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Facets of Mindfulness in Health Professionals
and Patient Adjustment to Cancer

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Doctorate in Clinical Psychology

University of Edinburgh

2014

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Signature **Date** 01 November 2013

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Overview to Thesis Portfolio

The thesis has been conducted in part fulfillment of the Doctorate in Clinical Psychology. It comprises two distinct parts: a systematic review and an empirical research study.

The systematic review examines the current literature pertaining to mindfulness-based interventions for reducing stress and burnout for professional healthcare staff. This study is presented in Chapter one, titled ‘A Review of Mindfulness-Based Interventions for Reducing Occupational Stress and Burnout in Healthcare Professionals’.

The empirical project is a cross-sectional study exploring adjustment to cancer. It examines the relationships between mental adjustment, coping, self-compassion, cognitive fusion, distress and quality of life. Specifically the study aimed to explore whether two newer constructs related to mindfulness – self-compassion and cognitive fusion – predict adjustment to cancer (as measured by distress and quality of life), over and above more established predictors such as demographic characteristics, mental adjustment and coping styles. The empirical project is presented in Chapter two, titled ‘The Role of Self-Compassion and Cognitive Fusion in the Psychological Adjustment to Cancer of a Heterogeneous Adult Cancer Population’.

Both studies are presented in a journal article format.

Thesis Portfolio Abstract

Systematic Review: Healthcare professionals work in highly emotive environments and are considered to be at high risk of developing burnout due to the nature of their roles. There has been increased interest in applying mindfulness-based interventions for stress reduction in healthcare professionals. Previous reviews have tended to include a heterogeneous mix of patients, healthcare students and healthcare professionals. The inherent differences in these roles limits the conclusions that can be drawn regarding the effectiveness of mindfulness-based interventions for healthcare professionals. The current review aimed to address this gap in knowledge by reviewing mindfulness-based interventions specifically for healthcare professionals. Eight studies were included in the review. It was concluded that despite some methodological weaknesses there was promising evidence of the effectiveness of mindfulness-based interventions in reducing stress and improving well-being particularly when baseline levels of stress were high. The evidence in support of reducing burnout was less conclusive. Future studies employing larger samples using active controls and longitudinal designs will provide valuable information on the long-term efficacy of these interventions.

Empirical Research Study: Several studies have identified psychological adjustment as one of the most important factors correlating with psychological distress and quality of life in people with cancer. Identifying ways to promote positive adjustment to cancer is an important goal in helping to alleviate distress and improve quality of life for this client group. This can be facilitated by identifying robust predictors of distress. Previous studies have identified a number of useful predictors, such as coping styles and psychological adjustment styles. The current study aimed to explore the predictive power of two newer constructs aligned to mindfulness-based processes: self-compassion and cognitive fusion - in determining adjustment to cancer. 114 adults with various cancer diagnoses completed the Mini Mental Adjustment to Cancer Scale, Brief COPE, the Self-Compassion Scale, Cognitive Fusion Questionnaire; and two outcome measures: the Hospital Anxiety and Depression Scale and the Functional Analysis of Cancer Therapy – General.

Hierarchical multiple regression was used to explore relationships between predictor variables: mental adjustment, coping style, self-compassion and cognitive fusion, and outcome variables: distress and quality of life. Results showed that a known predictor, emotional avoidance coping and the newer construct, cognitive fusion were significant predictors of distress over and above other known predictors. Emotional avoidance coping was the only significant predictor of quality of life over and above known predictors and the newer constructs under examination. Self-compassion did not account for any significant incremental variance in distress or quality of life after controlling for other known predictors. The results of this study indicate that interventions focused on reducing cognitive fusion and emotional avoidance are warranted and potentially beneficial in reducing distress in this population.

Chapter 1: Systematic Review

A review of Mindfulness-Based Interventions for reducing occupational stress and burnout in healthcare professionals

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*This review has been written in accordance with Clinical Psychology Review
(Appendix A)*

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Abstract

Background: Mindfulness-Based Interventions (MBI) represent a cost effective approach to addressing occupational stress and burnout. Research has shown MBI to be effective for clinical as well as non-clinical populations. While previous reviews have included heterogeneous populations the current review summarises and evaluates the quality of current research exploring the efficacy of MBI for professional healthcare staff.

Method: A systematic search strategy was used and eight studies met the inclusion criteria. Traditional and adapted forms of MBI including those based on Mindfulness-Based Stress Reduction (MBSR) and Acceptance and Commitment Therapy (ACT) are reviewed. The methodological quality, main findings and limitations of these studies are summarised.

Results: Overall, MBI were found to be helpful in reducing stress and improving well-being for healthcare professionals, particularly for those with higher levels of stress at baseline. The evidence in support of reducing burnout was less conclusive. Evidence suggests that brief versions of MBI are effective.

Conclusion: A number of methodological weaknesses were identified limiting the conclusions that can be reached, however there was promising evidence to suggest that MBI are effective in reducing stress and improving well-being particularly when baseline levels of stress are high. Future studies should aim to employ larger samples using active controls and longitudinal designs, which will provide valuable information on the long-term efficacy of these interventions.

Keywords: Mindfulness, ACT, burnout, stress, healthcare professional

Words: 216

Note: Tables and figures appear within the text for the purpose of the thesis only. The submitted journal will place tables and figures in the appendices according to *Clinical Psychology Review* author guidelines.

Highlights

- Mindfulness-Based Interventions are effective in alleviating stress.
- Adapted versions of Mindfulness-Based Stress Reduction are effective.
- Evidence was not conclusive regarding burnout.
- Limitations included small sample sizes with limited statistical power.
- Therapist training, experience and own mindfulness practice was poorly addressed.

Introduction

During the 1970s research on Mindfulness meditation began to focus on its efficacy in improving psychological well-being. Over the last few decades there has been increased interest in mindfulness within Western psychology (Kabat-Zinn, 1990) and a growing evidence base with clinical populations such as people with cancer (Specia, Carlson, Goodey & Angen, 2000), eating disorders (Kristellar, Baer & Quillian-Wolever, 2006), chronic pain (Dahl & Lundgren, 2006) anxiety and depression (Baer, 2003; Grossman, Niemann, Schmidt & Walach, 2004). Research in neuroscience has shown MBSR for example, to be associated with changes in brain activity reflecting increased positive emotion and this was maintained four months later (Davidson, Kabat-Zinn, Schumacher, Rosenkranz, Muller, Santorelli, Urbanowski, *et al.*, 2003). Treadway & Lazar (2009) saw benefits in terms of attention, stress and emotional reactivity, as well as increased positive emotion and reductions in the cognitive decline related to the normal ageing process.

Initially mindfulness was applied to the treatment of chronic pain and delivered in the form of Mindfulness-Based Stress Reduction (Kabat-Zinn, 1982). Since then, other types of MBI have been developed, including Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams & Teasdale, 2002), Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson, 1999; 2012) and Dialectical Behaviour Therapy (DBT; Linehan, 1993). The growing evidence base is gradually

establishing MBI as evidence-based interventions across a range of clinical and non-clinical populations (Baer, 2003; Grossman *et al.*, 2004; Escuriex & Labbé, 2011). There has been increased interest in interventions for stress reduction in healthcare professionals (Shapiro & Carlson, 2009), who are considered to be at high risk of developing burnout due to the nature of their roles (Lindsay, Hanson, Taylor & McBurney, 2008; Lim, Bogossian & Ahern, 2010; Laranjeira, 2011). May and O'Donovan (2007) found that therapists who had high levels of mindfulness traits reported better job satisfaction and lower levels of burnout. Healthcare professionals work in highly emotive environments and are routinely faced with suffering, death and organisational stressors due to limited resources, inadequate staffing levels, role ambiguity and increasing levels of accountability. It has been suggested that oncology staff and those working in acute settings are at increased risk of burnout due to the emotional aspect of their roles (Ekedahl & Wengstrom, 2007; Dogherty, Pierce, Clement, Panzarell, Rodin & Zimmermann, 2009). Oddie and Ousley (2007) in a small UK study found that 54% of their sample of mental health workers were experiencing emotional exhaustion. In 2005 the Health Care Commission reported key findings of a national survey of UK National Health Service (NHS) staff, which highlighted a strong link between occupational stress and sickness absence in NHS healthcare personnel (Health Care Commission, 2005). It is therefore important to explore the efficacy of interventions that show potential in reducing occupational stress and preventing burnout for healthcare professionals.

Burnout and Occupational Stress in Healthcare Professionals

Burnout reflects a person's response to high levels of on-going work related stress and the impact this has on their job satisfaction and performance. It can present as heightened arousal, numbing, avoidance, emotional exhaustion, depersonalization and a low sense of occupational achievement (Maslach, Schaufeli & Leiter, 2001). The most cited definition of burnout is "a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who work with people in some capacity" (Maslach, Jackson & Leiter, 1996, p.4). The continuous contact with those experiencing physical or mental distress can vicariously lead to psychological distress in healthcare staff, which may

in turn lead to burnout (Hannigan, Edwards & Burnard, 2004). It can have a negative impact on the individual experiencing burnout, as well as the patients in their care and the quality of care they receive. Research has found that high stress amongst nurses has been related to poor patient satisfaction (Argentero, Dell'Olivo & Ferretti, 2008; Vahey, Aiken, Sloane, Clarke & Vargas, 2004). Other terms which are associated with burnout are 'compassion fatigue' or 'secondary traumatic stress'.

Previous reviews have explored the effectiveness of MBI however many have included a heterogeneous mix of patients, students, prisoners, community volunteers, healthcare professionals and administrative staff (Baer, 2003; Escuriex & Labbé, 2011) or have focussed only on MBSR with a heterogeneous sample (Grossman *et al.*, 2004). The inherent occupational and clinical differences amongst these groups limits the conclusions that can be drawn regarding the effectiveness of MBI specifically for healthcare professionals. The current review aims to address this gap in knowledge by evaluating interventions targeted towards qualified health professionals.

Mindfulness, Meditation and the “Third Wave” of CBT

The concept of mindfulness has its roots in Buddhism with meditation as the central mechanism for developing mindfulness. Meditation has been defined as “the intentional self-regulation of attention from moment to moment” (Goleman & Schwartz, 1976; Kabat-Zinn, 1982, cited in Baer, 2003). Gockel (2010, p249) describes mindfulness as “a practice that helps one attend to experience without judgment, bringing kindness and acceptance to the process of witnessing the mind and its contents”. Perhaps the most frequently cited definition is from Kabat-Zinn (2003) who defines mindfulness as “paying attention on purpose, in the present moment, and non-judgementally to the unfolding experience moment by moment”. Although associated with Eastern Religion, MBI are not religious or esoteric in nature. They represent brief, cost effective interventions that have been found to be effective for a range of clinical and non-clinical populations (Grossman *et al.*, 2004). Baer's (2003) review outlines some of the key mechanisms of mindfulness. She suggests that mindfulness can bring about change through exposure, cognitive

change, self-management, relaxation and acceptance and is concerned with the cultivation of compassion.

Within contemporary psychotherapeutic practice, MBI have come to be loosely associated with what has been termed a “third wave in CBT” (Hayes, 2004). In contrast to traditional forms of CBT such as Cognitive Therapy, MBI encourage a way of perceiving inner experiences or mental states with kindness, acceptance and perspective taking as opposed to attempts to directly change the form, content or frequency of cognitive events. The emphasis is on the ability to have mindful awareness, to witness experience as it is without the need to change it whereas CBT focuses on changing cognitions and challenging negative automatic thoughts. MBI emphasise acceptance rather than avoidance of that which is distressing and a commitment to pursue valued goals despite the presence of unwanted thoughts or emotions.

Mindfulness-Based Interventions

The following section provides a brief summary of the mindfulness-based interventions considered for inclusion in this review:

Mindfulness-Based Stress Reduction is a manualised intervention based on Buddhist mindfulness meditation and incorporates body scan, sitting meditation and Hatha yoga practice. It was developed by Jon Kabat-Zinn in 1979 and initially used for treating chronic pain. The program consists of eight weeks of 2-2.5 hour sessions and a day-long retreat, which falls between weeks six and seven. Participants are encouraged to carry out daily practice both during and after the intervention. MBSR aims to foster greater awareness, insight and a non-judgmental openness and acceptance of internal and external experiences (i.e. thoughts, situations, events) and to promote reflective rather than impulsive responses to these. It is usually delivered in a group format, typically with 10-40 participants.

Mindfulness-Based Cognitive Therapy is also a manualised intervention delivered as an 8-week group intervention. It is an adaptation of the MBSR programme and

includes elements of cognitive therapy. It was initially found helpful in treating and preventing relapse in chronic depression (Teasdale, Segal & Williams, 1995). MBCT aims to teach participants how to recognise negative automatic thoughts as mental events rather than facts, and identify the role these play in maintaining negative affect. Similar to MBSR, the aim is to change the relationship between thought and emotion.

Dialectical Behaviour Therapy was initially developed as a treatment for people with personality disorder (Linehan, 1993a; 1993b). It can be delivered in a group format or individual therapy and the program is usually covered over a year with weekly sessions. It combines traditional CBT with Zen philosophy and focuses on helping individuals to develop emotion regulation, acceptance and behavioural change strategies. Specifically, individuals are encouraged to accept their past, current situations and themselves just as they are whilst working towards a better life through behavioural and environmental change (Baer, 2003). Mindfulness skills are a central component and aim to foster self-acceptance and willingness to experience rather than avoid emotions. DBT has also been shown to be effective in treating chronic depression (Lynch, Morse, Mendelson & Robins, 2003); self-harm (Linehan, Comtois, Murray, Brown, Gallow, Heard, Korslund, *et al.*, 2006); eating disorders (Telch, Agras & Linehan, 2001; Safer, Telch & Agras, 2001) and personality disorder and substance misuse (Linehan, Dimeff, Reynolds, Comtois, Welch Heagerty & Kivlahan, 2002).

Acceptance and Commitment Therapy was developed by Hayes, Strosahl and Wilson (1999; 2012). It is based on Relational Frame Theory (RFT) and Behaviour Analysis (Hayes & Wilson, 1993) and examines the way language can entangle an individual into an inner struggle with their own thoughts. ACT comprises six core processes: acceptance, defusion, contact with the present moment, self as context, values and committed action (Hayes, Luoma, Bond, Masuda & Lillis, 2006). Although ACT does not focus specifically on mindfulness or meditation, its strategies are consistent with mindfulness approaches. Individuals are taught to give up the struggle to control thoughts and feelings and instead adopt an accepting, observing and non-

judging stance whilst also committing to change behaviours in a way that will be in contact with their own values and improve their lives (Hayes, 1994). ACT can be delivered in a group format, couples or individual therapy and duration ranges from a few hours to about 16 weeks (Hayes, Bisset, Roget, Padilla, Kohlenberg, Fisher, *et al.*, 2004). In 2012 ACT was recognised as an empirically supported treatment for depression and for chronic pain by the American Psychological Association (APA Division 12). There is also modest research support for its effectiveness in anxiety disorders, obsessive-compulsive disorder and psychosis (APA Division 12, 2006). It has been found to be more effective than controls in treating anxiety, depression, schizophrenia, addiction, trichotillomania and occupational stress (see Powers, Zum Vorde Sive Vording & Emmelkamp, 2009 and Keng, Smoski & Robins, 2011 for reviews).

Aim of the Review

The aim of the review was to evaluate evidence of the effectiveness of MBI in reducing occupational stress, psychological distress and burnout and improving well-being for qualified healthcare personnel.

Methodology

Search Strategy

The Cochrane Database of Abstracts of Reviews of Effects (DARE) was searched in July 2013 in order to establish whether a similar review examining MBI for professional healthcare staff had already been conducted. No such review was found.

A multi-database search was then conducted in August 2013. The following terms were mapped onto subject headings and relevant terms exploded: mindfulness, mindfulness-based, MBSR, MBCT, Acceptance and Commitment Therap*, ACT, DBT, Dialectical Behavior Therap*, DBT, stress, burnout, job stress, occupational stress, compassion fatigue, staff, nurs*, healthcare, healthcare personnel.

The following electronic databases were searched:

EBSCO PsychInfo (1806 to August Week 1, 2013)

Ovid MEDLINE (R) (1946 to 13 August 2013)

Ovid Embase (1980 to 2013 week 32)

EBSCO CINAHL (Cumulative Index to Nursing and Allied Health Literature) Plus (August 2003 to August 2013)

The Cochrane Central Register of Controlled Trials (CENTRAL)

Titles and abstracts were screened and relevant articles reviewed according to the inclusion and exclusion criteria. The reference lists of selected studies were checked and authors contacted in order to establish whether there were any known unpublished or on-going studies in the area. The journal *Mindfulness* was hand searched for relevant papers and the website www.mindfulexperience.org which produces a monthly list of research papers relevant to mindfulness in its online publication: Mindfulness Research Monthly, was searched.

Inclusion/Exclusion criteria

Studies had to report on a mindfulness-based intervention for professional healthcare personnel and include active or non-active control conditions to allow for comparison. In order to ensure a good level of quality, only peer-reviewed journal articles were included. Dissertations, book chapters and conference papers were excluded, as were reviews, qualitative studies, single case studies and studies not reporting on a mindfulness-based intervention for professional healthcare staff. Studies involving clinical populations, students and administrative or university staff were also excluded. The studies needed to use standardized and validated measures for the key variables of interest: distress, burnout and well-being. Finally only original studies published in the English language were included as resources were not available for translation services. In any cases where there was ambiguity the full-text was retrieved. A flow chart of the study selection process is outlined in Figure A.1.

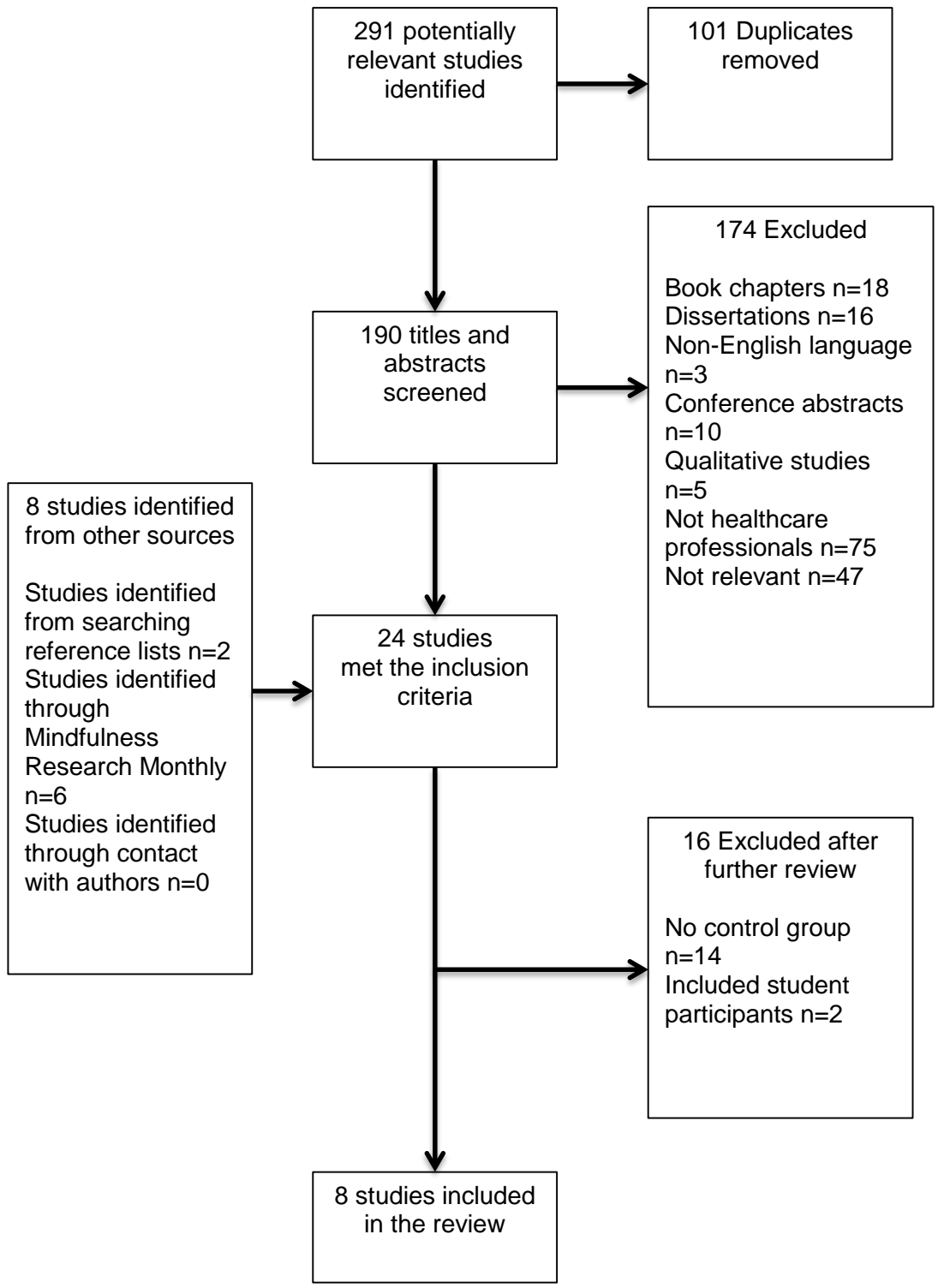


Figure A.1: Flow chart of study selection process

Data Extraction

Studies meeting the inclusion criteria were summarised in tabulated form. Information on study design, participants, intervention, control group, outcome measures, main findings and limitations, were extracted by the first author.

Assessment of Quality

Quality criteria from a variety of sources were reviewed and the most relevant criteria to the focus of this review were selected. The quality assessment checklist was developed based on methodology guidelines from the Scottish Intercollegiate Guidelines Network (SIGN) and the Consolidated Standards of Reporting Trials (CONSORT). Each study was rated on 15 items relating to study design, methodology, intervention, results and limitations. The quality assessment checklist is provided in Appendix B and gives detail on the criteria required in order to meet the following possible ratings: Well covered, adequately addressed, poorly addressed and not addressed. A total quality score was calculated with the highest possible score achievable on the quality rating scale being 45. Liberati *et al.* (2009) suggest that numerical quality ratings may be misleading and so total scores were converted into percentages and categorised into quality ratings as follows: low quality (<50%), moderate quality (50%-75%), high quality (>75%).

All studies were rated by the first author. In order to establish the reliability of ratings two studies were rated by a Clinical Psychologist with expertise in ACT (DG), two by a MacMillan Consultant Psychologist in Psycho-oncology with expertise in MBSR (MM) and four by another Clinical Psychologist with ACT training (KJ). Agreement was 91% and disparity was resolved through discussion. A summary of completed ratings is provided in Table A.2

Results

Study inclusion

291 studies were identified in the final search with 190 studies remaining after exclusion of duplicates. A total of 8 studies met the inclusion criteria.

General characteristics of included studies

Three studies evaluated an Acceptance and Commitment Therapy intervention (Bethay *et al.*, 2012; Brinkborg *et al.*, 2011; Hayes *et al.*, 2004). Two studies used a traditional 8-week MBSR program (Shapiro *et al.*, 2005 and Cohen-Katz *et al.*, 2005). Two studies used brief mindfulness-based meditation interventions (Pipe *et al.*, 2009 & Ando *et al.*, 2011); and one used a 4-week MBSR program (Mackenzie *et al.*, 2006). Table A.1 provides a summary of the findings.

Study design

All studies were randomized controlled trials or controlled trials. Five studies used a wait-list control group (Brinkborg *et al.*, 2011; Cohen-Katz *et al.*, 2005; Shapiro *et al.*, 2005; Mackenzie *et al.*, 2006; and Ando *et al.*, 2011). One used two educational controls for substance abuse counselors in comparison with an ACT intervention (Hayes *et al.*, 2004). One used a leadership course as a control in comparison with a brief mindfulness meditation intervention (Pipe *et al.*, 2009) and one study used an applied behavior analysis (ABA) workshop as a control in comparison with an ACT + ABA workshop intervention (Bethay *et al.*, 2013).

Power Calculation

Only two studies reported power calculations, both of which were limited in power. (Pipe *et al.*, 2009 and Brinkborg *et al.*, 2011). Cohen (1977) suggests that a minimum sample of 33 is required to have an 80% chance of detecting a medium-to-large effect size with a two-tailed independent samples t-test at an alpha level of 0.05. One study did not report power calculations but due to sample size was likely to have been adequately powered to detect medium effects or larger (Hayes *et al.*, 2004). The remaining studies were likely to be underpowered based on small sample sizes. Only three studies reported effect sizes (Bethay *et al.*, 2012; Brinkborg *et al.*, 2011; Mackenzie *et al.*, 2006

Table A.1: Summary of findings

Study	Design	Participants	Intervention and Control	Outcomes relevant to the review and main findings	Limitations
Ando, Natsume, Kukihara, Shibata & Ito (2011) Japan	Controlled Trial	Nurses n=28	Intervention: Mindfulness-Based Meditation Therapy (modified from MBSR) N=15 Control: Wait-list control N=13	Outcome measures: General Health Questionnaire - 28 Sense of Coherence Questionnaire (Short form) Main findings: Mindfulness-based meditation was effective for improving psychological well-being and sense of coherence. Significant decrease in GHQ scores for intervention group compared with control ($p < .001$), although baseline stress scores were already low. Pre-post scores for the three subscales of the Sense of Coherence Questionnaire were $p=0.058$, $p=0.128$ and $p=0.037$ (Comprehensibility, Manageability and Meaningfulness).	Small sample and no follow up data. Wait list control group. Baselines stress scores were low and therefore little room for improvement.
Bethay, Wilson, Schnetzer, Nassar & Bordieri (2012)	Controlled Trial	Intellectual Disability Staff n=38	Intervention: ACT + applied behaviour analysis (ABA) workshop n=20 Control: ABA workshop n=18	Outcome measures: General Health Questionnaire-12. Maslach Burnout Inventory Main findings: ANOVA found no differences between groups. Further exploratory analyses were conducted. Improvements in distress levels were	Small sample limits internal validity. Intervention contained education on applied behaviour analysis for LD clients so not clear whether gains were

USA				observed for participants who reported consistent application of techniques with large effect size reported ($d=0.87$) however not maintained at follow up. Participants with higher distress at baseline showed greater reductions in stress at follow up relative to control ($r=0.67$) and maintained at follow up. No significant results for burnout.	solely attributable to ACT or to the combination of ACT+ABA.
Brinkborg, Michanek, Hesser & Berglund (2011) Sweden	RCT	Social Workers n=106	<p>Intervention: Brief ACT stress management intervention (ACT-SMI) Low stress group n=38 then randomized as follows: ACT-SMI n=25 Control n=13 High stress group n = 68 then randomized as follows: ACT-SMI n=40 (two treatment groups) Control n=23</p> <p>Control: Wait list control</p>	<p>Outcome measures: The Perceived Stress Scale The General Health Questionnaire -12 The Maslach Burnout Inventory</p> <p>Main findings: Participants stratified at baseline according to stress level. Intervention showed significantly decreased stress ($M=22.2$, $SD=7.5$, $n=70$) compared to control ($M=27.5$, $SD=7.1$, $n=36$) at post-treatment, with a large effect size (Cohen's $d = .72$). Scores on the GHQ also showed significantly lower scores for the intervention group ($M=10.6$, $SD=4.6$, $n=70$) compared to the control ($M=12.3$, $SD=4.1$, $n=36$) at post-treatment with a small effect size (Cohen's $d=.38$). Scores on the MBI (total score) also showed significantly lower levels of burnout for the intervention group ($M=37.4$, $SD=14.4$, $n=70$) compared to the control group ($M=44.4$, $SD=12.4$, $n=36$) at post-treatment. This represented a medium</p>	Wait list control group. Last observation carried forward (LOCF) used for missing data. No follow up data. Small sample sizes.

				effect size (Cohen's $d = .50$). For perceived stress and participants in the low stress intervention groups no difference was observed ($p=.19$).	
Cohen-Katz, Wiley, Capuano, Baker & Shapiro (2005) USA	RCT	Nurses (90%), respiratory therapy and social work staff N=31	Intervention: Mindfulness-Based Stress Reduction program Cohort 1 n=14 Cohort 2 n=11 (included 7 members of wait list control group) Control: wait list control n=13	Outcome measures: Maslach Burnout Inventory Brief Symptom Inventory Main findings: MBSR effective in reducing burnout. Intervention cohort 1 had significantly reduced scores on Emotional Exhaustion ($p=.050$). Lower scores on the Depersonalization subscale, but not statistically significant ($p=.063$), and increased scores on the personal accomplishment subscale ($p=.014$) relative to wait-list control. Gains on Emotional Exhaustion subscale maintained at 3-month follow up ($p=.01$). (NB. Wait-list-control also showed decreased scores on burnout on pre-post measures). Cohort 2 showed reduced scores for Emotional Exhaustion ($p=.001$) but not for Depersonalization ($p=.08$) and improved but non-significant scores on the personal accomplishment subscale ($p=.06$). Both cohorts showed decreased psychological distress on the global severity index of the BSI following intervention however Fisher exact test found no statistically significant pre-post differences for treatment ($p=.25$) or control ($p=.16$) groups.	Small sample. Wait list control. BSI potentially not sensitive enough to distinguish stress levels for high-functioning group. Potential bias as information session prior to study provided an introduction to mindfulness for all study participants, therefore some wait-list control participants may have explored mindfulness practice independently.

<p>Hayes, Bissett, Roget, Padilla, Kohlenberg, Fisher, Masuda, Pistorello, Rye, Berry & Niccolls (2004)</p> <p>USA</p>	<p>RCT</p>	<p>Substance Abuse Counselors n= 93</p>	<p>Intervention: ACT n=30</p> <p>Control: Multicultural training n=34 Methamphetamine training n = 29</p>	<p>Outcome measures: Maslach Burnout Inventory</p> <p>Main findings: ACT showed a positive impact on burnout at post-treatment $t(29) = 3.01, p=.005$ and 3 month follow up $t(29) = 2.70, p=.012$. The multicultural training control group also improved at post-treatment $t(33) = 2.33, p=.026$ but not at follow up. No change was found for the educational control group. Comparison across the three groups found that ACT was significantly more effective than the educational control group $t(36) = 2.44, p=.02$. At follow up ACT was more effective than the multicultural training group $t(60) = 2.72, p=.008$. No other comparisons were significant.</p>	<p>Small sample. Cross-contamination was not controlled and participants aware of all three workshops. Potential selection bias. Attendance not recorded. Baseline level of burnout was low which limits applicability of results.</p>
<p>Mackenzie, Poulin & Seidman-Carlson (2006)</p> <p>Canada</p>	<p>RCT</p>	<p>Nurses and nurse aides n=30</p>	<p>Intervention: 4-week Mindfulness-Based Stress Reduction program n=16</p> <p>Control: wait-list control n=14</p>	<p>Outcome measures: Maslach Burnout Inventory Satisfaction With Life Scale</p> <p>Main findings: significant improvements in burnout and satisfaction with life relative to control. The intervention group had statistically significant reductions on the Emotional Exhaustion subscale at post-intervention ($M=20.67, SD=10.39$) compared to the control group ($M=17.23, SD=10.62$) representing a large effect size ($\eta^2_p = .16$). On the Depersonalization subscale the intervention group remained relatively stable on pre-post analysis whereas the</p>	<p>Small, heterogeneous sample with reduced power (although large effect sizes found) and limited generalizability. Wait-list control. No follow up data.</p>

				control group scores increased significantly. On the Personal Accomplishment subscale the intervention group reported higher scores pre and post-intervention compared to the control group but not statistically significant. NB: The intervention group were more emotionally exhausted than the control group $t(1,27)=-2.82, p=.01$. at pre-test. Post-intervention the intervention group scores on satisfaction with life and well-being improved ($M=27.31, SD=4.54$) and the control group remained stable ($M=20.00, SD=5.63$), and this represented a large effect size ($\eta^2_{p=.21}$).	
Pipe, Bortz & Dueck, Pendergast, Buchda & Summers (2009) USA	RCT	Nurse Leaders n=32	Intervention: Brief Mindfulness Meditation n=15 Control: Leadership course n=17	Outcome measures: Symptom Checklist 90-Revised Main findings: Intervention group showed significant improvement in the Positive Symptom Distress Index ($p=0.010$; $CI=-0.483$ to -0.073) and the Global Severity Index ($p=0.019$; $CI=-0.475$ to -0.046) and approaching significance in Positive Symptom Total ($p=0.066$; $CI=-16.66$ to 0.581) compared to the control group.	Small sample limits internal validity. Selection bias restricts external validity. No follow up data.
Shapiro, Astin, Bishop & Cordova (2005) USA	RCT	Health Care Professionals n=38	Intervention: 8-week Mindfulness-Based Stress Reduction program n=18 Control: wait-list control n=20	Outcome measures: Brief Symptom Inventory Maslach Burnout Inventory Satisfaction With Life Scale Main findings: Relative to control the MBSR group reported decreased	Small sample size and high attrition rate (44%). Insufficiently powered. Wait-list control. No follow up data.

				<p>perceived stress ($p=.04$), and decreased psychological distress (mean reduction 27% vs. 7%). Satisfaction with life increased and burnout decreased in the intervention group but differences between groups were non-significant $F(2,25) = 3.84, p=.06$ and $F(2,25) = 1.69, p=.21$.</p>	
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Table A.2: Quality assessment of included studies

Study Criteria	Ando <i>et al.</i> (2011)	Bethay <i>et al.</i> (2013)	Brinkborg <i>et al.</i> (2011)	Cohen Katz <i>et al.</i> (2005)	Hayes <i>et al.</i> (2004)	Mackenzie <i>et al.</i> (2006)	Pipe <i>et al.</i> (2009)	Shapiro <i>et al.</i> (2005)
Aims/hypotheses	Poorly addressed	Well covered	Well covered	Well covered	Well covered	Well covered	Well covered	Well covered
Design	Poorly addressed	Adequately addressed	Well covered	Adequately addressed	Adequately addressed	Adequately addressed	Well covered	Adequately addressed
Inclusion criteria	Well covered	Poorly addressed	Well covered	Well covered	Adequately addressed	Not addressed	Well covered	Adequately addressed
Sampling / demographics / baseline assessed	Poorly addressed	Well covered	Well covered	Adequately addressed	Adequately addressed	Well covered	Well covered	Poorly addressed
Control group well matched	Poorly addressed	Well covered	Poorly addressed	Poorly addressed	Well covered	Poorly addressed	Well covered	Poorly addressed
Outcome measures	Poorly addressed	Well covered	Well covered	Well covered	Well covered	Well covered	Well covered	Well covered
Intervention well defined	Poorly addressed	Well covered	Well covered	Adequately addressed	Well covered	Well covered	Adequately addressed	Poorly addressed
Homework assigned/assessed	Adequately addressed	Well covered	Adequately addressed	Adequately addressed	Poorly addressed	Adequately addressed	Adequately addressed	Not addressed
Therapist training/experience	Not addressed	Adequately addressed	Poorly addressed	Not addressed	Well covered	Not addressed	Poorly addressed	Poorly addressed
Treatment fidelity	Not addressed	Not addressed	Well covered	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Attrition/retention	Not addressed	Well covered	Well covered	Well covered	Well covered	Not addressed	Well covered	Poorly addressed
Analysis appropriate and statistics reported	Poorly addressed	Well covered	Well covered	Adequately addressed	Adequately addressed	Well covered	Well covered	Poorly addressed
Results relate to aims/hypotheses	Adequately addressed	Well covered	Well covered	Well covered	Well covered	Well covered	Adequately addressed	Well covered

Study Criteria	Ando <i>et al.</i> (2011)	Bethay <i>et al.</i> (2013)	Brinkborg <i>et al.</i> (2011)	Cohen Katz <i>et al.</i> (2005)	Hayes <i>et al.</i> (2004)	Mackenzie <i>et al.</i> (2006)	Pipe <i>et al.</i> (2009)	Shapiro <i>et al.</i> (2005)
Power calculation/ sufficient power	Poorly addressed	Poorly addressed	Adequately addressed	Poorly addressed	Adequately addressed	Poorly addressed	Poorly addressed	Poorly addressed
Follow up period	Not addressed	Adequately addressed	Not addressed	Adequately addressed	Adequately addressed	Not addressed	Not addressed	Not addressed
Total Score	15	35	36	29	34	24	32	20
Percentage Score	33%	77%	80%	64%	76%	53%	71%	44%
Qualitative Rating	low	high	high	moderate	high	moderate	moderate	low

Population/Sample

Participants were generally recruited via flyers, posters, internal magazine publications or email communication at their work place or through email contact via professional group memberships. It is noted that this method of sampling may introduce potential bias due to self-selection of participants. It is possible that those experiencing higher levels of distress may avoid taking part, may have insufficient time due to current demands or may be off sick or on long term absence due to stress.

Four studies included nurses (Pipe *et al.*, 2009; Cohen-Katz *et al.*, 2005; Mackenzie *et al.*, 2006; Ando *et al.*, 2011) with the remaining studies including social workers (Brinkborg *et al.*, 2011) substance abuse counselors (Hayes *et al.*, 2004) intellectual disability staff (Bethay *et al.*, 2013) and one study including a mixed sample of healthcare professionals (Shapiro *et al.*, 2005).

The number of participants in the studies ranged from n=27 (Cohen-Katz *et al.*, 2005) to n=106 (Brinkborg *et al.*, 2011) with six out of the eight studies having a sample of 30 or more participants in total. Following randomization the number of participants per group ranged from 11-34 with a mean group size of 19. The total number of participants was 392. Two studies provided limited information on the demographics of the sample (Shapiro *et al.*, 2005 and Ando *et al.*, 2011). Among the remaining six studies the range in terms of gender was 63%-100% female. The age of participants ranged from 18-65 with the mean ranging from 38-50. The number of years in employment ranged from 0.17 – 41 years and the mean ranged from 7.6 to 21 years experience.

Attrition rates were reasonably good with at least six studies achieving 80% or higher retention. One study had a high attrition rate of 44% (Shapiro *et al.*, 2005) and one study did not report on attrition rates (Ando *et al.*, 2011).

Interventions

Two main types of MBI were evaluated based on either MBSR or ACT. No studies evaluating DBT or MBCT were identified for review. The following section provides a review of the studies grouped by intervention and outcomes of interest.

Mindfulness-Based Interventions

Five studies evaluated Mindfulness-Based training programs.

Two evaluated the traditional 8-week MBSR program developed by Jon Kabat-Zinn at the University of Massachusetts Medical Centre (1979). In the first study by Cohen-Katz *et al.* (2005) MBSR was delivered to nurses (intervention group n=25) by two therapists with approximately four years experience running the program. Details on therapist training were not provided. The second study included a heterogeneous sample of healthcare professionals (intervention group n=18) (Shapiro *et al.*, 2005) and was delivered by a clinical psychologist with extensive training and experience, although no specific details were provided. Both studies used a wait-list control for comparison.

One study used a brief 4-week MBSR program delivered to nurses and nurse aides (intervention n=25) (Mackenzie *et al.*, 2006). Based on the 8-week program, the intervention consisted of four 30-minute sessions and included both didactic and experiential content. Therapist training, experience and personal practice was not well defined. Effect sizes were reported.

Two studies used a brief mindfulness-based meditation intervention for nursing staff focusing specifically on stress reduction. Pipe *et al.* (2009) randomly assigned 33 nurses to either a 4-week mindfulness meditation program for stress management or an active intervention control in the form of a leadership course. The intervention consisted of five 2-hour sessions including didactic and experiential content and was led by an experienced MBSR teacher although limited details were provided regarding training and experience. Participants were encouraged to commit to 30 minutes of daily practice. In the second study Ando *et al.* (2011) used a very brief and poorly defined mindfulness-based meditation intervention including breathing and meditation to the movement of hands or legs over a 30-60 minute session. Nurses (n=28) were taught the program in two sessions and carried out home practice for two weeks. The intervention was provided by nurses who had received 3 hours training however no details were provided. Pre- and post-measures were compared with a wait-list control group.

Acceptance and Commitment Therapy (ACT)

Three studies were based on ACT. Two implemented a traditional ACT program and one used a brief adaptation.

Hayes *et al.* (2004) evaluated Acceptance and Commitment Training with substance abuse counselors (n=30). The intervention was based on the psychotherapy manual developed by Hayes *et al.* (1999). The focus of the intervention was using acceptance, mindfulness and cognitive defusion exercises to reduce the impact of and entanglement with negative thoughts and to encourage commitment to values. The intervention was compared with two educational control groups, one consisting of multicultural training (n=34) and the other, methamphetamine training (n=29). The aim of each was to reduce stigmatizing attitudes towards substance abusing clients. The impact on burnout was measured as a secondary outcome. Steven Hayes developed the ACT intervention and so can be considered expert in the method, however treatment fidelity was not assessed.

Bethay *et al.* (2012) evaluated an ACT + Applied Behaviour Analysis (ABA) education intervention with intellectual disability staff. The intervention was based on protocols developed by Bond and Hayes (2002), Hayes (2004) and Blackledge and Hayes (2006) and adapted to suit the intellectual disability work context. The therapist had one year of training and supervision in ACT. The ACT+ABA intervention (n=20) encompassed six hours of ACT training and three hours ABA training. The control group (n=18) received nine hours of didactic training on ABA and was delivered by clinical psychology graduates. Information on therapist training was well covered and it is noted that one of the co-authors, Kelly Wilson, is one of the original treatment developers of ACT and so his expertise in the intervention and in providing supervision is well established. Nonetheless treatment fidelity was not measured or assessed.

Brinkborg *et al.* (2011) evaluated a Brief ACT Stress Management Intervention (ACT-SMI) for Swedish social workers (n=65) which consisted of four 3-hour sessions and homework practice with the overall aim to increase psychological flexibility. The treatment was delivered to three intervention groups in pairs of

therapists specialized in cognitive behavior therapy. Therapists had received training although no details were provided. Therapists followed a protocol and adherence was assessed using a checklist. A wait list control was used for comparison and effect sizes were reported.

Outcome measures

A small number of standardized outcome measures were used to assess the outcomes of relevance to this review:

Psychological distress/stress

Four outcome measures were used to measure distress.

The General Health Questionnaire (Goldberg, 1992) is a 28-item self-report measure of general psychological distress, which has shown good psychometric properties (Goldberg, Gater, Sartorius, Ustun, Piccinelli, Gureje & Rutter, 1997; Bond & Bunce, 2003). A brief version, the GHQ-12, was used by two studies (Brinkborg *et al.*, 2011; Bethay *et al.*, 2012) to assess psychological distress in social workers and intellectual disability staff respectively. One study used a Japanese version of the GHQ-28 (Ando *et al.*, 2011) with nurses.

The Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983) is a 14-item self-report measure of perceived stress. Brinkborg *et al.* (2011) used the Swedish version of the PSS, which has good psychometric properties (Eskin & Parr, 1996).

The Symptom Checklist 90-Revised (SCL-90; Derogatis & Lazarus, 1994) is a 90-item self-report measure providing three global distress indices: Global Severity Index which provides an assessment of overall psychological distress; the Positive Symptom Distress index which assesses the intensity of symptoms; and the Positive Symptom Total which is the total number of items endorsed. This measure has good psychometric properties and has been widely used in clinical work. Pipe *et al.* (2009) used this measure to assess levels of distress in a sample of nurse leaders.

The Brief Symptom Inventory (BSI; Derogatis, 1993) is a 53-item self-report measure developed from the SCL-90 as a more brief measure of psychological distress. It has shown good psychometric properties and high correlations with its parent measure. Cohen-Katz *et al.* (2005) and Shapiro *et al.* (2005) used the BSI to measure psychological distress.

Although not specifically a measure of distress, Ando *et al.* (2011) used the Japanese short version of the Sense of Coherence questionnaire (Yamazaki, 2001). This 13-item self-report questionnaire assesses three domains: sense of comprehensibility, sense of manageability and sense of meaningfulness, and studies have shown that high scores on the SOC are related to decreased fatigue, burnout, stress and increased work satisfaction (Hanse & Engstrom, 1999; Albertse, Nielsen & Borg, 2001; Gilver, 1988; Tselebis, Moulou & Ilias, 2001; and Eda, Tatsumi & Nomura, 2007).

Burnout

The *Maslach Burnout Inventory* (MBI; Maslach & Jackson, 1996) is a 22-item self-report measure of work-related burnout, which is categorized into three subscales: emotional exhaustion, depersonalization and personal accomplishment. The measure has shown good psychometric properties (Maslach, Jackson & Leiter, 1996) and is widely used. Six studies in the current review measured burnout using the Maslach Burnout Inventory (Brinkborg *et al.*, 2011; Hayes *et al.*, 2004; Bethay *et al.*, 2012; Cohen-Katz *et al.*, 2005; Shapiro *et al.*, 2005 and Mackenzie *et al.*, 2006.)

Well-being

The Satisfaction With Life Scale (SWLS; Deiner *et al.*, 1985) is a 5-item measure of global satisfaction with life. It has shown good psychometric properties and was used by two studies in this review (Shapiro *et al.*, 2005 and Mackenzie *et al.*, 2006).

Studies may have used other measures in addition to these, however only those of direct relevance to the current review are discussed.

Main findings

Interventions using Meditation and/or MBSR

The main findings of the five studies using MBSR/meditation found improvements in self reported stress, burnout and satisfaction with life. One study reported large effect sizes for burnout and well-being (Mackenzie *et al.*, 2006).

Distress

Cohen-Katz *et al.* (2005) found that MBSR significantly decreased psychological distress on the global severity index of the BSI following intervention, relative to the wait-list control group, although the wait-list control group also showed decreased distress. Only a quarter of the intervention group showed high levels of psychological distress prior to intervention, which implies that there may have been limited room for improvement. All participants attended an information session at the start of the study where an introduction of mindfulness was given. It is possible that nurses in the wait-list control may have been independently exploring their own mindfulness practice, which could have influenced their perceived stress and this was not assessed. It was also suggested that the BSI is not a sensitive enough tool to distinguish stress levels in a high functioning sample. An alternative such as the Perceived Stress Index may have been more informative.

Shapiro *et al.* (2005) found that relative to the wait list control group, the intervention group reported statistically significant decreases in perceived stress. This result may have been influenced by the high attrition rate of 44% and a small sample size of (n=18 in the intervention group) suggesting inadequate power. The comparison group was a wait-list-control and there was no follow up.

Ando *et al.*'s (2011) mindfulness-based meditation therapy was generally effective in decreasing distress as measured by the GHQ, although baseline distress scores were low at pre-test so there was little room for improvement. They also found improvements in sense of coherence (related to stress management). There were several limitations to this study, namely the aims and hypotheses were not clear,

baseline assessments were poor, the intervention was not well defined and attrition was not reported. In addition, no follow up data was gathered and the sample size was small. All of these factors limit the validity of their findings.

In a study using a brief mindfulness meditation program for stress management with nurse leaders, Pipe *et al.* (2009) found statistically significant improvements in psychological distress. The attendance for their intervention was high with only one participant dropping out. Of note was the fact that stress levels at pre-intervention were much higher for both intervention and control groups than anticipated. In view of this the authors adjusted the original study design from a longitudinal randomised controlled trial in order that the control group could receive the intervention sooner. Limitations of the study included a small sample size, lack of monitoring meditation practice, bias in terms of a motivated sample of nurses which restricts the external validity, and lack of long-term follow up to compare the level of maintenance of effects between intervention and control. It may have been interesting to carry out follow up assessments for both groups after one year to establish whether benefits of the intervention had been sustained, even though there would be no control group for comparison.

Burnout

The study by Cohen-Katz *et al.* (2005) reported that MBSR was effective in reducing burnout. Their first intervention group reported significantly reduced scores on Emotional Exhaustion and Depersonalisation subscales of the Maslach Burnout Inventory relative to the wait-list control group and these benefits were maintained at 3-month follow up. Their second intervention group showed improvements on Emotional Exhaustion and Personal Accomplishment subscales, but not for Depersonalization. Although likely to be underpowered, this study provides promising evidence of the effectiveness of MBI in reducing burnout, particularly given the process model which posits that Emotional Exhaustion is the first stage in burnout (Maslach, *et al.*, 1996).

Shapiro *et al.* (2005) found decreased burnout in the intervention group, but this was not statistically significant when compared to the wait-list control group. The high attrition rate and small sample size are likely to be influencing factors.

Mackenzie *et al.*'s (2006) study used a brief 4-week MBSR program with nurses and nurse aides. On pre-test measures the intervention group showed higher scores on Emotional Exhaustion compared to the control group. Following the intervention scores on Emotional Exhaustion reduced for those receiving the intervention and increased for those in the control group. In terms of Depersonalisation the intervention group scores were relatively stable whereas the control group scores increased significantly. Finally in terms of Personal Accomplishment, the intervention group showed higher levels before and after the intervention compared with the control group. There were some limitations to this study, in particular the modest sample size (n=16 in the intervention group) and lack of follow up data. However, despite the lack of statistical power the study demonstrated significant findings with large effect sizes for all three subscales of burnout and for satisfaction with life, which suggests that their innovative intervention has the potential to have a significant positive effect on participants. It would be interesting to compare the brief 4-week MBSR with the 8-week MBSR in a similar population and to track the duration of effects. It may be that the 4-week program is enough to change these processes but not enough to maintain them over a longer term.

Well-being

Two studies based on MBSR/Meditation included measures of well-being. Mackenzie *et al.* (2006) found that intervention participants reported increased general well-being and satisfaction with life, compared to control participants. Large effect sizes were reported, although the study may have lacked statistical power to detect more modest effects. 19% of healthcare professionals in Shapiro *et al.*'s (2005) study reported increased satisfaction with life compared to 0% in the control group, however these differences were statistically non-significant.

Acceptance and Commitment Therapy

Three studies examined the efficacy of Acceptance and Commitment therapy with social workers, learning disability staff and substance misuse counsellors (Brinkborg *et al.*, 2011; Hayes *et al.*, 2004; Bethay *et al.*, 2012). However the effects of the intervention on burnout were inconclusive. Two studies examined outcomes of stress with both finding positive effects and one study reporting a large effect size. One study examined the effect on general well-being and reported a small effect size.

Distress

The study by Bethay *et al.* (2012) initially found no difference on measures of distress between the intervention and the ABA education control group following an ANOVA. Further exploratory analyses were conducted and improvements in distress levels were then observed for participants who reported consistent application of ACT techniques. This was a large effect size ($d=.87$), however the improvement in distress was not maintained at follow up 3 months later. This study had several limitations. It was a small sample ($n=20$ in the intervention group) lacking power and therefore limiting internal validity. The intervention also contained education about the application of ABA for LD clients therefore it is not clear whether gains were solely attributable to the ACT intervention or to the combination of ACT+ABA education. Information on therapist training and experience was considered adequate although treatment fidelity was not assessed.

Brinkborg *et al.* had the largest sample out of all the studies included in the review ($n=106$), however these were stratified across three treatment groups and two wait list control groups. A low stress group of $n=38$ was randomized into an intervention group ($n=25$) and a wait list control group ($n=13$). A high stress group ($n=68$) was randomized into two intervention groups ($n=20$ each) and a wait list control group ($n=23$). An intent-to-treat analysis was carried out and ANCOVA conducted. Results found that participants who reported higher stress levels at baseline showed significantly decreased stress levels and better general mental health compared to the wait-list control at post-test. No significant effects were found for those with low baseline stress. The study is limited by the small sample sizes following

randomization and the lack of follow up data. Information on therapist training, experience and personal practice was lacking although an attempt was made to assess treatment fidelity.

Burnout

All three studies examining the effects of ACT also included measures of burnout using the Maslach Burnout Inventory.

Brinkborg *et al.* (2011) found that the intervention group had significantly lower levels of burnout (Maslach Burnout Inventory Total Score) compared to the control, and a medium effect size was found (Cohen's $d = .46$) with a similar pattern of results for each subscale. Their study used a wait list control group and gathered no follow up data. Last observation carried forward (LOCF) was used for missing data. Although the amount of missing data was relatively small (11%), the authors acknowledge that this approach may be out-dated in view of several alternative multiple imputation techniques which are based on statistical foundations and less likely to introduce bias or to underestimate the variances (Kenward & Molenberghs, 2009).

Bethay *et al.* (2012) found no differences between intervention and control groups in terms of burnout following a one-way ANOVA using pre-test scores. A 2x3 repeated measures ANOVA also found no significant differences. Further exploratory analyses were conducted but no significant group x time interactions were found for the MBI or any of its subscales, and so it was concluded that the ACT intervention did not have any effect on burnout for intellectual disability staff in this sample.

Hayes *et al.* (2004) found that ACT reduced overall burnout at post-treatment. These gains were maintained at three-month follow up and exceeded those of multicultural training. It is assumed that the quality of intervention for this study was very good, given that it was provided by one of the key developers of the approach. However there were also several limitations to this study. First of all, there was potential for

selection bias, and cross-contamination between treatment and control groups was not controlled. Attendance was not recorded and the level of burnout at baseline was low which perhaps limits the validity of their findings. Finally, treatment fidelity was not assessed.

Well-being

None of the three studies using an ACT intervention measured well-being.

Discussion

General findings

Despite methodological weaknesses in the reviewed studies, overall they offer some evidence to support the hypothesis that MBI are effective in reducing occupational stress and burnout for healthcare professionals, particularly for interventions based on MBSR and for participants with high levels of stress at baseline.

The evidence was mixed with regard to which approach was the most effective. The evidence for ACT in reducing burnout was not compelling given that only three studies used this approach and one study found no significant effects. Similarly for the MBSR/Meditation based studies, of the three studies examining burnout, only two found significant results. Mackenzie *et al.* (2006) reported a large effect size, however their sample was very small (n=16). Cohen-Katz *et al.* (2005) found that MBSR was effective in reducing burnout particularly on the Emotional Exhaustion subscale and the Personal Accomplishment Subscale. Gains were also maintained at 3-month follow up for Emotional Exhaustion. However potential contamination bias cannot be ruled out as both intervention and control group were provided with information about mindfulness prior to randomization.

The evidence for stress reduction was stronger in that all six of the studies found that the intervention reduced self-reported stress.

Ando *et al.* (2011) found a significant decrease in GHQ scores for the intervention group although they noted that baseline stress scores were already low. This study

was methodologically the weakest and so their results are considered with caution. Bethay *et al.* (2012) also found significant improvements in distress with a large effect size, however these gains were not maintained at follow up. Brinkborg *et al.* (2011) found similar results with a small effect size. Cohen-Katz *et al.* (2005) also found reduced distress on the global severity index of the BSI however pre-post differences for the treatment group or the control group were not significant suggesting that neither group was experiencing high levels of distress, or that the BSI was not sensitive enough for detecting distress in this population. Pipe *et al.* (2009) and Shapiro *et al.* (2005) found similar results, however external validity is limited due to small sample sizes and potential bias.

Finally, two studies used measures of satisfaction with life (Mackenzie *et al.*, 2006 and Shapiro *et al.*, 2005). Both found an improvement in satisfaction with life however Shapiro *et al.*'s findings were non-significant.

Limitations of reviewed studies

The main weaknesses related to limited statistical power, poorly matched control groups, inadequate information on therapist training/experience and treatment fidelity. Five out of the eight studies reviewed used a wait-list control group, which is the weakest control design. Although it allows for comparisons to be made it is not clear whether the effect is due to the intervention or to the attention aspect *per se*. Future research would benefit from comparing MBI to a treatment control that has been found to be effective for reducing stress and burnout such as Cognitive Behaviour Therapy (van der Klink, Blonk, Schene, Dijk & Van, 2001; Orly, Rivka, Rivka & Dorit, 2012) or supportive counseling, which is often available in organizational settings.

Studies generally lacked reasonable follow up periods with only three studies using a 3-month follow up (Hayes *et al.*, 2004; Bethay *et al.*, 2013; Cohen-Katz *et al.*, 2005) limiting conclusions regarding longer-term benefits.

Only one study assessed treatment fidelity (Brinkborg *et al.* 2011) and nearly all demonstrated inadequate levels of therapist training, experience and personal

mindfulness practice. Jon Kabat-Zinn (2003) has emphasized the importance of mindfulness practice for therapists. It is considered a requirement to those offering training in the approach, particularly for MBSR and MBCT (Segal, Teasdale, Williams & Gemar 2002; Baer, 2006; Woods, 2009). However, to date there is very little data to support this requirement. Further studies are required which record therapist training and personal practice and systematically manipulate these as independent variables and measure the effect these have on outcomes.

All studies used self-report questionnaire data, which may introduce common rater bias. Finally, a number of studies may have been limited by floor effects, where baseline levels of stress or burnout were already low, resulting in little room for improvement.

Strengths and limitations of the review

There were a number of potential limitations to the current review. Firstly a meta-analysis was not possible given that there were only eight studies included. Field (2001) suggests that such an analysis requires at least 15 studies otherwise there is a high likelihood of Type 1 errors. Secondly, the review was subject to publication and language biases as it was limited to studies reported in the English language and did not include dissertations.

The review had a number of strengths. A systematic search strategy was conducted and efforts made to secure literature from a wide range of sources. All eight of the studies were second-rated with high inter-rater reliability helping to limit potential bias. Strict inclusion/exclusion criteria resulted in a more homogenous population being studied and clearly delineated criteria for quality rating were applied. The review provides clearer evidence on the efficacy of MBI for health professions and as far as is known, it is the first review that has been carried out specifically for this group and intervention.

Clinical Implications

According to the evidence, MBIs may represent a valid option as a mechanism for self-care, particularly MBSR and there has been a trend towards including mindfulness as part of the training of the next generation of healthcare professionals (Gockel, 2010). There is, however, a need to establish more clearly what the length and nature of programs should be, what level of training and personal practice of trainers is required and whether participants require ‘booster’ sessions.

Future Research

Future research will benefit from comparing traditional MBSR with brief adaptations, which may increase access and alleviate stress caused due to the time commitment required. Studies should also consider including more objective measures such as salivary cortisol, as has been done with clinical populations (Carlson, Speca, Patel & Goodey, 2004; Matousek, Dobkin & Pruessner, 2010). This may address the problem of the common method that is inherent when exclusively using self-report questionnaires to measure outcomes. Future studies should actively recruit people who are absent from work due to stress or burnout, identify high-risk individuals and establish the intervention’s prophylactic effect. Return-to-work and absenteeism should be monitored and measured. The long-term nature of effects also needs to be investigated along with the potential need for ‘booster’ sessions. Future research could also explore the delivery of MBI in large scale low intensity formats, for example via computer modules or bibliotherapy.

Summary and conclusion

The review set out to explore the evidence for MBI in reducing stress and burnout and improving satisfaction with life for qualified healthcare professionals. The evidence overall suggests reasonable support for the efficacy of MBI in reducing distress and improving quality of life, particularly for those who are already experiencing high levels of stress. There was less conclusive support for reducing burnout. There was also some evidence to suggest brief versions of the traditional 8-

week MBSR are of benefit. Despite modest sample size and limited statistical power, Mackenzie *et al.*'s findings were promising, particularly in view of large effect sizes and the increased accessibility of their intervention.

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Chapter 2: Empirical Project

The Role of Self-Compassion and Cognitive Fusion in the Psychological Adjustment to Cancer of a Heterogeneous Adult Cancer Population

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*This study has been written in accordance with Clinical Psychology and
Psychotherapy
(Appendix C)*

Word Count: 8,335 (excluding abstract and references)

Abstract

Objective: The study aimed to explore the predictive power of self-compassion and cognitive fusion in determining distress and quality of life in a cancer population, in comparison to known predictors.

Method: A quantitative cross sectional design was used. 114 adults with various cancer diagnoses completed questionnaires assessing mental adjustment to cancer, coping, self-compassion, cognitive fusion, distress and quality of life. Hierarchical multiple regression was used to explore relationships between predictor variables: mental adjustment, coping style, self-compassion and cognitive fusion, and outcome variables: distress and quality of life. Cancer type was entered as a covariate.

Results: Cancer type, Mini MAC Anxious Preoccupation and low self-compassion (SCS) were significant predictors of distress when first entered into the model. In the final model only Cognitive Fusion (CFQ) and the Brief COPE Emotional Avoidance subscale were found to be significant predictors of distress.

Cancer type, Mini MAC Helplessness-Hopelessness and Anxious Preoccupation were significant predictors of quality of life when first entered into the second regression model. In this final model the Brief COPE Emotional Avoidance Coping subscale was the only significant predictor of quality of life. The SCS and CFQ did not account for significant incremental variance in quality of life after controlling for other known predictors.

Conclusions: The SCS was not found to be a predictor of distress or quality of life after controlling for other known predictors. The CFQ was found to be a significant predictor of distress. This provides empirical support for cognitive fusion as an important construct influencing distress in cancer patients. Interventions focused on reducing cognitive fusion and emotional avoidance are warranted in this population.

Key words: Self-compassion, cognitive fusion, ACT, CBT, mindfulness, cancer.

Word count: 266

Highlights

- Psychological adjustment is one of the most important factors correlating with distress and quality of life in people with cancer.
- Emotional Avoidance Coping and Cognitive Fusion were found to be significant predictors of distress in people with cancer.
- Emotional Avoidance Coping was a significant predictor of quality of life.
- Interventions focused on reducing cognitive fusion and emotional avoidance are warranted in cancer populations.

Introduction

Cancer is one of the world's leading causes of death according to the World Health Organisation (Ferlay, Shin, Bray, Forman, Mathers & Parkin, 2010) and according to the National Cancer Intelligence Network there are over 2 million people with a current or previous diagnosis of cancer in the UK (latest figures from 2008) (NCIN, 2010). These figures are rising due to a higher than expected incidence rate of more than 3% a year and increased survival rates (Maddams, Brewster, Gavin, Steward, Elliott, Utley & Møller, 2009).

Evidence suggests that depression, anxiety and adjustment disorder in cancer patients contributes to suffering, distress, longer duration in hospital, reduced adherence to medical care, reduced quality of life and reduced survival rates (Bui, Ostir, Kuo, Freeman & Goodwin, 2005; Colleoni, Mandala, Peruzzotti, Robertson, Bredart & Godhirsch, 2000; Pinguart & Duberstein, 2010; Prieto *et al.*, 2002). Research on the prevalence of distress in cancer patients has produced mixed results with estimates ranging between 30-75% (Zabora, Brintzenhofesoc, Curbow, Hooker & Piantadosi, 2001; Jacobsen, 2007; Mitchell, Kaar, Coggan & Herdman, 2008). In a recent meta-analysis Mitchell, Chan, Bhatti, Halton, Grassi, Johansen and Meader (2011) found a prevalence of emotional disorders in cancer patients of up to 38% and suggested that within five years after diagnosis about a third of those with cancer will experience either depression or adjustment disorder. It is likely however, that psychological distress in cancer patients is underdiagnosed (Ziegler, Hill, Neilly, Bennett, Higginson, Murray & Stark, 2011). Symptoms may go unrecognised or be attributed to treatment side effects, thereby hindering diagnosis and access to appropriate psychotherapeutic interventions (Passik, Dugan, McDonald, Rosenfield, Theobald & Edgerton, 1998; Spiegel & Giese-Davis, 2003).

Psychological Adjustment

Psychological adjustment has been described as “the psychological processes that occur over time as the individual, and those in their social world, manage, learn from and adapt to the multitude of changes” precipitated by a diagnosis (Brennan, 2001,

p.1). It is often referred to as the ‘absence of psychopathology’ (Stanton, Revenson & Tennen, 2007). Having a better understanding of the processes involved in terms of distress and quality of life for cancer patients (or any other chronic illness) can help to identify factors that can be influenced in order to prevent psychological distress for these populations.

Several studies have identified psychological adjustment as one of the most important factors correlating with psychological distress and quality of life (Ferrero, Barreto & Toledo, 1994; Stanton & Snider, 1993; Wagner, Armstrong & Laughlin, 1995; Watson, Greer, Blake, & Shrapnell, 1984; Watson, Greer, Rowden, Gorman, Robertson, Bliss & Tunmore, 1991). Identifying ways to promote positive adjustment to cancer is an important goal in helping to alleviate distress and improve quality of life for this client group. This can be facilitated by identifying robust predictors of distress. However, studies examining demographic, psychological, social and medical variables have produced conflicting results: gender, age, socioeconomic status, religion, level of hope, characteristics of disease, medical treatment, type or stage of cancer, side effects of treatment, and cancer recurrence have all failed to provide consistent evidence to predict distress and quality of life (Shapiro, Astin, Bishop & Cordova, 2005; van’t Spijker, Trijsburg, & Duivenvoorden, 2007).

Although psychological distress is considered to be a normal response to a diagnosis of cancer, a person’s response can be moderated by a number of factors, such as coping strategies (Carver, 1993), ability to successfully adapt to the threat to self and identity (Taylor, 1983), cognitive appraisals (Parle, Jones & Maguire, 1996), rumination, worry and social support (Carver, 1993; Morris & Shakespeare-Finch, 2011). There is empirical support for constructs such as problem focused coping which includes active planning and seeking instrumental support; emotional avoidant coping styles such as self-distraction, denial, behavioural disengagement, self-blame and substance use; and emotion focused coping such as venting, reframing, using humour, seeking emotional support and acceptance. These constructs can be measured using the Brief COPE (Carver, 1997). In terms of mental or psychological adjustment to cancer, constructs such as Helplessness-Hopelessness, Cognitive

Avoidance, Anxious Preoccupation, Fatalism and Fighting Spirit relate to psychological response to threat to self and have shown good empirical evidence. These constructs can be measured by the Mini Mental Adjustment to Cancer Scale (Watson, Greer, Young, Inayat, Burgess & Robertson, 1988). In previous research Helplessness-Hopelessness, Anxious Preoccupation and Fatalism have been associated with depression (Watson *et al.*, 1988) while Fighting Spirit has been associated with less distress (Watson *et al.*, 1991). There is empirical evidence that these constructs and coping styles are important moderating factors in terms of adjustment to cancer.

In addition to established predictors, constructs such as acceptance and mindfulness have begun to be explored, for example Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 1982; Ledesma & Kumano, 2009), Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson, 1999; Feros, Lane, Ciarrochi and Blackledge, 2011; Wicksell, Olsson & Hayes, 2010), Self-Compassion (Pinto-Gouveia, J., Duarte, C., Matos, M., and Fráguas, S., 2013; Przewdziecki, A., Sherman, K. A., Baillie, A., Taylor, A., and Foley, E., 2012) and Compassion Focused Therapy (CFT; Gilbert, 2005, 2009, 2010; Kyremis, 2007; Morris, Shakespeare-Finch & Scott, 2012). These are associated with ‘the third wave’ of cognitive behavioural therapy and represent a shift away from traditional attempts to change cognitions and behaviours in order to try and eliminate distress. When faced with unchangeable aversive experiences such as chronic pain or cancer, changing the content of cognitions may be less helpful (Thompson, 1981). Negative automatic thoughts may be accurate representations of a difficult reality and alternative perspectives may not be accurate. Processes such as self-compassion place greater emphasis on relating to oneself with kindness during distressing experiences and constructs such as cognitive fusion describe the relationship a person has with distressing thoughts (Gillanders, Bolderston, Bond, Dempster, Flaxman, Campbell, *et al.*, in press). Interventions from these traditions aim to foster acceptance and a willingness to experience mental and physical events as they unfold, as part of the human experience. This may then lead to an increased ability to tolerate distress and

a redirection of energies towards values-based living. The current study examines two constructs aligned with these processes: self-compassion and cognitive fusion.

Self-Compassion

Self-compassion has been defined as a process of “being open to and moved by one’s own suffering, experiencing feelings of caring and kindness toward oneself, taking an understanding, non-judgmental attitude toward one’s inadequacies and failures, and recognizing that one’s experience is part of the common human experience” (Neff, 2003, pp.224). It is considered to be an important coping resource (Allen & Leary, 2010) and is associated with improved well-being, adaptive coping abilities, decreased anxiety and depression, greater connectedness and satisfaction with life (Barnard & Curry, 2011; Leary, Tate Adams, Allen & Hancock, 2007; Neely, Schallert, Mohammed, Roberts & Chen, 2009; Neff, 2003a; Neff, Kirkpatrick & Rude, 2007; Neff & Vonk, 2009; Neff, 2009). Gilbert (2010) suggests that self-compassion is linked to the activation of the oxytocin/opiate system, which is linked to positive affect. It has also been recognised as an emotional regulation strategy important in adaptive reactions to illness (Terry & Leary, 2011).

However, many of these studies have been carried out with healthy student participants. It is only recently that the concept of self-compassion has been evaluated within chronic illness populations. Costa and Pinto-Gouveia (2011) found associations between self-compassion and acceptance of pain in patients experiencing chronic pain. A recent study by Pinto-Gouveia, Duarte, Matos and Fráguas (2013) studied the protective effect of self-compassion against depression in cancer patients. They found that self-compassion was negatively correlated with depression and positively related with optimism and quality of life. Self-compassion was found to be a significant global predictor of lower levels of depression and anxiety in an international study of adults with anxiety (Van dam, Sheppard, Forsyth & Earleywine, 2011). In a recent study with older adult participants Allen, Leary & Goldwasser (2011) identified self-compassion as a predictor of coping and well-being.

Cognitive Fusion

Cognitive fusion is one of the six core processes of Acceptance and Commitment Therapy (ACT; Hayes *et al.*, 2004). It describes a process where a person becomes excessively attached to the content of their thoughts, so that these thoughts dominate behaviour (Hayes, 2004). A person who is highly cognitively fused is likely to fuse their identity, sense of self and their experience with the language they use, which may lead to experiential avoidance and possible psychopathology. The opposite, cognitive defusion, means learning to separate or step back from thoughts, allowing oneself to experience cognitive flexibility. Cognitive fusion is considered to be a central component of the ACT model and recently a new measure of cognitive fusion has been developed (Gillanders, *et al.*, in press). It has demonstrated excellent psychometric properties but has not yet been used with a cancer population.

Previous research has shown that self-compassion is related to lower levels of depression and anxiety and higher levels of psychological well-being. In addition, cognitive fusion can predict distress (Gillanders *et al.*, in press; Wicksell, Renofalt, Olsson, Bond & Melin, 2008). However, the predictive power of self-compassion and cognitive fusion in cancer patients has not been fully explored.

Aims

The current study aims to identify whether self-compassion and cognitive fusion are predictors of distress and quality of life in cancer patients. Specifically it will examine the combined explanatory power of established predictors of distress and quality of life (demographic and clinical variables), including the newer constructs of self-compassion and cognitive fusion.

In addition, the study aims to contribute to the knowledge of how health care professionals can support patients in everyday practice by identifying those most vulnerable to distress. It has been suggested that oncology health professionals may find screening tools cumbersome and time consuming (Mitchell *et al.*, 2008). If self-compassion and cognitive fusion are found to be significant predictors of distress, they represent clinically useful tools to aid early diagnosis of those most likely to

benefit from psychological therapy. They may also support alternative perspectives on the processes of adjustment compared to existing models (e.g. traditional Cognitive Behaviour Therapy); such as ACT, MBSR, Mindfulness-Based Cognitive Therapy (MBCT) and Compassion Focused Therapy in cancer settings.

Hypotheses

It was hypothesised that self-compassion and cognitive fusion would predict an additional and significant amount of variance in distress (hypothesis 1) and quality of life (hypothesis 2), over and above demographic variables, mental adjustment and coping styles.

Methodology

Design

The study used a quantitative cross-sectional design where participants completed a set of questionnaires on a one-off basis. Data were collected using six standardised self-report questionnaires measuring mental adjustment to cancer, coping, self-compassion, cognitive fusion, distress, quality of life and demographic characteristics.

Ethical Approval

Ethical approval was granted by the University of Edinburgh Doctorate in Clinical Psychology Program Ethics Committee, the NRES Committees – North of Scotland and NHS Grampian Research & Development Management. (For the purposes of the thesis see Appendix D for documentation pertaining to ethical approval).

Ethical Considerations

It was not anticipated that there were any risks or disadvantages to taking part in the study. All participants were in contact with at least one oncology health professional for monitoring and support. All participants received an information sheet outlining the study and any potential risks. The study was anonymous and informed consent

was assumed on receipt of completed questionnaires. (For the purposes of the thesis see Appendix E for documentation provided to participants, excluding questionnaires).

Statistical Power and Sample Size

Previous studies examining relationships between adjustment, coping, cognitive fusion, self-compassion and distress or quality of life have typically found moderate to large effects. (e.g. Schillani *et al.*, 2010; Johansson, Ryden & Finizia, 2011; Hulbert-Williams, Neal, Morrison, Hood & Wilkinson, 2011; Grassi *et al.*, 2004; Wei Ting, *et al.*, 2013; Fang *et al.*, 2006; Horney *et al.*, 2011; Keeling, Bambrough & Simpson, 2013; Bond, *et al.*, 2011; Gillanders *et al.*, in press; Neff *et al.*, 2007; Neeley *et al.*, 2009; Raes, 2010).

Power calculations were carried out *a priori* to determine the minimum number of participants required in order to detect a medium effect size at an alpha level of .05 ($p < .05$) and a power of .80 (80% power). Green (1991) suggests the formula $50 + 8m$ (where m equals the number of predictor variables) in order to determine the overall fit of the model. Using this formula for the current analysis with the same alpha and beta levels, a sample size of 138 is suggested. To be able to compare specific predictors Green recommends the formula $104 + m$, which for the current analysis equals a sample size of 115. ‘Rule of thumb’ estimates have been criticised for being simplistic (Miles & Shevlin, 2001) and so an online power calculator was also used to check the reliability of Green’s recommendations. (<http://danielsoper.com/statcalc3/calc.aspx?id=1>.) This recommended a sample size of 122. The study therefore aimed to recruit at least 138 participants.

Participants

In order to be included in the study participants had to have received a diagnosis of cancer no less than 30 days previous; be aged 18 or over at the time of diagnosis; be able to complete a set of questionnaires taking approximately 20-30 minutes; have awareness of their cancer diagnosis; and be physically well enough to take part.

Criterion for exclusion included a diagnosis of brain cancer or any cognitive impairment suggesting that the individual was not physically well enough to take part in the study. These criteria were assessed by the treating health professional before inviting participants to take part in the study.

Measures

The following validated self-report measures were completed:

1) **The Mini Mental Adjustment to Cancer** (Mini-MAC; Watson *et al.*, 1994) is a revised brief version of the Mental Adjustment to Cancer scale (MAC; Watson *et al.*, 1988). It is designed to assess an individual's psychological response to a diagnosis of cancer. It is comprised of 29 items and measures five domains: Helplessness-Hopelessness, Cognitive Avoidance, Fighting Spirit, Anxious Preoccupation and Fatalism. Participants are asked to rate to what extent a range of statements apply to them on a four-point scale from 'Definitely does not apply to me' to 'Definitely applies to me'. An example statement is "I deliberately push all thoughts of cancer out of my mind". There is no total score. Instead scores are calculated for each of the five domains. The Mini-MAC demonstrates reliability for each domain ranging from Cronbach's alpha coefficients of 0.62-0.88. It has also been translated into a number of other languages. The higher the score on each subscale the greater the use of that particular set of psychological response styles. There is no reversal of scoring. Cronbach's alphas for the current study were as follows: Helplessness-Hopelessness (0.82), Anxious Preoccupation (0.90), Cognitive Avoidance (0.81), Fighting Spirit (0.67) and Fatalism (.65) indicating adequate to good reliability.

2) **The Brief-COPE Inventory** (Carver, 1997) is a 28-item self-report scale measuring 14 coping mechanisms, including active coping, use of emotional support, use of instrumental support, positive reframing, planning, humour, acceptance, religion, self-distraction, denial, substance use, behavioural disengagement, venting and self-blame. Participants are asked to rate each statement according to the extent that they have been using the strategy described on a four-point scale from 1 = 'I haven't been doing this at all' to 4 = 'I've been doing this a lot'. For example "I've

been taking action to try to make the situation better”. The Brief COPE has been factor analysed and can be broken down into three broad coping categories: Problem Focused Coping, Active Emotion Coping and Emotional Avoidance Coping (Schnider, Elhai & Gray, 2007). The higher the score on each category, the greater the use of that particular set of coping styles. Reliability coefficients range from .50 and .90 (Shapiro, McCue, Heyman, Dey & Haller, 2010). The Brief-COPE has been used in a number of cancer related studies. (Carver *et al.*, 1993; Walker, Zona, & Fisher, 2006; Scrignaro, Barni & Magrin, 2010). Cronbach’s alphas for the current study were as follows: Problem Focused Coping (.77), Active Emotion Coping (0.71) and Emotional Avoidance Coping (0.74) indicating good reliability.

3) **The Self-Compassion Scale** (SCS; Neff, 2003) is a 26-item questionnaire to assess overall self-compassion. Participants are asked to rate how they typically act towards themselves in difficult times on a 5-point scale. For example “When times are really difficult, I tend to be tough on myself”[reverse scored]. A total score can be used or the scale can be used to identify three distinct facets of self-compassion, namely common humanity, mindfulness and self-kindness. In this study the total score is used. Negative items are reversed, mean scores are calculated for each subscale and these are then averaged to produce a total score (Neff, Hsieh and Dejitterat, 2005; Van Dam, Sheppard, Forsyth & Earleywine, 2011). Higher scores indicate higher self-compassion. Score ranges are as follows: 1-2.5 = low in self-compassion; 2.5-3.5 = moderate; 3.5-5 = high. The total SCS score shows good reliability and validity (Neff, 2003; Neff, *et al.*, 2005), including high internal reliability (Cronbach’s alpha= 0.93) in a sample of 88 obese patients with musculoskeletal pain (Wren *et al.*, 2012), and test-retest consistency with a correlation of $r=0.93$ for the overall scale over a three week period in a sample of 43 Buddhist practitioners (Neff, 2003). It has been used in a small number of studies related to cancer (Przedziecki, Sherman, Baillie, Taylor & Foley, 2012; Forti, 2012; Pinto-Gouveia, *et al.*, 2013) and health populations (Wren *et al.*, 2012; Costa & Pinto-Gouveia, 2011). It has been used in a range of clinical populations such as eating disorders (Adams & Leary, 2007); depression and anxiety (Raes, 2010; Van Dam *et al.*, 2011; Terry, Leary & Mehta, 2012), and borderline personality disorder

(Krawitz, 2012; Schanche, 2011). Cronbach's alpha for the current study was 0.87 for the total score indicating very good reliability.

4) **The Cognitive Fusion Questionnaire** (CFQ; Gillanders *et al.*, in press) is a 7-item brief self-report measure of cognitive fusion. The CFQ was developed to be generic to thoughts rather than specific content. It is designed to be used across healthy as well as unwell samples and has been shown to be valid in a wide range of samples including people with healthy function, mental health problems, physical health problems, work stress and dementia care givers. Participants are asked to rate statements on a 7-point Likert-type scale from "never true" to "always true", for example "I tend to get very entangled in my thoughts". Items explore literality, engagement with thoughts, entanglement, struggle, and behaviour being dominated by thinking. The CFQ has shown very good reliability (Cronbach's alpha = 0.87), good test-retest reliability in non clinical samples ($r = .82$, $p < .001$) and has a theoretically coherent factor structure (Gillanders *et al.*, in press). Higher scores indicate higher levels of fusion. The Cronbach's alpha for the current study was 0.93, which represents very good reliability.

5) **The Hospital Anxiety and Depression Scale** (HADS; Zigmond & Snaith, 1983) is a brief 14 item self-report scale developed for patients with physical illness. Participants are asked to rate the extent to which they agree with a range of statements on a 4-point Likert scale. For example "I feel tense or wound up". It is comprised of anxiety and depression subscales (7 items for each). Sub-scale scores and total scores can be used. For the current study total scores were used with higher scores representing higher levels of distress. Validation studies have established high internal consistency and validity (Bjelland, Dahl, Haug, & Neckelmann, 2002). The HADS has been used in a number of research studies with cancer patients. Significant correlations have been found between the HADS subscales and quality of life as measured by the Functional Assessment of Cancer Therapy – General (FACT-G) (see below). The Cronbach's alpha for the current study was 0.91 indicating very good reliability.

6) **The Functional Assessment of Cancer Therapy - General** (FACT-G; Cella *et al.*, 1993) is a 27-item scale measuring health related quality of life in cancer patients. Participants are asked to indicate on a 5-point Likert scale their response to each statement from “not at all” to “very much”. An example item is “I am content with the quality of my life right now”. The scale is divided across four domains of well-being: physical, social/family, emotional and functional. It is widely used in cancer populations and has demonstrated high reliability and validity. Concurrent validity has been shown with strong correlations with the Functional Living Index – Cancer ($r = .79$) as well as the self-report version of the Quality of Life Index ($r = 0.74$). Reliability has also been confirmed in a number of studies (Cella *et al.*, 1993; Lee, Chun, Kang & Lee, 2004; Davies, Kinman, Thomas & Bailey, 2008) and more recently Friedman *et al.* (2010) found a Cronbach’s alpha of 0.74. The FACT-G is one of the most commonly used measures in cancer research and has shown ability to discriminate among stages of disease and performance ability in cancer patients (Cella, 1994). Sub-scale scores and total scores can be used. For the current study total scores were used. High scores represent better quality of life. The Cronbach’s alpha for the current study was 0.79 for the total score, representing good reliability.

Demographic Data

Demographic data regarding participants’ gender, age, relationship status, education, ethnicity, first language, year of first diagnosis, cancer type, type(s) of treatment(s) received, current treatment(s) received and any other physical or mental health difficulties was gathered. No person identifiable information was requested and questionnaires took an estimated 20-30 minutes to complete.

Procedure

Recruitment

Clinicians within an NHS oncology service in Scotland distributed 280 questionnaire packs to patients on their caseload who met the inclusion criteria. Completed questionnaires were returned by post using a pre-paid self-addressed envelope, or one of several study-specific secure post boxes located in the relevant waiting areas.

114 completed questionnaire packs were returned, indicating a 41% return rate. Two were excluded from analyses due to failure to meet the inclusion criteria and six were excluded due to large proportions of missing data on several variables resulting in a total sample of 106.

Overview of statistical analytic method

A preliminary analysis was carried out in order to screen the data and ensure that the assumptions of parametricity were met. A missing data analysis was conducted and Little's MCAR test indicated that data was missing completely at random. The total amount of missing data was 0.6%. Where individual scales contained less than 20% missing data, missing items were prorated based upon completed data for that individual. In a second step, Expectation Maximization based upon all available data was used to impute the remaining missing values. In total 0.6% of the data was imputed. This resulted in a total sample size of 106. Outliers were screened and winsorised where appropriate and transformations conducted in order to meet the assumption of normality. Preliminary analysis confirmed that there were no violations of the assumptions of normality, linearity, homoscedasticity or multicollinearity and this was confirmed with tolerance and variance inflation factor statistics. All analyses were conducted using SPSS (version 19). (For the purpose of the thesis full details of preliminary analyses and variable transformations are provided in Appendix F).

Results

Descriptive Statistics /Sample Characteristics

Of the 106 participants included in the study 55% were male, 93% were white British and the majority (60%) were within the 60-79 age bracket. The mean time since diagnosis was 3.70 years (*SD* 4.7 years) with 62% diagnosed within the last two years. Further demographics are provided in table B.1 and national statistics are shown where available, for comparison. Figure B.1 illustrates the frequency of cancer types reported in the sample.

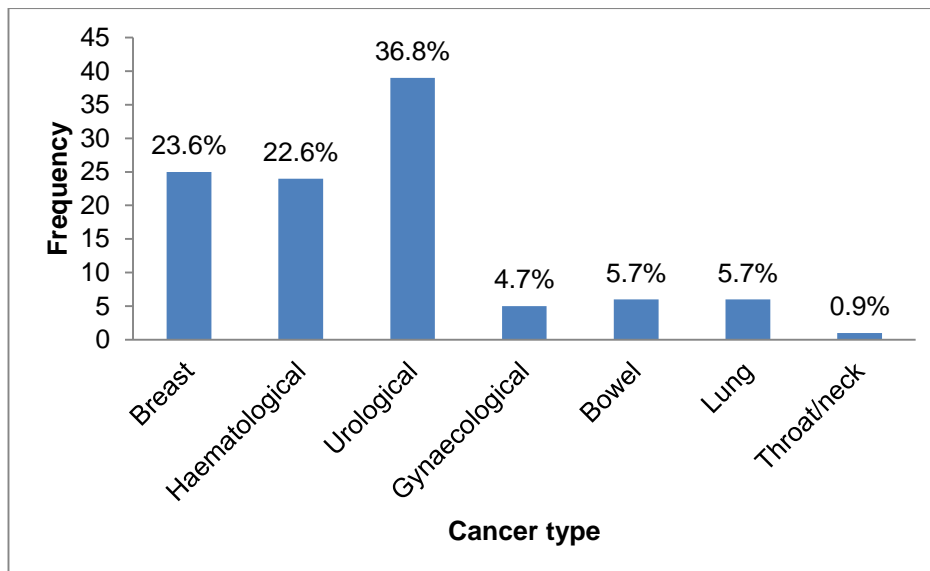


Figure B.1: Frequency of cancer types in the sample

How representative is this of cancer diagnoses in the UK population?

The sample broadly compares to incidence statistics for the 20 most commonly diagnosed cancers provided by Cancer Research UK (2010). These figures show that the most commonly diagnosed cancers in the UK during 2010 were breast cancer, prostate cancer, bowel cancer and haematological cancers (combining figures for non-Hodgkin's lymphoma and leukaemia). The main difference is that bowel cancer was not as strongly represented in the current sample.

Table B.1: Participant characteristics (n=106)

Characteristic	Current sample		National Statistics	
	N	%	N	%
Gender				
Male	58	55	14500	48
Female	48	45	15600	52
Age				
18-39	5	5	1154	3
40-59	36	34	8070	20
60-79	64	60	22251	55
80+	1	1	9144	22
Marital Status				

Characteristic	Current sample		National Statistics	
	N	%	N	%
Single/separated/widowed	23	22	-	
Married/co-habiting	80	76	-	
Missing	3	2		
Highest Level of Education				
GCSE/O Level	25	23	-	
A Level	15	14	-	
Diploma	14	13	-	
Bachelor's Degree	21	20	-	
Master's Degree	8	8	-	
Doctor's Degree	3	3	-	
Other	12	11	-	
Missing	8	8	-	
Ethnic Identity				
White			-	
British	98	93	-	
Missing	8	7	-	
Years since diagnosis				
	Mean:	SD:	-	
	3.59	4.607		
	Range: 1-24 years		-	
1 – 2 years	66	62	-	
3-5 years	20	19	-	
6-10 years	10	10	-	
11 + years	9	8	-	
Missing	1	1	-	
Cancer Type				
Urological	39	37	4432	15
Breast	25	23	4604	15
Hematological	24	22	1001 ^d	3
Lung	6	6	5069 ^a	17

Characteristic	Current sample		National Statistics	
	N	%	N	%
Bowel	6	6	3986	13
Gynaecological	5	5	583 ^c	4
Throat/neck	1	1	1186 ^b	4
Type of treatment(s) received				
Surgery	61	58	12119	40
Radiation Therapy	35	33	2769	8
Chemotherapy	67	63	3823	13
Hormone Therapy	20	19	2227	7
Other	16	15	1621	5
Comorbidity				
Physical	21	20	-	-
Mental health	8	8	-	-
Total N.	106			

a = trachea and bronchus; b = head and neck; c = ovary; d = non-Hodgkin's lymphoma (statistics provided by the Information Services Division, NHS Scotland)

Table B.2 provides summary descriptive statistics for predictor and outcome variables for the current sample and normative data where available.

Table B.2: Descriptive statistics for predictor and outcome variables compared to normative data

Variable	Max possible score	Min	Max	Mean	SD	Normative Data	
						Mean	SD
Predictor Variables:							
Mini MAC Helplessness-Hopelessness	32	38	22	11.6	3.4	11.965	3.915
Mini MAC Anxious Preoccupation	32	8	32	18.32	5.528	19.261	5.148
Mini MAC Fighting Spirit	16	6	16	12.17	2.348	12.639	2.209
Mini MAC Cognitive Avoidance	16	4	16	9.90	2.821	9.479	2.504
Mini MAC Fatalism	20	5	20	13.32	3.212	13.763	2.906
Brief COPE Problem Focused Coping	32	8	32	18.66	5.327	Not available	
Brief COPE Active Emotional Coping	40	14	37	25.28	4.979	Not available	
Brief COPE Emotional Avoidance Coping	40	10	26	15.66	3.993	Not available	
Self Compassion Scale	5	2	5	3.348	.566	Not available	
Cognitive Fusion Questionnaire	49	7	43	19.37	9.578	21.22	10.36
Outcome Variables:							
Hospital Anxiety and Depression Scale	42	0	27	10.41	7.442	9.82	5.98
Functional Assessment of Cancer Therapy - General	108	47	107	81.98	16.53	86.5 ^a	15.2 ^a

CFQ Normative data (Ferenbach, 2011); Mini MAC Normative data (Watson *et al.*, 1992); HADS normative data (Crawford, *et al.*, 2001); FACT-G normative data (Holzner *et al.*, 2004)

^a FACT-G normative data is derived from a population-based sample (Holzner *et al.*, 2004).

Prevalence of distress in the sample

Zigmond and Snaith (1983) suggest a cut off score of ≥ 16 to identify individuals with clinical levels of distress, however a cut off score of ≥ 13 was considered more appropriate for identifying ‘caseness’ in a cancer population in line with previous research (Morse, Kendell & Barton, 2005). 28% (n=30) of the sample were experiencing clinical levels of distress on the HADS (total score >13). Scores ranged between 0 and 27 with a mean score of 10.41 (SD: 7.442).

Covariate analyses

Potential confounding demographic variables were explored by examining correlations and conducting t-tests or Analysis of Variance (ANOVA) for categorical variables and dependent variables. No significant differences were identified within the sample for gender, age, marital status or time since diagnosis. A one-way ANOVA found significant differences for cancer type, and so cancer type was entered as a covariate at step 1 of each hierarchical multiple regression analysis. Note that the Miscellaneous cancer variable consists of lung, gynaecological, bowel and throat/neck cancers. (For the purpose of the thesis further details about covariate analyses are presented in Appendix G).

Correlation Analyses

Correlational analyses were conducted to explore the relationships between predictor variables and outcome variables. Table B.3 shows a range of strong correlations that are in predicted directions and are consistent with previous research and theory (Barnard & Curry, 2011; Leary *et al.*, 2007; Neff, 2003; Neff *et al.*, 2007; Neff & Vonk 2009; Pinto-Gouveia *et al.*, 2013; Ferenbach, 2011; Gillanders *et al.*, in press).

Mini MAC Fighting Spirit and Fatalism, and two of the Brief COPE subscales (Problem Focused Coping and Active Emotion Coping) did not correlate with either distress or quality of life. The Mini MAC Cognitive Avoidance subscale also did not correlate with quality of life. This was consistent with previous research (Hulbert-Williams, 2011; Shapiro *et al.*, 2005).

Including all potential predictor variables in multivariate analyses would result in the regression analyses being under-powered. Therefore variables that did not correlate with the outcome variables to a significance of $p < .05$ were excluded from further analysis (Tabachnick & Fidell, 2006).

Table B.3: Correlation matrix between predictor variables and outcome variables

	1	2	3	4	5	6	7	8	9	10	11
1. Mini MAC Helplessness-Hopelessness (transformed)	1										
2. Mini MAC Anxious Preoccupation	.773**	1									
3. Mini MAC Fighting Spirit	-.086	.095	1								
4. Mini MAC Cognitive Avoidance	.173	.273**	.330**	1							
5. Mini MAC Fatalism	-.060	.028	.313**	.191	1						
6. Brief COPE Problem Focused Coping	-.065	.120	.374**	.013	.356**	1					
7. Brief COPE Active Emotion Coping	-.052	.066	.296**	.056	.319**	.512**	1				
8. Brief COPE Emotional Avoidance Coping (transformed)	.534**	.610**	-.008	.436**	.020	.146	.159	1			
9. Self-Compassion Scale	-.442**	-.415**	.294**	-.015	.278**	.111	.062	-.414**	1		
10. Cognitive Fusion Questionnaire (transformed)	.621**	.675**	-.038	.254**	-.035	.183	.127	.645**	-.612**	1	
11. Hospital Anxiety and Depression Scale (transformed)	.530**	.593**	-.052	.280**	.121	.195*	.162	.621**	-.439**	.666**	1
12. Functional Assessment of Cancer Therapy-General	-.633**	-.643**	.111	-.179	.029	-.102	-.114	-.618**	.411**	-.606**	-.782**

p < .05 and ** *p* < .01; All correlations are Pearson's *r*; *n* = 106

MAC: Mental Adjustment to Cancer

Multivariate Analyses

Prediction of distress (HADS)

Hierarchical multiple regression analysis was conducted to determine the predictors of distress with cancer type as a covariate entered into the model at step 1. At step 2 the three Mini MAC subscales; Helplessness-Hopelessness, Anxious Preoccupation and Cognitive Avoidance were entered. At step 3 the Brief COPE Problem Focused Coping and Emotional Avoidance Coping subscales, at step 4 the SCS and step 5 the CFQ was added into the regression model. The results are presented in table B.4.

The overall model found that the nine predictors together accounted for 53.8% of the variance in distress ($R^2=.538$). The overall equation was highly significant ($F_{(10,95)} = 11.057, p < .0001$) and represented a large effect size of $f^2=1.16$. Brief COPE Emotional Avoidance Coping and the CFQ were the only significant predictors of distress in the final model as shown from the magnitude of the t-statistics Brief COPE Emotional Avoidance Coping: ($\beta = .227, p=.042$) and CFQ ($\beta = .293, p=.020$).

The variables entered into the model prior to the CFQ together accounted for 51.1% of the variance. The CFQ accounted for a further 2.7% of the variance. When entered into the model at step 4 the SCS accounted for 2.8% of the variance in distress over and above cancer type; Mini MAC Helplessness-Hopelessness, Anxious Preoccupation and Cognitive Avoidance; Brief COPE Problem Focused Coping and Emotional Avoidance coping.

Hypothesis 1 was partially supported. The covariate miscellaneous vs. urological cancer type and the Mini-MAC Anxious Preoccupation variables were significant predictors of distress when first entered into the model, however the addition of the Brief COPE Emotional Avoidance Coping subscale resulted in these earlier variables no longer being significant. The Brief COPE Emotional Avoidance subscale continued to be a significant predictor of distress, even when further variables (SCS and CFQ) were entered into the model. The SCS was a significant predictor of

distress at entry into the model, however on entering the CFQ to the final step of the regression analysis the SCS was no longer significant. The CFQ and the Brief COPE Emotional Avoidance subscale were found to be significant predictors of distress over and above cancer type, Mini MAC Helplessness-Hopelessness, Anxious Preoccupation, Cognitive Avoidance, Brief COPE Problem Focused Coping and the SCS.

Table B.4: Hierarchical Multiple Regression for the prediction of distress (HADS)

Model	β	t	p	R ²	Adj. R ²	Δ R ²	p	Effect Size r	Effect Size f ²
STEP 1: Constant		13.090	<.001	.102	.076	.102	.011		f ² = .11
Breast Cancer	.187	1.781	.078					r=.72	
Haematological Cancer	.152	1.446	.151					r=.64	
Miscellaneous Cancers	.346	3.347	.001					r=.89	
STEP 2: Constant		-1.049	.297	.393	.356	.291	<.001		f ² = .65
Breast Cancer	.051	.570	.570					r=.23	
Haematological Cancer	.057	.634	.527					r=.25	
Miscellaneous Cancers	.127	1.380	.171					r=.49	
Mini MAC HH	.176	1.409	.162					r=.50	
Mini MAC AP	.383	2.982	.004					r=.77	
Mini MAC CA	.129	1.576	.118					r=.54	
STEP 3: Constant		-3.484	.001	.483	.440	.090	<.001		f ² = .93
Breast Cancer	-.018	-.207	.837					r=.07	
Haematological Cancer	-.017	-.191	.849					r=.07	
Miscellaneous Cancers	.051	.573	.568					r=.20	
Mini MAC HH	.154	1.239	.218					r=.40	
Mini MAC AP	.212	1.660	.100					r=.51	
Mini MAC CA	.029	.358	.721					r=.13	
Brief COPE PFC	.113	1.426	.157					r=.45	
Brief COPE EAC	.375	3.552	.001					r=.78	
STEP 4: Constant		-.852	.396	.511	.465	.028	.021		f ² = 1.04
Breast Cancer	.013	.148	.882					r=.05	

Haematological Cancer	-.021	-.244	.808					r=.08
Miscellaneous Cancers	.074	.855	.395					r=.27
Mini MAC HH	.011	.920	.359					r=.29
	3							
Mini MAC AP	.179	1.432	.156					r=.43
Mini MAC CA	.071	.864	.389					r=.28
Brief COPE PFC	.141	1.796	.076					r=.51
Brief COPE EAC	.302	2.803	.006					r=.68
Self-Compassion	-.204	-2.354	.021					r=.62
STEP 5: Constant		-1.318	.191	.538	.489	.027	.020	f ² = 1.16
Breast Cancer	.035	.418	.677					r=.13
Haematological Cancer	.020	.240	.811					r=.08
Miscellaneous Cancers	.080	.948	.346					r=.29
Mini MAC HH	.072	.597	.552					r=.19
Mini MAC AP	.112	.891	.375					r=.27
Mini MAC CA	.052	.644	.521					r=.20
Brief COPE PFC	.095	1.195	.235					r=.35
Brief COPE EAC	.227	2.061	.042					r=.55
Self Compassion	-.093	-.956	.341					r=.29
Cognitive Fusion	.293	2.358	.020					r=.60

Mini MAC HH: Helplessness-Hoplessness; **Mini MAC AP:** Anxious Preoccupation; **Mini MAC CA:** Cognitive Avoidance; **Brief COPE PFC:** Problem Focused Coping; **Brief COPE EAC:** Emotional Avoidance Coping
Miscellaneous cancers: Lung, gynaecological, bowel, throat/neck

Prediction of Quality of Life (FACT-G)

A second hierarchical multiple regression was conducted in order to address hypothesis 2 using quality of life as the outcome variable. Cancer types were entered at step 1 as covariates. Mini MAC Helplessness-Hopelessness and Anxious Preoccupation were entered at step 2, Brief COPE Emotional Avoidance Coping at step 3, SCS at step 4 and CFQ at step 5. The results are presented in table B.5.

The overall model accounted for 55.5% of the variance in quality of life ($R^2=.555$). The overall equation was highly significant ($F_{8,97} = 15.153, p < .0001$) with a large

effect size of $f^2=1.25$. Brief COPE Emotional Avoidance Coping was the only significant predictor of quality of life in the final model ($\beta = -.300, p=.003$).

Adding Brief COPE Emotional Avoidance Coping to the regression model at step 3 explained an additional 7.1% of the variance in quality of life ($R^2=.545$). This change in R^2 was significant, $F_{(1,99)} = 15.330, p<.001$ and represents a large effect size ($f^2 = 1.20$). The inclusion of SCS to the regression model at step 4 explained 0.8% of the variance in quality of life ($R^2 .553$). This change in R^2 was not significant, $F_{(1, 98)} = 1.758, p=.188$. Adding CFQ to the model at step 5 explained an additional .2% of the variance in quality of life. This change in R^2 ($R^2=.519$) was also not significant, $F_{(1,97)} = .585, p=.446$.

Hypothesis 2 was not supported. The covariates breast vs. urological cancer and miscellaneous vs. urological cancer were significant predictors of quality of life when first entered into the model, however on the addition of the Mini MAC Helplessness-Hopelessness and Anxious Preoccupation variables cancer type was no longer a significant predictor of quality of life. Similarly, on addition of the Brief COPE Emotional Avoidance variable, the Mini MAC Anxious Preoccupation variable became non-significant. The Mini MAC Helplessness-Hopelessness variable remained significant until the addition of the SCS, at which point the Brief COPE Emotional Avoidance Coping variable was the only significant predictor of quality of life, even when the SCS and CFQ were added to the model at step 4 and step 5 of the regression and after part of the variance had already been accounted for by other variables. Neither the CFQ or the SCS were found to be significant predictors of quality of life when entered into the regression model after controlling for other known predictors.

Table B.5: Hierarchical Multiple Regression for the prediction of quality of life (FACT)

Model	β	t	p	R^2	$Adj. R^2$	ΔR^2	p	Effect Size r	Effect Size f^2
STEP 1: Constant		34.584	<.001	.119	.093	.119	.005		$f^2 = .14$
Breast Cancer	-.223	-2.146	.034					$r = .78$	
Haematological Cancer	-.061	-.587	.558					$r = .32$	
Miscellaneous Cancers	-.351	-3.433	.001					$r = .89$	
STEP 2: Constant		14.951	<.001	.474	.448	.355	<.001		$f^2 = .90$
Breast Cancer	-.084	-1.008	.316					$r = .41$	
Haematological Cancer	.020	.249	.804					$r = .14$	
Miscellaneous Cancers	-.109	-1.280	.203					$r = .50$	
Mini MAC HH	-.311	-2.695	.008					$r = .77$	
Mini MAC AP	-.366	-3.145	.002					$r = .82$	
STEP 3: Constant		14.604	<.001	.545	.517	.070	<.001		$f^2 = 1.20$
Breast Cancer	-.018	-.225	.823					$r = .09$	
Haematological Cancer	.110	1.365	.175					$r = .49$	
Miscellaneous Cancers	-.054	-.674	.502					$r = .27$	
Mini MAC HH	-.251	-2.302	.023					$r = .68$	
Mini MAC AP	-.217	-1.884	.062					$r = .61$	
BRIEF COPE EAC	-.354	-3.915	<.001					$r = .85$	
STEP 4: Constant		8.634	<.001	.553	.521	.008	.118		$f^2 = 1.24$
Breast Cancer	-.034	-.421	.675					$r = .16$	
Haematological Cancer	.114	1.420	.159					$r = .47$	
Miscellaneous Cancers	-.069	-.846	.399					$r = .30$	
Mini MAC HH	-.220	-1.975	.051					$r = .60$	
Mini MAC AP	-.208	-1.809	.073					$r = .56$	
BRIEF COPE EAC	-.329	-3.568	.001					$r = .80$	
Self-Compassion	.105	1.326	.188					$r = .45$	
STEP 5: Constant		8.561	<.001	.555	.519	.003	.446		$f^2 = 1.25$
Breast Cancer	-.041	-.503	.616					$r = .18$	
Haematological Cancer	.099	1.207	.230					$r = .39$	
Miscellaneous Cancers	-.069	-.844	.401					$r = .29$	

Mini MAC HH	-.214	-1.915	.058	<i>r</i> =.56
Mini MAC AP	-.182	-1.513	.133	<i>r</i> =.47
BRIEF COPE EAC	-.300	-3.008	.003	<i>r</i> =.73
Self-Compassion	.075	.838	.404	<i>r</i> =.28
Cognitive Fusion	-.089	-.765	.446	<i>r</i> =.26

Mini MAC HH: Helplessness-Hopelessness; **Mini MAC AP:** Anxious Preoccupation;
Brief COPE EAC: Emotional Avoidance Coping
Miscellaneous cancers: Lung, gynaecological, bowel, throat/neck

Diagnostics

The regression models were examined to establish how well the models fit the data. Examination of standardized residuals confirmed that the level of error within both models was acceptable. Cook's distance and Mahalanobis distances were also within acceptable limits (Cook & Weisberg, 1982). The standardized DFFit values, leverage and covariance ratios were also examined. Although a small number of cases had values close to the various cut off points, (Chatterjee & Hadi 1986; Stevens, 2002; Belsey, Kuh & Welsch, 1980) it was concluded that these cases were not having a significant influence on the models. Stein's formula was used to assess the cross-validity of the final models. The difference between the adjusted R^2 and observed R^2 values was small, indicating good cross-validity and generalizability. The assumptions of normality, linearity, generalizability, multicollinearity and homoscedasticity were all met. (For the purpose of the thesis further details of diagnostic analyses are presented in Appendix H).

Discussion

The study aimed to explore the predictive power of self-compassion and cognitive fusion in determining distress and quality of life in a cancer population, in comparison to known predictors. The results showed that Emotional Avoidance Coping and cognitive fusion were significant predictors of distress over and above known predictors and the newer construct, self-compassion. Emotional Avoidance Coping was also the only significant predictor of quality of life.

This is the first study to examine the constructs of cognitive fusion and self-

compassion simultaneously with a cancer population and one of the first studies to examine self-compassion with a cancer population. The results suggest that although self-compassion was associated with lower distress and increased quality of life in cancer patients, it was not found to be a significant predictor of distress or quality of life after controlling for other known predictors. This is in contrast to earlier studies (Pinto Gouveia *et al.*, 2013; Wren *et al.*, 2012). Wren *et al.* (2012) found that self-compassion explained 20% of the variance in negative affect over and above demographic factors in a sample of obese patients with musculoskeletal pain. Pinto Gouveia *et al.* (2013) used linear multiple regression analyses with self-compassion and self-judgment as the predictor variables and found that self-compassion accounted for 37% of the variance in depression, 33% of the variance in stress and 33% of the variance in quality of life.

The CFQ demonstrated strong correlations with distress and quality of life consistent with previous literature (Ferenbach, 2011; Gillanders *et al.*, in press), however it was not found to be a significant predictor of quality of life. It was a significant predictor of distress, even after a large proportion of the variance had already been accounted for by established predictor variables. This is consistent with Ferenbach (2011) who found that in a sample of multiple sclerosis patients when the CFQ was entered into the final step of a multiple regression model it was a significant predictor of distress (Ferenbach, 2011). Further research with a cancer population will help to extend and replicate these findings.

Although the results for the SCS were unexpected, previous studies have included fewer predictors. The current study examined a relatively large number of predictors in a hierarchical multiple regression, resulting in a tough test for the newer constructs of SCS and CFQ. It is also possible that the HADS was not a sensitive enough measure to detect distress in this population (Morse *et al.*, 2005).

The results in terms of the Mini MAC were also consistent with previous research (Baider *et al.*, 2003; Hulbert-Williams *et al.*, 2012) with Helplessness-Hopelessness and Anxious Preoccupation showing predictive power when first entered into the

regression model for the prediction of quality of life, however less so for distress with Anxious Preoccupation being significant only at first entry into the model.

Previous studies have also found that the Mini MAC Helplessness-Hopelessness and Anxious Preoccupation subscales are consistently related to high levels of psychopathology (Watson *et al.*, 1988; 1991; Grassi *et al.*, 2005). This is consistent with the current analysis as 29% of the variance in distress was accounted for by the Mini MAC Helplessness-Hopelessness, Anxious Preoccupation and Cognitive Avoidance subscales. Similar to the current findings, Ferenbach (2011) found that appraisals of helplessness were found to be a strong predictor of distress.

Consistent with the current study, previous studies have also found coping to be a strong predictor of adjustment in cancer populations (McCaul *et al.*, 1999) and chronic illness (de Ridder & Schreurs, 1996; 2001). The results may have been influenced by the choice of factors used in the analysis. Carver (1997) does not suggest any particular factor structure, preferring to analyse the 14 individual coping dimensions. To reduce the number of variables in the regression the decision was taken to adopt a 3-factor solution based on research by Schnider & Elhai (2007) which identifies Problem Focused Coping, Active Emotional Coping and Emotional Avoidant Coping. Although a two factor model has also been proposed (Meyer, 2001; Steinhardt, 2009; Lethborg, Aranda, Cox & Kissane, 2007) - Adaptive and Maladaptive - it was decided that this was not appropriate given that what is an adaptive strategy for one person may not be so for another and is also likely to be dependent on the time since diagnosis, position on the individuals cancer journey and their subsequent appraisals of the situation.

In terms of outcome variables the current sample reported slightly lower levels of quality of life in comparison to the normative sample. Approximately 30% of the current sample reported clinical levels of distress, which is similar to those found in previous studies (Mitchell *et al.*, 2011; Bleiker, Pouwer, van der Ploeg, Leer & Ader, 2000).

Previous studies have found that timeframe is an important factor predicting outcomes, for example Hulbert-Williams *et al.* (2012) found that depression can be most effectively predicted if screening occurs at baseline, whereas quality of life is more reliably predicted at a later time point. In addition they found that anxiety was a more unstable construct which varied over time and therefore would require risk-assessment and screening over shorter time frames. Vinokur, Threatt, Vonokur-Kaplan and Satariano (1990) found that anxiety and depression were at their highest immediately after diagnosis and then declined over time. Interestingly, the study by Hulbert-Williams *et al.* (2012) strongly favoured cognitive predictors over coping predictors in line with the Transactional Model of Stress (Lazarus, 1999). This model suggests that coping styles and emotional response are influenced by cognitions. Thus, it would be interesting to explore the moderating effects of cognitive fusion on coping styles and outcomes such as distress.

Clinical implications

Gaining a better understanding of the variables that account for distress and quality of life in relation to cancer can help facilitate the provision of interventions designed to help cancer patients manage the psychological and emotional distress of the illness. Although more evidence is needed in order to identify the most effective treatments for cancer patients, based on the findings of this cross-sectional study the targets most likely to hold promise in terms of preventing or reducing distress and poor quality of life are avoidant coping, helplessness-hopelessness appraisals, and fusion with thinking. The results of the current study are based on the choice and order of variables entered into the regression equation. These findings suggest that in comparison to interventions designed to change mental adjustment there is insufficient evidence to suggest that interventions targeting self-compassion would be of added benefit and therefore self-compassion is less likely to be an important target for intervention.

The Mental Health Strategy for Scotland (2012-2015) aims to facilitate the promotion of mental well-being and prevention of illness. This includes early identification of those who are at risk of psychological distress. It is also concerned

with ensuring that treatments are focused on the whole person and aligned to recovery-based approaches which recognise the importance of hope, connectedness and the lived experience. In line with these objectives the current study provides new information regarding the predictive capacity of a new measure of cognitive fusion for cancer patients and supports previous research regarding the utility of the CFQ in a chronic illness population. Moreover, there is preliminary evidence that the CFQ has shown sensitivity to an ACT intervention targeting cognitive fusion with adults in an organisational setting (Gillanders *et al.*, in press).

Limitations of the Study

A number of limitations to the study deserve mention. The study used self-report measures which may introduce subjective bias and the cross-sectional nature of the study design limits any causal inferences that can be made. The sample was heterogeneous, with respect to cancer diagnosis and time since diagnosis. Although previous studies have suggested that distress and quality of life can improve with time, this was not borne out in the current study, however this may be due to limited sample size and the wide range of time since diagnosis ($\leq 1-24$ years). Data on disease stage and socio economic status was not gathered. A recent meta-analysis found no significant differences with regards to disease stage and distress in cancer patients (Mitchell *et al.*, 2011). The data represents participants' self-reported distress and quality of life at one point in time, along their individual cancer journeys. The sample was also predominantly white British. These factors limit the generalizability of the findings. Finally, the ordering of variables in the hierarchical multiple regression requires sensitive interpretation. Although this is an appropriate way to test newer constructs it is important to be open to the idea that interventions based on these newer constructs may also operate, even if appraisal based interventions are not conducted first.

Future Research

The overall models accounted for 55.5% of the variance in quality of life and 53.8% of the variance in distress. Future studies will need to identify what other variables have explanatory power in terms of distress and quality of life in cancer patients.

Future research could focus on carrying out longitudinal studies with a more homogenous population, for example recently diagnosed or advanced cancer patients. Arguably, other variables could be used to assess distress or quality of life in future studies for example positive and negative affect, pain, disability, and objective measures such as salivary cortisol.

Conclusion

The purpose of this study was to examine the relationships between mental adjustment to cancer, coping strategies, self-compassion, cognitive fusion, distress and quality of life in adults diagnosed with cancer.

In summary, although self-compassion was significantly associated with increased quality of life and decreased distress, it was not a significant predictor compared to coping styles and demographic variables. Although the CFQ was significantly associated with decreased quality of life it was not found to be a significant predictor when compared to other variables. It was, however, a significant predictor of distress even after much of the variance had been accounted for by coping styles. This suggests that cognitive fusion is an important and useful predictor of distress in cancer patients. Furthermore, the CFQ is a brief and reliable measure, which can contribute to the early identification of cancer patients who may be vulnerable to distress. The findings also suggest that interventions targeting cognitive fusion and emotional avoidance, such as ACT may be an effective treatment in addressing distress and adjustment difficulties in cancer patients.

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GUIDE FOR AUTHORS

Article structure

Manuscripts should be prepared according to the guidelines set forth in the Publication Manual of the American Psychological Association (6th ed., 2009). Of note, section headings should not be numbered.

Manuscripts should ordinarily not exceed 50 pages, *including* references and tabular material. Exceptions may be made with prior approval of the Editor in Chief. Manuscript length can often be managed through the judicious use of appendices. In general the References section should be limited to citations actually discussed in the text. References to articles solely included in meta-analyses should be included in an appendix, which will appear in the on line version of the paper but not in the print copy. Similarly, extensive Tables describing study characteristics, containing material published elsewhere, or presenting formulas and other technical material should also be included in an appendix. Authors can direct readers to the appendices in appropriate places in the text.

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Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

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Footnotes should be used sparingly. Number them consecutively throughout the article, using superscript Arabic numbers. Many wordprocessors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

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Appendix B: Quality Assessment Checklist

Quality criteria	Description	Rating
Aims / hypotheses	Aims, hypotheses and outcome measures clearly stated	Well covered (3)
	Aims, hypotheses and outcome measures stated	Adequately addressed (2)
	Aims stated but no hypotheses given	Poorly addressed (1)
	Aims not clear and/or no outcome measures stated	Not addressed (0)
Study design / randomization	Randomized controlled trial with appropriate method of randomisation reported	Well covered (3)
	Randomized controlled trial or controlled trial but no clear information on method of randomization	Adequately addressed (2)
	Study design and/or randomization not clear	Poorly addressed (1)
	No information on study design given	Not addressed (0)
Inclusion/Exclusion	Inclusion/exclusion criteria clearly stated	Well-covered (3)
	Limited information on inclusion/exclusion criteria	Adequately addressed (2)
	Inclusion/exclusion criteria not reported	Poorly addressed (1)
	N/a	Not addressed (0)
Sampling	Sample demographics and baseline assessments allow comparison between intervention and control groups	Well covered (3)
	Some demographic information gathered to allow basic comparisons between groups.	Adequately addressed (2)
	Limited information on demographic variables reported	Poorly addressed (1)
	No demographic information and/or baseline measures reported	Not addressed (0)
Control group	Well-matched control group used. Control group and intervention group interventions well-matched in terms of duration and intensity.	Well covered (3)
	Reasonably well-matched control group used	Adequately

	with a reasonably well-matched intervention.	addressed (2)
	Control group was a wait-list control.	Poorly addressed (1)
	A control group was used but was not well-matched and/or insufficient information provided to assess. No information provided in terms of duration and intensity of intervention(s)	Not addressed (0)
Measures	Outcome measures of interest to this review (distress/burnout/well-being) are standardized measures with known psychometric properties in this population/sample	Well covered (3)
	Use of standardized measures. Reliability and validity specified	Adequately addressed (2)
	Use of non-standardized measures	Poorly addressed (1)
	N/a	Not addressed (0)
Intervention	Intervention well defined. Intervention protocol used	Well covered (3)
	Intervention well defined but no mention of protocol use	Adequately addressed (2)
	Intervention not clearly defined	Poorly addressed (1)
	N/a	Not addressed (0)
Homework	Homework assigned and data on home practice gathered	Well-covered (3)
	Homework assigned but no data gathered on home practice	Adequately addressed (2)
	Homework was not assigned	Poorly addressed (1)
	N/a	Not addressed (0)
Therapist training	Training and experience of therapist reported. Attendance of an 8 week MBSR/MBCT course, at least 12 months of training similar groups and personal practice reported	Well covered (3)
	Training and experience of therapist reported and/or <12 months experience training similar groups. Mention of personal practice	Adequately addressed (2)
	Therapist/trainer has some experience (<12 months) providing the intervention and/or some level of training. Limited/no information about personal practice reported	Poorly addressed (1)

	Therapist training and experience not reported or therapist/trainer not qualified/has limited experience. Limited/no information about personal practice reported.	Not addressed (0)
Treatment fidelity	Adherence to treatment protocol assessed using recording of sessions or observed sessions and no exceptions noted	Well covered (3)
	Adherence to treatment protocol assessed using checklist and any exceptions noted.	Adequately addressed (2)
	Adherence to treatment protocol was reported but no method given	Poorly addressed (1)
	Adherence to treatment protocol not assessed or not reported	Not addressed (0)
Attrition/Retention	Attrition rates reported. Retention $\geq 80\%$	Well covered (3)
	Attrition rates reported. Retention between 61-79%	Adequately addressed (2)
	Attrition not clearly reported and / or retention rates $\leq 60\%$	Poorly addressed (1)
	Attrition/retention rates not reported	Not addressed (0)
Analysis	Method of statistical analyses reported and appropriate to study design. Confidence intervals, p-values, effect sizes etc., reported where appropriate	Well covered (3)
	Method of statistical analyses reported and appropriate to study. Some information on confidence intervals and p-values reported but no effect sizes reported	Adequately addressed (2)
	Method of statistical analysis not clear or not appropriate to study. Limited information on confidence intervals and p-values reported but no effect sizes reported	Poorly addressed (1)
	Method of statistical analysis not clear or not appropriate to study. No information on confidence intervals and p-values reported and no effect sizes reported	Not addressed (0)
Results	Results clearly reported and relate to aims/hypotheses	Well covered (3)
	Results reported and broadly related to aims/hypotheses	Adequately addressed (2)
	Results not clearly reported and/or do not relate well to aims/hypotheses	Poorly addressed (1)
	Results not related to aims/hypotheses	Not addressed (0)

Power calculation	Power calculation reported and sufficient power achieved	Well covered (3)
	Power calculation not reported and/or study has reasonable sample size ($n \geq 30$ per group) and likely to have sufficient power	Adequately addressed (2)
	Power calculation not reported and/or study likely to be insufficiently powered ($n < 30$ per group)	Poorly addressed (1)
	Power calculation not reported/sample very small (≤ 10 per group)	Not addressed (0)
Follow up	Length of follow up ≥ 6 months	Well covered (3)
	Length of follow up ≥ 3 months	Adequately addressed (2)
	Length of follow up ≤ 1 month	Poorly addressed (1)
	No follow up data gathered	Not addressed (0)

Appendix C: Clinical Psychology & Psychotherapy Author Guidelines

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A. A typical citation of an entire work consists of the author's name and the year of publication .

Example: Charlotte and Emily Bronte were polar opposites, not only in their personalities but in their sources of inspiration for writing (Taylor, 1990). Use the last name only in both first and subsequent citations, except when there is more than one author with the same last name. In that case, use the last name and the first

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B. If the author is named in the text, only the year is cited .

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Example: In a 1989 article, Gould explains Darwin's most successful. . .

D. Specific citations of pages or chapters follow the year .

Example: Emily Bronte "expressed increasing hostility for the world of human relationships, whether sexual or social" (Taylor, 1988, p. 11).

E. When the reference is to a work by two authors, cite both names each time the reference appears .

Example: Sexual-selection theory often has been used to explore patters of various insect matings (Alcock & Thornhill, 1983) . . . Alcock and Thornhill (1983) also demonstrate. . .

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Further information. For accepted manuscripts the publisher will supply proofs to the corresponding author prior to publication. This stage is to be used only to correct errors that may have been introduced during the production process. Prompt return of the corrected proofs, preferably within two days of receipt, will minimise the risk of the paper being held over to a later issue. Once your article is published online no further amendments can be made. Free access to the final PDF offprint or your article will be available via author services only. Please therefore sign up for author services if you would like to access your article PDF offprint and enjoy the many other benefits the service offers

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- E-mail Publication Alerts
- Personalization Tools

Cite EarlyView articles. To link to an article from the author's homepage, take the DOI (digital object identifier) and append it to "http://dx.doi.org/" as per following example: DOI 10.1002/hep.20941, becomes http://dx.doi.org/10.1002/hep.20941.

Appendix D: Ethical Approval Documentation

Research and Development
Foresterhill House Annexe
Foresterhill
Aberdeen
AB25 2ZB

Miss Ashleigh K Stewart
NHS Grampian
Trainee Clinical Psychologist
c/o The Psycho-Oncology Service
Roxburghe House
Ashgrove Road
Aberdeen
AB25 2ZH

Date 02 October 2012
Your Ref
Our Ref 2012PC006

Enquiries to Anne-Marie Sinclair
Extension 53846
Direct Line 01224 553846
Email grampian.randdpermissions@nhs.net

Dear Miss Stewart

Management Permission for Non-Commercial Research

MREC Ref: 12/NS/0080

Project title: Investigating the relationship between mental adjustment to cancer, coping, self-compassion, cognitive fusion and distress in cancer patients.

Thank you very much for sending all relevant documentation. I am pleased to confirm that the project is now registered with the NHS Grampian Research & Development Office. The project now has R & D Management Permission to proceed locally. This is based on the documents received from yourself and the relevant Approvals being in place.

All research with an NHS element is subject to the Research Governance Framework for Health and Community Care (2006, 2nd edition), and as Chief or Principal Investigator you should be fully committed to your responsibilities associated with this.

It is particularly important that you inform us when the study terminates.

The R&D Office must be notified immediately and any relevant documents forwarded to us if any of the following occur:

- A change of Principal Investigator, Chief Investigator or any additional research personnel
- Premature project termination
- Any amendments – substantial or non-substantial (particularly a study extension)
- Any change to funding or any additional funding

We hope the project goes well, and if you need any help or advice relating to your R&D Management Permission, please do not hesitate to contact the office.

Yours sincerely

A handwritten signature in black ink, appearing to read 'S. Ridge', with a long horizontal stroke extending to the right.

Susan Ridge
Non-Commercial Manager

Cc Dr Joy Eldridge, Quality Assurance Manager, NHS Grampian

NRES Committees – North of Scotland

Summerfield House
2 Eday Road
Aberdeen
AB15 6RE

Telephone: 01224 558474
Facsimile: 01224 558609
Email: nosres@nhs.net



27 July 2012

Miss Ashleigh K Stewart
Trainee Clinical Psychologist
NHS Grampian
C/o The Psycho-Oncology Service
Roxburghe House
Ashgrove Road
ABERDEEN
AB25 2ZH

Dear Miss Stewart

Study title: **Investigating the relationship between mental adjustment to cancer, coping, self-compassion, cognitive fusion and distress in cancer patients.**
REC reference: **12/NS/0080**

The Proportionate Review Sub-Committee of the NRES Committee – North of Scotland 2 reviewed the above application by correspondence.

Provisional opinion

The Sub-Committee would be content to give a favourable ethical opinion of the research, subject to the following changes being made to the documentation for study participants:

- The Proportionate Review Sub Committee had concerns over exactly who would be initially approaching patients to take part in the trial, as this may be a vulnerable time for individuals. Please confirm that this initial approach will only be made by members of the direct clinical care team.
- Recruitment will be dependant on clinic and ward staff identifying potential patients and the Proportionate Review Sub Committee had concerns, that as a result of the researcher's maternity leave, there may be a delay in the researcher becoming aware off, and responding to, any recruitment issues. Please comment.
- Please provide the Proportionate Review Sub Committee with details of how the study will be advertised on Face Book, providing relevant text and pictures where appropriate.
- The Sub Committee suggested that you may wish to re examine the timescale of the project. A questionnaire deadline of 31 May with a submission in August would only allow one month for data analyse and write up. Please comment.

- A43 – Please clarify it is the personal data that is being stored for only three months.
- The Proportionate Review Sub Committee had concerns that the time to complete the six questionnaires and the demographic sheet may have been underestimated at 20 – 30 minutes as there are a lot of questions to answer. Please comment.
- The Participant Information Sheet and contact sheet indicates that the researcher can be contacted through the department. Please confirm how this will operate during maternity leave and the role other staff members will play, if any, to assist.
- Please add a section to the Participant Information Sheet providing information on who participants can contact if they feel distressed.

When submitting your response, please send the revised documentation ***underlining or otherwise highlighting the changes you have made and giving revised version numbers and dates.***

Authority to consider your response and to confirm the final opinion on behalf of the Committee has been delegated to Dr Alex Johnstone.

Please let me know if you need any further clarification or would find it helpful to discuss the changes required with the lead reviewer.

The Committee will confirm the final ethical opinion within 7 days of receiving a full response.

Documents reviewed

The documents reviewed were:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Advertisement	2	17 July 2012
Investigator CV		17 July 2012
Letter of invitation to participant	3	14 July 2012
FACT-G (Version 4)	4	16 November 2007
Demographic Information	3	14 July 2012
Dr David Gillanders - CV		13 February 2012
Participant Information Sheet	4	17 July 2012
Protocol	4	17 July 2012
Questionnaire: Mini Mental Adjustment to Cancer Scale		20 July 2012
Questionnaire: Brief COPE		20 July 2012
Questionnaire: CFQ13		20 July 2012
Questionnaire: Self Compassion Scale		20 July 2012
Questionnaire: HAD Scale		20 July 2012
REC application	105174/344 862/1/997	19 July 2012*
Referees or other scientific critique report		06 April 2012

*date received

Membership of the Committee

The members of the Committee who were present at the meeting are listed on the attached sheet.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

12/NS/0080

Please quote this number on all correspondence

Yours sincerely



Dr Alex Johnstone
Chair

Enclosures:

List of names and professions of members who took part in the review

Copy to:

*Marianne Laird, University of Edinburgh
NHS Grampian R & D Department*

NRES Committees – North of Scotland 2**Attendance at PRS Sub-Committee of the REC meeting on 20 July 2012****Committee Members:**

<i>Name</i>	<i>Profession</i>	<i>Present</i>
Dr Alex Johnstone	Chair & Senior Scientist in Human Nutrition	Yes
Dr Jeremy Morse	Manager of Clinical Skills	Yes
Dr Ruth Stephenson	Vice Chair and Consultant in Anaesthesia	Yes

NRES Committees – North of Scotland

Summerfield House
2 Eday Road
Aberdeen
AB15 6RE

Telephone: 01224 558474
Facsimile: 01224 558609
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27 July 2012

Miss Ashleigh K Stewart
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- Please add a section to the Participant Information Sheet providing information on who participants can contact if they feel distressed.

When submitting your response, please send the revised documentation ***underlining or otherwise highlighting the changes you have made and giving revised version numbers and dates.***

Authority to consider your response and to confirm the final opinion on behalf of the Committee has been delegated to Dr Alex Johnstone.

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12/NS/0080

Please quote this number on all correspondence

Yours sincerely



Dr Alex Johnstone
Chair

Enclosures:

List of names and professions of members who took part in the review

Copy to:

*Marianne Laird, University of Edinburgh
NHS Grampian R & D Department*

NRES Committees – North of Scotland 2**Attendance at PRS Sub-Committee of the REC meeting on 20 July 2012****Committee Members:**

<i>Name</i>	<i>Profession</i>	<i>Present</i>
Dr Alex Johnstone	Chair & Senior Scientist in Human Nutrition	Yes
Dr Jeremy Morse	Manager of Clinical Skills	Yes
Dr Ruth Stephenson	Vice Chair and Consultant in Anaesthesia	Yes

Appendix E Participant Information



Ashleigh Stewart
Psycho-Oncology Service
Roxburghe House
Ashgrove Road
Aberdeen
AB25 2ZH

Dear Sir/ Madam

You are invited to take part in a research study which is designed to explore how people adjust to a diagnosis of cancer.

Your nurse specialist/oncology nurse or your psychologist was asked to speak to people they think would be suitable to take part in this study. Your name or contact details have not been given out and participation is entirely voluntary and anonymous. Should you decide NOT to participate in the study, this will have no effect on any of your treatment.

Or, you may have seen this study advertised, and be reading this after picking up a questionnaire pack at one of the local voluntary organisations supporting people with cancer.

For further information about this study please see the enclosed Research Participant Information Sheet. If you would like to find out more about the study before deciding to take part, you can contact the department on 01224 557080 or you can email me at: ashleigh.stewart2@nhs.net.

If you would like to take part in the study, please complete the questionnaires enclosed.

You can return the questionnaire pack in several ways:

- Hand it directly to your nurse specialist/oncology nurse or psychologist.
- Post it back using the enclosed pre-paid self-addressed envelope.
- Place it in one of the secure collection boxes located in the waiting area.

Thank you for taking the time to read this letter.

Yours faithfully
Ashleigh Stewart
Trainee Clinical Psychologist
University of Edinburgh



Research Participant Information Sheet (Version 5: 6th September 2012)

Study title: Investigating the relationship between mental adjustment to cancer, coping, self-compassion, cognitive fusion and distress in cancer patients

Invitation

You are being invited to participate in a study which aims to explore how people adjust to a diagnosis of cancer. It involves completing an anonymous survey which should take no longer than 20-30 minutes to complete.

Please take time to read the following information carefully. Please ask if there is anything that you are not clear about. You can ask the health professional who told you about the study or you can contact the researcher by email at: ashleigh.stewart2@nhs.net or on telephone 01224 557080 for more information.

What is the purpose of the study and why have I been chosen?

We are inviting anyone aged 18 or over who currently has a diagnosis of cancer to participate. We would like you to help us to explore how people adjust to a diagnosis of cancer, and how this relates to distress and quality of life. We hope to include over 100 people in this study.

Participation is voluntary. You are under no obligation to take part. Should you decide that you do NOT wish to take part this will not affect your treatment in any way.

What do I have to do to take part?

If you decide to take part, all you need to do is complete the set of questionnaires enclosed in this pack. The questionnaires should take approximately 20-30 minutes to complete.

You can submit your completed questionnaires in a number of ways:

- Hand them in to your nurse specialist/oncology nurse or your psychologist in the envelope provided.
- Post back using the self-addressed prepaid envelope provided.
- Post them (in a sealed envelope) into one of the collection boxes. These can be found in the waiting areas where you obtained the questionnaire pack or the Chemotherapy Ward at Aberdeen Royal Infirmary.

Your consent to participate will be assumed by the completion and submission of your questionnaires.

What are the possible risks of taking part?

We are not aware of any disadvantages or risks to taking part in this study. However, if completing the questionnaires leaves you feeling upset in anyway, please speak to your GP or oncology care team, or alternatively contact Dr Margaret McLean (Macmillan Consultant in Psycho-Oncology and clinical supervisor for the study) on 01224 557080. We have also provided a list of support agencies, should you wish to pursue further help or support.

What are the benefits of taking part?

By taking part in this research study you will contribute towards increasing our understanding of mental adjustment to cancer. This will improve our knowledge of how best to support individuals with cancer, which in the future may inform health professionals training and the development of support services for people with cancer.

Confidentiality

The study is anonymous. No personal information that could identify you will be collected.

What will happen to the results of the research study?

Once this study is complete at the end of August 2013, the findings will be published in an academic journal. They will also be presented at local and international conferences. They will be written up by the researcher, Ashleigh Stewart, in the form of a thesis, and be submitted in part fulfilment of a Doctorate in Clinical Psychology at the University of Edinburgh.

If you would like to receive a brief report outlining the main findings from the study, please provide your name, address and/or email address to the Department Secretary:

Mrs Lesley Walker
Department Secretary
Psycho-Oncology Service
Roxburghe House
Ashgrove Road
Aberdeen AB25 2ZH
t: 01224 557080
Email: lesley.walker@nhs.net

This information will not be passed on to the researcher. This ensures that your name is not linked in any way to your completed questionnaires and your privacy is protected. You can expect to receive this brief report by the end of November 2013.

Who has reviewed the study?

The University of Edinburgh Doctorate in Clinical Psychology Programme Ethics Committee and the North of Scotland Research Ethics Committee have reviewed this

study under the terms of the current Governance Arrangements for Research Ethics Committees (GfREC) in the UK.

Who can I contact if I need further information?

You can contact the researcher if you would like more information:

Ashleigh Stewart, Trainee Clinical Psychologist, Psycho-Oncology Service,
Roxburghe House, Ashgrove Road, Aberdeen, AB25 2ZH. Email:
ashleigh.stewart2@nhs.net. Telephone: 01224 557080.

Alternatively you can contact Dr Margaret McLean (clinical supervisor for the study)
on telephone: 01224 557080.

If you wish to make a complaint about the study please contact NHS Grampian:

Feedback Service
NHS Grampian
St Martin's House
181 Union Street
Aberdeen AB11 6BB
Tel: 0845 337 6338

Thank you for taking the time to read this information sheet.

*Deadline for submission of completed questionnaires: **no later than 31 May 2013**

Contact details:

Ashleigh Stewart
Trainee Clinical Psychologist
University of Edinburgh
Psycho-Oncology Service
Roxburghe House
Aberdeen
AB25 2ZH
Email: ashleigh.stewart2@nhs.net

Supervised by:

Dr Margaret McLean
Macmillan Consultant in Psycho-Oncology
Acting Head of Psychology Specialisms
Psycho-Oncology Service
Roxburghe House
Ashgrove Road
Aberdeen AB25 2ZH
Email: Margaret.mclean@nhs.net

Dr David Gillanders

University of Edinburgh
Email: david.gillanders@ed.ac.uk

DETAILS OF SOME CANCER SUPPORT AGENCIES
(This is not an exhaustive list)

If you are concerned that you may need support around your own emotional well-being please contact your GP or for advice about yourself or someone else you can call NHS direct on 0845 4647 or visit: www.nhsdirect.nhs.uk.

Macmillan Cancer Support

If you have any questions about cancer, need support or just someone to talk to, call free, Monday to Friday 9am-8pm (interpretation service available).

Te: 0808 808 00 00

Web: www.macmillan.org.uk

UCAN

Urological cancer charity. UCAN has launched a web forum for people affected by urological cancers and living in north-east Scotland. This partnership with NHS Grampian is the latest addition to the package of support that patients and their families receive.

www.ucanhelp/forum

UCAN's Cancer Care Centre

Patient support centre providing newly diagnosed urological cancer patients with clear information and guidance.

Ward 44, Aberdeen Royal Infirmary. Opening hours: Monday - Friday 9am 'till 5pm. 1st Saturday of every month 2pm 'till 5pm

Tel: 01224 550333

CLAN

An independent charity based in Aberdeen and covers the whole of Grampian, Orkney and Shetland. For anyone affected by any type of cancer at any time from diagnosis onwards.

Tel: 01224 647000

Support: 0330 440 2526

email: enquiries@clanhouse.org

Web: www.clanhouse.org

Maggie's Cancer Caring Centres

For anyone affected by cancer. Locations in Edinburgh, Glasgow, Dundee, Highlands, Fife, Lanarkshire, London, Oxford, Cheltenham, Nottingham, South West Wales, Hong Kong. They also have an online centre.

Web: www.maggiescentres.org

Tel: 0300 123 1801

email: enquiries@maggiescentres.org

Cancer Support Scotland

Provides talking therapies, complementary therapies, and a network of support groups for anyone affected by cancer

Tel: 0141 211 0122

Web: www.cancersupportscotland.org

Breast Cancer Care

Offers practical advice, information and support to women concerned about breast cancer.

Tel: 020 7384 2984

Nationwide Freeline: 0808 800 6000 (Mon – Fri 10am – 5pm)

Scottish Information Line: 0141 221 9499

Email: info@breastcancercare.org.uk

The Leukaemia Care Society

Provides care and support to all those affected by Leukaemia, lymphoma, myeloma and the allied blood disorders.

Helpline: 08088 010 444

Tel: 01905 755977

Website: www.leukaemiacare.org

email: enquiries@leukemiacare.org.uk

Prostate Cancer Charity

Helpline: 0845 300 8383 (Mon-Fri 9.00 am – 5.00 pm)

E-mail: info@prostate-cancer.org.uk

Freephone: 0800 783 7922

Website: www.prostate-cancer.org.uk

Samaritans (24 hour phonenumber)

Tel: 08457909090

Web: www.samaritans.org

Breathing Space (Mon-Thurs 6pm-2am, Fri 6pm-Mon 6am)

Tel: 0800 83 85 87

Web: www.breathingspacescotland.co.uk

NHS 24 (24 hour phonenumber)

Tel: 08454 24 24 24

Appendix F: Preliminary Statistical Analyses

Missing Data

Overall there was 2.5% missing data. Downey & King (1998) have suggested a cut off of 20% as an acceptable level of missing data for likert-type scales. 6 participants had more than 20% missing data across all the variables and so the data for these participants was removed at the first stage, representing 1.9% of the missing data overall (Downey & King, 1998). This left a remaining 0.6% missing data. 0.3% of the missing data constituted 5% or less per participant. These missing data points were prorated based on participants' scores for other items on each subscale for each respective measure. Finally there remained 0.3% of missing data overall. Two participants failed to complete the CFQ, two completed one side of the Mini MAC measure and one participant completed one side of the FACT-G measure. These represented less than 10% missing data for each of the five participants. Therefore the total scores for these measures was estimated using Expectation Maximisation. In summary, 0.6% of the data was estimated using imputation techniques.

There do not appear to be any clear guidelines regarding the proportion of missing data that is acceptable. Schafer (1999) suggests that less than 5% is of little concern whereas Bennett (2001) suggests less than 10%. Cohen and Cohen (1983) recommend up to 10% is an acceptable level. Tabachnick and Fidell (2006) assert that the pattern of missing data is more important.

A missing data analysis was conducted in order to identify the pattern of missing data and to select an appropriate method of imputation. The results of Little's

MCAR test confirmed that the data was missing completely at random (MCAR) for all variables.

Little's MCAR test: Chi-Square = 158.825, $DF = 143$, $p = .173$

Expectation Maximisation (EM) is a statistically efficient method for handling missing data which uses an iterative process to produce estimated values with acceptable standard errors (Ruud, 1991). It is also an appropriate method to use when the data is missing completely at random. This approach was chosen over alternative options such as listwise deletion and mean imputation, which are known to cause problems such as a loss of statistical power and statistical bias. EM was applied to the remaining missing data and final scores were calculated.

Outliers and influential cases

A small number of outliers were apparent from inspection of the histograms and box and whisker plots. Most fell within the upper and lower tails of the distribution curves and therefore were not considered to be deviating significantly from the mean. In order to confirm this z-scores were inspected.

Tabachnick and Fidell (2007) suggest that a standardized score (z-score) greater than 3.29 standard deviations from the mean represents an outlier. Two outliers were detected with z-scores greater than 3.29 and four outliers with z-score values of ± 3 on different variables. Examination of histograms also indicated that these outliers may be having an impact on the normality of the distribution. In order to reduce the influence of these values, improve normality of the distributions and avoid reducing the power of the analyses, these cases were windzorised.

ASSUMPTIONS OF PARAMETRICITY

Normality

Histograms and P-P plots were visually inspected to assess for normality. Z-scores were calculated and an absolute value of 2.58 was used to indicate significant skew and kurtosis (Field, 2009). Transformations were carried out according to the direction of skew indicated (Tabachnick & Fidell, 1989). See Table B.3 below for calculated z-scores and subsequent transformations.

Table B.3 Variable transformations

Variable	Visual of Histogram / Q-Q plot	Untransformed Data	Method	Transformed Data	Conclusion
		z-scores Skew / Kurtosis		z-scores Skew / Kurtosis	
Mini-MAC HH	+ skew	2.97 / 1.06	Square root	2.14 / 1.83	Normal
Mini-MAC FS	Normal	0.96 / 0.42	-	-	Normal
Mini-MAC AP	Normal	0.70 / 1.12	-	-	Normal
Mini-MAC F	Normal	0.09 / 0.45	-	-	Normal
Mini-MAC CA	Normal	0.15 / 0.35	-	-	Normal
Brief-COPE PFC	Normal	1.42 / 0.09	-	-	Normal
Brief-COPE AEC	Normal	0.07 / 0.80	-	-	Normal
Brief-COPE EAC	+ skew	2.70 / 0.57	Square root	1.71 / 1.22	Normal
SCS	Normal	1.43 / 0.66	-	-	Normal
CFQ	+ skew	2.69 / 1.15	Square root	1.11 / 1.97	Normal
HADS	+ skew	2.92 / 0.94	Square root	0.89 / 0.92	Normal
FACT-G	- skew *	1.14 / 2.10	-	-	Normal

Mini MAC HH - Helplessness-Hopelessness; **Mini MAC FS**: Fighting Spirit; **Mini MAC AP**: Anxious Preoccupation; **Mini MAC F**: Fatalism; **Mini MAC CA**: Cognitive Avoidance; **Brief COPE PFC**: Problem-Focused Coping; **Brief COPE AEC**: Active Emotional Coping; **Brief COPE EAC**: Emotional Avoidance Coping; **SCS**: Self-Compassion Scale; **CFQ**: Cognitive Fusion Questionnaire; **HADS**: Hospital and Anxiety Scale; **FACT-G**: Functional Assessment of Cancer Therapy – General

* FACT-G looked slightly negatively skewed on visual inspection of the histogram, however the z-scores for skewness and kurtosis were within limits and so this variable was not transformed.

Multicollinearity

Another assumption of parametric tests is multicollinearity, which refers to the level of correlation between variables. If two variables correlate very highly (above $r=.9$) then multicollinearity is said to exist. Pearson's correlation coefficients were examined for all predictor variables. The strongest correlation was $r= .78$. This was below the $r > .9$ level considered to be problematic for a regression analysis (Field, 2009). This was further supported by the variance inflation factor (VIF) which was no more than 3.3; and tolerance statistics which were all .296 or above. (Myers, 1990; Menard, 1995). This confirmed that the assumption of no multicollinearity was met.

Linearity and Homoscedasticity

Examination of Standardized residual plots indicated that the assumptions of linearity were met. Durbin Watson statistics were close to 2 suggesting that the assumption of homogeneity of variance was met.

Appendix G: Covariate Analyses

Gender differences

Independent samples *t*-tests indicated that women were more likely to report higher scores for distress (HADS) ($M=3.18$, $SE=.183$) than men ($M=2.80$, $SE=.163$). This difference was not significant $t(104)=-1.526$, $p=.130$. These results are consistent with previous research suggesting that women tend to report more distress than men (Revenson 2003; Tunistra *et al.*, 2004) and also consistent with previous research indicating that gender is not a significant predictor of distress (Hulbert-Williams *et al.*, 2012) in a cancer population. Gender was therefore not controlled for in the regression analyses.

In terms of quality of life, independent samples *t*-tests indicated that men were more likely to report higher scores for quality of life (FACT-G) ($M=83.41$, $SE=2.075$) than women ($M=80.24$, $SE=2.508$). This difference was not significant $t(104)=.982$, $p=.328$ and is consistent with previous research (Furzer *et al.*, 2013; Holzner *et al.*, 2004; Janda, DiSipio, Hurst, Chella & Newman, 2009).

Marital status

Independent samples *t*-tests were conducted to explore whether there were differences in terms of distress or quality of life for those in a relationship and those who are single, divorced or widowed. Those in a relationship reported slightly higher rates of distress ($M=2.99$, $SD=1.211$) than those not in a relationship ($M=2.90$, $SD=1.441$). This difference was not significant $t(101)=-.317$, $p=.752$. In terms of quality of life, participants in a relationship reported better quality of life ($M=82.68$, $SD=15.876$) than those not in a relationship ($M=79.50$, $SD=18.618$). This difference was not significant $t(101)=-.813$, $p=.418$. These results were consistent with previous research (Giese-Davis *et al.*, 2012; Hulbert-Williams *et al.*, 2012; Terrell *et al.*, 2004).

Age

Independent samples *t*-tests were conducted to explore whether there were differences in terms of older (60+ years) and younger (18-59 years) participants in

terms of distress and quality of life. Participants in the younger age group reported higher levels of distress ($M=3.13$, $SD=1.354$) than those in the older age group ($M=2.87$, $SD=1.199$), however this difference was not significant ($t(104)=1.053$, $p=.295$). In terms of quality of life, participants in the older age group reported better quality of life ($M=82.83$, $SD=15.954$) than participants in the younger age group ($M=80.62$, $SD=17.519$), however this difference was not significant ($t(104) = -.668$, $p=.505$). This is consistent with previous research (eg. Alter *et al.*, 1996; Epping-Jordan *et al.*, 1999; Osborne, Elsworth & Hopper, 2003) although not consistent with studies by Hulbert-Williams *et al.*, (2012) and van't Spiker *et al.*, (1997) who found that older patients tend to experience less distress than younger patients.

Cancer Type

A one-way ANOVA found a significant association between cancer type and distress ($F_{3,102} = 3.878$, $p = .011$.) Post hoc multiple comparison Scheffé tests revealed statistically significant differences between urological cancer ($M=2.54$; $SD=1.247$) and miscellaneous cancers ($M=3.70$; $SD=.995$). This showed that participants in the miscellaneous cancers group reported significantly higher levels of distress compared to those in the urological cancer group with a medium effect size ($r=.46$). There were no other significant differences between cancer groups and distress levels.

A second one-way ANOVA was conducted to examine the associations between cancer type and quality of life. The assumption of homogeneity of variances was violated (*Levene's F* test $p=.012$) and so *Welch's F* test is reported. *Welch's F*(3,50.23)=7.009, $p<.001$. This indicates that participants in the miscellaneous cancers group ($M=71.78$; $SD=10.95$) reported significantly lower quality of life compared to the urological cancer group ($M=87.18$; $SD=14.19$), with a large effect size ($r=.52$). There were no other significant differences between cancer groups and quality of life. These results are consistent with previous research, which suggests

that cancer type is usually modestly associated with distress, and lung and pancreatic cancer patients are likely to report higher levels of distress and lower quality of life (Carlson, Waller & Mitchell, 2012).

Appendix H: Diagnostics

Generalisation and Cross-validity

In order to assess the accuracy of the model and whether it can be generalized to other samples the difference between the adjusted R^2 and R^2 was examined. This difference was small which suggests that the current model demonstrates a small loss of predictive power. However this method is derived from Wherry's equation and has been criticized as it cannot tell us how reliable the regression model is when using a different sample, i.e. its cross-validity (Field, 2009). Stein's formula was used to assess the cross-validity of the HADS model. This found that the adjusted R^2 (.187) was close to the observed R^2 (.294) and therefore we can assume that the HADS model is generalizable beyond the current sample.

The difference between the adjusted R^2 and R^2 was small (.028) for the FACT model and therefore we can assume that the model is generalizable beyond the current sample. Stein's formula established that the adjusted R^2 (0.456) was reasonably close to the observed R^2 (0.523) and so we can assume that the cross-validity of the model is good and the model would generalize well.

Outliers

Cook's distance was examined for each model in order to measure the overall influence of individual cases in the model. For both models Cook's distance was well below 1 (Cook & Weisberg, 1982) indicating that no cases were exerting any

undue influence on the model parameters. Mahalanobis distances were also within acceptable limits.

In order to establish how well the models fitted the data and to identify whether there were any influential cases the standardised residuals were examined for both hierarchical multiple regression models. Field (2009) suggests that no more than 5% of cases should have absolute values of ± 2 (or 1.96). Tabachnick and Fidell (2006) define outliers as cases with a standardised residual with an absolute value greater than 3.3. For the HADS regression model less than 3 per cent of cases had an absolute value greater than 1.96 and none were greater than 3.3. This suggests that the level of error within the first model was acceptable.

For the FACT regression model less than 4 per cent of cases had an absolute value greater than 1.96 and none were greater than 3.3. This suggests that the level of error within the second model was also acceptable.

The standardized DFFit values, leverage and covariance ratios were also examined. Although a small number of cases had values close to the various cut off points, it was concluded that these cases were not having a significant influence on the models.

The DFFit value is the difference between the value predicted for a case when that case is included in the model and when the case is excluded. The standardized DFFit values were examined. As a general 'rule of thumb' values greater than 2 are

considered to represent influential cases (Chatterjee and Hadi 1986). No values exceeded this value confirming that there were no influential cases.

Leverage is a measure of the influence of the observed value of the outcome variable over the predicted values. In order to assess the leverage first the average is calculated. Stevens (2002) suggests that cases which are three times the average leverage may be having an influence on the regression model. There were no such cases in the HADS analysis. Three cases in the FACT analyses had a leverage value very slightly above the cut off, and so it was decided that these values were not exerting any undue influence over the model.

The Covariance Ratio is another measure of influence. According to Belsey, Kuh and Welsch (1980) if the CVR is greater than $1 + [3(k+1)/n]$ (where k is the number of predictor variables and n is the sample size) then deleting that case could result in less precision in model parameters. If the CVR is less than $1 - [3(k+1)/n]$ then deleting the influential case may actually improve the precision of parameters. A number of cases fell outside of these limits however all values were very close to the criteria and given that Cook's Distance was well below the value of 1 it was decided that these cases were not significantly influencing the regression model.

Assumptions of multiple regression

The regression models were finally assessed to confirm that the assumptions of multiple regression had been met. Examination of the Standardized residual plots indicated that the FACT-G was normally distributed and also met assumptions of

homoscedasticity and linearity. The HADS showed a normally distributed histogram although slightly kurtotic at values around the mean. The normal probability plot was mostly normal, with a very slight skew, but was considered to meet the assumption of homoscedasticity and linearity. There was no multicollinearity and this was supported by VIF and tolerance statistics. Homogeneity of variance was tested with the Durbin Watson statistic. Field (2009) suggests that values close to 2, as a general rule of thumb, indicate independence of errors. For the FACT model this was 2.120 and for the HADS model 1.850. This suggests that the assumption of homogeneity of variance was met.