one used an abbreviated intervention. The study which found that MBSR was not significantly effective in the reduction of stress used a full 8 week MBSR intervention.

Shapiro and colleagues (2005) found significantly reduced scores on the Perceived Stress Scale in an intervention versus control group following an 8 week MBSR intervention, and Bazarko et al (2013) found significant reductions in scores on the Perceived Stress Scale following a predominantly telephone based intervention. However Moody et al (2013) also used the Perceived Stress Scale to measure stress levels following an 8 week MBSR intervention and found no significant reductions in scores pre to post intervention. However qualitative data related to feelings of stress suggested that participants reported decreased stress and an improved ability to handle stress. These studies suggest that MBSR is effective in the reduction of stress,

however the study by Moody et al (2013) highlights the need to apply caution when interpreting results, suggesting that the Perceived Stress Scale may not have accurately captured changes in stress levels amongst the participants. In addition, it is worth noting that the study carried out by Moody et al (2013) was conducted on oncology staff only, and failed to find significant effects on any of the measures. As a result it may be that this study lacks generalizability to a range of professions, with Shapiro et al (2005) and Bazarko et al (2013) providing support for the effectiveness of MBSR for reducing stress in a more diverse sample of healthcare professionals.

1.4.1.3 Burnout

Nine studies investigated the effectiveness of MBSR in the reduction of burnout amongst qualified healthcare professionals (Cohen-Katz, Wiley, Capuano, Baker & Shapiro, 2005; Shapiro, Astin, Bishop & Cordova, 2005; Mackenzie, Poulin & Seidman-Calrson, 2006; Krasner et al, 2009; Goodman & Schorling, 2012; Bazarko, Cate, Azocar & Kreitzer, 2013; Fortney, Lucherband, Zakletskaia, Zgierska & Rakel, 2013; Moody et al, 2013; Horner, Piercy, Eure & Woodard, 2014). Six of these found that MBSR was effective in the reduction of burnout, however three failed to find significant reductions in levels of burnout pre to post intervention. Of those that found that MBSR was effective, three used a full 8 week mindfulness intervention, and three used an abbreviated intervention. Two of those which found that MBSR was not significantly effective in the reduction of burnout used a full 8 week MBSR intervention and one used an abbreviated intervention.

Cohen-Katz et al (2005) conducted a randomised waitlist controlled study investigating the effects of an MBSR intervention on burnout in nurses using the Maslach Burnout Inventory (MBI). On the MBI, significantly higher scores on personal accomplishment and significantly lower scores on emotional exhaustion were found in the treatment group compared to the control group post intervention. Lower scores in depersonalization in the treatment compared to the control group were also found, however this only demonstrated a trend towards significance. In addition, Mackenzie and colleagues (2006) found a significant group x time interaction on the MBI following a 4 week MBSR intervention, with emotional exhaustion reducing in the intervention group and depersonalization remaining stable in comparison to increases in both subscales within the control group. Krasner et al (2009) also

supported the effectiveness of MBSR for the reduction of burnout in a study of 70 primary care physicians. They found that levels of burnout, as measured by the MBI, showed significant improvements across all three subscales, with results being maintained at 3 month follow up. Goodman and Schorling (2012) indicated significant improvements pre to post intervention in all subscales of the MBI following an 8 week MBSR course and Fortney et al (2013) and Bazarko et al (2013) further supported the above findings, with significant reductions in burnout following abbreviated mindfulness interventions being maintained at a 9 and 4 month follow up respectively.

However three studies failed to find significant reductions in burnout following a mindfulness intervention. Moody et al (2013) indicated no significant differences in burnout as measured by the MBI pre to post intervention in the intervention group and no significant differences between the intervention and control group. However it is worth noting that nearly 100% of participants in this study fell into the category of high levels of burnout pre intervention. In addition, as highlighted above, this study recruited oncology staff exclusively, limiting the generalizability of the results. In addition, Shapiro and colleagues (2005) found that scores on the MBI following an 8 week MBSR course did not reduce significantly, however scores did demonstrate a trend towards significance in the intervention versus the control group. However analysis of results was based on 10 participants in the intervention group due to 8 not finishing the course, reducing the power of the study. In addition, whilst Horner et al (2014) found that following 10 30 minute mindfulness sessions scores on the burnout subscale of the ProQOL improved, this reduction did not meet statistical significance.

The literature suggests that MBSR is largely effective for the reduction of burnout amongst qualified healthcare professionals. Whilst 3 studies failed to find significant reductions in burnout, a number of limitations have been outlined which may question the reliability of the results found, with the majority of studies presented finding promising results for the effectiveness of MBSR in the management of burnout.

1.4.1.4 Empathy

Three studies investigated the effectiveness of MBSR in the reduction of empathy amongst qualified healthcare professionals (Krasner et al, 2009; Bazarko, Cate, Azocar & Kreitzer, 2013; Pipe, Bortz & Dueck, 2009). Two of these found that MBSR was effective in increasing empathy, however one failed to find significant increases in levels of empathy pre to post intervention. Of those that found that MBSR was effective, one used a full 8 week mindfulness intervention, and one used an abbreviated intervention. The study which found that MBSR was not significantly effective in increasing empathy used an abbreviated mindfulness intervention.

Krasner et al (2009) investigated the benefits of an 8 week mindful education program in primary care clinicians, and found that scores on the Jefferson Scale of Physician Empathy increased significantly. Significant improvements were maintained at follow up (15 months post intervention) on all subscales other than the compassion care subscale. Bazarko et al (2013) also found significant increases in empathy following an abbreviated mindfulness intervention using the Jefferson Scale of Physician Empathy. However Pipe et al (2009) found that empathy increased in both an intervention and control group following a 4 week MBSR course, with no significant differences in empathy between the two groups, as measured by the Caring Efficacy Scale. The literature investigating the effectiveness of MBSR for increasing empathy amongst this population is sparse, and whilst promising, more research is needed in order to draw firm conclusions as to the impact of MBSR on clinician's levels of empathy. Both studies which found significant improvements in empathy used the Jefferson Scale of Physician Empathy, contrasting with Pipe et al (2009) who failed to find significant improvements using the Caring Efficacy Scale. As a result it is difficult to draw comparisons between these studies as it may be that the variation in measures used impacted on the results observed.

1.4.1.5 Job satisfaction

Only one study investigated the effectiveness of MBSR on job satisfaction amongst qualified healthcare professionals (Mackenzie, Poulin & Seidman-Calrson, 2006). Mackenzie and colleagues (2006) conducted a brief version of an MBSR intervention for nurses and nurse aides using a non randomised controlled study. The

intervention group indicated significantly higher levels of job related personal accomplishment than the control group, however the group x time interaction only approached significance. Whilst there was a significant main effect of time on the job satisfaction measure, this was found in both the intervention and control group and no significant group interactions were found. The literature therefore requires further investigation into the effectiveness of MBSR in increasing job satisfaction amongst healthcare professionals.

1.4.1.6 Patient care

Two studies investigated the effectiveness of MBSR in increasing the quality of patient care amongst qualified healthcare professionals (Horner, Piercy, Eure & Woodard, 2014; Krasner et al, 2009). One of these found that MBSR was effective in increasing patient care, however one failed to find significant increases in quality of patient care pre to post intervention in an intervention group compared to a control group.

Krasner et al (2009) investigated the benefits of a mindful education program on the quality of patient care as measured by the Physician Belief Scale, which represents the physicians understanding of the psychosocial aspects of a patients care. They found that scores on the Physician Belief Scale showed significant improvements and were maintained at a 15 month follow up. However, whilst Horner et al (2014) found that levels of patient satisfaction following an abbreviated mindfulness intervention increased by 32 points in an intervention group, this was not statistically different to patient satisfaction levels in a control group. The literature therefore presents conflicting evidence as to the effectiveness of MBSR for increasing levels of patient satisfaction. However the two studies presented use different methods of measurement, limiting the ability to compare across these. In addition, whilst Horner et al were unable to demonstrate significant differences between the intervention and control group, their findings supported those of Krasner et al to the extent that levels of patient care increased following a mindfulness intervention.

1.4.1.7 Quality of life

Three studies investigated the effectiveness of MBSR in increasing the quality of life amongst qualified healthcare professionals (Shapiro, Astin, Bishop & Cordova (2005; Mackenzie, Poulin & Seidman-Calrson, 2006; Abeni et al, 2014). One of these found that MBSR was effective in increasing quality of life, however two failed to find significant increases in quality of life pre to post intervention. The study which found MBSR to be effective in increasing quality of life used an abbreviated mindfulness intervention. Amongst those which found that mindfulness was not effective at significantly increasing quality of life, one used a full 8 week intervention and one used an abbreviated Balint group method consisting of 30 sessions of 60 minutes each based over a 1 year period.

Following a brief 4 week MBSR intervention, Mackenzie and colleagues (2006) found a significant group x time interaction for the influence of mindfulness training on life satisfaction, with a control group remaining stable and an intervention groups scores increasing significantly between time 1 and time 2. However Shapiro and colleagues (2005) failed to find significant increases on the Satisfaction with Life Scale following an 8 week controlled MBSR intervention, however the results demonstrated trends towards greater positive changes in the intervention versus the control group. In addition, Abeni et al (2014) measured quality of life immediately pre and post a mindfulness intervention using the Satisfaction Profile (SAT-P), and showed very little change between time 1 and 2. However the authors note that this was not in line with reported difficulties in managing everyday life pre-intervention vs post intervention discussed in clinical interviews, however no qualitative analysis has been performed using this data. The literature suggests that mindfulness may contribute to increases in quality of life, however the lack of studies investigating this aspect of wellbeing as well as the lack of consistency in measures used highlights the need for further research investigating this outcome.

1.4.1.8 Compassion

Four studies investigated the effectiveness of MBSR in increasing compassion amongst qualified healthcare professionals (Shapiro, Astin, Bishop & Cordova, 2005; Bazarko, Cate, Azocar & Kreitzer, 2013; Horner, Piercy, Eure & Woodard, 2014;

Fortney, Lucherband, Zakletskaia, Zgierska & Rakel, 2013). Two of these found that MBSR was effective in increasing compassion, however one failed to find significant increases in levels of compassion pre to post intervention. One of the studies which found MBSR to be effective in increasing compassion used an abbreviated mindfulness intervention, and one used a full 8 week intervention. The two studies which found that mindfulness was not effective at significantly increasing compassion used abbreviated mindfulness interventions.

Shapiro and colleagues (2005) found significant between group differences on the Self Compassion Scale following an 8 week MBSR intervention, with the intervention group demonstrating significantly higher self compassion scores post intervention. In addition, Bazarko and colleagues (2013) delivered a telephone based mindfulness intervention and found significant improvements in self compassion post intervention, with gains being maintained at 4 months follow up. On follow up, 75% of participants reported that they had maintained their practice since completing the intervention, and those who had maintained their practice were significantly higher at time 3 than those who had not in areas of self compassion.

However in contrast to the above studies, which have found MBSR to be effective for increasing levels of self compassion, two studies found that mindfulness was not effective at increasing compassion directed externally. Horner and colleagues (2014) found that, following a 10 week mindfulness intervention, scores on the compassion satisfaction subscale of the ProQOL did not significantly increase amongst a group of nurses. The compassion satisfaction subscale of the ProQOL is concerned with a number of aspects related to an individual's feelings towards patient care such as the positive feelings one gets from helping others (Stamm, 2010), which may go beyond the construct of compassion being measured by Bazarko et al (2013) and Shapiro et al (2005). Similarly, Fortney and colleagues (2013) also investigated the impact of mindfulness on compassion using the Santa Clara Brief Compassion Scale. In contrast to the Self Compassion Scale as used by Bazarko et al (2013) and Shapiro et al (2005), this measure investigates an individual's feelings of compassion towards others. Fortney et al (2013) found that, following 18 hours mindfulness training across a non-residential weekend immersion plus 2 follow up evenings, participants demonstrated no significant increase in compassion scores at any of the 4 time points measured. As a result, it may be that mindfulness is effective

and increasing feelings of self compassion, however less effective at increasing feelings of compassion directed externally. However further research is needed in order to consider the impact of mindfulness on compassion amongst qualified healthcare professionals.

Table 2*: Studies conducted with qualified healthcare professionals*

Study	Ptps	Measures	Design	Intervention	Results
Cohen-Katz et al, 2005	N=29. 23 participants across two interventions, 13 participants in a wait list control (7 of whom joined the second intervention). Nurses.	Maslach Burnout Inventory (MBI), Brief Symptom Inventory (BSI) and Mindfulness Attention Awareness Scale (MAAS)	Randomized controlled trial. Measures presented to group 1 at baseline, immediately following intervention and at 3 months follow up. Measures presented to group 2 at baseline and immediately following intervention.	8 week MBSR intervention consisting of 2.5 hours per week, a day retreat and homework assignments.	Tx sig > control post intervention and follow up on MBI subscale of personal accomplishment and sig < on MBI subscale of emotional exhaustion. Tx sig <on MBI pre to post intervention. No significant between or within group effects on the BSI.
Shapiro et al, 2005	N=38. 18 in the intervention group (10 completed post intervention measures) and 20 in a waitlist control. Healthcare professionals.	Brief Symptom Inventory (BSI), Maslach Burnout Inventory (MBI), Perceived Stress Scale (PSS), Satisfaction With Life Scale (SWLS) and Self Compassion Scale (SCS)	Pilot randomized controlled pre and post intervention design. Data collected immediately pre and post intervention.	8 week MBSR course, each session lasting 2 hours.	Tx sig < control post intervention on the PSS Tx sig > control on the SCS post intervention No sig differences post intervention on the MBI, BSI and SWLS
Mackenzie et al, 2006.	N= 30. 16 intervention and 14 wait list controls. Nurses and nurse aides.	Maslach Burnout Inventory (MBI), Smith Relaxation Dispositions Inventory (SRDI), Intrinsic Job Satisfaction subscale from the Job Satisfaction Scale (JSS), Satisfaction with Life Scale (SWLS) and the 13 item Orientation to Life Questionnaire	Pilot randomized controlled trial. Measures provided immediately pre and post intervention.	4 week MBSR course, each session lasting 30 minutes with an additional 10 minutes home practice each day.	Tx sig < control on MBI post intervention Tx sig > control on SWLS post intervention Tx sig > job related personal accomplishment and satisfaction pre-post intervention
Krasner et al, 2009	N= 70. Primary care clinicians.	2 Factor Mindfulness Scale, Maslach Burnout Inventory (MBI), Jefferson Scale of Physician Empathy (JSE), Physician Belief Scale (PBS), Mini Markers of the Big Five	Single sample longitudinal study. Measures taken at baseline, following the intervention (2 months), following	8 week mindful education course, each session lasting 2.5 hours plus 7 hour retreat. 10 month maintenance phase of 2.5 hours per	Ptps sig > MBI, JSE, PBS PMS pre to post intervention Mindfulness α mood disturbance, emotional exhaustion, personal accomplishment, conscientiousness and emotional stability. All

		Factor Structure and Profile of Mood States (PMS)	the maintenance phase (12 months) and 3 months post maintenance (15 months).	month.	improvements maintained at 15 months excluding compassionate care, tension, confusion, extraversion, agreeableness and openness.
Pipe et al, 2009	N= 33. 16 intervention and 16 in a 'leadership course' control. Nurse leaders.	Symptom Checklist 90-Revised (SCL-90-R) and Caring Efficacy Scale (CES)	Randomized controlled trial with a matched group contact control. Measures administered at baseline and immediately post intervention.	4 week brief mindfulness meditation course consisting of 2 hour sessions and 30 minutes home practice a day.	Tx sig < on SCL-90-R pre to post intervention
Goodman & Schorling, 2012.	N= 93. 55% physicians, 16% nurses, 13% psychologists, 4% social workers and 12% 'other' healthcare professionals.	Maslach Burnout Inventory (MBI) and Short Form-12 Version 2 (SF-12 v2)	Pre and post intervention design Measures provided at baseline and immediately post intervention.	Participants attended one of 11 8 week MBSR courses run over a period of 6 years. Sessions lasted 2.5 hours long including a day retreat and 45 minutes home practice 6 days a week. All courses run by the same two instructors.	Sig > on the mental health subscales of the SF-12 v2 and all subscales of the MBI pre to post intervention
Bazarko et al, 2013	N= 36. Nurses.	The Perceived Stress Scale (PSS), Copenhagen Burnout Inventory (CBI), Short Form-12 version 2 (SF-12 v2), Brief Serenity Scale (BSS), Jefferson Scale of Physician Empathy (JSE) and Self Compassion Scale (SCS)	Pre-posttest design. Measures provided at baseline, immediately following the intervention and at a 4 month follow up.	Two full day retreats plus 6 weekly 1.5 hour teleconference calls and 30 minutes home practice a day.	Ptps sig < on the PSS, CBI, SF-12 v2 and sig > on the BSS, JSE and SCS pre to post intervention Gains being maintained 4 months post intervention.
Fortney et al, 2013	N= 30. Primary care clinicians.	Maslach Burnout Inventory (MBI), Depression Anxiety Stress Scale (DAAS), 14 Item Resilience Scale and Santa Clara Brief Compassion Scale (SCBCS)	Single sample longitudinal design. Measures taken at baseline, immediately post intervention, 8 weeks post intervention and 9 months post intervention.	18 hours training across a non residential weekend immersion, plus 2 follow up evenings, and 10-20 minutes home practice each day.	Ptps sig < pre to post intervention on the MBI and the DAAS. No sig changes on the Resilience Scale or SCBCS across any time points.

Fourer et al, 2013.	N=40. 20 midwives and 20 nurses.	General Health Questionnaire-12 (GHQ-12), SOC-Orientation to Life Scale and Depression Anxiety Stress Scale (DAAS). Qualitative data collected post intervention from 10 participants.	Pilot pre and post intervention design. Measures completed post intervention by all participants, and 4-8 weeks post intervention by 28 participants.	One day mindfulness workshop and a CD to practice at home for 20 minutes a day for 8 weeks.	Ptps sig < on the GHQ-12, DAAS and SOC-Orientation to Life Scale pre to post intervention. Ptps reported feeling more relaxed and more able to deal with feeling overwhelmed at work however found it challenging to implement the strategies and make mindfulness a priority in their day to day lives.
Moody et al, 2013.	N=47. 23 in the intervention group and 24 in a no intervention control group. Pediatric oncology staff.	Maslach Burnout Inventory (MBI), Beck Depression Inventory (BDI) and Perceived Stress Scale-14 (PSS-14). The researchers also analyzed diaries kept by those in the intervention group.	A pilot randomized controlled trial. Measures provided at baseline and immediately post intervention.	8 week mindfulness based course consisting of a 6 hour introductory session, 6 weeks of 1 hour sessions and a 3 hour final session.	No sig differences between Tx and control group on the MBI, PSS-14 and BAAS. No sig differences pre to post intervention in Tx group. Ptps talked about an increased inner peace, calm and joy, decreased stress, anger, worry and anxiety, improved ability to handle stress, increased mindfulness, self awareness, focus and goal setting and an increased appreciation, gratitude and compassion.
Abeni et al, 2014	N=34. 10 caregivers 11 Hematologists & 13 nurses.	Satisfaction Profile (SAT-P)	Single sample pilot explorative study. Measures taken at baseline and immediately post intervention.	'Balint Group Method'. 30 sessions each of 60 minutes over the course of 1 year.	No sig changes on the SAT-P
Horner et al, 2014.	N= 74. 46 intervention & 28 wait list controls (31 and 12 respectively post intervention). Nurses..	Professional Quality of Life Scale (ProQOL), Mindfulness Attention Awareness Scale (MAAS), self reports of personal stress levels and those of the unit and Hospital Consumer Assessment of Healthcare Providers Systems (HCAHPS) survey.	Non randomized controlled pilot study. Measures taken pre and post intervention.	10 mindfulness sessions of 30 minutes each.	No sig differences between Tx and control group on MAAS, ProQOL, HCHAPS, or on the self report stress measure. No sig differences in Tx group pre to post intervention.

Table 3: *Effect sizes for qualified healthcare professionals (where data is available)*

Study	Intervention	Results								
		MF	BO	P.D	JS	LS	SC	EM	PC	Stress
Abeni et al 2014	Balint group Physicians & nurses						d=0.10	d=0.28		
Krasner et al 2009	8 week mindful education course Primary care clinicians		d=1.12	d= 0.5	d=0.69				d=0.45	d=0.37
Mackenzie et al 2006	4 week mindfulness course Nurses			d=0.59		d=0.33	d=0.68			
Bazarko et al 2013	Two day retreats plus 6 telephone sessions Nurses			d=0.98	d=1.42			d=1.26	d=0.77	d=1.22
Fourer et al 2013	One day workshop plus 8 weeks home practice Nurses and midwives					d=0.44				
Goodman & Schorling 2012	8 week MBSR course Physicians, nurses, psychologists, social workers, other			d=0.46	d=0.96					
Average			d=1.12	d=0.63	d=0.88	d=0.39	d=0.31	d=0.97	d=0.61	d=0.37	d=1.22

Note: MF = mindfulness, BO = burnout, PD = psychological distress, JS = job satisfaction, LS = life satisfaction, SC = self compassion, EM = empathy, PC = patient care

1.4.2 Healthcare Students

1.4.2.1 Psychological Distress

Seven studies examined psychological distress amongst healthcare students (Shapiro, Schwartz, & Bonner, 1998; Rosenzweig, Reibel, Greeson, Brainard & Hojat, 2003; Jain et al, 2007; Kang, Choi & Ryu, 2009; Chen, Yang, Wang & Zhang, 2013; De Vibe et al, 2013; Barbosa et al, 2014). All of these found that MBSR was effective in the reduction of at least one aspect of psychological distress, however one failed to demonstrate the maintenance of change over time, one failed to replicate the findings in males and one found significant reductions in anxiety but not depression. Only two of the studies implemented a full 8 week MBSR intervention, with the remaining studies using abbreviated interventions.

Shapiro et al (1998) carried out a randomised controlled trial investigating the use of a 7 week mindfulness intervention with medical and premedical students. Results indicated that the intervention groups demonstrated significantly less psychological distress post intervention. The authors also replicated these findings in the control group following their participation in the intervention, demonstrating the effectiveness of MBSR across two different interventions in premedical students. Further support for the effectiveness of MBSR for the reduction of psychological distress in healthcare students comes from Rosenzweig et al (2003), who found significant differences in overall scores on the Profile of Mood States (POMS) between an intervention and control group following 10 'MBSR seminars'. Within the intervention group, there were significant decreases in the overall POMS score as well as in the anxiety and confusion subscales, and significant increases in the vigor subscale. This is in comparison to significant increases in anxiety, fatigue, and overall POMS scores in the control group. In addition, Jain et al (2007) conducted a randomised controlled trial in which they compared a 4 week mindfulness intervention to relaxation training and a waitlist control on the well-being of 81 healthcare students. Scores on the Brief Symptom Inventory revealed significantly greater reductions in psychological distress in both the mindfulness and relaxation group compared to the control group. Whilst there were no significant differences between the mindfulness and relaxation groups, the mindfulness group did show considerably larger effect sizes. In contrast to the adapted MBSR interventions

presented above, Kang et al (2009) carried out a full 8 week MBSR intervention with nursing students and found that scores on the Psycho-Social Well-being Index Short Form (PWI-SF), the State Trait Anxiety Inventory (STAI) and the Beck Depression Inventory (BDI) reduced significantly in the treatment group pre-post intervention, and scores on the PWI-SF and STAI were significantly lower post intervention in the intervention versus control group.

However Chen et al (2013) found conflicting results, failing to demonstrate significant reductions on the Self Rating Depression Scale following a brief mindfulness intervention; however this study did demonstrate significant reductions in the Self Rating Anxiety Scale, suggesting that mindfulness had a more significant impact on anxiety than depression within in this study. In addition, De Vibe et al (2013) found a significant effect of a 7 week MBSR intervention on psychological distress in females, however the authors found no significant effects in males. Whilst this is possibly due to the fact that there were significantly fewer men in the intervention group than the control group, this study provides data for the differential effects of MBSR for females versus males, a factor which has not been identified as relevant in previous studies, and therefore requires further investigation. Barbosa et al (2014) investigated the effectiveness of an 8 week MBSR intervention in reducing psychological distress amongst 31 graduate healthcare students. Significant differences were observed on the Burns Anxiety Inventory between the experimental and control group at the 8 week time point, with the experimental group demonstrating significantly less anxiety. However neither of these effects were maintained at the 11 week time point. However it is worth noting that week 11 coincided with exams, and as such this may have had an impact on participants psychological distress at the time this measure was taken.

The literature presented above presents promising findings for the effectiveness of MBSR for the reduction of psychological distress amongst healthcare students. A range of abbreviated mindfulness interventions appear to be effective for the reduction of psychological distress in this population, prompting the need for further investigation into the application of abbreviated interventions and the efficacy of these in comparison to full 8 week MBSR interventions.

1.4.2.2 Stress

Three studies examined stress amongst qualified healthcare students (Young, Bruce, Turner & Linden; 2001; Beddoe & Murphy, 2004; DeVibe et al, 2013). All of these found that MBSR was effective in the reduction of stress using a 7-8 week MBSR intervention.

Young and colleagues (2001) conducted an MBSR intervention with 30 student nurses in a quasi-experimental non randomised controlled trial. Participants in the MBSR group reported a number of benefits of mindfulness including helping them to juggle the demands of work and a reduced sense of urgency. Quantitative findings revealed significant differences between the intervention and control group on stress levels, measured on the Overall Health Status Profile. Beddoe & Murphy (2004) also found that stress levels reduced following an 8 week MBSR course for nursing students. Results in this study indicated significant differences in pre to post test scores on the Derogatis Stress Profile, with journal entries revealing common themes including increased relaxation, increased patience and a greater sense of appreciation for daily life. In addition, De Vibe et al (2013) conducted a randomised controlled trial using a 7 week MBSR intervention with 288 medical and psychology students. Results indicated a significant effect of the intervention on stress in females, however no significant effects in males, which may be due to the reduced number of males in the study. However these results may also suggest that MBSR is less effective for the reduction of stress in males than females. These studies therefore provide support for the effectiveness of mindfulness in the reduction of stress amongst healthcare students, however further research is needed in order to replicate these findings as well as investigate the impact of gender in the relationship between mindfulness and stress.

1.4.2.3 Burnout

Two studies investigated the impact of mindfulness on the reduction on burnout amongst healthcare students. DeVibe et al (2013) failed to demonstrate significant reductions in burnout following a 7 week mindfulness intervention in an intervention group compared to a control group, and Barbosa (2014) found that

scores on the MBI did not demonstrate significant improvements following an 8 week MBSR intervention. Whilst the intervention carried out in this study coincided with exams and therefore potentially a stressful period for the participants involved, the literature presented differs from the literature amongst healthcare professionals, suggesting that perhaps mindfulness is less effective at targeting burnout in the student population. However only two studies have investigated the reduction of burnout following MBSR in healthcare students, prompting the need for further research in this area.

1.4.2.4 Empathy

Three studies examined the effectiveness of MBSR in reducing empathy amongst healthcare students (Shapiro, Schwartz, & Bonner, 1998; Beddoe & Murphy, 2004; Barbosa et al, 2014). One of these found that MBSR significantly increased levels of empathy, however the remaining two found that mindfulness did not significantly increase empathy amongst this population. The two studies which found that MBSR was not effective at significantly increasing empathy levels used full 8 week MBSR interventions, suggesting that it may not be the brevity of the intervention accounting for the lack of significant change in this variable.

Shapiro, Schwartz, & Bonner (1998) found that scores on the Empathy Construct Rating Scale increased significantly following a 7 week MBSR intervention. The authors also replicated these findings in a control group following their participation in the intervention, demonstrating the effectiveness of MBSR for increasing levels of empathy across two different interventions in premedical students. However Beddoe & Murphy (2004) found that, following an 8 week MBSR intervention, scores on the Interpersonal Reactivity Index (IRI), a measure of dispositional empathy, did not significantly increase. However it is worth noting that participant's scores on the IRI were 40-50% higher pre intervention compared to the mean scores of participants pre intervention in two similar studies (Atkins & Steitz, 2000; Davis, 1980). Furthermore, Barbosa et al (2014) failed to demonstrate significant increases in empathy following an 8 week MBSR intervention, with scores on the Jefferson Scale of Physician Empathy lower at the 11 week follow up than at baseline. Whilst the 11 week follow up did coincide with exams, the results presented in this study, alongside the findings by Beddoe and Murphy (2004) highlight the need

for further investigation into the effectiveness of MBSR for increasing empathy levels amongst healthcare students.

1.4.2.5 Job satisfaction

Only one study investigated the impact of MBSR on job satisfaction amongst healthcare students. Beddoe & Murphy (2004) used a measure of attitude posture to explore changes in satisfaction at work and achievement ethic amongst a sample of nursing students following an 8 week mindfulness intervention. Whilst they did not find significant changes pre to post intervention on this measure, scores did demonstrate a strong upward trend. Whilst this study therefore suggests that mindfulness may have positive effects on job satisfaction, it is unable to conclude that scores on this measure are significantly increased following MBSR. The lack of literature investigating changes in job satisfaction prompt the need for further research into the impact of MBSR on job satisfaction amongst healthcare students.

1.4.2.6 Patient care

Only one study investigated the impact of MBSR on patient care amongst healthcare students. Beddoe & Murphy (2004) found that scores on the Time Pressure Scale, which has been used as a measure of errors and poor patient care, demonstrated a strong downward trend following an 8 week MBSR intervention amongst nursing students. Whilst they were therefore unable to demonstrate significant reductions on this measure, the results suggest that MBSR may have impacted on better patient care amongst nursing students. However further research is needed in order to explore whether more robust effects may be demonstrated.

1.4.2.7 Quality of life

Only one study investigated increases in quality of life following an MBSR intervention amongst healthcare students. De Vibe et al (2013) conducted a randomised controlled trial using a 7 week MBSR intervention with 288 medical and psychology students. Participant's scores increased significantly on the Subjective Well-being Scale amongst females, indicating a significant effect of MBSR on quality of

life, however no significant effect was observed in males. Whilst this is possibly due to the fact that there were significantly fewer men in the intervention group than women, this study provides data for the differential effects of MBSR for females versus males, a factor which has not been identified as relevant in previous studies, and therefore requires further investigation.

Table 4: *Overview of studies with healthcare students*

Study	Participant	Measures	Design	Intervention	Results
Shapiro et al, 1998	N= 78. 37 in the intervention group and 41 in a waitlist control. Medical and pre medical students.	Empathy Construct Rating Scale (ECRS), Hopkins Symptoms Checklist, subscale 4 of the Symptoms Checklist-90 Revised, State Trait Anxiety Inventory and Index of Core Spiritual Experiences	Randomized controlled pre and post intervention study. Data collected immediately pre and post intervention.	Participants were assigned to one of two 7 week mindfulness interventions or a wait list control. Sessions lasted 2.5 hours and required daily home practice.	Tx sig < control on the SCL-90-R and sig > on the ECRS pre-post intervention
Young et al, 2001	N=30. 15 in the intervention group and 15 in a no intervention control. Nurses.	Overall Health Status Profile (HSP) and Orientation to Life Questionnaire (OLQ). Qualitative data was collected through the use of focus groups.	Non randomized pre and posttest controlled trial. Measures provided immediately pre and post intervention.	8 week MBSR intervention. Measured provided at baseline and immediately post Intervention.	Tx sig > control on the HSP and OLQ post intervention. Ptps reported a number of benefits of mindfulness including helping them to juggle to demands of work, increased awareness, a reduced sense of urgency, increased time for themselves, reduced physical symptoms and increased appreciation and connectedness.
Rosenzweig et al, 2003	N= 302. 140 in the intervention group and 162 in the control group. Medical students.	Prolife of mood states (POMS)	Non randomized controlled trial. Data collected at baseline and immediately following the intervention.	Intervention consisted of 10 MBSR 'seminars' held on consecutive weeks for 90 minutes each. Participants in the control group attended seminars which discussed topics such as alternative medicine.	Tx sig < control on the POMS post intervention. Tx sig < on the POMS pre to post intervention

Beddoe & Murphy, 2004	N= 16. Nurses.	Interpersonal Reactivity Index (IRI), Derogatis Stress Profile (DSP), and the Homework Questionnaire. Participants were also asked to keep journal entries regarding their experiences of the course.	Pilot pre and post intervention design. Data collected immediately pre and post intervention.	8 week MBSR course consisting of 2 hour sessions and daily home practice.	Ptps sig < on the DSP pre to post intervention No sig reductions on the IRI. Strong upward trend in the Time Pressure Scale and the Attitude Posture Scale. 63% of participants reported changes in their relationship to thoughts and feelings, 75% reported greater confidence, 88% reported feeling more hopeful and 69% reported feeling more assertive. Journal entries revealed increased relaxation, increased awareness and acceptance, increased patience and a greater sense of appreciation for daily life
Jain et al, 2007.	N= 81. 27 participants allocated to an MBSR intervention, 24 to a relaxation intervention and 30 participants in a wait list control. 17 Medical students, 5 nursing students, 28 premedical students and 31 pre health students.	Daily Emotion Report (DER), Index of Core Spiritual Experiences, Brief Symptom Inventory (BSI), the Positive States of Mind Scale (PSOM) and the Marlowe-Crowne Short Form	Randomized controlled pre and posttest intervention study. Measures completed at baseline and 2 weeks post intervention.	Participants attended one of two 4 week MBSR intervention with each session lasting 1.5 hours or one of two somatic relaxation interventions matched in time and duration. Each intervention run by a different instructor.	MBSR sig < control on the rumination subscale of DES post intervention Non sig trends towards < rumination on the DES in MBSR versus relaxation group. MBSR significantly < control and relaxation group on distraction subscale of the DES pre to post intervention Mindfulness and MBSR significantly < control on the BSI and PSOM, with the MBSR group showing considerably larger effect sizes on the BSI and PSOM than the relaxation group
Kang et al, 2009	N=32. 16 in the intervention group and 16 in a no intervention control group. Nurses.	Psycho-Social Well-being Index Short Form (PWI-SF) State Trait Anxiety Inventory (STAI) and Beck Depression Inventory (BDI)	Randomized controlled pre and post intervention design. Measures provided at baseline and one week post intervention.	8 week stress coping program based on mindfulness meditation with sessions lasting between 1.5 and 2 hours.	Tx sig < on the PWI-SF, STAI and BDI pre to post intervention Tx sig < control on the PWI-SF and STAI post intervention
Chen et al, 2013	N=60. 30 in the intervention group and 30 in a no intervention control. Nurses.	The Self Rating Anxiety Scale and the Self Rating Depression Scale (Chinese versions) and heart rate and blood	Randomized controlled pre and post intervention design. Data collected immediately pre and	Mindfulness mediation course run on 7 consecutive days for 30 minutes each day.	Tx significant < control on the Self Rating Anxiety Scale post intervention No sig differences between Tx and control on the Self Rating Depression Scale post intervention.

		pressure recordings	post intervention.		No sig differences between Tx and control for heart rate or diastolic blood pressure post intervention Tx sig < systolic blood pressure post intervention
De Vibe et al, 2013	N=288. 144 in intervention and 144 in a wait list control group. 176 medical students 112 psychology students.	The General Health Questionnaire-12 (GHQ-12), the Maslach Burnout Inventory (MBI), the 13-item Perceived Medical School Stress Scale (PMSS), the Five Facet Mindfulness Questionnaire (FFMQ) and the Subjective Wellbeing Scale (SWB).	Randomized controlled pre and post intervention study. Data collected immediately pre and post intervention.	6 weekly sessions of 1.5 hours each, a 6 hour session in week 7 and 30 minutes of home practice daily.	Tx (females) sig > control on SWB and sig < control on PMSS post intervention No sig effects observed in males.
Barbosa et al, 2014	N= 31. 13 in the intervention group and a matched no intervention control group of 15. 7 podiatrists, 5 physicians, 7 physical therapists, 5 occupational therapists, 4 nurses.	The Burns Anxiety Inventory (BAI), the Jefferson Scale of Physician Empathy (JSE) and the Maslach Burnout Inventory (MBI).	Non randomized pre and post intervention design. Measures provided at baseline, on completion of the course and 3 weeks post intervention.	8 week MBSR course consisting of 2.5 hour sessions, a day retreat and homework assignments.	Tx sig < control at time 2 and 3 on the BAI, and sig > at time 2 on the JSE, however this was not maintained at time 3. No sig between or within group differences post intervention on the MBI.

Table 5: *Effect sizes for healthcare students (where data is available)*

Study	Intervention	Results								
		MF	BO	P.D	JS	LS	SC	EM	PC	Stress
Chen et al 2013	7 day MBSR Nurses			d=0.3						
Kang et al 2009	8 week mindful stress coping course Nurses			d=1.26						d=1.14
Rosenzweig et al 2003	10 MBSR seminars Medical students			d=0.06	d=0.33	d=0.68				
Jain et al 2007	4 week MBSR Nursing, medical and health students			d=0.72			d=1.26	d=0.77		d=1.22
De Vibe et al 2013	6 week MBSR Psychology and medical students		d=0.15	d=0.6		d=0.47				d=0.18
Average			d=0.15	d=0.59		d=0.47				d=0.66

Note: MF = mindfulness, BO = burnout, PD = psychological distress, JS = job satisfaction, LS = life satisfaction, SC = self compassion, EM = empathy, PC = patient care

1.5 Strengths and weaknesses

A number of limitations exist within the literature presented in this review, and must therefore be taken into consideration when drawing conclusions and considering directions for future research.

1.5.1 Longitudinal follow up

Only five of the studies included a longitudinal follow up (> 8 weeks), with the remaining studies measuring participants scores on the outcome measures immediately or less than 8 weeks post intervention, with no further investigation into the maintenance of change observed over time (e.g. Jain et al, 2007., Goodman & Schorling, 2012., Young et al, 2001., Moody et al, 2013.) This has led to a paucity of research which is able to demonstrate the long term benefits of a mindfulness intervention for healthcare professionals. However a number of studies which have benefited from longitudinal follow up have been successful in providing evidence for the maintenance of gains over time following a mindfulness intervention (e.g. Fortney et al, 2013., Martin-Asuero & Garcia-Banda, 2010). This highlights the need for future research to focus on the long term analysis of MBSR interventions within healthcare professionals.

1.5.2 Randomized controlled trials

Few studies used randomized controlled trials and have therefore been unable to draw comparisons between a mindfulness versus control intervention (e.g. Goodman & Schorling, 2012; Bazarko et al, 2013.). It is possible that the improvements observed in a number of studies following a mindfulness intervention were due to regression to the mean as opposed to the direct effects of increased levels of mindfulness. In those studies which did use a control group, participants were often not randomised to conditions, creating a possible bias (e.g. Horner et al, 2014). In addition, only three of the studies presented in this review (Rosenzweig, 2003; Pipe et al, 2009; Jain et al 2007) included a control group who received group contact which matched that of the intervention. As a result, the gains identified in the

mindfulness interventions presented may have been due to the impact of group contact and support as opposed to the direct effects of mindfulness. However this hypothesis was considered by Jain et al (2007) who compared a mindfulness intervention with a relaxation intervention versus a no intervention control. The authors supported the increased benefits of mindfulness compared to a relaxation intervention, particularly in reducing levels of rumination. Future research must focus on providing robust randomised controlled trials with a matched group contact control in order to extend the current literature.

1.5.3 Recruitment

The majority of studies recruited participants through convenience sampling (e.g. Barbosa, 2014; Krasner, 2009). It may be that participants who had prior experience with mindfulness, were more open to psychological therapies or were more aware of taking care of their well-being were more likely to declare their interest in taking part in the intervention. As a result, future research must address whether MBSR is effective for all healthcare professionals regardless of prior interest or increased motivation to take care of oneself. In addition, there is a bias towards female participants in the majority of studies presented in this review (e.g. Chen et al, 2013; Bazarko et al, 2013) limiting the generalisability of results to a wider sample of male healthcare professionals. De Vibe et al (2013) found significant effects for women on a measure of stress following MBSR however did not find similar effects for men. This suggests that gender may have an effect on treatment effectiveness, prompting the need for further investigation into the potential benefits of MBSR for males given that the majority of participants in the studies presented are female.

1.5.4 Measures

Amongst the studies reporting significant improvements in well-being pre to post intervention, few have measured changes in levels of mindfulness (e.g. Moody et al, 2013; Abeni et al, 2014; Fortney et al, 2013). This has limited opportunities to test whether increases in mindfulness correlate with improvements in well-being. As a result, it is unclear the degree to which improvements in well-being might co-vary with increases in levels of mindfulness. However the limited number of studies which

did include a measure of mindfulness have all succeeded in demonstrating positive associations between mindfulness and a number of measures of well-being (e.g. Krasner, 2009; Leggett, 2010.).

1.5.5 Intervention

Whilst many of the studies presented in this review used a robust 8 week MBSR intervention, 11 studies adapted the traditional MBSR intervention, reducing the number or length of sessions and altering the content or delivery method (e.g. Jain et al, 2007; Mackenzie, 2006; Bazarko, 2013). In addition, a number of studies did not use qualified mindfulness instructors to deliver the intervention, or did not state the qualification status of the instructors, which may have reduced the effectiveness of the intervention and complicates interpretation of the results (e.g. Horner et al, 2014). As a result, it is important to apply caution when drawing conclusions as to the limited effectiveness of mindfulness for healthcare professionals, as it may be that the intervention was ineffective due to its removal away from a traditional evidence based MBSR intervention. However it is important to note that there was no clear evidence amongst the literature to suggest that 8 week MBSR interventions are more effective than abbreviated interventions, with both full 8 week interventions and shortened interventions yielding significant results. In addition, given the increased levels of stress and burnout amongst healthcare professionals, a brief version of the MBSR intervention may be more realistic and effective when encouraging participation in the course. As a result, those studies which present a shortened version of a full MBSR intervention provide valuable data in order to consider the ways in which full MBSR may be applied to a healthcare setting. For example, whilst the study presented by Chen et al (2013) may have yielded stronger results had the intervention been delivered over the course of 8 weeks, the results support the benefits of a short term intervention for the reduction of anxiety in nursing students. Future studies must present a standardized and replicable brief MBSR intervention in order to allow for comparison with a full 8 week MBSR course within this population.

1.5.6 Patient satisfaction

Few studies include a measure of patient satisfaction following healthcare professionals participation in a mindfulness intervention. This limits the implications which can be drawn based on the literature, as improvements in patient satisfaction may provide a strong rationale for the introduction of mindfulness in healthcare settings. As a result, few studies are able to support the benefits of mindfulness on the wider context of service delivery. However Beddoe & Murphy (2004) investigated time pressure and clinicians attitudes toward patient care post intervention, extending the research towards the investigation of the impact of mindfulness on clinician effectiveness. However no studies directly ask patients their experiences of care following participants engagement in a mindfulness intervention, reducing the strength of the conclusions which can be drawn from the limited findings presented in this area.

1.5.7. PTSD & Compassion fatigue

This review aimed to investigate the effectiveness of MBSR for the well-being of healthcare professionals. An important consideration when investigating well-being amongst healthcare professionals is the impact of experiencing high levels of trauma within their role on their mental health. However no studies identified in this review included a measure of compassion fatigue or PTSD, preventing conclusions being drawn regarding the benefits of MBSR for PTSD and compassion fatigue/secondary traumatic stress in healthcare professionals. Given the evidence for the use of MBSR for the treatment of PTSD in other populations (Goldsmith et al, 2013) as well as the prevalence of PTSD and compassion fatigue in the healthcare population, the effectiveness of MBSR in the treatment of PTSD and compassion fatigue remains an important area for future investigation.

1.6 Limitations of the review

This review was focused only on studies which included an intervention, and excluded correlational studies investigating associations between mindfulness and

well-being in healthcare professionals. Given the lack of robust intervention studies relative to correlational designs, this limited the review to a number of pilot studies. In addition, it did not carry out a meta-analysis in order to investigate trends in the data. However given the range of measures used and variety in aspects of well-being investigated within the studies presented, it may not have been appropriate to conduct a meta-analysis of the available literature at this time. However future research must focus on closely replicating past studies in areas such as the intensity of the intervention and the outcome measures used in order to allow for conclusions to be drawn regarding the effectiveness of MBSR for healthcare professionals.

1.7 Conclusions

For the purposes of this review, studies were divided into healthcare students and qualified professionals. The literature suggests that mindfulness interventions amongst both of these cohorts successfully impact on a number of areas of well-being, with few distinctions in effectiveness being present between these two groups. The literature suggests that mindfulness is an effective intervention in reducing stress (Beddoe & Murphy, 2004), depression and anxiety (Rosenzweig et al, 2009) and burnout (Cohen-Katz, 2005). In addition, a limited number of studies have provided support for the benefits of mindfulness on patient satisfaction amongst student populations.

However the results demonstrate large variations in effect sizes across studies, for example Bazarko et al (2013) found a large effect size of d=0.98 for levels of burnout, in comparison to De Vibe et al (2013) who reported results representing a small effect size of 0.15. In addition, a number of studies failed to find significant effects (e.g. Barbosa et al, 2014; Chen et al, 2013; Leggett, 2010) in at least one of the measures used, stating possible influencing factors such as the intervention coinciding with exams (Barbosa et al, 2014), higher baseline scores (Beddoe & Murphy, 2004), and the brevity of the intervention program (Chen et al, 2013). The brevity of the intervention is a possible influencing factor which exists within a number of studies presented, with few of those which implemented a brief MBSR intervention using an evidence based program taught by a qualified instructor. It is important therefore to consider the role that this may play in any effects found, and

the greater effect sizes which may have been identified in those studies had they provided a full MBSR intervention.

Further research is needed to investigate the relative benefits of a full MBSR intervention versus a brief version in order to consider the costs and benefits of reducing the intensity of the intervention for this cohort. Research could focus on those aspects of mindfulness which are most important and relevant for healthcare professionals, and compare the effectiveness of a number of alternative brief mindfulness interventions tailored to this cohort. Given that both studies which investigated job satisfaction failed to find significant increases following an MBSR intervention (Mackenzie et al, 2006; Penque, 2009), and the lack of investigation into the impact of mindfulness on patient satisfaction, future research must also focus on investigating the impact of improvements in well-being on patient and job satisfaction, in order to support the rationale for the implementation of mindfulness interventions in healthcare environments. In addition, given the findings in this review, future research may investigate whether MBSR could also be effective in promoting well-being amongst mental health professionals. Whilst, as outlined at the beginning of this review, mental and physical health professionals are exposed to different working environments, they also share a number of similarities including working within the context of a caring role, large caseloads and high levels of burnout (Evans et al, 2005)

This literature review has highlighted the need for further evaluation of the effectiveness of MBSR for the prevention and treatment of PTSD and compassion fatigue/secondary traumatic stress in healthcare professionals. As previously mentioned, healthcare professionals working in physical health settings are frequently exposed to highly distressing environments in which they witness the traumatic experiences of those they are there to help, leaving them at high risk of suffering from a trauma response (Dominguez-Gomez & Rutledge, 2009). MBSR has been found to be effective for the treatment of PTSD within clinical populations (Follette, Palm & Pearson, 2006) and as such may be reasonably investigated for its effectiveness in the treatment of secondary traumatic stress disorder within the healthcare population. However this has not been investigated in any of the studies outlined in this review, and as such future research must focus on the potential

effectiveness of MBSR for the treatment and prevention of secondary traumatic stress in healthcare professionals.

Chapter 2: Empirical Paper

Associations between Mindfulness, Levels of Post-Traumatic Stress and Compassion Fatigue in Healthcare Professionals

2.1 Introduction

2.1.1 Mindfulness

Mindfulness is a form of meditation which has its roots in ancient Buddhist practice, becoming popular in western cultures more recently. Mindfulness is centered on the concept of focusing ones attention in a non-judgmental way on a chosen experience (Kabat-Zinn, 2003) and has been used as an approach to guide purposeful and skillful responding to unhelpful cognitive and behavioural processes (Bishop et al, 2004). Bishop et al (2004) propose a two component model of mindfulness, involving self regulation of attention focused on the present moment, in addition to approaching ones experiences with curiosity, openness and acceptance. A central component of mindfulness is therefore the chosen purposeful focus of attention, challenging the 'automatic pilot' mode of living in which being 'in one's head' is replaced with awareness of the present moment (Mertz, 2013). Jha, Krompinger & Baime (2007) state that mindfulness is concerned with the development of 'concentrative attention', in which one is able to consciously attend to a chosen stimulus, and 'receptive attention', in which one can quickly shift attention between stimuli. Attention control in mindfulness is therefore a significant focus for practice in order to develop ones skills in living mindfully moment by moment.

Mindfulness has also been associated with the development of compassion and unconditional regard for oneself and others (Gilbert, 2005). Neff (2003b) defined compassion as consisting of three constructs: kindness, common humanity and

mindfulness, placing mindfulness within the definition of compassion and demonstrating the overlap between the two concepts. Research has demonstrated an association between mindfulness and the development of self compassion, highlighting the link between these two constructs. Bazarko, Cate, Azocar & Krietzer (2013) found that self compassion increased following a mindfulness based stress reduction program with 36 nurses; results which were supported by Shapiro Astin, Bishop, & Cordova (2005) who found that self compassion scores were significantly higher following an 8 week MBSR course amongst 38 healthcare workers.

As the concepts of mindfulness gained attention, the need for the development of a formalized practice, which could be applied to clinical populations, resulted in the development of mindfulness based stress reduction (MBSR), and (Kabat Zinn, 1982). Kabat-Zinn clarified the philosophies and concepts of mindfulness creating an accessible practice for the benefit of individuals with long-term physical health conditions (Kabat-Zinn, Lipworth, Burney & Sellars, 1987). Kabat-Zinn's program consists of 8 weeks mindfulness practice, with sessions lasting 2.5 hours, daily home practice and a full day mindfulness retreat. This standardized MBSR program has since gained a great deal of interest and support, and the benefits of MBSR have become apparent for a range of physical and mental health disorders, as well as within non-clinical populations. In addition, mindfulness techniques have also been incorporated into a number of additional treatment approaches such a Dialectical Behaviour Therapy (Linehan, 1993) and Mindfulness Based Cognitive Therapy (Segal, Williams & Teasdale, 2002) and have been successfully applied to varying populations, such a personality disorder (Linehan, Armstrong, Saurez, Allmon & Heard, 1991) and depression (Teasdale et al, 2000; Kuyken et al, 2008).

A number of measures of mindfulness have been developed in order to attempt to define and measure the key components of mindfulness. The Five Facet Mindfulness Questionnaire (FFMQ) (Baer, Smith, Hopkins, Krietemeyer & Toney, 2006) was developed to provide a measure of mindfulness based on five key facets: Non-judgment, acting with awareness, observing, describing, and non-reactivity to inner experience, and these have been understood in the literature to represent key concepts when discussing the nature of mindfulness.

2.1.2 Effectiveness of MBSR

MBSR has demonstrated effectiveness for a range of mental health conditions including social anxiety disorder (Goldin & Gross, 2010), stress (Chang et al, 2004), generalized anxiety disorder (Evans et al, 2008) and depression (Smith et al, 2008). In a meta-analytic review, Hofmann, Sawyer, Witt & Oh (2010) investigated the effectiveness of MBSR across 39 studies consisting of 1,140 participants. Amongst patients suffering from anxiety or depression, mindfulness based therapy demonstrated robust effect sizes (Hedges g = 0.97 and 0.95 respectively) highlighting the beneficial effects of mindfulness for anxiety and mood disorders. The beneficial effects of mindfulness was supported by Nyklieek & Kuijpers, 2008, who conducted a randomized controlled trial investigating the benefits of MBSR versus a wait list control in 57 participants reporting psychological distress. Following an 8 week MBSR course, participants in the treatment group reported significantly greater reductions in stress and vital exhaustion and significantly greater increases in positive affect, quality of life and mindfulness, highlighting the role of mindfulness in the management of psychological distress.

2.1.3 MBSR applied to post traumatic-stress disorder (PTSD)

With the increasing evidence base supporting the effectiveness of MBSR for a range of psychological disorders, mindfulness has also demonstrated positive effect sizes in the treatment of PTSD, with greater trait/dispositional mindfulness associated with reduced PTSD symptom severity (Kearney, McDermott, Malte, Martinez & Simpson, 2012). PTSD is defined in the DSM-5 as witnessing or directly experiencing actual or threatened death, serious injury or sexual assault, and requires the individual to be suffering from re-experiencing symptoms, avoidance, hyper-arousal and negative thoughts and mood (American Psychiatric Association, 2013). In a study of trait levels of mindfulness amongst urban firefighters, Smith et al (2011) found that mindfulness was associated with fewer PTSD symptoms. Whilst it may be that an increase in PTSD symptom severity caused a subsequent reduction in mindfulness scores, this study may also suggest that mindfulness plays a protective role against the development of PTSD following exposure to a traumatic event. Kimbrough, Magyari, Langenberg, Chesney & Berman (2010) examined the impact of a mindfulness intervention on PTSD scores amongst survivors of childhood sexual

abuse, finding that PTSD scores were reduced following an 8 week mindfulness based stress reduction course. In addition, Owens, Walter, Chard & Davis (2012) found that mindfulness was negatively associated with PTSD symptom severity in a clinical sample of veterans receiving residential treatment.

As the evidence base for an association between mindfulness and PTSD symptom severity has increased, research has investigated the particular components of mindfulness which may explain the observed effects. Ehlers and Clark (2000) outline a cognitive model of PTSD, which highlights the factors which maintain a sense of current threat within a diagnosis of PTSD. They state that PTSD is maintained by three key factors: the unprocessed nature of the trauma memory, the beliefs that one holds in relation to the trauma and avoidance behaviours including avoidance of internal and external threat. Mindfulness may act on each of these areas, as outlined below, contributing to the reduction of current threat and therefore the reduction of PTSD symptom severity.

Thompson, Arnkoff & Glass (2011) state that the attentional control taught within mindfulness practice acts on the avoidance facet of PTSD. They state that attentional control facilitates an individual's willingness to focus their attention on their emotional experiences within the present moment, therefore reducing emotional disengagement and experiential avoidance. In addition, deficits in attention control have been implicated in the re-experiencing symptoms associated with PTSD (Anderson & Levy, 2009; Joormann, Yoon & Siemer, 2010), and may be targeted with the intentional shifting of attention practiced within mindfulness (Lang et al, 2012). The role of attentional focus in the relationship between mindfulness and PTSD has been further supported by Boden et al (2012), who found that increases in the 'acting with awareness' subscale of the FFMQ accounted for a significant unique amount of variance in PTSD scores post treatment in a sample of 48 veterans. This subscale indexes an individual's ability to focus their attention on the present moment, and pay attention to the sensations they experience, as they experience them. The literature therefore highlights the impact of attention control of the maintenance cycle of PTSD presented by Ehlers and Clark (2000), specifically the avoidance and re-experiencing components of the model.

Furthermore, investigation into the concepts of mindfulness which are most strongly associated with resilience to PTSD has also highlighted the role of a non-judgmental approach to one's internal and external experiences. Vujanovic, Youngwirth, Johnson & Zvolensky (2009) found that only the non-judgmental subscale of the FFMQ was negatively associated with PTSD symptom severity, highlighting the possible role of a non-judgmental approach in resilience to PTSD. In addition, Wahbeh, Lu and Oken (2011) found that non-judgment was the only subscale which significantly predicted the variance in PTSD symptoms amongst a group of veterans. Wahbeh and colleagues (2011) state that people who are higher in the non-judging subscale are likely to be less avoidant of trauma memories and have a less negative reaction to their intrusion, highlighting the role of a non-judgmental approach on the avoidance and re-experiencing symptoms in PTSD. If an individual has a less negative reaction to their re-experiencing symptoms, they may be less likely to push away memories of the trauma when they arise, therefore facilitating processing of the memory to take place, reducing a sense of current threat.

In addition, self compassion within a mindfulness approach has become increasingly investigated for the role it plays in the development and maintenance of PTSD, with low levels of compassion and high levels of shame being implicated in the development and maintenance of PTSD (Lee, James & Gilbert, 2013). Shame has been found to influence an individual's attributions following a traumatic event (Lee & Scragg, 2001), and is associated with higher levels of self critical thinking in individuals with PTSD, impacting on an individual's psychological integrity and therefore contributing to an increased sense of current threat (Harman & Lee, 2009). MBSR's focus on compassion as outlined above may therefore target such processes in individuals suffering from PTSD, contributing to the effectiveness of mindfulness in the management of trauma. As a result, mindfulness's focus on self compassion may alter an individual's trauma related beliefs, thus impacting on a key maintaining factor within the cognitive model of PTSD. The role of compassion was supported by Kearney et al (2013) who found that a loving kindness meditation reduced PTSD symptoms amongst veterans, with effects being maintained at 3 month follow up. Further research may therefore investigate the mediating role of compassion in the protective effects of mindfulness against the development of PTSD.

The research into the role of mindfulness in the management of PTSD has demonstrated strong associations between mindfulness and PTSD symptom severity, with a non-judgmental, compassionate approach as well as present moment awareness being specifically implicated as factors which may impact on the maintenance of PTSD as outlined by Ehlers and Clark (2000). However further research is needed in order to investigate this relationship in clinical, non-clinical and at-risk populations.

2.1.4 Psychological well-being of healthcare professionals

Healthcare professionals are exposed to a large number of work place stressors such as high levels of pressure, large caseloads and the emotional cost of caring (McVicar, 2003), with a report of U.S physicians demonstrating a decline in work place satisfaction between 1986-1997 (Murray et al, 2001). In addition, healthcare staff working in high responsibility roles often face unrealistic expectations which affect their ability to cope as well as increasing their experience of stress (Shirley Ebright & McDaniel, 2008). The experience of stress amongst healthcare workers has been found to impact clinicians self reported ratings of patient care (Shanafelt, Bradley, Wipf & Back, 2002) and is associated with a number of aspects of well-being including burnout (Spickard, Gabbe & Christensen, 2002), job satisfaction (Blegen, 1993) and depression (Tyssen, Vaglum, Gronvold & Ekeberg, 2001). Burnout has been identified as a common difficulty facing healthcare workers and was defined by Freudenberger in 1974 to refer to the reduction of motivation in the face of a failure to produce the desired results. The prevalence of burnout has since been widely investigated within this population, with the Maslach Burnout Inventory (Maslach & Jackson, 1981) dividing burnout into 3 main constructs: Emotional exhaustion, depersonalization and personal accomplishment. Hinderer and colleagues (2014) reported high levels of burnout (36%) amongst trauma nurses and Ishak and colleagues (2013) found that at least half of all medical students may be affected by burnout at some point during their education.

In addition to high levels of burnout within the healthcare profession, PTSD is a significant risk factor for healthcare professionals who work in highly traumatic environments. As outlined earlier, an individual may suffer from PTSD following the

witnessing of a traumatic event inflicted on another individual, and as such healthcare workers, who work with others suffering on a daily basis may be particularly at risk of suffering from PTSD. Laposa & Alden (2001) found that 20% of emergency room personnel met PTSD symptom criteria, a finding which was supported by Laposa, Alden & Fullerton (2003) who found that 12% of emergency department nurses met the full criteria for PTSD and 20% met the criteria for three symptom clusters. Given the nature of trauma exposure within healthcare professionals, the terms 'vicarious traumatization' (McCann and Pearlman, 1990), 'secondary traumatic stress' (STS) and 'compassion fatigue' (CF) (Figley, 1995) have frequently been used within this population. These terms refer to the traumatic stress response which may be commonly experienced within this population following the witnessing of single or multiple traumatic events, along with a desire to help the suffering person (Figley, 1995). Stamm (2010) argues that, despite subtle differences in the constructs associated with these three terms, no studies have provided sufficient evidence for their valid differentiation, resulting in them being used interchangeably in the literature. Vicarious trauma, STS and CF symptoms mimic those of post-traumatic stress disorder, however the terms are used solely to refer to the witnessing of a traumatic event happen to another individual as opposed to being the direct victim of trauma (Baird & Kracen, 2006). In defining compassion fatigue, Figley (1995) categorized it into three key concepts: Psychological distress, cognitive shifts and relational disturbances. Psychological distress is characterized by distressing emotions, re-experiencing, avoidance, somatic complaints, hyper-arousal and impairment in day to day functioning. Cognitive shifts refer to an alteration in the beliefs that the individual holds about the world, such as a heightened sense of vulnerability and feelings of helplessness. In addition, relational disturbances refers to a distancing from patients or an over identification with those one is meant to be helping.

In an exploratory study, Dominuez-Gomez & Rutledge (2009) examined the prevalence of secondary traumatic stress amongst nurses working in an emergency department. They found that 85% of a sample of 67 reported at least one symptom indicative of secondary traumatic stress, with 33% meeting the cut off for a diagnosis of secondary traumatic stress disorder. In addition, Beck (2011) conducted a systematic review which reported on the prevalence of compassion fatigue amongst

nurses in 7 studies. It was found that compassion fatigue was reported in nurses in all 7 studies, with specialties including forensic, emergency, oncology, pediatric and hospice nurses. The prevalence of compassion fatigue amongst nurses was supported by Faucher (2013) who found that one third of labour and delivery nurses experience moderate to severe compassion fatigue. Investigations into the impact of compassion fatigue on effectiveness at work has demonstrated associations between compassion fatigue and poor professional judgments amongst social workers (Rudolph, Stamm & Stamm, 1997), indicating the implications of compassion fatigue for healthcare provision.

2.1.5 MBSR applied to healthcare professionals

Given the prevalence of a number of mental health disorders in healthcare professionals, the application of MBSR to this cohort has been researched for its potential benefits in the management of such difficulties. Krasner et al (2009) investigated the effectiveness of an 8 week MBSR course in reducing levels of burnout and mood disturbance amongst 70 primary care clinicians. They found significant improvements on all measures, and reported gains which were maintained over a 15 month follow up. The benefits of MBSR for primary care clinicians has also been supported by Fortney, Lucherband, Zakletskaia, Zgierska & Rakel (2013) who found that burnout, depression and stress all reduced significantly within a sample of 30 clinicians. Within a larger sample of physicians, psychologists, social workers and nurses, Goodman & Schorling (2012) also demonstrated significant improvements in burnout following an 8 week MBSR course. In addition, Shapiro, Astin, Bishop & Cordova (2005) conducted a randomised controlled trial of MBSR versus a waitlist control amongst healthcare professionals (physicians, social workers, physical therapists, nurses and psychologists), demonstrating significant improvements in self compassion and perceived stress and non-significant improvements in burnout and satisfaction with life. The effectiveness of MBSR for reducing burnout, depression and anxiety amongst healthcare professionals has also been found within midwives, oncology staff and medical students (Mackenzie et al, 2006; Fourer et al, 2013; Chen et al, 2013).

Despite the evidence for MBSR in the reduction of a number of mental health problems faced by healthcare professionals, there has been little research into the use of MBSR for the treatment or prevention of PTSD in healthcare workers. In addition, given the evidence supporting the effectiveness of MBSR in the treatment of PTSD, it may be that these benefits extend to the treatment of compassion fatigue within healthcare workers, given the overlap between compassion fatigue and PTSD. However no studies to the author's knowledge have attempted to extend these findings to compassion fatigue within the healthcare population. As a result, further research is required in order to investigate the role of mindfulness in the management of PTSD and compassion fatigue within the healthcare population. In addition, given the research supporting the role of self compassion in resilience against PTSD, further research would benefit from a focus on the mediating role that this factor may play in the protection against PTSD and compassion fatigue within the healthcare population. This may support the development of short term, focused mindfulness interventions centered on the key concepts found to impact on PTSD in healthcare professionals.

2.1.6 The current study

2.1.6.1 Outline of study

The present study was a cross sectional correlational design investigating the associations between components of mindfulness, levels of post-traumatic stress (PTS) and compassion fatigue within healthcare professionals. Furthermore the study examined the extent to which self compassion mediates the relationship between mindfulness and PTS/compassion fatigue. Data was collected at one time point across a cohort of healthcare professionals working in physical health settings with direct patient contact. Participants completed an online survey consisting of 6 questionnaires which measured mindfulness, compassion fatigue, PTS, self compassion, burnout and psychological distress.

This study had two key objectives. Firstly it was concerned with extending the current literature into the association between mindfulness and PTSD and applying this to healthcare professionals, in order to consider whether mindfulness is

associated with reduced levels of PTS within this population, as well as extending this to examine associations between mindfulness and compassion fatigue. Secondly, it was concerned with the mediating role of self compassion in any association observed between mindfulness and PTS and/or compassion fatigue. In addition, this study provided measures of burnout and psychological distress in order to place it within the existing literature, which highlights the role of mindfulness in the management of these mental health conditions in healthcare professionals.

Whilst this study was concerned with investigating aspects of psychological well-being which may fall within the construct of 'resilience', this was not a construct which was directly examined in this study. Resilience has been widely discussed within the literature (Connor & Davison, 2003) and contains a number of varying components and facets which are beyond the scope of the present study. As a result, this study does not claim to investigate factors which correlate with increased 'resilience' amongst healthcare workers, and is instead concerned with specific aspects of well-being which may, together with a number of additional constructs define our understanding of resilience.

2.1.6.2 Research Questions

1. What is the association of components of mindfulness and PTS, compassion fatigue, compassion satisfaction, psychological distress and burnout amongst healthcare professionals?

2. Does self compassion mediate this relationship?

2.1.6.3 Hypotheses

1. A negative association will be observed between levels of mindfulness and PTS, psychological distress, burnout and compassion fatigue.

2. Self compassion will mediate the association observed between mindfulness and compassion fatigue and between mindfulness and PTS.

2.2 Method

2.2.1 Design

This study used a cross sectional survey design and collected participants through the use of a convenience sample.

2.2.2 Participants

Participants were recruited via a number of methods. The study was advertised via online media sites including Facebook and Twitter, and healthcare professionals were asked to take part and share the study on their own social media site. In addition, two NHS trusts advertised the study amongst their staff. An email with a link to an online survey and information sheet was sent to a local collaborator at each site (see appendix B and C), who then forwarded this on to all healthcare staff who have direct patient contact. Participants were also recruited via posters, which were displayed at both of the participating NHS sites (see appendix A).

Participants were recruited between December 2014 and April 2015. The minimum sample size required for regression analyses to detect an effect size of 0.15, 5% significance and 0.8 Power with six predictors = 98 (calculated using G Power 3.1, Faul, Erdfelder, Buchnew & Lang, 2009). A total of 114 participants completed the online survey, which consisted of six questionnaires. Seven participants were excluded from the final analysis (details below) leaving 107 participants in the study. The majority of participants worked between 26 to 40 hours per week, with a mean number of 13 years in service. The mean age was 37. 86% of participants were female and 14% were male. A full outline of demographic information can be seen in table 6.

Table 6: *Demographic information for participants*

Demographic variable	**Number (%)** [1]
Ethnicity	
British	94 (87.9%)
African	1 (0.9%)
Asian	2 (1.9%)
Chinese	1 (0.9%)
Other	8 (7.4%)
Irish	1 (0.9%)
Hours worked per week	
Less than 15	5 (4.7%)
15-25	5 (4.7%)
26-40	66 (61.7%)
41-50	26 (24.3%)
More than 50	5 (4.7%)
Job title	
Nursing	66 (52%)
Chiropractor	1 (0.8%)
Clinical Manager	1 (0.8%)
GP	9 (7.1%)
Doctor	4 (3.1%)
Occupational Therapist	2 (1.6%)
Heath Care Assistant	4 (3.1%)
Line Manager	1 (0.8%)
Podiatrist	1 (0.8%)
Midwife	4 (3.1%)
Paramedic	1 (0.8%)
Physiotherapist	2 (1.6%)
Radiographer	6 (4.7%)
Other/Unknown	6 (4.7%)

2.2.3 Materials

An online survey was created consisting of six questionnaires. In addition, the demographic information outlined in table 6 was collected. The two predictor variables were mindfulness and self compassion. The five criterion variables were burnout, compassion fatigue, PTS, compassion satisfaction, and psychological distress.

[1] Analyses were repeated with the exclusion of the chiropractor, podiatrist and clinical manager due to their reduced likelihood of experiencing trauma, and yielded the same results as those reported in the main text.

2.2.3.1 Mindfulness

Mindfulness was measured using the Five Facet Mindfulness Questionnaire (FFMQ: Baer, Smith, Hopkins, Krietemeyer & Toney, 2006). The FFMQ is a 39 item measure consisting of 5 distinct subscales: Observing, describing, acting with awareness, non-judging of inner experience and non-reactivity to inner experience. Responses are measured on a scale of 1-5, with 1 representing 'never or very rarely true' and 5 representing 'very often or always true'. The FFMQ was developed using a factor analysis of five widely used mindfulness questionnaires: the Frieburg Mindfulness Inventory (Buchheld, Grossman & Walach, 2001), the Mindful Attention Awareness Scale (Brown & Ryan, 2003), the Mindfulness Questionnaire (Chadwick, Hember, Mead, Lilley & Dagnan, 2005), the Kentucky Inventory of Mindfulness Skills (Baer et al, 2004) and the Cognitive and Affective Mindfulness Scale (Feldman, Hayes, Kumar & Greeson, 2004), drawing together mindfulness concepts into 5 key components, and has demonstrated construct validity in a number of studies (Baer et al, 2008).

2.2.3.2 Self compassion

The Self Compassion Scale (Neff, 2003) (SCS) is a 26 item scale which was used to measure levels of self compassion amongst participants. It assesses six factors of self compassion, which have been categorised into three constructs, each consisting of a negative and positive pole: self kindness/self judgment, common humanity/perceived isolation and mindfulness/over identification. The Self Compassion Scale has demonstrated high internal reliability and consistency (Neff, 2003) and has been found to correlate with self and others reports of self compassion (Neff, 2006).

2.2.3.3 Compassion fatigue

Compassion fatigue was measured using the Professional Quality of Life Scale Version 5 (ProQOL: Stamm & Figley, 2009). The ProQOL is a 30 item measure with a 6 item Likert scale, with 0 representing never and 5 representing very often. It consists of three distinct scales which do not yield a composite score: Compassion satisfaction,

compassion fatigue and burnout. The burnout subscale was excluded in this study due to the inclusion of the Maslach Burnout Inventory, which is more commonly used in the literature as a measure of burnout in healthcare professionals (Krasner et al, 2009; Fortney, Luchterhand, Zakletskaia & Rakel, 2013). Compassion satisfaction refers to the pleasure and sense of drive individuals get from their work and compassion fatigue is related to negative symptoms experienced as a result of witnessing traumatic events inflicted on another individual. The ProQOL has demonstrated good construct validity and internal consistency (Stamm, 2010), and has been used in a number of studies to measure levels of compassion fatigue amongst healthcare professionals (Yoder, 2010; Potter et al, 2010)

2.2.3.4 Post-traumatic stress (PTS)

The Impact of Events Scale-Revised (IES-R: Weiss & Marmar, 1997) was used to provide a measure of post-traumatic stress amongst healthcare providers. The IES-R is most commonly used to assess for trauma symptoms related to direct experiences, however participants in this study were instructed to consider their clinical work with clients when reporting their experiences of trauma. The IES-R is not a diagnostic tool, and was used in this study to provide a measure of post-traumatic stress symptoms as opposed to for the purpose of investigating the presence of a PTSD diagnosis. The use of the IES-R in this study allowed for the collection of an additional measure of trauma in order to ensure that a full picture of clinician's trauma experiences was collected, as suggested by Bride, Radley & Figley (2007). The IES-R collects data related to intrusions and avoidance, whereas the ProQOL collects data related to more general symptoms associated with trauma such as hyper arousal and sleep problems. In addition, the IES-R measures symptoms over the past week, whereas the ProQOL measures symptoms present over the past 30 days, presenting participants with two alternative time frames from which to consider their symptoms. The IES-R consists of 22 items measured on a scale of 0 to 4, with 0 representing not at all and 4 representing extremely. The scale has three subscales: Intrusion, avoidance and hyper-arousal, which can be combined to provide an overall measure of PTS. Beck et al (2007) supported the three factor structure of the IES-R and highlighted the internal consistency for each subscale. They supported the concurrent and discriminative validity of the IES-R and suggested that it may be used as a reliable measure of PTS. Whilst reliability and validity has been

demonstrated for the measure when testing for PTS, little research has investigated its use in the measurement of STS. However a number of studies have used the IES-R in order to highlight the prevalence of trauma symptoms amongst healthcare professionals (Crabbe, Bowley, Boffard, Alexander & Klein, 2003), suggesting that it may be a reasonable measure to complement the ProQOL in the current study.

2.2.3.5 Burnout

The Maslach Burnout Inventory- Human Services Survey (MBI: Maslach & Jackson, 1981) was used in order to collect a thorough measure of burnout and imbed the current study within the existing literature. The MBI measures three dimensions of burnout on a 22 item scale: Emotional exhaustion, depersonalisation and personal accomplishment. Internal reliability and the three factor structure of the MBI within the healthcare population has been supported by a number of studies (Beckstead, 2002; Hastings, Horne & Mitchell, 2004), resulting in the MBI being widely used within studies of burnout in healthcare professionals (Fortney, Luchterhand & Zakletskaia, 2013; Shapiro, Astin Bishop & Cordova, 2005).

2.2.3.6 Psychological distress

A measure of general psychological distress was collected in this study using the Hospital Anxiety and Depression Scale (HADS: Zigmond & Snaith, 1983). The HADS is a 14 item scale containing six items related to depression and six items related to anxiety. The HADS is a widely used measure of psychological well-being amongst a range of clinical populations and has demonstrated strong correlations with other commonly used measures (Bjelland, Dahl, Haug & Neckelmann, 2002). It has demonstrated strong internal consistency and stability and high concurrent validity (Stafford, Berk & Jackson, 2007; Michopoulos et al, 2008). The HADS was included in this study in order to support existing literature related to the positive association between mindfulness and psychological well-being (Nyklicek & Kuijpers, 2008).

2.2.4 Procedure

The study was advertised through a number of sources including an email from their clinical director, a poster presented at their place of work (see appendix A)

or on social media, each of which invited them to participate in an online survey and gave them some brief information about the study. They were provided with a link to access, which took them directly to the participant information sheet (see appendix B). This provided additional information about the purpose and nature of the study, as well as their right to withdraw, contact details in case of any queries and data protection information. They were also informed that they could choose to be entered into a prize draw to win one of four prizes: £100 cash, £50 cash, £75 amazon vouchers or £25 amazon vouchers. Participants were asked to email the key researcher (author) with a contact number or email address should they wish to take part in the prize draw. This was designed to ensure that any identifiable information was kept separate from their questionnaire data. Participants were then asked to tick a box to confirm that they agreed to take part in the study and had understood the information provided (see appendix D). Six questionnaires were then presented in turn and participants were asked to select the response most applicable to them. Following this participants were presented with a debrief sheet (see appendix E) and thanked for their participation. Once all data was collected, the four winning participants entered into the draw were contacted and awarded their prize.

2.2.5 Ethics approval

Ethical approval for the study was granted by the University of Southampton Research Governance Office. Approval covered indemnity and insurance and allowed for the data to be collected and reported for the purposes of a thesis for the degree of Doctor of Clinical Psychology. In addition, Research and Development teams were contacted from the two hospitals in which participants were recruited, and an application was made via the Integrated Research Application System for each trust. The information sheet informed participants that they were free to withdraw at any time, and ensured them that their results would be anonymous (see appendix B). A debrief statement (see appendix E) gave information regarding the reasons for the study and the possible benefits that their taking part may have for future research and support of healthcare professionals. They were provided with contact details of the supervisor and the chair of the ethics committee should they have any concerns regarding the study.

2.2.6 Data Analysis

Data analysis was conducted using SPSS version 22. Correlational analysis and regression models were used to test hypotheses. Mediation analysis was used to test hypothesis two. Non parametric analysis and bootstrapping was employed in order to correct for violations of assumptions.

2.3 Results

2.3.1 Data preparation

Data was missing for seven participants. Missing data was replaced with the respondents mean for the corresponding subscale as suggested by Tacachnick and Fidell (2007) for four of these participants. Three participants missed out an entire questionnaire, and were therefore not included in the analysis for the relevant variable. Seven participants were excluded from the analysis because they were working in mental health rather than physical health professions. In addition, due to an administration error, two questions were omitted from the ProQOL when constructing the online survey, one from the compassion satisfaction subscale and one from the compassion fatigue subscale. Analysis was therefore conducted with missing data from one question on each of these subscales.

All variables created interval data. Normal distribution for criterion and predictor variables was explored using the Kolmogorov-Smirnov test of normality. Mindfulness, compassion fatigue and self compassion were all normally distributed. The compassion satisfaction subscale of the ProQOL was negatively skewed ($D(104) = 0.09$, $p<0.05$, skewness = -0.80, kurtosis = 1.32) and PTS was positively skewed ($D(104) = 0.11$, $p<0.01$, skewness = 0.54, kurtosis = -0.68). The emotional exhaustion (EE) and depersonalisation (DP) subscales of the MBI were both positively skewed (EE: $D\ (104) = 0.09$, $P<0.05$, skewness = 0.26, kurtosis = -0.71; DP: $D\ (104) = 0.15$, $p<0.01$, skewness = 1.17, kurtosis = 1.67) and the personal accomplishment subscale of the MBI was negatively skewed ($D\ (104) = 0.11$, $p<0.01$, skewness = -0.94, kurtosis = 1.23). In addition, personal distress was

negatively skewed (D (104) = 0.10, p <0.05). Non parametric tests were used in the correlational analysis of variables which were not normally distributed.

2.3.2 Descriptive Statistics

2.3.2.1 PTS

The mean total PTS score for the sample was 24.55(SD 18.26). Whilst there is no universally agreed cut off score for the IES-R and the scale is not used as a diagnostic measure, a score of 33 has been highlighted in the literature as representing clinically significant levels of PTSD (Creamer, Bell & Failla, 2003). 32% of participants scored above the clinical cut off for PTSD in this sample. This is slightly higher than the findings in the current literature, with Mealer et al (2009) finding that 18% of nurses met the clinical cut off for PTSD, with higher prevalence rates being observed for nurses working in intensive care units (24%) (Mealer, Shelton, Berg, Rothbaum, & Moss 2007). The avoidance subscale mean was 17.12 (SD 6.84), the intrusion subscale mean was 17.43 (SD 7.218), and lowest was the hyper-arousal subscale mean at 11.99 (SD 5.75). Spearman's rho analysis revealed no significant relationship between hours worked and total levels of PTS (rs = -0.03, p = 0.80) and no significant relationship between number of years worked and total PTS (rs = 0.04, p = 0.67). The measure demonstrated good internal consistency and significant correlations between each subscale, as demonstrated in table 7.

Table 7: *Descriptive statistics of the IES-R*

Variable	**N**	**Mean**	**SD**	**α**	**Correlations**			
					TOT	**AV**	**HYP**	**INT**
IES_TOT	106	24.6	18.3	0.95	1.000			
IES_AV	106	17.1	6.8	0.88	0.92**	1.000		
IES_HYP	106	11.9	5.8	0.90	0.90**	0.74**	1.000	
IES_INT	106	17.4	7.2	0.91	0.94**	0.78**	0.81**	1.000

*Note: TOT = total, AV = avoidance subscale, HYP = hyper-arousal subscale, INT = intrusion subscale. ** p<0.01*

2.3.2.2 Compassion fatigue

The mean compassion fatigue score was 20.49(SD 5.5.5), which is in the low level of compassion fatigue. 65.4% scored in the 'low' range and 34.6% of participants scored in the 'moderate' range. This is much lower than Phillips (2011) who found that 86% of emergency nurses presented with moderate to high levels of compassion fatigue, perhaps due to the wider variation in speciality included in this study. Pearson's correlational analysis revealed no significant relationship between years worked and compassion fatigue ($r = 0.10$ $p = 0.17$) and no significant relationship between hours worked and compassion fatigue ($r = -0.09$ $p = 0.19$).

The mean compassion satisfaction score for the sample was 35.70 (SD 6.15). This is in the average range for this subscale. 2.8% scored in the low range, 83.2% scored in the moderate range and 14% scored in the high range. Spearman's rho analysis revealed a significant negative correlation between hours worked and compassion satisfaction ($rs = -0.17$, $p<0.05$) however revealed no significant correlation between years worked and compassion satisfaction ($rs = -0.10$, $p = 0.15$). Correlational analysis revealed a significant negative correlation between compassion satisfaction and compassion fatigue, demonstrating that higher compassion fatigue is associated with lower levels of compassion satisfaction. Table 8 provides the descriptive statistics for the compassion fatigue and compassion satisfaction subscales of the ProQOL as well as correlations between the two. The two subscales were found to be significantly negatively correlated.

Table 8: *Descriptive statistics of the ProQOL*

Variable	N	Mean	SD	α	Correlations	
					CF	CS
PROQOL_CF	107	20.5	5.5	0.82	1.000	
ProQOL_CS	107	35.6	5.9	0.86	-0.27**	1.000

*Note: CF = compassion fatigue, CS = compassion satisfaction, ** p<0.01*

2.3.2.3 Psychological distress and burnout

Burnout

Burnout was measured using the three subscales of the MBI (emotional exhaustion, depersonalisation and personal accomplishment). The mean score on the emotional exhaustion subscale of the MBI (EE) was 25.18 (SD 12.72), which is in the moderate range. 27.1% scored in the low range, 29.9% scored in the moderate range and 42.9% scored in the high range. The mean score on the depersonalisation subscale (DP) was 6.55 (SD 5.74) which is in the low range, with 93.5% of participants scoring in the low range, and 6.5% scoring in the moderate range. The mean score on the personal accomplishment subscale (PA) was 36.52 (SD 7.30) which is in the high range, with 1% of the sample scoring in the low range, 9.3% scoring in the moderate range and 89.7% scoring in the high range of personal accomplishment. Spearman's correlational analysis revealed no significant correlation between years worked and burnout on any of the subscales (EE: rs = 0.07, p = 0.25; DP: rs = -0.15, p = 0.07; PA: rs = -0.03, p = 0.38). However there was a significant positive correlation between hours worked and burnout on the emotional exhaustion subscale (rs = 0.22 p<0.05), however this relationship was not observed between the depersonalisation or personal accomplishment subscales of the MBI (DP: rs = 0.123, p = 0.10; PA: rs = -0.08, p = 0.22). Table 9 outlines the descriptive statistics for each subscale of the MBI and the associated correlations. The EE subscale was found to be significantly positively correlated with DP, however there was no significant correlation between EE and PA.

Table 9: *Descriptive statistics of the MBI*

*Note: EE = emotional exhaustion, DP = depersonalisation, PA = personal accomplishment, ** p<0.01*

Variable	N	Mean	SD	α	Correlations		
					EE	DP	PA
MBI_EE	106	25.2	12.7	0.93	1.000		
MBI_DP	106	6.6	5.7	0.877	0.47**	1.000	
MBI_PA	106	36.5	7.3	0.80	-0.40	-0.35**	1.000

Psychological distress

Psychological distress was measured using the Hospital Anxiety and Depression Scale. The mean score on the HADS, which was used to provide a measure of psychological distress was 19.41 (SD 2.60). The mean score on the anxiety subscale was 10.88 (SD 2.32) and the mean score on the depression subscale was 8.53 (SD 1.60). Whilst there are no universally agreed cut off scores for the HADS, the authors suggest a score of 11-15 on each subscale to represent moderate levels of anxiety and depression. The sample in this study therefore fell within moderate levels of anxiety and mild levels of depression. However Cronbach's Alpha revealed inadequate internal consistency for this measure (α = -0.44) demonstrating that the measure did not stand up within this sample and was therefore excluded from further analysis.

Table 10: *Descriptive Statistics of the HADS.*

Variable	N	Mean	SD	α
HADS_TOT	105	19.4	2.56	-0.44
HADS_ANX	105	10.9	2.3	0.04
HADS_DEP	105	8.5	1.6	-0.60

Note: TOT = total, ANX = anxiety, DEP = depression

2.3.2.4. Mindfulness

The mean mindfulness score for the sample was 124.95 (SD 18.49). Whilst there are no universally agreed cut offs for the FFMQ, levels of mindfulness as measured on the FFMQ within other studies have been reported to be between 106.3 (Kearney et al, 2013) in veterans and 127.1 in medical students (De Vibe et al, 2013). There was no significant correlation between years worked and mindfulness scores ($r_s = 0.06$, $p = 0.28$) and no significant correlation between hours worked and mindfulness scores ($r = 0.03$, $p = 0.37$). However a significant negative correlation was observed between age and mindfulness ($r_s = -0.32$ $p < 0.05$). Table 11 outlines the descriptive statistics, internal consistency and correlations between subscales. There was a significant correlation observed between all subscales with the exception of the acting with awareness and describe subscales, the observe and non-judgment subscales, the observe and the acting with awareness subscales and the observe and non-reactivity subscales.

Table 11: *Descriptive statistics of the FFMQ*

Variable	**N**	**Mean**	**SD**	**α**	**Correlations**					
					TOT	**NR**	**OB**	**AA**	**DS**	**NJ**
FFMQ_TOT	107	124.9	18.5	0.90	1.000					
FFMQ_NR	107	221.8	3.9	0.72	0.57**	1.000				
FFMQ_OB	107	25.1	5.2	0.79	0.37**	-0.02	1.000			
FFMQ_AA	107	25.1	5.8	0.87	0.65**	0.32**	0.09	1.000		
FFMQ_DS	107	27.5	6.1	0.88	0.62**	0.19*	0.35**	0.15	1.000	
FFMQ_NJ	107	25.5	7.5	0.92	0.78**	0.47**	-0.01	0.49**	0.26**	1.000

*Note: TOT = total, NR = non reactivity, OB = observe, AA = acting with awareness, DS = describe, NJ = non judgment. * p<0.05, ** p<0.01*

2.3.2.5 Self compassion

The mean self compassion score based on total scores for each participant was 76.51 (SD 17.09). Neff (2006) recommends the use of the mean of each participants score rather than the total in order to compare scores to the population norms. The mean self compassion score based on mean scores for each participant was 2.99. Neff (2006) states that the mean score norms for the student population is 3.07, which places the current findings within the expected range for this variable. Pearsons correlation analysis revealed no significant correlation between self compassion and years worked ($r = 0.11$, $p=0.13$) and no significant correlation between self compassion and hours worked ($r = 0.05$, $p<0.05$, $p=0.32$). Table 12 outlines the descriptive statistics for the self compassion scale and it's subscales as well as the internal consistency and correlations between subscales. There was a significant correlation observed between all subscales of the SCS.

Table 12: *Descriptive statistics of the SCS*

Variable	**N**	**Mean**	**SD**	**α**	**Correlations**						
					TOT	**SK**	**SJ**	**CH**	**IS**	**M**	**OVI**
SCS_TOT	107	76.5	17.1	0.94	1.000						
SCS_SK	107	14.5	3.7	0.81	0.80**	1.000					
SCS_SJ	107	16.4	4.4	0.87	-0.88**	-0.65**	1.000				
SCS_CH	107	12.8	2.9	0.73	0.63**	0.56**	-0.37**	1.000			
SCS_IS	107	12.7	3.6	0.79	-0.80**	-0.47**	0.75**	-0.32**	1.000		
SCS_M	107	13.1	2.9	0.76	-0.78**	0.66**	-0.55**	0.54**	-0.48**	1.000	
SCS_OVI	107	12.8	3.7	0.79	-0.86**	-0.52**	0.76**	-0.42**	-0.77**	0.62**	1.000

Note: TOT = total, SK = self kindness, SJ = self judgment, CH = common humanity, IS = isolation, M = mindfulness, OVI = over identification. ** $p<0.01$

2.3.3 Hypothesis 1: Relationship between Mindfulness, PTS, Compassion fatigue, Compassion Satisfaction and Burnout.

In order to test this hypothesis, correlational analysis was first used to consider whether a relationship existed between mindfulness, PTS, compassion fatigue, compassion satisfaction or burnout. The data was also examined in order to consider the association between particular facets of mindfulness and the four criterion variables. The data was explored for the presence of a monotonic relationship using scatter plots and met the required assumptions. However due to the fact that the data was skewed, non-parametric analysis was conducted to overcome the non-normality of the data.

Spearmans rho correlations were computed to investigate the relationship between mindfulness, PTS, compassion fatigue, compassion satisfaction and burnout (see table 19). The FFMQ showed a significant, moderate, negative correlation with the IES ($r_s = -0.525$, $N = 106$, $p<0.001$), with mindfulness scores increasing as PTS scores decreased. In addition, the FFMQ showed a significant, moderate, negative correlation with the compassion fatigue subscale of the ProQOL ($r_s = -0.471$, $N = 107$, $p<0.001$), demonstrating that as mindfulness scores increased, compassion fatigue scores decreased. The individual subscales of the FFMQ were investigated in order to consider their relationship with compassion fatigue and PTS. All of the subscales with the exception of the observe subscale were significantly negatively correlated with PTS, and the subscales of non-judgment, non-reactivity and acting with awareness were significantly negatively correlated with compassion fatigue, with the observe and describe subscales showing no significant correlation (see table 19).

Spearman's Rho analysis revealed that there was a significant negative relationship between mindfulness and the depersonalisation subscale of the MBI ($r_s = -0.167$, $N = 106$, $p<0.05$), a significant negative relationship between mindfulness and the emotional exhaustion subscale of the MBI ($r_s = -0.493$, $N = 106$, $p<0.001$) and a significant positive relationship between mindfulness and the personal accomplishment subscale of the MBI ($r_s = 0.415$, $N = 106$, $p<0.001$). In addition, the FFMQ was significantly positively correlated with the compassion satisfaction subscale of the ProQOL ($r_s = 0.409$, $N = 107$, $p<0.001$) (see table 19).

In order to further examine the relationship between mindfulness and PTS, compassion fatigue, compassion satisfaction and burnout, multiple regression was carried out for each of these criterion variables, considering the specific role of each of the subscales of the FFMQ in the relationship observed.

Mindfulness and PTS

Multiple regression was run to predict PTS from each of the five facets of the FFMQ. The assumption of linearity, independence of errors, homoscedasticity, unusual points and normality of residuals were met. All subscales of the FFMQ together statistically significantly predicted PTS ($F(5, 100) = 9.614$, $p<0.001$), adj. $R^2 = 0.291$. The only subscale which was uniquely predictive of PTS was the acting with awareness subscale (see table 13 below for regression coefficients and standard errors)

Table 13: *Multiple regression analysis for the 5 facets of mindfulness and PTS*

	B	SE	95% CI	B
Variable				
Constant	86.046	11.905	62.426-109.666	
NR	-0.858	0.456	-1.762 - -0.047	-0.183
OB	0.146	0.305	-0.459-0.752	0.042
AA	-0.863	0.299	-1.455- - 0.270	-0.277*
DS	-0.538	0.275	-1.081-0.005	-0.180
NJ	-0.394	0.254	-0.898-0.110	-0.163

Note: CI = confidence interval. Total $R^2 = 0.274$, NR = non reactivity, OB = observe, AA = acting with awareness, DS = describe, NJ = non judgement. * $p<0.05$.

Mindfulness and compassion fatigue

Multiple regression analysis was conducted in order to consider the role of the specific facets of mindfulness in predicting compassion fatigue. The assumption of

linearity, independence of errors, homoscedasticity, unusual points and normality of residuals were met. All subscales of the FFMQ together statistically significantly predict compassion fatigue (F (5, 100) = 12.297, p<0.001, adj. R^2 = 0.350). The non-judgment, non-reactivity and acting with awareness subscales significantly predicted FFMQ scores over and above the other subscales, as demonstrated in table 14 below.

Table 14: *Multiple regression analysis for the 5 facets of mindfulness and compassion fatigue*

	B	SE	95% CI	B
Variable				
Constant	40.208	3.301	33.659-46.757	
NR	-0.371	0.126	-0.621- - 0.120	-0.274**
OB	-0.108	0.085	-0.276-0.060	-0.107
AA	-0.264	0.083	-0.429- -0.099	-0.293**
DS	0.046	0.077	-0.106-0.198	-0.052
NJ	-0.146	0.071	-0.286- -0.006	-0.208*

Note: CI = confidence interval. Total R^2 = 0.274, NR = non reactivity, OB = observe, AA = acting with awareness, DS = describe, NJ = non judgement. * p<0.05, ** p<0.01.

Mindfulness and burnout: MBI_Emotional Exhaustion

The data met the assumption of linearity and homoscedasticity, however 1 case was identified as an outlier and was removed from the analysis (> 3 S.D. from the mean), and bootstrapping was employed as the data was negatively skewed. The multiple regression analysis revealed that mindfulness could statistically significantly predict the emotional exhaustion subscale of the MBI (F (5, 99) = 10.495, p<0.001) and accounted for 31.3% of the variance. In addition, the analysis showed that the acting with awareness subscale was the only facet to contribute unique variance to the significant relationship between mindfulness and emotional exhaustion.

Table 15: *Regression analysis to test the effect of mindfulness on the emotional exhaustion subscale of the MBI*

	B	SE	95% CI	B
Variable				
Constant	72.638	8.130	56.506-88.770	
FFMQ_NR	-0.446	0.312	-1.065-0.173	-0.139
FFMQ_OB	-0.267	0.211	-0.686-0.152	-0.109
FFMQ_AA	-0.823	0.204	-1.228- - 0.419	-0.381***
FFMQ_DS	-0.148	0.185	-0.514-0.219	-0.072
FFMQ_NJ	-0.233	0.172	-0.575-0.109	-0.140

Note: CI = confidence interval. Total $R^2 =$ 0.313, F(5, 99) = 10.495, ***p<0.01, NR = non reactivity, OB = observe, AA = acting with awareness, DS = describe, NJ = non judgement.

Mindfulness and burnout: MBI_Depersonalisation

The data met the assumption of linearity, normality and homoscedasticity, however one case was removed as it was identified as an outlier (3 S.D. from the mean). The multiple regression analysis revealed that mindfulness did not statistically significantly predict depersonalisation (F (5, 99) = 1.908, p=0.100).

Table 16: *Regression analysis to test the effect of mindfulness on the depersonalisation subscale of the MBI*

	B	SE	95% CI	B
Variable				
Constant	14.794	4.010	6.838-22.750	
FFMQ_NR	-0.146	0.154	-0.452-0.159	-0.108
FFMQ_OB	0.076	0.103	-0.129-0.281	0.076
FFMQ_AA	-0.159	0.108	-0.373-0.055	-0.172
FFMQ_DS	-0.106	0.092	-0.290-0.077	-0.122
FFMQ_NJ	-0.011	0.090	-0.190-0.168	-0.016

Note: CI = confidence interval. Total $R^2 = 0.042$, $F(5, 99) = 1.908$, NR = non reactivity, OB = observe, AA = acting with awareness, DS = describe, NJ = non judgement.

Mindfulness and burnout: MBI_Personal Accomplishment

The data met the assumption of linearity and homoscedasticity, however did not meet the assumption of normality, requiring the use of bootstrapping. In addition, one case was identified as an outlier and removed from the analysis. The multiple regression analysis revealed that mindfulness could statistically significantly predict personal accomplishment ($F (5, 99) = 4.667$, $p< 0.01$) and accounted for 15% of the variance. In addition, the acting with awareness subscale accounted for a unique amount of variance in the relationship between mindfulness and personal accomplishment.

Table 17: *Regression analysis to test the effect of mindfulness on the personal accomplishment subscale of the MBI*

	B	SE	95% CI	B
Variable				
Constant	16.467	4.880	6.785-26.150	
FFMQ_NR	0.216	0.181	-0.175-0.550	-0.124
FFMQ_OB	0.111	0.133	-0.155-0.379	0.087
FFMQ_AA	0.315	0.166	-0.048-0.611	-0.274
FFMQ_DS	0.166	0.122	-0.084-0.407	-0.149
FFMQ_NJ	0.013	0.137	-0.232-0.316	-0.014

Note: CI = confidence interval. Total $R^2 =$ 0.150, F(5, 99) = 4.667, NR = non reactivity, OB = observe, AA = acting with awareness, DS = describe, NJ = non judgement.

Mindfulness and compassion satisfaction:

The data met the assumption of linearity and homoscedasticity, however did not meet the assumptions of normality, requiring the use of bootstrapping when performing the analysis. In addition, one case was identified as an outlier (> 3 S.D from the mean) and was removed from the analysis. The multiple regression analysis revealed that mindfulness could statistically significantly predict compassion satisfaction (F (5, 100) =5.366, p<0.001) and accounted for 17.2% of the variance.

Table 18: *Regression analysis to test the effect of mindfulness on compassion satisfaction*

	B	SE	95% CI	β
Variable				
Constant	18.275	3.295	11.972-25.093	
FFMQ_NR	0.147	0.159	-0.166-0.451	-0.107
FFMQ_OB	0.207	0.110	-0.022-0.405	0.200
FFMQ_AA	0.232	0.103	0.017-0.430	0.246
FFMQ_DS	0.070	0.091	-0.125-0.241	-0.078
FFMQ_NJ	0.053	0.090	-0.109-0.246	0.073

Note: CI = confidence interval. Total $R^2 = 0.172$, F(5, 100) = 5.366, NR = non reactivity, OB = observe, AA = acting with awareness, DS = describe, NJ = non judgment

2.3.4. Hypothesis 2: The mediating role of self compassion in the association observed between mindfulness and PTS and/or CF.

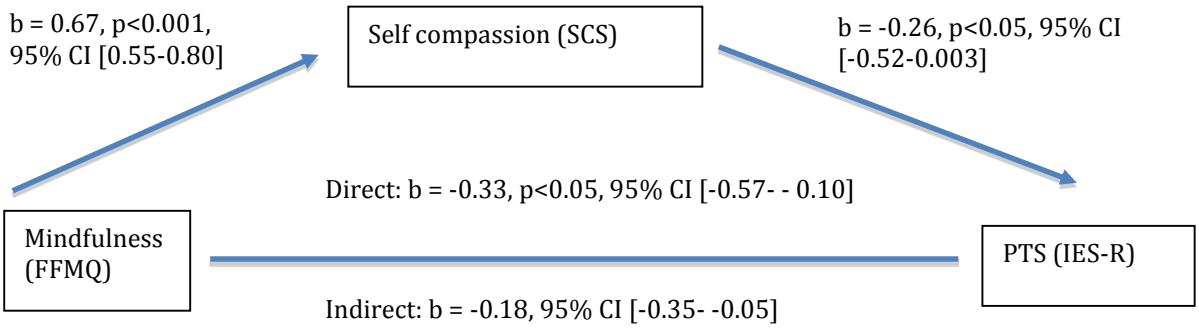
Correlational analysis was initially conducted in order to investigate the existence of an association between mindfulness, self compassion, PTS and compassion fatigue. The association between mindfulness and PTS and mindfulness and compassion fatigue was not explored at this stage as the presence of this relationship was confirmed in the previous analysis. Spearman's Rho analysis was conducted due to the fact that the data was skewed for both criterion variables, and scatter plots were used to check for the existence of a monotonic relationship.

Spearman's Rho calculations were conducted in order to consider the relationship between the variables outlined above (see table 19). There was a significant positive relationship between mindfulness and self compassion ($r_s = 0.733$, N = 107, $p<0.001$), a significant negative relationship between self compassion

and PTS (rs = -0.531, N = 106, p<0.001), and a significant negative relationship between self compassion and compassion fatigue (rs = -0.405, N = 107, p<0.001).

Mediation analysis was carried out using PROCESS (Hayes, 2013) in order to further investigate the relationship between these variables and consider whether self compassion plays a mediating role in the relationship observed between mindfulness and PTS and/or CF. Self compassion was first examined in order to investigate whether it mediated the effect of mindfulness on PTS, as measured on the Impact of Events Scale. Figure 2 shows that self compassion does play a mediating role in the relationship between mindfulness and PTS (b = -0.18, bootstrapped SE = 0.08, BCa 95% CI [-0.35- - 0.05]). This is a medium-large effect size (k^2 = 0.15, BCa 95% CI [0.04-0.25].

Figure 2: *The mediating role of self compassion in the relationship between mindfulness and PTS*



Mediation analysis was also conducted in order to examine whether self compassion mediated the effect of mindfulness on compassion fatigue. Figure 3 shows that mindfulness does not significantly indirectly effect compassion fatigue through self compassion (b = -0.02, bootstrapped SE = 0.03, BCa 95% CI [-0.07-0.03]).

Figure 3: *The mediating role of self compassion in the relationship between mindfulness and compassion fatigue*

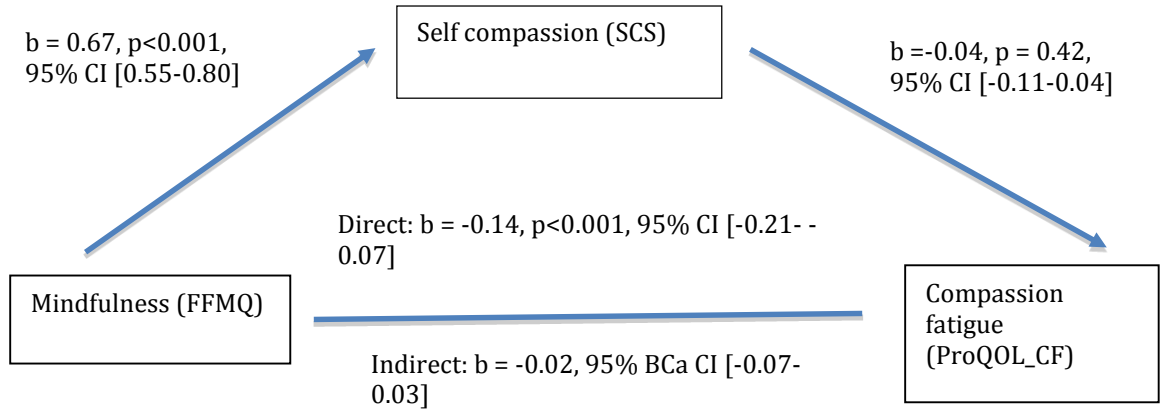


Table 19: *Spearman's Rho correlation matrix to demonstrate correlations between variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 MBI_PA	1.000													
2 MBI_DP	-0.35***	1.000												
3 MBI_EE	-0.40***	0.47***	1.000											
4 IES	-0.30**	0.30**	0.45**	1.000										
5 SCS	0.25*	-0.20*	-0.49**	-0.53***	1.000									
6 PROQOLCF	-1.78	0.33**	0.45**	0.55***	-0.41***	1.000								
7 PROQOLBO	-0.56***	0.49***	0.82***	0.48**	-0.58**	0.41**	1.000							
8 PROQOLCS	0.68***	-0.44***	-0.60***	-0.19	0.35**	-0.19*	-0.72***	1.000						
9 FFMQ	0.42***	-0.17*	-0.49***	-0.57***	-0.73***	-0.47***	-0.64***	0.41***	1.000					
10 FFMQ_NR	0.15	-0.23*	-0.35**	-0.38**	0.35**	-0.41**	-0.37**	0.23*	0.50**	1.000				
11 FFMQ_NJ	0.12	-0.15	-0.34**	-0.50**	0.61**	-0.44**	-0.41**	0.16	0.74**	0.39**	1.000			
12 FFMQ_OB	0.28**	-0.04	-0.13	-0.06	0.24*	0.11	-0.19	0.23*	0.42**	-0.01	0.02	1.000		
13 FFMQ_AA	0.20*	-0.25*	-0.49**	-0.48**	0.39**	-0.47**	-0.53**	0.31**	0.68**	0.31**	0.51**	0.12	1.000	
14 FFMQ_DS	0.29**	-0.20*	-0.28**	-0.30**	0.33**	-0.11	-0.40**	0.26*	0.62**	0.18	0.23*	0.35**	0.20*	1.000

*Note: * p<0.05, ** p<0.01, ***p<0.001*

2.4 Discussion

The aim of this study was to investigate the association between mindfulness and PTS/CF, whilst considering the possible mediating role of self compassion. This study also attempted to support findings of previous research which has highlighted the role of mindfulness in the management of burnout and psychological distress (e.g. Krasner at al, 2009).

2.4.1. Hypothesis 1

Hypothesis 1 predicted a significant association between mindfulness, PTS, compassion fatigue and burnout, with higher levels of mindfulness associated with lower levels of PTS, compassion fatigue and burnout, and higher levels of compassion satisfaction. This hypothesis was supported, with a moderate negative correlation observed between mindfulness and PTS, mindfulness and compassion fatigue and mindfulness and burnout, and a moderate positive correlation between mindfulness and compassion satisfaction.

These results in part support the current literature which suggests an association between mindfulness and burnout (Goodman & Schorling, 2012; Krasner et al, 2009). However there was no significant relationship between mindfulness and the depersonalisation subscale of the MBI. This may be due to the fact that 93.5% of participants scored in the low range of depersonalisation, resulting in floor effects in the data. Further regression analysis revealed that the acting with awareness subscale provided unique variance in the relationship between mindfulness and emotional exhaustion, highlighting the role of attention control in this particular aspect of burnout. In addition, the regression analysis revealed that mindfulness significantly predicted higher scores on the compassion satisfaction subscale of the ProQOL. This has been conceptualised as the feelings of positivity one gets from caring (Phelps, Lloyd, Creamer & Forbes, 2009) and has been found to be inversely associated with compassion fatigue and burnout (Simon, Pryce, Roff & Klemmack, 2006).

The findings in this study are in line with previous evidence that mindfulness predicts lower levels of PTS (e.g. Smith et al, 2011), and extend these findings to the prediction of compassion fatigue. The only subscale which provided a unique

contribution to the variance accounted for in PTS was the acting with awareness subscale, suggesting that acting with awareness is a better predictor of PTS than the other facets of mindfulness measured by the FFMQ. However interestingly, the non-judgment and non-reactivity subscales also contributed unique variance to the relationship between mindfulness and CF, suggesting that these facets play a more significant role in the relationship between mindfulness and CF in comparison to mindfulness and PTS. The results support the findings by Boden et al (2012) that the acting with awareness subscale uniquely predicts levels of PTS, and extends these findings to support the role of acting with awareness when predicting compassion fatigue scores. This may be explained by the role of attention control in protecting against processes which are key to the maintenance of PTS, such as rumination and re-experiencing, as outlined by Anderson & Levy (2009) and Joorman, Yoon & Siemer (2010).

However, whilst these results support the unique effect of non-judgment in the prediction of a traumatic stress reaction, as found by Wahbeh, Lu & Oken (2012), this was observed for CF only in this study and not for PTS. This suggests that there may be unique factors associated with CF which are not present in PTS, which the facets of non-judgment and non-reactivity are impacting upon. Alternatively, it may be that the subscales of observe and describe play a less significant role in the protection against CF in comparison to PTS. Further research is needed in order to explore the role of these facets and understand their unique contribution to CF and PTS.

2.4.2 Hypothesis 2

Hypothesis 2 predicted that self compassion will play a mediating role in the relationship observed between mindfulness and PTS. The research investigating the mediating role of self compassion in PTS or CF is sparse, and as such this was largely an exploratory hypothesis based on research demonstrating the link between mindfulness and increased self compassion (Bazarko et al, 2013; Shapiro et al, 2005), and mindfulness and decreased PTS (Kimbrough et al, 2010).

The data demonstrated an association between mindfulness, self compassion, PTS and compassion fatigue. In addition, the results showed a medium to large significant mediating effect of self compassion in the relationship between mindfulness and PTS, however this was not extended to CF, suggesting that self

compassion plays a more important role in the relationship between mindfulness and PTS in comparison to mindfulness and CF. The findings in this study support the literature, which demonstrates an association between compassion and reduced PTS (Lee, James & Gilbert, 2013). These results suggest that compassion may be higher in those demonstrating higher levels of mindfulness, subsequently impacting on an individual's resilience to PTS. However the results of this study suggest that self compassion plays a less significant role in the relationship between mindfulness and compassion fatigue, suggesting that additional factors may be contributing to the relationship observed between these two factors.

The results of this study suggest that self compassion plays an important role in the relationship observed between mindfulness and PTS, however whilst increased self compassion is associated with decreased PTS and CF scores, this does not mediate the relationship observed between mindfulness and CF and only partially explains the relationship between mindfulness and PTS. As a result, it is important to incorporate additional aspects of mindfulness when considering any role it may play in the protection against CF and PTS in healthcare workers.

2.4.3 Clinical Implications

The findings suggest that mindfulness may act as a protective factor against the development of PTS and CF in healthcare workers. In addition, self compassion is associated with fewer PTS symptoms, with self compassion acting as a mediator in the relationship between mindfulness and PTS. However additional aspects of mindfulness play a role in the protection against CF and PTS over and above these two factors. Mindfulness interventions may be beneficial for healthcare staff in order to support them to manage symptoms of PTS and CF, with a focus on self compassion important especially in the management of PTS. Whilst a number of mindfulness interventions have been carried out with healthcare workers (Goodman & Schorling, 2012; Cohen-Katz et al, 2005) these have not explored the benefits for individual's subsequent levels of PTS or CF symptom severity. The results from this study suggest that mindfulness interventions may be effective for these factors, extending previous research to consider the application of MBSR to the treatment of traumatic stress in healthcare staff. In addition, the results suggest

that acting with awareness is an important aspect of mindfulness that might target PTS and CF, and could therefore be a key focus for intervention.

Given the potential protective effects of mindfulness for PTS and CF in healthcare workers, incorporating MBSR into training programs of healthcare workers may prove valuable in increasing student's resilience prior to exposure to trauma. These interventions should focus on the development of self compassion and attention control in order to ensure that the key mediating and predicting facets of mindfulness are incorporated into the intervention. A number of studies have found beneficial effects of incorporating MBSR into training programs for healthcare students (Kang et al, 2009; Rosenzweig et al 2003) however have not extended this to exploring the benefits of this for protecting against PTS or CF. This study provides evidence to support the incorporation of MBSR into healthcare students training.

Whilst the results from this study suggest that mindfulness interventions may be important in the self care of healthcare workers, it is important to consider time constraints amongst these staff which may impact on their ability to engage in regular practice (Fourer et al, 2013). Bazarko et al (2013) found that individuals who maintained their mindfulness practice demonstrated significantly higher self compassion, serenity and empathy than those who did not, highlighting the importance of maintained practice in improved mental health. As a result shorter, focused interventions may be more realistically and effectively applied to this cohort in order to facilitate the development of resilience against PTS and CF. Given that the current study provided evidence that self compassion significantly predicts lower PTS scores, interventions focused solely on self compassion may increase resilience to PTS amongst this population. However the results also showed that additional factors over and above self compassion were important in predicting the relationship between mindfulness and PTS/CF, suggesting that interventions must incorporate a number of aspects of mindfulness in order to remain in line with the current evidence base for the effectiveness of mindfulness in the management of CF in the healthcare population. In addition, all facets other than the observe subscale provided unique variance in the relationship between mindfulness and burnout. As a result, in order for interventions to have implications for a number of aspects of well-being in this population, it may be that mindfulness interventions must

develop skills in each of these areas rather than purely focusing on the development of self compassion.

2.4.4 Strengths and limitations

This study benefitted from a large sample size over and above the number required for sufficient power, allowing for a meaningful analysis of the data. However due to the predominance of nurses in the sample, professional group could not be analysed meaningfully. This was also the case for gender, as the majority of participants were female (86%).

In addition, whilst regression analysis provides proposed predictor variables, it does not imply causality (Tabachnick & Fidell, 2007). As such, the association observed between mindfulness, PTS and CF might be the result of a causal effect of PTS or CF on subsequent levels of mindfulness, rather than mindfulness acting as a protective factor against the development of PTS or CF. This is an important consideration when suggesting the use of mindfulness interventions in the development of resilience against PTS and CF in healthcare workers.

This study did not measure whether participants were students or qualified members of staff. Doing so may have allowed for an investigation into the impact of qualified status on the relationships observed, in order to consider the benefits of providing interventions during training courses, or whether the relationship between mindfulness and PTS/CF only becomes apparent amongst qualified staff.

2.4.5 Future research

Future research may replicate this study in a sample of critical care nurses who may be more likely to experience more frequent and severe trauma, in order to investigate whether the observed associations still apply. In addition, future research would benefit from an investigation into the predictive value of mindfulness for PTS and CF for different staff groups. Due to the predominance of nurses in this sample, such an analysis was not possible in this study, however this would allow for further consideration of the specific staff groups which may benefit from this intervention and those for whom it may be less effective. This may extend to an investigation amongst mental health practitioners, given the high levels of

compassion fatigue and burnout reported within this population (Evans et al, 2006; Figley, 2002).

Future research would also benefit from an exploration of ways in which mindfulness can be applied to this population given the predictive value of mindfulness for the severity of PTS and CF. This requires an investigation into the effectiveness of MBSR interventions in the protection against and treatment of PTS and CF in healthcare workers. Analysis of such research would benefit from a focus on the specific aspects of treatment which were found more or less useful through the use of qualitative analysis as well as quantitative analysis of the role of various facets of mindfulness. This may support the development of an understanding of the benefits of MBSR for PTS and CF in this population as well as consideration of whether it is most effective as a traditional 8 week protocol or whether it can be effectively applied in a shorter form to the needs of this population.

In addition, given that this is the first study to the author's knowledge to investigate associations between mindfulness, PTS and CF in the healthcare population, future research would benefit from replicating this study with larger sample sizes and a range of staff groups in order to consider the findings in the context of a larger literature base. This would benefit from the use of the same questionnaires employed in this study in order to allow for comparisons, as the literature investigating the effectiveness of MBSR for the wellbeing of healthcare professionals has used a wide range of measures making comparison and summarising across the evidence base difficult.

2.4.6 Conclusions

The findings from this study contribute to the literature by providing evidence to suggest that mindfulness predicts PTS and CF scores in healthcare professionals. Acting with awareness was found to be a significant contributing factor in the relationship observed, and self compassion was able to partially explain the association between mindfulness and PTS. However this relationship was not replicated for mindfulness and CF. the results suggest that mindfulness may act as a protective factor against the development of PTS and CF in healthcare workers, and prompts the need for further research into the effectiveness of mindfulness interventions for the management of these difficulties in the healthcare population.

Appendices

Appendix A Study poster

IDENTIFYING PSYCHOLOGICAL FACTORS THAT PREDICT STRESS AND TRAUMA IN HEALTHCARE PROFESSIONALS

Are you a student or qualified healthcare professional working in physical health?

I am conducting an online survey investigating which psychological traits might protect against trauma, burnout and stress amongst individuals working in the physical healthcare profession. We are interested in collecting data from both students and qualified professionals who are involved in direct patient care.

The survey takes about 20 minutes and you will be entered into a prize draw to win one of the following prizes:

£100 CASH
£50 CASH
£75 AMAZON VOUCHER
£25 AMAZON VOUCHER

To take part in the survey, please type in the following web address

www.isurvey.soton.ac.uk/12969

If you would like further information please contact khw1g12@soton.ac.uk

Appendix B Participant information sheet

PARTICIPANT INFORMATION SHEET

Study title: An investigation into the association between mindfulness, trauma and compassion fatigue in healthcare professionals.

Researcher Name: Katy Woolf
Ethics reference: 13001

I am a Trainee Clinical Psychologist at the University of Southampton currently undertaking my doctoral thesis as part of a Doctorate in Clinical Psychology. You are being invited to take part in a research study, the details of which are outlined in this information sheet.

Please read this carefully and feel free to contact me if you have any questions.

WHAT IS THE PURPOSE OF THE STUDY?

Healthcare professionals are exposed to a great deal of stress and pressure in their work and are at greater risk of burnout, secondary traumatic stress and exhaustion. This study will investigate the association between your experiences of job related stress and your levels of mindfulness and self compassion.

DO I HAVE TO TAKE PART?

Your involvement in this study is entirely voluntary. If you do decide to take part, you are free to withdraw at any time without giving a reason.

AM I ELIGIBLE TO TAKE PART?

If you are a healthcare professional working with physical health disorders, you are invited to take part in this study.

WHAT WILL TAKING PART INVOLVE?

If you do decide to take part in this study, you will be asked to fill out a number of questionnaires which should take approximately 20 minutes to complete. These questionnaires will ask about your general mental health and wellbeing.

WHAT ARE THE POSSIBLE DISADVANTAGES AND RISKS OF TAKING PART?

If you agree to take part, you will be asked to spend about 20 minutes of your time completing some questionnaires. They ask about general aspects of your mental health as well as about your feelings towards your work. In order to compensate for your time you will be entered into a prize draw for the chance to win one of 4 prizes:
£100 cash, £50 cash, £100 amazon vouchers, £50 amazon vouchers

WHAT ARE THE POSSIBLE BENEFITS OF TAKING PART?

Taking part in this study will help us to understand whether there is an association between an individuals levels of mindfulness and their resilience to the stressors associated with the healthcare profession. This may support the application of a mindfulness intervention for healthcare professionals in order to protect against these difficulties.

WILL WHAT I SAY BE KEPT CONFIDENTIAL?
All information taken from your questionnaires will be anonymised, and completed questionnaires will be stored securely.

WHAT SHOULD I DO IF I WANT TO TAKE PART?
If you would like to take part in this study, please go to the following link:

www.isurvey.soton.ac.uk/12969

WHAT WILL HAPPEN TO THE RESULTS OF THE RESEARCH STUDY?
The results from the questionnaires will be used to consider whether teaching mindfulness to healthcare professionals is beneficial in managing the potential pressure of the job. These will be analysed and the results reported in the write up of the study. If you would like access to the final report, you are welcome to request this through the contact details below.

WHO IS ORGANISING AND FUNDING THE RESEARCH?
I am conducting the research as part of my Doctoral Training in Clinical Psychology, and am based in the Psychology Academic Unit, Faculty of Social and Human Sciences, University of Southampton. My research supervisor is Dr Matt Garner. The research has been approved by University of Southampton Ethics & Research Governance committees.

CONTACT FOR FURTHER INFORMATION
If you have any questions, please contact me:

Email: khw1g12@soton.ac.uk

If you have any concerns about the way in which the study has been conducted, you may contact:

Email: M.J.Garner@soton.ac.uk

If you wish to make a complaint, you may contact the Chair of the Ethics Committee, Psychology, University of Southampton, SO171BJ, Tel: 02380594663, Email: slb1n10@soton.ac.uk.

Thank you for taking the time to read this information sheet, and I hope you are interested in taking part.

Appendix C Email to staff

Hello,

I am a Trainee Clinical Psychologist at the University of Southampton currently undertaking my doctoral thesis as part of a Doctorate in Clinical Psychology. I am investigating the impact of job related stress and trauma on healthcare professionals psychological well being.

I would be grateful if you could take the time to read the attached information sheet which will provide more details about the study. If you would like to take part, please click on the link below and follow the instructions.

https://www.isurvey.soton.ac.uk/12969

Everyone that participates in the study will be entered into a prize draw for a chance to win one of the following prizes:

£100 cash
£50 cash
£100 amazon voucher
£50 amazon voucher

I hope you are interested in taking part,

Kind Regards,

Katy Woolf
Trainee Clinical Psychologist

Appendix D Consent form

CONSENT FORM

Study title: An investigation into the association between mindfulness, trauma and compassion fatigue in healthcare professionals.

Researcher name: Katy Woolf
Study reference: 13001
Ethics reference: 13001

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet (17.11.14 /version 1) and have had the opportunity to ask questions about the study.	☐
I agree to take part in this research project and agree for my data to be used for the purpose of this study	☐
I understand my participation is voluntary and I may withdraw at any time without my legal rights being affected	☐
I am happy to be contacted regarding other unspecified research projects. I therefore consent to the University retaining my personal details on a database, kept separately from the research data detailed above. The 'validity' of my consent is conditional upon the University complying with the Data Protection Act and I understand that I can request my details be removed from this database at any time.	☐

Data Protection
I understand that information collected about me during my participation in this study will be stored on a password protected computer and that this information will only be used for the purpose of this study. All files containing any personal data will be made anonymous.

Name of participant (print name)……

Signature of participant……..

Date……

Appendix E Debriefing statement

PARTICIPANT DEBRIEF FORM

Study Title: An investigation into the association between mindfulness, trauma and compassion fatigue in healthcare professionals

Ethics reference: 13001

Thank you for agreeing to participate in this study. The general purpose of this research was to investigate whether healthcare professionals who have higher levels of mindfulness experience lower levels of compassion fatigue and trauma than those who score lower in levels of mindfulness.

We invited healthcare professionals to complete a series of questionnaires looking at their levels of post-traumatic stress disorder (PTSD), compassion fatigue, burnout, stress and depression, attention control and self compassion. The scores on these questionnaires were then analysed in order to consider whether there was an association between participant's levels of mindfulness and each of these areas of psychological well-being. The results from this study will help to draw conclusions as to whether teaching healthcare professionals mindfulness would protect against the development of PTSD and compassion fatigue as a result of job related stress.

If you have any further questions about the study, please contact Katy Woolf, email: khw1g12@soton.ac.uk. In addition, if you have any concerns about any aspect of the study, you may contact Dr Matt Garner, email: M.J.garner@soton.ac.uk.

If you wish to make a complaint, you may contact the Chair of the Ethics Committee, Psychology, University of Southampton, SO171BJ, Tel: 02380594663, Email: slb1n10@soton.ac.uk.

Thank you for your participation in this study.

Katy Woolf
Trainee Clinical Psychologist
University of Southampton

References

Abeni, M. S., Magni, M., Conte, M., Mangiacavalli, S., Pochintesta, L., Vicenzi, G., … Corso, A. (2014). Psychological care of caregivers, nurses and physicians: a study of a new approach. *Cancer Medicine*, *3*(1), 101–10. doi:10.1002/cam4.163

American Psychiatric Association, (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Washington D.C: American Psychiatric Association.

Anderson, M.C, & Levy, B.J.(2009). Suppressing unwanted memories*. Current Directions in Psychological Science, 18*(4), 189–194. doi:10.1111/j.1467-8721.2009.01634.x.

Ashworth, C.D., Williamson, P., & Montano, D. (1984). A scale to measure physician beliefs about psychosocial aspects of patient care. *Social Science and Medicine, 19*(11), 1235-1238. doi: 10.1016/0277-98195

Baer, R.A., Smith, G.T., Hopkins, J., Krietemeyer, J., Toney, L. (2006). Using self report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27-45. doi: 10.1177/1073191105283504

Baer, R. A., Smith, G., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., Walsh, E., Duggan, D., & Williams, M. (2008). Construct validity of the five facet mindfulness questionnaire in mediating and nonmediating samples. *Assessment, 15*(3), 329-342. doi: 10.1177/1073191107313003

Baird, K., & Kracen, A. (2006). Vicarious traumatization and secondary traumatic stress: A research synthesis. *Counseling Psychology Quarterly, 19*(2), 181-188. doi: 10.1080/09515070600811899

Bale, R. (2008). Seondary traumatic stress and related concepts. Retrieved from http://www.freedomfromtorture.org/sites/default/files/documents/Bale,%20Rod-SECONDARY%20TRAUMATIC%20STRESS.pdf

Barbosa, P., Raymond, G., Zlotnick, C., Wilk, J., Toomey, R., & Mitchell, J. (2014). Mindfulness-based stress reduction training is associated with greater empathy and reduced anxiety for graduate healthcare students. *Education for Health, 26*(1), 9–14. doi:10.4103/1357-6283.112794

Bazarko, D., Cate, R., Azocar, F., Krietzer, M. (2013). The impact of an innovative mindfulness based stress reduction programme on the health and well-being on nurses employed in a corporate setting. *Journal of Workplace Behaviour and Health, 28*(2), 107-133. doi:10.1080/15555240.2013.779518

REFERENCES

Beck, A.T., Ward, C.H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*(6), 561-571. doi: 10.1001/archpsyc.1961.01710120031004

Beck, A. (2011). Secondary traumatic stress in nurses: A systematic review. *Archives of Psychiatric Nursing, 25*(1), 1-10. doi:10.1016/j.apnu.2010.05.005

Beckstead, J.W. (2002). Confirmatory factor analysis of the Maslach Burnout Inventory among Florida nurses. *International Journal of Nursing Studies.* 39(8), 785-792. doi: 10.1300/J479v01n03_05

Beddoe, A., & Murphy, S. (2004). Does mindfulness decrease stress and foster empathy among nursing students. *Journal of Nursing Education, 43*(7), 305-312.

Bjelland, I., Dahl, A., Haug, T., Neckelmann, D. (2002). The validity of the hospital anxiety and depression scale. An updated literature review. *Journal of Psychosomatic Research, 52*(2), 69-77. doi:10.1016/S0022-3999(01)00296-3

Blegen, M.A. (1993). Nurses job satisfaction: A meta analysis of related variables. *Nursing research, 42*(1) 36-41. doi: 10.1097/00006199-199301000-0007

Boden, T., Bernstein, A., Walser, R.D., Bui, L., Alvarez, J., & Bonn-Miller, M.O. (2012). Changes in facets of mindfulness and post-traumatic stress disorder treatment outcome. *Psychiatry Research, 200*(2-3), 609-613. doi: 10.1016/j.psychres.2012.07.011

Bride, B., Radley, M., & Figley, C. (2007). Measuring compassion fatigue. *Clinical Social Work Journal, 35*(3)*,* 155-163. doi: 10.1007/s10615-007-009107

Burns, D.D., & Eidelson, R.J. (1998). Why are depression and anxiety correlated? A test of the tripartite model. *Journal of Consulting and Clinical Psychology, 66*(3), 461-473. doi: 10.1037/0022-006X.66.3.46

Centre for Medicare & Medicaid Services. (2005). Hospital Consumer Assessment of Healthcare Providers and Systems. Retrieved from http://www.hcahpsonline.org

Chang, V., Palesh, O., Caldwell, R., Glasgow, N., Abramson, M., Luskin, F., Gill, M., Burke, A., & Koopman, C. (2004). The effects of a mindfulness based stress reduction program on stress, mindfulness self efficacy and positive states of mind. *Stress and Health, 20*(3), 141-147. doi: 10.1002/smi.1011

Chen, Y., Yang, X., Wang, L., & Zhang, X. (2013). A randomized controlled trial of the effects of brief mindfulness meditation on anxiety symptoms and systolic blood

pressure in Chinese nursing students. *Nurse Education Today*, *33*(10), 1166–72. doi:10.1016/j.nedt.2012.11.014

Coates, C.J. (1997). The caring efficacy scale: nurses' self reports of caring in practice settings. *Advanced Practice Nursing Quarterly, 3*(1), 53-59.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behaviour, 24*(4), 385-396. doi: 10.2307/2136404

Cohen-Katz, J., Wiley, S.D., Capuano, T., Baker, D.M., Shapiro, S. (2005). The effects of mindfulness based stress reduction on nurse stress and burnout, Part II: A quantitative and qualitative study. *Holistic Nursing Practice, 19*(1), 26-35. doi: 10.1097/00004650-20050100-00008

Connor, K.M., & Davidson, J.R. (2003). Development of a new resilience scale: the Connor Davidson resilience scale. *Depression and Anxiety, 18*(2), 76-82.

Crabbe, J.M., Bowley, D.M., Boffard, K.D., Alexander, D.A., & Klein, S. (2003). Are health professionals getting caught in the crossfire? The personal implications of caring for trauma victims. *Emergency Medical Journal, 21*(5)*,* 568-572. doi: 10.1136/emj.2003.008540

Creamer, M., Bell, R., & Failla, S. (2003). Psychometric properties of the impact of event scale-revised. *Behaviour Research and Therapy, 41*(12), 1489-1496. doi: 10.1016/j.brat.2003.07.010

Dahlin, M., Joneborg, N., & Runeson, B. (2005). Stress and depression among medical students: a cross sectional study. *Medical Education, 39*(6), 594-604. doi: 10.111/j.1365-2929.2005.02176.x

Davis, M.H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44*(1)*,* 113-126. doi: 10.1037/0022-3514.44.1.113

Deci, E.L., & Ryan, R.M. (2008). Hedonia, eudaimonia and well-being: An introduction. *Journal of Happiness Studies, 9*(1), 1-11. doi: 10.1007/s10902-006-9018-1

De Vibe, M., Solhaug, I., Tyssen, R., Friborg, O., Rosenvinge, J. H., Sørlie, T., & Bjørndal, A. (2013). Mindfulness training for stress management: a randomised controlled study of medical and psychology students. *BMC Medical Education*, *13*(107). doi:10.1186/1472-6920-13-107

Derogatis, L.R. & Melisaratos, N. (1983). The brief symptom inventory, An introductory report. *Psychological Medicine, 13*(3), 595-605. doi: 10.1017/S0033291700048017

Derogatis, L.R. (1984). *The derogatis stress profile: A summary report.* Baltimore, MD: Clinical Psychometric Research

Diener, E., Emmons, R.A., Larsen, R.J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71-75. doi: 10.1207/s15327752jpa4901_13

Dodge, R., Daly, A., Huyton, J., & Sanders, L. (2012). The challenge of defining wellbeing. *International Journal of Wellbeing, 2*(3), 222-235. doi: 10.5502/ijw.v2i3.4

Dominguez-Gomez, E., & Rutledge, D. (2009). Prevalence of secondary traumatic stress among emergency nurses. *Journal of Emergency Nursing, 35*(3)*,* 199-204. doi: 10.1016/j.jen.2008.05.003

Ehlers, A., & Clark, D. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour, Research and Therapy, 38*(4), 319-345. doi: 10.1016/S0005-7967(99)00123-0

Epstein, R. M., Beckman, H., Suchman, A. L., Chapman, B., Mooney, C. J., & Quill, T. E. (2009). Association of an educational program in mindful communication with burnout , empathy , and attitudes among primary care physicians, *The Journal of the American Medical Association, 302*(12) 1284-1293. doi: 10.1001/jama.2009.1384

Epstein, R. (1999). Mindful practice. *The Journal of the American Medical Association, 282*(9), 833-839. doi: 10.1001/jama.282.9.833

Evans, S., Ferrando, S., Findler, M., Stowell, C., Smart, C., & Haglin, D. (2008). Mindfulness based cognitive therapy for generalised anxiety disorder, *Journal of Anxiety Disorders,* 22(4), 716-721. doi: 10.1016/j.janxdis.2007.07.005

Evans, S., Huxley, P., Gately, C., Webber, M., Mears, A., Pajak, S…Katona, C. (2006). Mental health, burnout and job satisfaction among mental health social workers in England and Wales. *The British Journal of Psychiatry. 188*(2), 75-80. doi: 10.1192/bjp.188.1.75

Faucher, M. (2013). Most labor and delivery nurses experience secondary traumatic stress. *Journal of Midwifery and Womens Health, 58*(1), 114-115.

REFERENCES

Fenton, W. (2011). The size and structure of the adult social care sector and workforce in England, 2011. *Skills for Care.* In Imison, C., & Bohmer, R. (2013). NHS and social care workforce: Meeting our needs now and in the future? *Perspectives.* Retrieved from: http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/perspectives-nhs-social-care-workforce-jul13.pdf.

Figley, C.R. (1995). *Compassion fatigue: coping with secondary traumatic stress disorder in those who treat the traumatized*. New York: Routledge

Figley, C. (2002). Compassion fatigue: Psychotherapists chronic lack of self care. *Journal of Clinical Psychology, 58*(11), 1433-1441. doi: 10.1002/jclp.10090

Fjorback, L., Arendt, M., Ornbol, E., Fink, P., & Walach, H. (2011). Mindfulness based stress reduction and mindfulness based cognitive therapy- a systematic review of randomized controlled trials. *Acta Psychiatrica Scandinavica, 124*(2), 102-119. doi: 10.1111/j.1600-0447.2011.01704.x

Follette, V., Palm, K., & Pearson, A. (2006). Mindfulness and trauma: implications for treatment. *Journal of Rational-Emotive & Cognitive Behavioural Theray, 24*(1), 45-61. doi: 10.1007/s10942-006-0025-2.

Fortney, L., Luchterhand, C., & Zakletskaia, L. Rakel, D. (2013). Abbreviated mindfulness intervention for job satisfaction, quality of life, and compassion in primary care clinicians: A pilot study. *Annals of Family Medicine,* 11(5), 412-420. doi:10.1370/afm.1511.INTRODUCTION

Foureur, M., Besley, K., Burton, G., Yu, N., & Crisp, J. (2013). Enhancing the resilience of nurses and midwives: pilot of a mindfulness based program for increased health, sense of coherence and decreased depression, anxiety and stress. *Contemporary Nurse, 45*(1), 114-125. doi: 10.5172/conu.2013.45.1.114

Freudenberger, H. J. (1974). Staff burnout. *Journal of Social Issues*, *30*(1),159-165. doi: 10.1111/j.1540-4560.1974.tb00706.x

Fullerton, C.S., & Ursano, R.J. (1997). Posttraumatic responses in spouse/significant others of disaster workers. In: Fullerton, C.S., & Ursano, R.J. (1997). *Posttraumatic stress disorder: acute and long-term responses to trauma and disaster.* Washington (DC): American Psychiatric Press

Gilbert, P. (2005) *Compassion: Conceptualisations, Research and Use in Psychotherapy.* London: Routledge

Gilbert, P., Baldwin, M., Irons, C., Baccus, J., Palmer, M. (2006). Self criticism and self warmth: An imagery study exploring their relation to depression. *Journal of Cognitive Psychotherapy, 20*(2), 183-200. doi: http://dx.doi.org/10.1891/jcop.20.2.183

Goldberg, D.P. (1978). *Manual of the general health questionnaire.* Windsor, England: NFER Publishing.

Goldin, P., & Gross, J. (2010). Effects of mindfulness-based stress reduction (MBSR) on emotion regulation in social anxiety disorder. *Emotion, 10*(1), 83-91. doi: 10.1037/a0018441

Goldsmith, R., Gerhart, J., Chesney, S., Burns, J., Kleinman, B., & Hood, M. (2013). Mindfulness based stress reduction for posttraumatic stress symptoms: Building acceptance and decreasing shame. *Journal of Evidence Based Complementary & Alternative Medicine, 19*(4), 227-234. doi. 10.1177/2156587214533703

Goodman, M.J. & Schorling, J.B. (2012). A mindfulness course decreases burnout and improves wellbeing among healthcare providers. *International Journal of Psychiatry in Medicine, 43*(2), 119-128. doi: 10.2190/PM.43.2.b

Greenglass, E., Burke, R., Fiskenbaum, L. (2001). Workload and burnout in nurses. *Journal of Community & Applied Social Psychology, 11*(3), 211-215. doi: 10.1002/casp.614

Grossi, E., Groth, N., Mosconi, P., Cerutti, R., Pace, F., Compare, A., & Apolone, G. (2006). Development and validation of the short version of the psychological general wellbeing index. *Health and Quality of Life Outcomes, 14*(4), 88. doi: 10.1186/1477-7525-4-88.

Harman, R., & Lee, D. (2009). The role of shame and self critical thinking in the development and maintenance of current threat in post traumatic stress disorder. *Clinical Psychology and Psychotherapy, 17*(1), 13-24. doi: 10.1002/cpp.636

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. doi: 10.1111/j.1365-2788.2003.00523.x

Hinderer, K., VonRueden, K., Friedmann, E., McQuillan, K., Gimore, R., Kramer, B., & Murray, M. (2014). Burnout, compassion fatigue, compassion satisfaction and secondary traumatic stress in trauma nurses. *Journal of Trauma Nursing, 21*(4),

160-169. doi: 10.1097/JTN.0000000000000055

Hoffman, S., Sawyer, A., Witt., A. & Oh, D. (2010). The effect of mindfulness based therapy on anxiety and depression: A meta analytic review. *Journal of Consulting and Clinical Psychology, 78*(2) 169-183. doi: 10.1037/a0018555

Hojat, M., Mangoine, S., Nasca, T., Gonnella, J., Erdmann, J., Veloski, J., & Mageem M. (2001). The jefferson scale of physician empathy: Development and preliminary psychometric data. *Educational and Psychological Measurement, 61*(2), 349-365. doi: 10.1177/00131640121971158

Horner, J. K., Piercy, B. S., Eure, L., & Woodard, E. K. (2014). A pilot study to evaluate mindfulness as a strategy to improve inpatient nurse and patient experiences. *Applied Nursing Research, 27*(3), 198–201. doi:10.1016/j.apnr.2014.01.003

Huppert, F.A. (2009). Psychological well-being: Evidence regarding its causes and consequences. *Applied Psychlogy: Health and Well-being, 1*(2), 137-164. doi: 10.1111/j.1758-0854.2009.01008.x

Hwang, J.Y., Plante, T., & Lackey, K. (2008). The development of the santa clara brief compassion scale: An abbreviation of sprecher and Fehr's compassionate love scale. *Pastoral Psychology, 56*(4)*,* 421-428. doi: 10.1007/s11089-008-0117-2

Irving, J. A., Dobkin, P.L., & Park, J. (2009). Cultivating mindfulness in healthcare professionals: A review of empirical studies of mindfulness-based stress reduction (MBSR). *Complementary Therapies in Clinical Practice,* 15(2), 61-66. doi: 10.1016/j.ctcp.2009.01.002

Ishak, W., Nikravesh, R., Lederer, S., Perry, R, Ogunyemi, D., & Bernstein, C. (2013). Burnout in medical students: a systematic review. *The Clinical Teacher*, *10*(4), 242-245. doi: 10.1111/tct.12014

Ishak, W.W., Lederer, S., Mandili, R., Nikravesh, L., Seligman, M., Vasa, M…Bernstein, C. (2009). Burnout during residency training. In. Montgomery, A. (2014). The inevitability of physician burnout: Implications for interventions. *Burnout Research. 1*(1). 50-56. doi: 10.1016/j.burn.2014.04.002.

Jain, S., Shapiro, S., Swanick, S., Roesch, S., Mills, P., Bell, I., & Schwartz, G. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination and distraction. *Annals of Behavioural Medicine, 33*(1), 11-21. doi: 10.1207/s15324796abm3301_2

Jha, A.P., Krompinger, J., & Baime, M.J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive, Affective, & Behavioral Neuroscience, 7*(2),

109- 119. doi: 10.3758/CABN.7.2.109

Joormann, J., Yoon, K. L., & Siemer, M. (2010). Cognition and emotion regulation. In: Kring, A., & Sloan, D. (Eds.), *Emotion regulation and psychopathology.* New York, NY: Guilford Press

Kabat-Zinn, J. (1982). An outpatient program in behavioural medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry, 4*(1), 33-47. doi: http://dx.doi.org/10.1016/0163-8343(82)90026-3

Kabatt-Zinn, J. (2003). Mindfulness based interventions in context: Past, present ad future. *Clinical Psychology: Science and Practice, 10*(2) 144-156. doi: 10.1093/clipsy/bpg016.

Kabat-Zinn, J., Lipworth, L., Burney, R., & Sellers, W. (1987). Four-year follow-up of a meditation-based program for the self-regulation of chronic pain: Treatment outcomes and compliance. *The Clinical Journal of Pain, 2*(3), 159–173.

Kakunje, A. (2011). Stress among healthcare professionals- the need for resiliency. *Online Journal of Health and Allied Sciences, 10*(1). Retrieved from http://cogprints.org/7952

Kang, Y. S., Choi, S. Y., & Ryu, E. (2009). The effectiveness of a stress coping program based on mindfulness meditation on the stress, anxiety, and depression experienced by nursing students in Korea. *Nurse Education Today*, *29*(5), 538–43. doi:10.1016/j.nedt.2008.12.003

Kearney, D. J., Malte, C. A., Mcmanus, C., Martinez, M. E., Felleman, B., & Simpson, T. L. (2013). Loving-Kindness Meditation for Posttraumatic Stress Disorder : A Pilot Study. *Journal of Traumatic Stress, 26*(4), 426–434. doi:10.1002/jts.21832

Knoury, B., Sharma, M., Rush, S.E., & Fournier, C. (2015). Mindfulness-based stress reduction for healthy individuals: A meta analysis. *Journal of Psychosomatic Research, 78*(6), 519-528. doi: 10.1016/j.psychores.2015.03.009

Kimbrough, E., Magyari, T., Langenberg, P., Chesney, M., & Berman, B. (2010). Mindfulness intervention for child abuse survivors*. Journal of Clinical Psychology, 66*(1), 17–33. doi:10.1002/ jclp.20624

Koeske, G.F., Kirk, S.A., Koeske, R.D., & Rautkis, M.B. (1994). Measuring the Monday blues: Validation of the job satisfaction scale for the human services. *Social Work Research, 18*(1), 27-35.

Krasner, M., Epstein, R., Beckman, H., Suchman, A., Chapman, B., Mooney, C., & Quill, T.

(2009). Association of an education program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *The Journal of The American Medical Association, 302*(12), 1284-1293. doi: 10.1001/jama.2009.1384

Kristensen, T., Borritz, M., Villadsen, E., & Christensen, K. (2005). The Copenhagen burnout inventory: A new tool for the assessment of burnout. *Work and Stress, 19*(3), 192-207. doi: 10.1080/02678370500297720

Kuyken, W., Watkins, E., Holden, E., & Cook, W. (2006). Rumination in adolescents at risk for depression. *Journal of Affective Disorders, 96*(1-2), 39-47. doi: http://dx.doi.org/10.1016/j.jad.2006.05.017

Kuyken, W., Taylor, R., Barrett, B., Evans, A., Byford, S., Watkins, E., Holden, E…Teasdale, J. (2008). Mindfulness based cognitive therapy to prevent relapse in recurrent depression. *Journal of Consulting and Clinical Psychology, 76*(6), 966-978. doi: 10.1037/a0013786

Lafond, S., Arora, S., Charlesworth, A., & Mckeon, A. (2014). *Into the red? The state of the NHS finances.* Retrieved from http://www.nuffieldtrust.org.uk/sites/files/nuffield/publication/into-the-red-report.pdf

LaMonica, E.L. (1981). Construct validity of an empathy instrument. *Research in Nursing and Health, 4*(4), 389-400. doi: 10.1002/nur.4770040406

Lang, A., Strauss, J., Bomyea, J., Bormann, J., Hickman, S., Good, R., & Essex, M. (2012). The theoretical and empirical basis for meditation as an intervention for PTSD. *Behaviour Modification, 36*(6), 759-786. doi:10.1177/0145445512441200.

Laposa, J., & Alden, L. (2003). Posttraumatic stress disorder in the emergency room: exploration of a cognitive model. *Behaviour Research and Therapy, 41*(1), 49-65. doi: 10.1016/S0005-7967(01)00123-1

Laposa, J., Alden, L., & Fullerton, L. (2003). Work stress and posttraumatic stress disorder in ED nurses/personnel. *Journal of Emergency Nursing, 29*(1), 23-28. doi: 10.1067/men.2003.7

Lee, D., & Scragg, P. (2001). The role of shame and guilt in traumatic events: A clinical model of shame based and guilt based PTSD. *British Journal of Medical Psychology, 74*(4), 451-466. doi: 10.1348/000711201161109

Lee, D., James, S., & Gilbert, P. (2013). *The compassionate mind guide to recovering from trauma and PTSD.* Oakland: New Harbinger Publications

Linehan, M. M. (1993). *Skills training manual for treating borderline personality disorder.* New York: Guilford Press.

Linehan, M. M., Armstrong, H. E., Suarez, A., Allmon, D., & Heard, H. L. (1991). Cognitive-behavioral treatment of chronically parasuicidal borderline patients. *Archives of General Psychiatry, 48*(12), 1060–1064. doi: 10.1001/archpsyc.1991.01810360024003

Lovibond, S.H., & Lovibond, P.F. (1995). *Manual for the depression anxiety stress scales.* Sydney: Psychology Foundation

Mackenzie, C. S., Poulin, P. a, & Seidman-Carlson, R. (2006). A brief mindfulness-based stress reduction intervention for nurses and nurse aides. *Applied Nursing Research, 19*(2), 105–9. doi:10.1016/j.apnr.2005.08.002

Majani, G., Callegari, S. (1998). *Satisfaction profile (SAT-P).* Trento: Ed. Erikson.

Marine, A., Ruotsalainen, C., & Verbeek, J. (2006). Preventing occupational stress in healthcare workers. *The Cochrane Database of Systematic Reviews, 18*(4). doi: 10.1002/14651858.CD002892.pub3

Maslach, C., & Jackson, S.E. (1981). The measurement of experienced burnout. *Journal of Occupational Psychology*, *2* (2), 99–113. doi: 10.1002/job.4030020205

McCann, I.L. & Perlman, L.A. (1990). Vicarious traumatization: A framework for understanding the psychological effects of working with victims. *Journal of Traumatic Stress, 3*(1), 131-149. doi: 10.1007/BF00975140

Mckim, R.D. (2008). Rumination as a mediator of the effects of mindfulness: Mindfulness based stress reduction with a heterogeneous community sample experiencing anxiety, depression and/or chronic pain [Abstract]. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 68*(11-B).

McNair, D.M., Lorr, M., & Droppleman, L.F. (1971). *Manual: Profile of Mood States*. San Diego, CA: Educational and Industrial Testing Service.

McVicar, A. (2003). Workplace stress in nursing: a literature review. *Journal of Advanced Nursing, 44*(6), 633-642. doi: 10.1046/j.0309-2402.2003.02853.x

Mealer, M., Burnham, E., Goode, C., Rothbaum, B., & Moss, M. (2009). The prevalence and impact of post traumatic stress disorder and burnout syndrome in nurses. *Depression and Anxiety, 26*(12), 1118-1126. doi: 10.1002/da.20631.

Mealer, M., Conrad, D., Evans, J., Jooste, K., Solyntjes, J., Rothbaum, B., & Moss, M. (2014). Feasibility and acceptability of a resilience training program for

intensive care nurses. *American Journal of Criticial Care, 23*(6). 97-105. doi: http://dx.doi.org/10.4037/ajcc2014747

Mealer, M.L., Shelton, A., Berg, B., Rothbaum, B., & Moss, M. (2007). Increased prevalence of post-traumatic stress disorder symptoms in critical care nurses. *American Journal of Respiratory and Critical Care Medicine, 175*(7), 693-697. doi: 10.1164/rccm.200606-735OC

Mertz, J. (2013). *A Mindful Difference: Respond vs React*. Retrieved from http://www.thindifference.com/2013/03/07/a-mindful-difference-respond-vs-react

Michael, T., Halligan, S., Clark, D., & Ehlers, A. (2006). Rumination in posttraumatic stress disorder. *Depression and Anxiety, 24*(5), 307-317. doi: 10.1002/da.20228

Michopoulos, I., Douzenis, A., Kalkavoura, C., Christodoulou, C., Michalopoulou, P., Kalemi, G., Fineti, K…Lykouras, L. (2008). Hopsital anxiety and depression scale (HADS): validation in a greek general hospital sample. *Annals of General Psychiatry, 7*(4), 744-859. doi: 10.1186/1744-859x-7-4

Montgomery, A. (2014). The inevitability of physician burnout: Implications for interventions. *Burnout Research. 1*(1). 50-56. doi: 10.1016/j.burn.2014.04.002.

Montgomery, A., Todorova, A., Baban, A., & Panagopoulou, E. (2013). Improving quality and safety in the hospital: The link between organizational culture, burnout and quality of care. *British Journal of Health Psychology, 18*(3), 656-662. doi: 10.111/bjhp.12045

Moody, K., Kramer, D., Santizo, R.O., Magro, L., Wyshogrod, D., Ambrosio, J., Castollio, C…Stein, J. (2013). Helping the helpers: mindfulness training for burnout in pediatric oncology- a pilot program. *Journal of Pediatric Oncology Nursing, 30*(5), 275-284. doi: 10.1177/1043454213504497

Moum, T., Naess, S., Sorensen, T., Tambs, K., & Holmen, J. (1990). Hypertension labeling, life events and psychological well-being. *Psychological Medicine, 20*(3), 635-646. doi: 10.1017/S0033291700017153

Murray, A., Montgomery, J. E., Chang, H., Rogers, W. H., Inui, T., & Safran, D. G. (2001). Doctor discontent: A comparison of physician satisfaction in different delivery system settings. In Shapiro, S. L., Astin, J. a., Bishop, S. R., & Cordova, M. (2005). Mindfulness-Based Stress Reduction for Health Care Professionals: Results From a Randomized Trial. *International Journal of Stress Management*, *12*(2), 164–176. doi:10.1037/1072-5245.12.2.164

Neff, K.D. (2003a). The development and validation of a scale to measure self compassion. *Self and Identity, 2*(3), 223-250. doi: 10.1080/15298860390209035

Neff, K.D. (2003b). Self compassion. An alternative conceptualization of a healthy attitude towards oneself. In Gilbert, P. (2009). Introducing compassion focused therapy. *Journal of Continuing Professional Development, 15*(3). doi: 10.1192/apt.bp.107.005264

Neff K.D. (2006). The role of self-compassion in healthy relationship interactions. In Allen, A.B. & Leary, M. (2010). Self compassion, stress and coping. *Social and Personality Psychology Compass, 4*(2), 107-118. doi: 10.1111/j.1751-9004.2009.00246.x

Nyklieek, I., & Kuijpers, K. (2008). Effects of mindfulness based stress reduction intervention on psychological wellbeing and quality of life: Is increased mindfulness indeed the mechanism? *Annals of Behavioral Medicine, 35*(3), 331-340. doi: 10.1007/s12160-008-9030-2

Owens, G., Walter, K., Chard, K., Davis, P. (2012). Changes in mindfulness skills and treatment response among veterans in residential PTSD treatment. *Psychological Trauma: Theory, Research, Practice and Policy, 4*(2), 221-228. doi: 10.1037/a0024251

Parloff, M.B., Kelman, H.C., & Frank, J.D. (1954). Comfort, effectiveness, and self awareness as criteria for improvement in psychotherapy. *American Journal of Psychiatry,111*(5), 343-352. doi: 10.1176/ajp.111.5.343

Penque, S. (2009). *Mindfulness based stress reduction effects on registered nurses* (Unpublished doctoral dissertation). University of Minnesota, Minnesota.

Pipe, T. B., Bortz, J. J., & Dueck, A. (2009). Nurse Leader Mindfulness Meditation Program for Stress Management A Randomized Controlled Trial, *Journal of Nursing Administration, 39*(3), 130–137. doi: 10.1097/NNA.0b013e31819894a0

Praissman, S. (2008). Mindfulness bases stress reduction: A literature review and clinicians guide. *Journal of the American Academy of Nurse Practitioners, 20*(4), 212-216. doi: 10.1111/j.1745-7599.2008.00306.x

Phelps, A., Lloyd, D., Creamer, M., & Forbes, D. (2009). Caring for carers in the aftermath of trauma. *Journal of Aggression, Maltreatment & Trauma*, *18*(3), 313-330. doi: 10.1080/10926770902835899.

Phillips, J. (2011). Hardiness as a defense against compassion fatigue and burnout. *Journal of Emergency Nursing. 37*(2), 125. doi: http://dx.doi.org/10.1016/j.jen.2010.10.012

Portnoy, D. (2011). Burnout and compassion fatigue: Watch for the signs. *Catholic Health Association of the United States.* Retrieved from https://www.chausa.org/publications/health-progress/article/july-august-2011/burnout-and-compassion-fatigue-watch-for-the-signs

Potter, P., Deshields, T., Divanbeigi, J., Berger, J., Cipriano, D., Norris, L., Olsen, S. (2010). Compassion fatigue and burnout. *Clinical Journal of Oncology Nursing, 14*(5), 56-62. doi: 10.1188/10.CJON.E56-E62

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. doi: 10.1177/014662167700100306

Romani, M., & Ashkar, K. (2014). Burnout among physicians. *Libyan Journal of Medicine, 9*(1), 235-256. doi: 10.3402/ljm.v9.23556

Rosenzweig, S., Reibel, D. K., Greeson, J. M., & Brainard, G. C., Hojat, M. (2003). Mindfulness-based stress reduction lowers psychological distress in medical students. *Teaching and Learning in Medicine: An International Journal,* 15(2), 88-92. doi:10.1207/S15328015TLM1502_03

Royal College of Nursing. (2009). RCN calls for guaranteed safe staffing levels as workload pressures soar. Retrieved from: http://www.rcn.org.uk/newsevents/press_releases/uk/rcn_calls_for_guaranteed_safe_staffing_levels_as_workload_pressures_soar

Rudolph, J.M., Stamm, B.H., & Stamm, H.E. (1997). Compassion fatigue: A concern for mental health policy, providers & administration. In Bride, B., Radley, M., & Figley, C. (2007). Measuring compassion fatigue. *Clinical Social Work, 35*(3), 155-163. doi: 10.1007/s10615-007-009107

Sabo, B. (2011). Reflecting on the concept of compassion fatigue. *American Nurses Association, 16*(1). doi: 10.3192/OJIN.vol16No01Man01

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse.* New York: Guilford

Shanafelt, T.D., Bradley, K.A., Wipf, J.E., & Back, A.L. (2002). Burnout and self reported patient care in an internal medicine resident program. *Annals of Internal Medicine, 136*(5), 358-367. doi: 10.7326/0003-4819-136-5-200203050

Shapiro, S. L., Astin, J. A., Bishop, S. R., & Cordova, M. (2005). Mindfulness-Based Stress Reduction for Health Care Professionals: Results From a Randomized Trial. *International Journal of Stress Management*, *12*(2), 164–176. doi:10.1037/1072-5245.12.2.164

Shapiro, S.L., Schwartz, G.E., & Bonner, G. (1998). Effects of mindfulness based stress reduction on medical and premedical students. *Journal of Behavioural Medicine, 21*(6), 581-599. doi: 10.1023/A:108700829825

Shirley, M., Ebright, P., & McDaniel, A. (2008). Sleepless in america: Nurse managers cope with stress and complexity. *Journal of Nursing Administration, 38*(3), 125-131. doi:10.1097/01.NNA.0000310722.35666.73

Simon, C. E., Pryce, J. G., Roff, L. L., & Klemmack, D. (2006). Secondary traumatic stress and oncology social work: Protecting compassion from fatigue and compromising the worker's worldview. *Journal of Psychosocial Oncology*, *23*(4), 1-14. doi: 10.1300/J077v23n04_01.

Smith, B.W., Shelley, B.M., Dalen, J., Wiggins, K., Tooley, E., & Bernard, J. (2008). A pilot study comparing the effects of mindfulness based and cognitive behavioural stress reduction. *Journal of Alternative and Complementary Medicine, 14*(3), 251-258. doi: 10.1089/acm.2007.0641

Smith, B., Ortiz, A., Steffen, L., Tooley, E., Wiggins, K., Yeater, E…Bernard, M. (2011). Mindfulness is associated with fewer PTSD symptoms, depressive symptoms, physical symptoms and alcohol problems in urban firefighers. *Journal of Consulting and Clinical Psychology, 79*(5), 613-617. doi: 10.1037/a0025189

Speilberger, C.D., Gorsuch, R.L., Lushene, R., Vagg, P.R., & Jacobs, G.A. (1983). *Manual for the state trait anxiety inventory.* Palo Alto, CA: Consulting Psychology Press

Spickard, A., Gabbe, S., & Christensen, J. (2002). Mid-career burnout in generalist and specialist physicians. *JAMA, 288*(12), 1447-1450. doi: 10.1001/jama.288.12.1447

Stafford, L., Berk, M., & Jackson, H.J. (2007). Validity of the hospital anxiety and depression scale and patient health questionnaire-9 to screen for depression in patients with coronary heart disease. *General Hospital Psychiatry,* 29*(5), 417-424*

Stamm, B.H. & Figley, C.R. (2009). *Advances in the theory of compassion satisfaction and fatigue and its measurement with the ProQOL 5.* International Society for Traumatic Stress Studies, Atlanta: GA

Stamm, B.H. (2010). The concise ProQOL manual (2nd ed). Accessed http://www.proqol.org/uploads/ProQOL_Concise_2ndEd_12-2010.pdf

Stanley, E., Schaldach, J., Kiyonage, A., & Jha, A. (2011). Mindfulness-based mind fitness training: A case study of a high stress predeployment military cohort. *Cognitive and Behavioural Practice, 18*(4), 566-576. doi. 10.1016/j.cbpra.2010.08.002

Suner-Soler, R., Grau-Martin, A., Flichtentrei, D., Prats, M., Braga, F., Font-Mayolas, S., & Gras, E. (2014). The consequences of burnout syndrome among healthcare professionals in Spain and Spanish speaking Latin American countries. *Burnout Research, 12*(2), 83-89. doi: 10.1016/j.burn.2014.07.004

Tabachnick, B.G., & Fidell, L.S. (2007). Using multivariate statistics (5th ed.). London: Pearson

Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology, 68*(4), 615–623. doi: 10.1037/0022-006X.68.4.615

Thompson, R., Arnkoff, D., & Glass, C. (2011). Conceptualising mindfulness and acceptance as components of psychological resilience to trauma. *Trauma, Violence and Abuse, 12*(4), 220-235. doi: 10.1177/1524838011416375.

Tyssen, R., Vaglum, P., Gronvold, N.T., & Ekeberg, O. (2001). Suicidal ideation among medical students and young physicians: A nationwide and prospective study of prevalence and predictors. *Journal of Affective Disorders, 64*(1) 69-79. doi: 10.1016/SO165-0327(00)00205-6

Valent, P. (2002). Diagnosis and treatment of helper stresses, traumas, and illnesses. In C. Figley (Ed.), *Treating Compassion Fatigue*. New York: Brunner - Routledge.

Vitalano, P.P., Russo, J., Carr, J.E., & Heerwagen, J.H. (1984). Medical school pressures and their relationship to anxiety. *The Journal of Nervous and Mental Disease, 172*(12), 730-736. doi: 10.1097/00005053-198412000-00006

Vollestad, J., Siversten, B., & Nielsen, G. (2011). Mindfulness based stress reduction for patients with anxiety disorders: Evaluation in a randomized controlled trial. *Behaviour Research and Therapy, 49*(4), 281-288. doi. 10.1016/j.brat.2011.01.007

Vujanovic, A.A., Youngwirth, N.E., Johnson, K.A., & Zvolensky, M.J. (2009). Mindfulness based acceptance and post traumatic stress symptoms among trauma exposed adults without axis 1 psycho-pathology. *Journal of Anxiety Disorders, 23*(2), 297-303. doi: 10.1016/j.janxdis.2008.08.005.

Wahbeh, H.,Lu, M., & Oken, B. (2011). Mindful awareness and nonjudging in relation to post traumatic stress disorder symptoms. *Mindfulness, 2*(4)*,* 219-227, doi. 10.1007/s12671-011-0064-3.

Ware, 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*.* doi: 10.1097/00005650-199603000-00003

Weiss, D., & Marmar, C. (1997). The impact of event scale revised. In Wilson, J.P. & Keane, T.M. (1997) *Assessing psychological trauma and PTSD.* New York: Guildford Press.

West, C., Huschka, M., Novotny, P., Sloan, J., Kolars, J., Habermann, T., Shanafelt, T. (2006). Association of perceived medical errors with resident distress and empathy: A prospective longitudinal study. *The Journal of the American Medical Association, 296*(6), 1071-1078. doi: 10.1001/jama.296.9.107

Young, L.E., Bruce, A., Turner, L., & Linden, W. (2001). Evaluation of mindfulness based stress reduction intervention. *The Canadian Nurse, 97*(6), 23-26.

Zigmond, A.S., & Snaith, R.P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica, 67*(6), 361-370. doi: 10.1111/j.1600-0447.1983.tb09716.x

Zung, W.W.K. (1965). A self rating depression scale. *Archives of general psychiatry, 12*(1), 63-70. doi: 10.1001/archpsyc.1965.01720310065008

Zung, W.W.K. (1971). A rating instrument for anxiety disorders. *Psychosomatics, 12*(6), 371-379. doi: 10.1016/S0033-3182(71)71479-0