



Coping and Its Relation to Gender, Anxiety, Depression, Fatigue, Cognitive Difficulties and Somatic Symptoms

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Authors' contributions

This research was carried out as collaboration between the authors. Both authors designed the study, author GM collected the data and performed the statistical analysis. Both authors wrote the drafts of the manuscript. They both read and approved the final manuscript.

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ABSTRACT

Background: The first aim of this study was to analyse the structure of coping and to develop a measuring instrument to be used in future work. A second aim was to examine associations between coping scores and negative outcomes (anxiety, depression, fatigue, cognitive difficulties and somatic symptoms). Finally, gender differences in coping with workplace events were examined, as were the relationships between gender and subjective health outcomes.

Methodology: A survey of a sample of 240 adults from the South Wales area was conducted at one-time point only. The questionnaire included a factor analysed version of the Ways of Coping Checklist (WCCL) as well as scales measuring anxiety, depression, fatigue, cognitive difficulties and somatic symptoms.

Results: Results showed that negative coping styles significantly predicted negative health outcomes, and positive coping styles predicted fewer negative outcomes. No significant differences were found for health outcomes between men and women, but women were significantly more likely to use self-blame and wishful thinking coping.

Conclusion: This study demonstrated that coping styles are associated with wellbeing outcomes.

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Further research should use more independent variables, such as workplace and individual characteristics, to explain more of the variance in health outcomes than just that explained by coping styles alone.

Keywords: Coping; positive coping; negative coping; gender; cognitive difficulties; somatic symptoms; fatigue; anxiety; depression.

1. INTRODUCTION

Many researchers in the areas of health psychology and occupational psychology consider coping to be a central process in the relationship between stressors and health outcomes [1] and interest has been growing since the beginning of the 1980s in coping processes and their role in mental health [2]. Coping is thought to be particularly instrumental in the aetiology of depression [3] which is an affective mood disorder characterised by feelings of hopelessness, anxiety, despair, low self-worth, negative future predictions, lack of energy, and many other symptoms [4]. Tennant has suggested that depression is the most likely of all psychological outcomes that can occur from exposure to work stress [5].

Depression, anxiety, and fatigue, along with many other stress-related negative health problems are issues of increasing concern today. A National Mental Health Association (NMHA) survey in the USA [6] found that depression was the third most common problem faced by workplace Employee Assistance Programmes. It reports that depression is also the third most expensive workplace-related health problem in the USA, with costs of over \$47 billion a year, and 200 million working days lost in absence behaviour, due to stress-related depression. This equates to a national average cost of \$600 per employee.

1.1 The Measurement and Structure of Coping

The work of Folkman and Lazarus [7] has been particularly germane in providing a framework for the study of coping. As has been previously discussed, coping behaviours have been characterised as cognitive or behavioural efforts to manage, reduce, minimise, master, or tolerate, events that individuals perceive as dangerous, threatening, or exceeding personal resources [3]. The application of coping strategies to a situation does not necessarily imply successful or adaptive behaviours, indeed certain coping behaviours may be maladaptive and can

lead to other significant long-term problems, for example avoidance coping through counterproductive means such as through alcohol or drug use [8].

Briner, Harris, and Daniels [9] state that if coping efforts "worked", the potential strain is reduced or removed. However, if threatening situations are not dealt with, due to inability to cope successfully (e.g. from lack of skills, resources or experience) then this is likely to lead to "stress scenarios" and negative health outcomes [10]. These could include depression, increased incidence of heart disease, gastrointestinal problems, anxiety, burnout, fatigue, musculoskeletal disorders, accidents, substance misuse, as well as consequences for work-life balance issues, and problems for employers, such as absence, turnover, and lack of organisational commitment [11].

Much research on coping focuses on the functional architecture of coping [12] where individuals are assumed to have access to a repertoire of coping options, which they assess during secondary appraisal. The assessment of coping often uses self-reports and the ways of coping checklist (WCCL: [13]) is a common measure, which uses 66 items that assess the frequency of endorsement of a variety of coping behaviours. Such measures can be used to assess situational coping (by focusing on a particular event) or dispositional coping (by focusing on general cross-situational coping). Correlations between these two are generally modest, supporting the view that different situations can give rise to dynamic behaviours, however Folkman and colleagues [3] imply that both appraisal and coping mechanisms are stable over time across similar situations.

Folkman and Lazarus [14] proposed that coping could take one of two major forms: efforts designed to target the problems underlying distress (problem-focused coping) such as by making plans of action, taking things one step at a time, focusing on the problem etc.; and those efforts aimed at regulating emotional states (emotion-focused coping) such as seeking

sympathy, becoming angry etc. Folkman and Lazarus [14] proposed that problem-focused behaviours are more adaptive in situations amenable to change, and emotion-focused behaviours are more effective when there is no opportunity for change, although too much emotion-focused coping could also be counterproductive.

1.2 Coping and Depression

Folkman and Lazarus [14] thought coping to be particularly instrumental in the aetiology of depression and much research has found evidence that different coping styles often strongly correlate with differing levels of depression [15]. For example, Whately, Foreman, and Richards [16] found that problem-focused coping behaviours were associated with significantly lower anxiety and depression scores in students at two time periods, and emotion-focused coping associated with significantly increased anxiety and depression, and increased scores on a trait anger measure. Zeidner [17] found that emotion-focused coping significantly predicted anxiety during university finals, and those with less active coping behaviours showed higher levels of depression, and Haghighatgou and Peterson [18] found similar results in a sample of Iranian students. Lease [19] found that avoidance coping significantly predicted role stress in academics. Welbourne, Eggerth, Hartley, Andrew, and Sanchez [20] found that problem-solving coping were associated with increased job satisfaction, and finally, Diong, Bishop, Enklemann, Tong, Why, Ang, and Khader [21] found that stress experience was associated with avoidance and re-appraisal coping.

However, as stated by Cooper et al. [22] there are inconsistencies in the findings of coping research, for example, research by Biggam, Power, and Macdonald [23] showed no relationship between methods of coping and psychological distress in a sample of Scottish police officers. Torkelson and Muhonen [24] found that there was no relation between problem-focused coping and health, and that the emotion-focused strategy of seeking emotional support associated with fewer health problems in male and female managers. Finally, Carver and Scheier [25] found that knowledge of coping styles did not predict levels of future distress in students faced with exam stress.

Despite Lazarus and Folkman's [26] assertion that problem-focused coping is more adaptive

when the situation is amenable to change, and emotion-focused when it isn't, as well as claims by Cox and Ferguson [12] that coping is multidimensional and situation specific, much dispositional research has found that individuals may tend to deal using a limited number of behaviours across situations (even when these are maladaptive).

1.3 Gender Differences in Depression

One significant trend that has been found in many areas of clinical research is the finding that females appear to be significantly more likely than males to suffer from depression [27]. Nolen-Hoeksema [28] reports that in a national institute of the mental health study of 1980, of the 10.2% who had diagnosable depressive symptoms, 70% were female, and in another major study in 1996, 76% of all sick days taken for depression at work were made by women.

Data from the USA, Australia, Britain, Germany, and Israel show females to be around twice as likely to suffer from depression, which is also reflected in the ratio of attempted suicides, where women are up to twice as likely to attempt suicide as men [28]. Nolen-Hoeksema [28] states that these differences "are accepted as absolute truth by most mental health practitioners". Sowa and Lustman compared the differences between the self-rated depression scores on the Beck Depression Inventory [29] for 140 male and female college students and found that women scored significantly higher on depression and rated stressful life events as having the most severe and negative impact.

However, not all studies report increased levels of depression for females. For example, McDermott et al. [30] found that there were high levels of depression in university students, but no overall differences between men and women, despite the fact that women scored higher on the "depressed affect" section of the scales, which were characterised by feelings of loneliness, sadness, and inability to "shake off the blues". Also, Nolan and Wilson [31] and King and Buchwald [32] found no overall differences in depression between men and women.

Nevertheless, McNee [cited in 33], states that "Depression is the number one barrier women face in the workplace" and that depression is a far more significant obstruction to professional success than childcare responsibility, pregnancy,

and sexual harassment. However, McNee [33] reports that despite the high incidence of depression in women, fewer than half of depressed women seek help, and many are worried about being stigmatised, appearing weak, or losing their jobs.

Psychosocial factors are vital in the aetiology of work stress and social and workplace stressors are likely to be different for men and women. Such stressors can include life events, workplace discrimination, role conflict, and socioeconomic differences such as education level, income, and poverty [15].

Women are more likely to suffer from multiple competing roles, such as mother, worker, wife, etc., and women are thus more likely to experience work-family balance and role issues [34]. Women are also more likely to prefer home-based social supports, and men to use work-based social support [35]. Women may also face socioeconomic disadvantage and discrimination at work. For example, Brems [34] states that 46% of single parent women are below the poverty line in the USA, and women have lower levels of education and lower incomes for the same job and educational level.

The Demand-Control-Support model (DCS: [36]) emphasises the importance of control at work, and Snow et al. [37] note that women are often likely to be employed in lower status jobs, and therefore have less control over their work. Also, Sowa and Lustman [27] found evidence that stressors had a more pronounced, long-lasting and negative impact upon women so that if men and women suffer similarly stressful life-events, women would be more likely to become depressed.

1.4 Gender Differences in Coping

In addition to the potentially different psychosocial stressors faced, there is also evidence that men and women may attempt to cope with stressors in different ways. For example, research by many authors has shown that women are more likely to exhibit an emotion-focused approach to stress and men are more likely to show a problem-focused approach [34]. This was found by Zeidner [17] in students trying to cope with exam stress, by Whately et al. [16] and by Haghaghian and Peterson [18], and as stated above, there is evidence that problem-focused styles are likely to correlate with better mental health outcomes than emotion-focused

coping, particularly depression. Brems and Johnson [38] also found that coping strategies were not just related to biological sex, but were shown to correlate with gender role score on the Bem Sex Role Inventory [38].

Butler and Nolen-Hoeksema (as cited in [39]) state that there may not be gender differences in initial levels of depression, but that different styles of responding give rise to varying levels of measured depression. They suggested that men may employ distracting forms to divert attention from their depressed mood, for example by working on hobbies and playing sports. In contrast, women were observed to have a ruminative style, that involves brooding and worrying, which serves to prolong and intensify the feelings of depression.

Portello & Long [40] found that women managers were more likely to see threats at work (suggesting differences in appraisal mechanisms, or a mediating effect of sex on appraisal) and to use disengagement coping when threatened, and Narayanan, Shanker, & Spector [41] claim that women were more likely to base esteem on interpersonal relations and are thus more vulnerable to organisational conflict. Vagg, Spielberger, and Wasala [42] found that women were most distressed by increased responsibility, inadequate salaries, and reduced personal time, and men were most distressed by lack of power and participation, conflicts, and interruptions.

Klag and Bradley [43] suggested that coping could mediate the relationship between hardiness and health in both sexes, and that hardiness was a more effective buffer in men than women against stress and ill health. Negative attributional behaviours which often correlate with depression have also been found to be more likely exhibited by women than men [34,44].

Jick and Mitz [45] claim that there is evidence for a moderating role of biological sex on health outcomes, but that more research needs to be done on the moderating effect of sex on the stressor-strain relationship. Jick and Mitz [45] state that while men, on the whole, may possess better psychological attributes and more adaptive coping repertoires, the research literature is biased against women, because emotion-focused coping is typically seen as a negative and "female" method of coping, that perpetuates the stereotype that women deviate

from the normal and healthy "male" types of coping.

1.5 Alternative Coping Conceptualisations

Despite the fact that the popularity of the problem-focused/emotion-focused distinction in coping behaviours as initially proposed by Folkman and Lazarus [14], this classification has been criticised by many as being too simplistic. These factors are derived by aggregating a large number of different coping behaviours into mean scores, which Dewe and Guest [46] state is too narrow and loses much of the essence of coping. Carver, Scheier and Weintraub [2] state that stressors often elicit both emotion-focused and problem-focused coping, and that emotion focused items involve too wide a range of responses (such as seeking social support, denial, the reinterpretation of events, etc.) to be captured in one single factor.

Several authors have created coping scales with a more complex structure than the WCCL's 2-factor model. Carver et al. [2] designed the COPE scale, which is influenced by the WCCL, and contains the factors of problem-focused coping, emotion-focused coping, venting of emotions, and behavioural and mental disengagement. Cox and Ferguson [12] support the multifactorial nature of coping, and state that dealing is far more multidimensional and situation specific than is suggested by the PFC/EFC distinction. Vitaliano, Russo, Carr, Maiuro, and Becker [47] analysed the psychometric properties of the original WCCL [12] and then developed a revised 42-item version, which had significantly better psychometric properties, with coping style scales based on the sub-factors of problem-focused coping, seeking social support, blamed self, wishful thinking, and avoidance. Falkum, Olff, and Aasland [1] developed a slightly different scale using Vitaliano et al.'s [47] revised 42 items of the original WCCL. They derived a six-factor structure, where problem-focused coping was split into three factors of action-oriented coping, accommodation, and positive thinking, with the seeking support and self-blame factors retained, and with wishful thinking and avoidance collapsed into one defence factor.

Dewe and Guest [46] claim that even with the massive amount of research into coping, it is a poorly defined construct, our measurement techniques are inadequate, we know too little

about the coping strategies people use, and there is still far too little empirical evidence on the effect of coping, particularly in work situations. Dewe [48] also claims that coping classifications should reflect what value the person gives to dealing behaviours and what they are thinking and doing, rather than the values others give to coping. Carver and Scheier [25] state that much research provides evidence about what types of dealing lead to adverse outcomes, but less research gives evidence on which types of coping facilitate good outcomes.

Briner, Harris, and Daniels [9] state that our existing knowledge is still partial, and much coping research contributes little to our understanding. Dewe and Guest [46] suggest that the study of coping is difficult, because by nature coping is internal, and may often not be measurable other than by self-report, with reliability and validity consequences.

1.6 Aims and Objectives

This study aimed to compare men and women on a range of coping and mental-health related factors, to find out more about the structure of coping, and to use a variety of analysis techniques, including correlation, factor analysis, ANOVA, and multiple regression.

Following Vitaliano et al. [47] a factor analysis of the revised 42-items from the WCCL was carried out, to see how many coping style factors are an excellent match to the sample used, as well as how these relate to health outcomes. Also, men and women were compared for their self-reported coping styles for stressful workplace events, and their scores for anxiety, depression, cognitive difficulties, somatic symptoms, and fatigue. These outcome measures were used to determine whether effects of coping were specific or generalised across different types of sign.

1.7 Hypotheses

Based on the literature reviewed in the introduction, some specific hypotheses were tested.

Hypothesis 1: The first hypothesis predicted that there would be a significant difference between the scores of men and women on the Hospital Anxiety and Depression scale (HAD) where women would report more symptoms of anxiety and depression. The hypothesis also predicted that men and women would say significantly

different levels of fatigue, cognitive difficulties, and somatic symptoms (from the PFRS scale).

Hypothesis 2: The second hypothesis predicted that self-rated coping styles for stressful workplace events, as derived from an exploratory factor analysis of the WCCL, would differ significantly in endorsement between men and women.

Hypothesis 3: The third hypothesis predicted that (assuming the factor analysis derives factors similar to those found by [47]) that “positive” coping styles such as positive thinking, problem solving, planning action, and seeking advice/support would be related to lower levels of negative mental health outcomes, and that “negative” coping behaviours, such as self-blame, escape-avoidance, or wishful thinking would be related to higher adverse mental health outcomes.

Hypothesis 4: The final hypothesis predicted that coping styles and gender would account for a significant percentage of the variance in predicting the various mental health outcomes.

2. METHODS

2.1 Participants

An a-priori power analysis was conducted using Gpower software [49] which showed that using a significance level of .05, and assuming a medium effect size of .5, at least 174 subjects would be required for an experimental power of 0.95. The participants used in this survey were 240 adults ($M = 38.56$ years, $SD = 6.47$) who responded to flyers distributed at primary schools in the Cardiff area, requesting (adult) participants for a study on mental health and coping. All those who volunteered participated in the study. They were 104 men ($M = 39.95$ years, $SD = 6.53$) and 136 women ($M = 37.49$ years, $SD = 6.25$) and were from a variety of socio-economic and racial groups. Participants were informed as to the purposes of the experiment and were told that they did not have to answer any questions they did not want to, and could withdraw from the experiment at any time. Participants were also told that their responses would be kept anonymously.

2.2 Materials

The Revised Ways of Coping Checklist [47] is a 42-item scale based on the 66 item WCCL by

[13] that has five subscales, measuring Problem-focused coping, Blamed Self, Wishful Thinking, Seeks Social Support, and Avoidance coping styles. Due to several different derived factor-structures for the WCCL in the literature, for this study, the 42 items were factor analysed using principal component analysis with varimax rotation. A five-factor solution was found to be the best fit to the data with two items removed as they did not load actively onto any factor. A detailed description of the results and procedure of the factor analysis can be found in the results section. The five elements derived were labelled as: Wishful Thinking; Problem-Focused Coping; Escape/Avoidance; Seek Advice and Support; and Self Blame. These factors were therefore very similar in structure to those derived by [50] but with the removal of two items.

For completion of the coping checklist, participants were asked to think of some recent stressful work experiences (or if they couldn't handle then other life situations) and then to indicate the extent to which they had used each of the suggested coping behaviours. Responses were made in the same format as in [50] with participants stating responses on a 4-point Likert scale. A score of 0 indicated “used not at all”, 1 indicated “used sometimes”, 2 indicated “used often”, and a score of 3 indicated “used all the time”. Sample items included “I just took things one step at a time”, “Made a plan of action and followed it”, and “Realised you brought the problem on yourself”. Mean scores for each factor were calculated, with a higher score indicating a greater tendency to use that coping style. The factor structure of the scales used in the current analysis were determined by factor analysis (see section 4.6.1). Derived scale internal consistency was good for all subscales, with Cronbach α scores calculated as .81 for Problem-focused coping, .79 for Seek advice, .81 for Self-Blame, .89 for Wishful thinking, and .79 for Escape/Avoidance.

The hospital anxiety and depression scale (HADS: [50]) is a 14-item scale that measures self-reported anxiety and depression. Developed for use in hospital staff, it has also shown good validity in other populations [51]. Fourteen mood-related descriptions are presented, with seven measuring anxiety, and seven measuring depression. Participants are asked to review the items and indicate on a 4-point Likert scale the extent to which they have been feeling in the previous week, with responses ranging from “not at all” (a score of 0) to “nearly all the time” (a

score of 3). Example items include "Worrying thoughts go through my head" and "I feel cheerful". Scores are summed from items for each sub factor, with final anxiety and depression scores ranging from 0-21. Scores of 11 or more were considered by [51] to be high enough to be of clinical significance, indicating that the individual may require clinical treatment for anxiety or depression. Cronbach α scores were found to be .81 for the anxiety subscale, and .83 for depression.

The Profile of Fatigue-Related Symptoms Questionnaire (PFRS: [52]) is a 54 item scale that measures four factors of cognitive difficulties (e.g. slowness of thought, difficulty concentrating), fatigue (physically tired), somatic symptoms (pain, etc.), and emotional distress (which was not used). Fifty-four signs are presented, and participants are asked to rate on a 7-point Likert scale the extent to which they have experienced each in the past seven days. A score of 0 indicates "not at all" up to a score of 6 which indicates "extremely". Sample items include "Feeling tense", "Being irritable", and "Stomach pain". Scores were summed for each subscale with final scores for each factor being converted into percentages. Reliability scores were calculated as .74 for cognitive difficulties, .78 for fatigue, and .71 for somatic symptoms. The emotional distress factor was not included as a dependent variable due to its conceptual similarity to both anxiety and depression.

2.3 Procedure

This study was carried out with the approval of the Ethics Committee, School of Psychology, Cardiff University, and with the informed consent of the participants. After recruitment participants were given an instruction sheet outlining the purposes of the study and assuring confidentiality of responses. Participants were also told that they didn't have to answer any questions they didn't want to, and they could withdraw from the study at any time. Contact details of researchers were given if participants required any further information about the research. Participants were asked to sign consent forms and were told that they could ask any questions during completion of the questionnaires. They then received a questionnaire pack which contained demographic questions, as well as the PFRS, HAD, and 40-item factor analysed WCCL. Instructions for all questionnaires were given as specified by the original authors, and it typically

took 20-40 minutes for participants to complete all questions.

3. RESULTS

3.1 Factor Analysis of WCCL

The factor analysis of the WCCL is described to show the process by which the coping style factors were derived. The factor analysis was conducted over eight phases of calculations as described below.

Estimates for the minimum number of participants required for a factor analysis vary from between 3 and 20 times the number of items, however Mundfrom et al. [53] state that there is little empirical evidence for these recommendations. Floyd and Widaman [54] recommend a 5-to-1 participant to variable ratio and a minimum sample size of 200. The sample size in the present study was 240 for 42 items, or a 5.7-to-1 ratio.

In phase one, data collected from Vitaliano et al.'s [50] 42-item revision of the WCCL were analysed using a principal components analysis (PCA) with varimax rotation. A solution was reached in 19 iterations with the initial screen plot suggesting a 5, 6, or 7-factor solution; however, 10 factors had eigenvalues over 1. The pattern matrix was examined and items were placed on factors that loaded over .3. Seven factors emerged, six of these factors were distinct and in line with the structure of the WCCL by Vitaliano et al. [50] with one factor showing a mixed content of items.

In phase two, a forced 7-factor solution was run with PCA and varimax rotation. A settlement was reached in 27 iterations, and the scree plot suggested a 5 or 6-factor solution. The pattern matrix indicated 6 clearly defined factors, with the seventh factor having only 1 item loading onto it (which was item 6: "Accepted the next best thing to what I wanted").

To see if this item could be forced into another factor, a 6 factor forced solution was run in phase three. However, instead of pushing this single item into another element, the answer forced two previously distinct factors to be combined into one, leaving issue 6 as a lone factor.

In phase four, a 7 factor forced solution was rerun (minus item 6), and a settlement was reached in 18 iterations. The scree plot

suggested 5 factors, however, and while some elements made sense, this solution caused many items to load onto unexpected elements.

In phase five, a 6 factor forced solution was run (with item 6 included) with the answer taking 19 iterations, and with the scree plot suggesting five factors. However, one of the derived factors had only two items loaded onto it.

In phase six, a 5 factor forced solution was run in 13 iterations, with the scree plot again suggesting five factors. This gave the best answer so far with nearly all items except item 6 loading above .3 ontological factors consistent with those of Vitaliano et al.'s factor structure [50]. Article 39 ("Tried to make myself feel better by eating, drinking, smoking, or taking medications") was not consistent with the other items in the factor that it loaded onto, but fit well into the consideration that it loaded onto second (this loading was still above the accepted limit of .3).

Item 6 did not load actively onto any factor in the 5 element forced analysis, but loaded highest onto the problem-focused coping factor. Phase seven was used to check if the removal of item 6 affected scale reliabilities. Two 5-factor forced solutions were run, with item 6 both present and excluded. Internal reliabilities for the relevant factor showed values of .809 for both solutions; therefore as item 6 made no difference to the reliability of the element, it was permanently removed in the interests of parsimony. During phase seven, it was also found that the removal of item 15 ("Stood my ground and fought for what I wanted") increased the reliability of the sub-factor it loaded onto from .772 to .788, and as it failed to load satisfactorily

onto any other factor so it was also permanently removed.

Finally, in phase eight, a forced 5 factor PCA with varimax rotation was re-run with items 6 and 15 removed. All items were placed into their highest loading factors over .3, except item 39, which was placed on its second highest loading factor of .313 (escape/avoidance) and item 5 (Made a plan of action and followed it) which was placed on its second highest factor loading of .306 (Problem-focused coping). This was acceptable as item 5 fits logically into the last factor, and increases factor reliability from .802 to .809.

Therefore, the final 40 items gave a scale with five distinct coping style factors which were designated: Wishful Thinking; Problem-focused coping; Escape/Avoidance; Seek Advice/Support; and Self Blame. Internal reliability scores were calculated for the factors as .894 for Wishful thinking; .809 for Positive Thinking/Planning; .789 for Escape/Avoidance; .788 for Seek Advice and Support; and .813 for Self -Blame.

3.2 Descriptive Statistics

Shown below in Table 1, are the descriptive statistics for age for all participants.

Shown below (Table 2) is a frequency table of clinical anxiety and depression scores on the HADS. It shows that those who score over 11 out of 21 (a clinically relevant score as defined by [51] are 16.3% of men, and 15.7% of women for anxiety, and 8.7% of men, and 8.1% of women for depression. This amounts to 16% of all participants for concern, and 8.4% of all participants for depression.

Table 1. Descriptives for age

	N	Minimum	Maximum	Mean	Std. deviation
Age Combined	240	20.23	53.69	38.5549	6.47361
Age Men	104	23.78	53.69	39.9459	6.52648
Age Women	136	20.23	53.12	37.4912	6.25006

Table 2. Percentage of men and women with clinical Anxiety and depression scores

	% Clinical anxiety	Number with clinical anxiety	% Clinical depression	Number with clinical anxiety
Male	16.3%	17 (of 104)	8.7%	9 (of 104)
Female	15.7%	21 (of 134)	8.1%	11 (of 135)
Combined	16.0%	38 (of 238)	8.4%	20 (of 239)

A Chi-Square calculation was carried out on the data in Table 2 to see if the percentages of participants who scored above the clinical cut-off of 11 on the anxiety and depression subscales of the HADS, differed between males and females. However, the Chi-square showed that there were no differences between men and women for the frequency of scoring at clinical levels on the HADS.

Shown below in Table 3, are descriptive statistics for all independent and dependent variables for males and females both separately and combined. Scores for all variables appear very similar for both men and women, except for wishful thinking, and seek advice/support coping styles, where women score slightly higher for both.

3.3 ANOVA Calculation

A one-way ANOVA calculation was carried out on the results, to compare men and women for levels of anxiety, depression, coping styles,

cognitive difficulties, fatigue, and somatic symptoms. The results of the ANOVA showed that there were significant differences between men and women on the wishful thinking and seek advice and support subscales of the WCCL, with women using significantly more wishful thinking coping, $F(1,235) = 4.13$, $p = .043$, and substantially more seeking of advice and support, $F(1,236) = 4.5$, $p = .035$. There were, however, no significant differences between men and women on the other subscales of the WCCL, and no significant differences in PFRS subscales of Fatigue, Cognitive Difficulties, and Somatic Symptoms. Finally, there were no significant differences between men and women in anxiety and depression scores from the HADS.

3.4 Correlations

Table 4 below, shows a series of Pearson correlations that were carried out to compare the relationships between coping styles from the WCCL and the mental and physical

Table 3. Descriptives for all independent and dependent variables for men and women

	Sex	N	Mean	Std. deviation	Min	Max
Wishful thinking (WCCL)	Male	101	1.073	.7759	.00	2.88
	Female	136	1.285	.8076	.00	3.00
	Total	237	1.195	.7995	.00	3.00
Positive thinking (WCCL)	Male	101	1.644	.4956	.15	2.85
	Female	133	1.632	.4642	.23	2.54
	Total	234	1.637	.4770	.15	2.85
Escape Avoidance (WCCL)	Male	103	.891	.5191	.00	2.33
	Female	136	.869	.5786	.00	2.44
	Total	239	.878	.5527	.00	2.44
Advice Support (WCCL)	Male	103	1.443	.6229	.00	3.00
	Female	135	1.625	.6752	.17	3.00
	Total	238	1.546	.6579	.00	3.00
Self Blame (WCCL)	Male	102	.973	.6866	.00	3.00
	Female	135	1.054	.7132	.00	3.00
	Total	237	1.019	.7015	.00	3.00
Cognitive Difficulties (PFRS)	Male	101	24.109	11.4016	11.00	65.00
	Female	133	25.384	12.5262	11.00	75.00
	Total	234	24.833	12.0451	11.00	75.00
Fatigue (PFRS)	Male	102	28.569	14.8694	12.00	79.00
	Female	135	29.882	14.1612	12.00	81.00
	Total	237	29.317	14.4538	12.00	81.00
Somatic Symptoms (PFRS)	Male	102	24.480	10.6527	15.00	61.00
	Female	133	26.617	12.2213	15.00	69.00
	Total	235	25.689	11.5914	15.00	69.00
Anxiety (HADS)	Male	104	5.942	4.1520	.00	20.00
	Female	134	6.045	3.9696	.00	16.00
	Total	238	6.000	4.0420	.00	20.00
Depression (HADS)	Male	104	4.481	4.3309	.00	20.00
	Female	135	4.267	3.6080	.00	16.00
	Total	239	4.360	3.9317	.00	20.00

Table 4. Correlations between coping styles and dependent variables for men and women

	Wishful thinking		Positive thinking		Escape avoidance		Advice support		Self blame	
	M	F	M	F	M	F	M	F	M	F
Cognitive difficulties	.532**	.262**	-.148	-.087	.524**	.329**	.021	.029	.409**	.348**
Sexes combined	.388**		-.121*		.418**		.037		.377**	
Fatigue	.508**	.282**	-.141	.003	.529**	.337**	-.024	.123	.223*	.294**
Sexes combined	.404**		-.060		.417**		.072		.268**	
Somatic symptoms	.459**	.239**	-.108	.059	.475**	.347**	.094	.054	.321**	.278**
Sexes combined	.339**		-.018		.397**		.077		.299**	
HADS Anxiety	.527**	.486**	-.153	.012	.512**	.502**	-.051	.080	.332**	.456**
Sexes combined	.505**		-.061		.504**		.026		.402**	
HAD depression	.398**	.411**	-.071	-.132	.622**	.422**	-.184*	-.08	.204*	.346**
Sexes combined	.412**		-.104		.510**		*		.279**	

** = $p > .001$; * = $p > .05$ **Table 5. Anxiety regressions for men and women combined and separately**

Anxiety combined	Beta weight	Std. error	Standardised beta weight	t	Sig.
(Constant)	3.588	.863		4.157	.000
Wishful thinking	2.022	.324	.400	6.234	.000
Escape avoidance	1.976	.469	.269	4.215	.000
PFC	-1.036	.461	-.122	-2.247	.026
Model: R = .595, R ² = .354				F: 40.96	.001
Anxiety Men	Beta Weight	Std. Error	Standardised Beta weight	t	Sig.
(Constant)	1.425	.699		2.038	.044
Wishful thinking	2.341	.500	.433	4.680	.000
Escape avoidance	2.364	.759	.289	3.116	.002
Model: R = .630, R ² = .397				F: 30.88	.001
Anxiety Women	Beta Weight	Std. Error	Standardised Beta weight	t	Sig.
(Constant)	2.225	.591		3.764	.000
Wishful thinking	1.681	.435	.344	3.867	.000
Escape avoidance	1.917	.605	.282	3.168	.002
Model: R = .555, R ² = .308				F: 28.45	.001

health outcomes from the PFRS and HADS. These were carried out both with genders combined and split by sex to enable comparisons between men and women.

Wishful thinking correlated significantly with all mental health outcomes for men and women combined and the sexes separately, with positive correlations in mixed samples of .388 for cognitive difficulties; .404 for fatigue; .339 for somatic symptoms; .505 for HADS anxiety; .412 for HADS Depression. For all correlations except HADS depression, the associations between wishful thinking and the health outcomes were higher for males than females, with particular discrepancies between the sexes in cognitive difficulties (.532 vs .262), fatigue (.508 vs .282), and somatic symptoms (.459 vs .239).

Problem-focused coping significantly negatively correlated with cognitive difficulties (-.121, $p = .034$) but for neither sex when split by sex (due to the reduction in sample size).

Escape/avoidance correlated significantly with all mental health outcomes for men and women combined, and for the sexes separately, with positive correlations in mixed samples of .418 for cognitive difficulties; .417 for fatigue; .397 for somatic symptoms; .504 for HADS anxiety; .510 for HADS Depression. Again, for all correlations between escape/avoidance and health outcomes, the relationships were higher for males than females. There were distinct differences between the sexes in cognitive difficulties (.524 for boys vs .329 for women), fatigue (.529 vs .337), and HADS depression (.622 vs .422).

Seeking advice and support only correlated significantly with HADS depression for sexes combined (-.125) and for males alone (-.184). All other correlations between information and support and health outcomes were non-significant.

Finally, self-blame correlated significantly with all mental health outcomes for men and women combined and men and women separately, with correlations in combined samples as .377 for cognitive difficulties; .268 for fatigue; .299 for somatic symptoms; .402 for HAD anxiety; .279 for HADS Depression. When split by sex all correlations were significant to at least $p < .05$ (with most significant to $p < .001$) with particular differences between the genders on HAD anxiety

(.332 for men vs .456 for women); and HADS depression (.204 vs .346).

3.5 Regressions

Eighteen main-effect multiple regressions were run to investigate the relationships between coping styles, gender, and mental health outcomes. For each of the dependent variables of anxiety, depression, cognitive difficulties, fatigue, and somatic symptoms, three sets of stepwise regressions were run. In the first for each DV, sex and coping style (wishful thinking, problem-focused coping, escape/avoidance, seek advice, and self-blame) were entered using stepwise selection. This would demonstrate whether sex and which coping styles were significant predictors of mental health outcomes. Then regressions were re-run with coping methods only as the independent variables, once for the male participants, and once for the female participants, to show if there were any differences in patterns of coping behaviours in predicting outcomes between male and female participants. Inter-correlations between independent variables show that there are no values above .8, showing no multicollinearity. The final regressions for each set of calculations are shown below.

Gender was not found to be a significant predictor of any mental-health related dependent variable in any of the regressions. However, when sex split the regressions, as shown in the second and third section of each table, there are slightly different patterns of coping styles found to be significant in predicting each of the health outcomes.

For the anxiety regression above, wishful thinking was found to be the most significant predictor by standardised beta weight for both men and women combined, and for both men and women separately. The data in the beta weight column shows that for men and women combined, with each unit increase in wishful thinking score, there is a 2.022 unit increase in anxiety score on the HAD, and a 2.341 unit increase for men alone, and a 1.681 unit increase for women alone.

Escape/avoidance was found to be the second most significant predictor by beta weight for men and women combined (1 unit escape/avoidance = 1.976 increase in anxiety) and for the sexes separately (men: 1 unit = 2.364; women: 1 unit = 1.917).

Finally, problem-focused coping (PFC) associated with a significant decrease in anxiety scores when men and women are combined, with one unit of PFC predicting a 1.036 unit decrease in anxiety score. This, however, was not found for men and women separately, perhaps due to the reduction in sample size. Problem-focused coping was the third most crucial predictor of anxiety for sexes combined by beta weight.

All regressions were found to be significant to $p < .001$, and the R^2 values show that the significant coping styles accounted for 35.4% of the variance in anxiety for the sexes combined, for 39.7% of the difference in men's concern, and 30.8% of the variance for women.

In the depression regressions for men and women combined, escape/avoidance was shown to be the most significant predictor by beta weight, followed by wishful thinking, seek advice and support, and positive thinking. Escape/avoidance and wishful thinking predicted substantial increases in depression scores on the HAD and seeking help and support, and PFC predicted significant decreases in depression. These factors accounted for 31.8% of the variance in depression.

For men only, escape/avoidance and wishful thinking were also the first and second most important predictors, both predicting increases in depression score, however seeking advice and positive thinking were not significant predictors. Despite there only being two significant predictors in men, these factors accounted for nearly 40% of the variance in depression scores.

For women, wishful thinking was the most significant predictor, with PFC second, and escape/avoidance third. These factors accounted for only 27% of the variance in depression scores. All regressions were significant to $p < .001$.

In predicting Cognitive difficulties (CD), wishful thinking and escape-avoidance were the two most significant coping styles by beta weight, for both men and women combined and for men alone. For men and women combined, self-blame was the third most significant predictor of cognitive difficulties. All of these factors associated with substantial increases in a CD. By contrast, for women only, self-blame was the most important predictor, followed by escape/avoidance coping, both of which

associated with increases in the CD. The important coping styles predicted 26% of the variance in CD for men and women combined, or 35.5% in men only, but only 17% in women only. All regressions were significant to $p < .001$.

For fatigue, wishful thinking was the most important predictor for both sexes combined, and for men and women separately (see Table 8), indeed it was the only significant predictor for women. Wishful thinking associated with a significant increase in fatigue for all regressions. For men alone, and for the sexes combined, escape/avoidance coping was also a significant predictor, which associated with increases in fatigue. Again, these factors accounted for far more of the variance in outcome in men than in women, with 37.7% accounted for in men, and only 9.8% estimated for in women. For the sexes combined this equals 20.7% accounted for. All regressions were significant to $p < .001$.

Finally, wishful thinking and escape/avoidance were the only coping styles that significantly predicted the level of somatic symptoms (see Table 9), in men and women combined, with wishful thinking the most important by standardised beta weight, and both coping styles predicting significant increases in the level of somatic symptoms. In women alone, only escape/avoidance was a significant predictor, however, in men, wishful thinking was the most important predictor, followed by escape/avoidance, and seeking advice and support. All significant coping styles predicted substantial increases in somatic symptoms for all regressions, including seeking help. The predictors accounted for nearly 40% of the variance in somatic symptoms scores in men, compared to only 10.3% in women, and 18.5% for the sexes combined. All regressions were again significant to $p < .001$.

Shown below is a table of post-hoc experimental power for the regression calculations. Empirical power is the probability of correctly rejecting a false null hypothesis. In other words, it is the probability of finding a significant effect, if a real considerable effect is present. Using a post-hoc power calculator [55] and entering the alpha level, the number of predictors, R^2 , and sample size, the following power calculations were made for each of the regressions above. A minimum power of .8 or 80% is considered satisfactory.

Table 6. Depression regressions for men and women combined and separately

Depression combined	Beta weight	Std. error	Standardised beta weight	t	Sig.
(Constant)	3.599	.877		4.103	.000
Escape Avoidance	2.284	.469	.321	4.867	.000
Wishful Thinking	1.429	.329	.292	4.348	.000
Advice Support	-.833	.378	-.140	-2.205	.028
PFC	-1.014	.514	-.123	-1.971	.050
Model: R = .564, R ² = .318				F: 26.15	.001
Depression men	Beta weight	Std. error	Standardised beta weight	t	Sig.
(Constant)	-.453	.721		-.629	.531
Escape Avoidance	4.251	.782	.503	5.434	.000
Wishful Thinking	1.133	.516	.203	2.196	.031
Model: R = .630, R ² = .397				F: 30.94	.001
Depression women	Beta weight	Std. error	Standardised beta weight	t	Sig.
(Constant)	4.269	1.050		4.065	.000
Wishful Thinking	1.480	.413	.332	3.579	.000
Positive Thinking	-1.940	.598	-.249	-3.242	.002
Escape Avoidance	1.441	.569	.232	2.533	.013
Model: R = .519, R ² = .270				F: 15.76	.001

Table 7. Cognitive difficulties regressions for men and women combined and separately

Cognitive difficulties combined	Beta weight	Std. error	Standardised beta weight	t	Sig.
(Constant)	19.366	2.799		6.919	.000
Wishful thinking	3.253	1.186	.215	2.742	.007
Escape avoidance	4.155	1.557	.188	2.668	.008
Self Blame	3.540	1.278	.204	2.770	.006
Model: R = .511, R ² = .261				F: 19.3	.001
Cognitive Difficulties Men	Beta Weight	Std. Error	Standardised Beta weight	t	Sig.
(Constant)	12.481	1.956		6.381	.000
Wishful Thinking	5.682	1.458	.388	3.897	.000
Escape Avoidance	6.352	2.170	.291	2.927	.004
Model: R = .596, R ² = .355				F: 25.07	.001
Cognitive Difficulties Women	Beta Weight	Std. Error	Standardised Beta weight	t	Sig.
(Constant)	16.583	2.040		8.131	.000
Self Blame	4.827	1.682	.269	2.870	.005
Escape Avoidance	4.526	2.080	.204	2.176	.031
Model: R = .413, R ² = .170				F: 13.03	.001

Table 8. Fatigue regressions for men and women combined and separately

Fatigue combined	Beta weight	Std. error	Standardised beta weight	t	Sig.
(Constant)	17.794	1.752		10.154	.000
Wishful Thinking	5.283	1.263	.295	4.183	.000
Escape Avoidance	5.819	1.837	.223	3.168	.002
Model: R = .455, R ² = .207				F: 29.17	.001
Fatigue men	Beta weight	Std. error	Standardised beta weight	t	Sig.
(Constant)	12.529	2.514		4.984	.000
Wishful Thinking	7.263	1.776	.389	4.090	.000
Escape Avoidance	9.074	2.710	.318	3.348	.001
Model: R = .614, R ² = .377				F: 27.85	.001
Fatigue women	Beta weight	Std. Error	Standardised beta weight	t	Sig.
(Constant)	22.781	2.261		10.076	.000
Wishful Thinking	5.507	1.471	.313	3.743	.000
Model: R = .313, R ² = .098				F: 14.01	.001

Table 9. Somatic symptom regressions for men and women combined and separately

Somatic symptoms combined	Beta weight	Std. error	Standardised beta weight	t	Sig.
(Constant)	16.938	1.433		11.821	.000
Wishful Thinking	3.835	1.048	.264	3.659	.000
Escape Avoidance	4.775	1.520	.227	3.142	.002
Model: R = .431, R ² = .185				F: 25.16	.001
Somatic symptoms men	Beta weight	Std. error	Standardised beta weight	t	Sig.
(Constant)	7.942	2.880		2.758	.007
Wishful Thinking	5.557	1.299	.408	4.279	.000
Escape Avoidance	5.925	1.990	.289	2.977	.004
Advice Support	3.477	1.424	.204	2.441	.017
Model: R = .628, R ² = .395				F: 19.80	.001
Somatic symptoms women	Beta weight	Std. error	Standardised beta weight	t	Sig.
(Constant)	20.870	1.867		11.176	.000
Escape Avoidance	6.805	1.782	.321	3.819	.000
Model: R = .321, R ² = .103				F: 3.82	.001

Table 10. Post hoc power analyses

	Combined	Men	Women
Anxiety	1.00	1.00	1.00
Depression	1.00	1.00	0.990
Cognitive difficulties	1.00	1.00	0.997
Fatigue	1.00	1.00	0.959
Somatic symptoms	1.00	1.00	0.968

As is clear from the above table, experimental power for all regressions was at least .959. This means that if there was a real significant effect present, the sample size at .05 was large enough to detect it almost 100% of the time.

4. DISCUSSION

4.1 Factor Analysis

The results of the factor analysis were very similar to the factor structure derived for the WCCL as found [50] in the revision of the original WCCL [12]. Despite the removal of two items that did not appear to fit well into coherent categories, the other 40 elements were well dispersed across the five derived factors and closely matched the content of coping style variables described by [50]. The scree plots consistently showed that a five or six-factor solution was the best fit for the data in this sample, which suggests that a two-factor Problem-focused vs Emotion-focused coping (EFC) style classification is too simple and supports the suggestions of Dewe and Guest [47] and others, that a two factor solution is not complex enough to represent how people actually cope. Also, the regression calculations show that different patterns of coping styles were found to predict different mental health outcomes significantly, and therefore a pure PFC vs EMF classification would not be sufficient to give this discriminant validity. Therefore, the results of the factor analysis support the work of Vitaliano et al. [50] for a five-factor structure for ways of coping, as does the content of the derived categories which were labelled: self-blame; escape/avoidance; seek advice and support; self-blame; and problem-focused coping.

4.2 Hypothesis One

Hypothesis one predicted that males and females would report significantly different levels of mental health, specifically with women reporting more anxiety, depression, fatigue, cognitive difficulties, and somatic symptoms. This

prediction was based on the massive amount of research that has reported significantly more reduced levels of mental health in women, both at clinical and non-clinical levels, such as Sowa and Lustman [26] and Nolen-Hoeksema [27].

However, a one-way ANOVA calculation that compared men and women for all independent and dependent variables showed that there are no significant differences in levels of mental health outcomes as measured by the HAD and PFRS between male and female participants. Furthermore, biological sex was not found to be a significant predictor of anxiety, depression, somatic symptoms, fatigue, or cognitive difficulties in any of the multiple regression calculations carried out.

Finally, two chi-square calculations comparing the percentage of men and women who scored over the clinical cut-off point of 11 for anxiety and depression on the HAD (as specified by [51]) showed that there were no significant differences in frequency of clinical incidence between men and women. Therefore, experimental hypothesis one is not supported, and the null hypothesis cannot be rejected.

This result does not support the findings reported by Sowa and Lustman [26] and Nolen-Hoeksema [27], however it is in line with findings from researchers such as Hawkins et al. [29], Nolan and Wilson [30] and King and Buchwald [31] who found no sex differences in depression. This data, therefore, add to the conflicting literature on this topic, and questions the long-held conceptualisation that women inherently suffer from more mental health problems than men.

4.3 Hypothesis Two

Hypothesis two predicted that the styles endorsed by men and women for coping with workplace stressors would differ significantly. The results of the ANOVA comparing men and women for coping methods showed that while there are no significant differences between men

and women for levels of PFC, self-blame, and escape/avoidance coping styles, women were found to score significantly higher for the wishful thinking and seeking advice and support dealing techniques, suggesting that they are more likely to daydream about problems going away, and to speak to others about issues, but show similar levels to men in the other coping styles. Thus, there is mixed support for hypothesis two, with significant differences between two of the five derived coping methods. For wishful thinking and seeking advice, therefore, the null hypothesis can be rejected, but for the other coping styles, the null hypothesis cannot be dismissed. These findings provide mixed support for the work of authors such as Zeidner [17], Whatley et al. [15] and Haghigatgou and Peterson [17], who all found that men were more likely to exhibit problem-focused coping styles, (such as positive thinking and planning) and that women were more likely to endorse more emotion-oriented behaviours (such as self-blame, escape/avoidance, and wishful thinking).

4.4 Hypothesis Three

Hypothesis three predicted that "positive" coping styles (e.g. problem-focused coping, seeking advice) would be associated with lower levels of negative mental health outcomes, and that "negative" coping styles (e.g. self-blame, escape-avoidance and wishful thinking) would significantly associate with higher adverse mental health outcomes.

The correlations in Table 4 show that wishful thinking, escape-avoidance, and self-blame all show significant positive correlations with the negative health outcomes of cognitive difficulties, fatigue, somatic symptoms, and anxiety and depression. This was found for both male and female participants, and for the sexes combined. These correlations range from around .2 to .62, with most correlations around .3 to .4 with virtually all significant ($p < .001$).

However, from the correlational results, there seemed to be less evidence for a relationship between health outcomes, and problem-focused coping and seeking advice. There was a significant negative correlation between positive thinking and cognitive difficulties, but this was small at only -.12. There were also negative correlations between positive thinking and the mental health outcomes for both men and women, and although these were in the predicted direction (and despite several sex-specific correlations being larger than -.12), none of them

were significant due to the reduction in sample size.

There were two significant negative correlations between seeking advice and support and depression score, for the sexes combined and for men only. However, the sexes connected result is apparently due to the more considerable correlation for men, as the women-only association was close to zero. The correlational results, therefore, provide support for a significant relationship between the harmful coping methods and adverse health outcomes, but insufficient support for the relationship between positive coping styles and health outcomes. More information on these relationships can be found in the results of the multiple regression calculations as discussed below.

Across all five sets of regression equations, it was again the negative coping styles that had the most robust relationships with health outcomes. While there were some differences in expression of coping and results between the sexes, it was clear that the coping styles of wishful thinking and escape/avoidance were the most consistent in predicting levels of adverse health outcomes, with either one method or the other being the most important predictor of outcomes by beta weight in 14 of the 15 regressions. The directions of association between wishful thinking and escape/avoidance were as predicted in hypothesis three, i.e. predicting increased adverse health outcomes.

There was also evidence that problem-focused coping was associated with a significant reduction in anxiety for the sexes combined. While this relationship did not show up in the correlations as substantial, it is possible there was a relationship between positive thinking and one or both of the other significant predictors that helped account for the relationship between positive thinking and anxiety (and thus was evident when the predictors were entered simultaneously).

In depression, the positive thinking was associated with a significant reduction in depression scores for the sexes combined and for women. This relationship did show up in the correlational data for the sexes combined, but not for women. However again this may have been due to relations between the other independent variables. There was also a significant association between seeking advice

and support, and a lower depression score for the sexes combined, a relationship which was evident in the correlations for men, but not for women.

The results of the depression and anxiety regressions, therefore, appear to lend support to hypothesis three, that negative coping styles predict poor health outcomes and more positive styles are likely to be associated with improved health outcomes, at least in some circumstances.

The coping style of self-blame was only found to be a significant predictor of outcomes in the cognitive difficulties regression. This was found to be the case in the sexes combined and for women only, and associated with a significant increase in cognitive problems. There were good correlations between self-blame and the other dependent variables, however as it just appears as a predictor for CD, this may suggest that it plays a different role in the prediction of CD than for other health outcomes, where perhaps the variance it accounts for is also considered for by stronger predictors in the other coping styles.

Interestingly, for the final regression of somatic symptoms, the seeking advice and support coping style, was associated with a significant increase in symptoms for men, this is despite being associated with a substantial decrease in depression score for the sexes combined. This suggests that this one coping style could have positive associations or effects for some health outcomes, but negative associations or effects for others (however cause and effect cannot be attributed from a cross-sectional design such as this). Alternatively, there could be two separate expressions of seeking advice which is being tapped into differently in the two regressions: Seeking advice could be seen as a proactive method of helping to cope with problems, i.e. being associated with improved health outcomes as in the depression regression; however, it is also precisely the case that those who are suffering from stress or adverse health, are more likely to seek advice anyway, as could be the case for the latter regression. Therefore, one regression could be measuring a cause, and the other an effect.

Overall, the correlational results and the regressions provide support for hypothesis three, particularly for the relationship between negative coping styles and health outcomes. While the support for the relationship between positive

coping methods and improved health outcomes was mixed, there is still evidence for these relationships in some of the regressions, either for the sexes combined or for one or other sex individually. While more research needs to be done to investigate this, there is enough evidence to enable the rejection of the null hypothesis, and hypothesis three can be accepted. These results support the findings of Whatley et al. [15], Zeidner [16], and Haghishatgou and Peterson [17].

4.5 Hypothesis Four

Hypothesis four predicted that coping styles and gender would account for a significant percentage of the variance in predicting mental health outcomes. The evidence supports this hypothesis, as was shown by the fact that all regressions were substantial to $p < .001$. While some regressions (for example somatic symptoms in women) only accounted for around 10% of the variance in outcomes, most regression equations accounted for approximately 25% to 35% of the difference in outcomes, with the predictors accounting for around 40% of the variance in anxiety and depression in men. This was despite the fact that gender failed to be a significant predictor of any mental health outcome. Therefore, there is sufficient evidence to enable the rejection of the null hypothesis, and experimental hypothesis four can be accepted.

Further to the results described above, data from the regressions and correlations show that slightly different patterns of coping styles predict health outcomes in men and women. This is of relevance to both hypotheses three and four. For example, in depression, escape/avoidance is the most important predictor, and while significant in women, it is less important overall. Also, positive thinking is not a significant predictor in men, but it is in women. Similarly, for cognitive difficulties, wishful thinking is a significant predictor for men but not for women, and self-blame is vital for women but not men. For fatigue, escape/avoidance is a significant predictor in men, but not in women, and for somatic symptoms, wishful thinking and seeking advice and support are significant in men, neither of which are significant for women. It is also clear that looking at the R^2 values for each regression, that far more variance was explained for each dependent variable in men compared to women, for example, nearly four times as much variation

was explained in fatigue for men, in comparison for women.

These results clearly show that while the direction of relationships between independent and dependent variables are largely the same in men and women, the relative importance of the predictors (coping styles) are different, with different variables significant for different health outcomes.

4.6 Implications

Three of the four hypotheses presented in this study were fully or partially supported, and much of the results are in line with the work of previous researchers. However, the lack of significant differences between mental health outcomes in men and women was unexpected (particularly for depression) given the large amount of research that suggests these differences exist. Also, the fact that no significant sex differences were found in three of the five examined coping styles, fails to support much previous research, and adds to the mixed findings on dealing differences between the sexes. These data suggest that men and women may be closer in mental health and ways of dealing with workplace stressors than much research suggests, perhaps due to increasing numbers of women in the workforce with more women in roles of increasing control and seniority. However, the fact that coping styles explained so much more variance in health outcomes in men than in women, suggests that coping may be a better predictor for health outcomes in men, and that women's mental health outcomes may be more strongly related to other factors, (for example work conditions or pay etc.).

Also, it is clear that in this study, for both men and women, there were much stronger relationships between negative coping and health outcomes, than between positive coping styles and health outcomes. While this data is cross sectional and the direction of causality between coping and results cannot be determined, the data suggests the possibility that it may be the absence or presence of negative coping styles that are most instrumental in predicting (or causing) negative health outcomes, rather than the absence or presence of positive coping methods.

This information could have implications for intervention, for example, as negative coping styles were most strongly related to health outcomes, if there was evidence that this was a

causal relationship, training on healthy coping behaviours could be used to help avert or deal with negative workplace events. It could also have implications for recruitment, as those with negative coping styles may be less suitable for certain stressful jobs.

The significant amount of explained variance in many of the outcomes, suggests that coping is important in the prediction of many health outcomes. However even in the most significant regressions, ways of coping accounted for less than 40% of the variance, suggesting that there are many other factors that are also important in the prediction of health. The most obvious factors which may significantly contribute to the explanation of variance in outcomes in relation to the workplace are work characteristics themselves, such as levels of control, reward, or job demands. Indeed, there is a great deal of research that focuses only on workplace stressors as the most important antecedent of negative health outcomes (for example [65]) with little or no reference to individual differences or ways of coping.

4.7 Limitations

There were a number of limitations in the methods and sample used in this study which may have consequences for the validity of the results. For example, while there were similar numbers of male and female participants, with similar average ages, due to the flyer-based selection process (where flyers requested participants for a study on nutrition, work, and stress) participants may not be representative because they were self-selected. For example, perhaps only those who were stressed or had workplace problems would be motivated to respond, or maybe the most stressed individuals would not have the time to complete and return a long questionnaire.

Also, as the study used a cross-sectional method, no cause and effect relationships can be suggested between coping styles and health outcomes. For example, those who use escape/avoidance or wishful thinking dealing may be more likely to go on and suffer more workplace problems because of their so called "negative" methods of transaction, however it is also possible that those who are already stressed from negative work conditions are more likely to use these negative coping styles. A longitudinal design would be more suitable for detecting the direction of such relationships.

As all data came from self-report, there may be issues with the accuracy of the data, for example biases from social desirability, demand characteristics, or negative affect (the tendency to answer questions in a negative way due to a general negative outlook) could have influenced the results to give higher levels of negative health than are accurate.

Another significant limitation to the study was to do with possible confounding variables. Aside from gender, which was included as an independent variable in the combined sex regressions (and removed from all due to lack of significance in predicting outcomes) no other possible confounding variables were included as covariates. Factors such as education, occupational status, pay, social class, shift working, and health-related behaviours, all could have affected the results, and thus any conclusions should be treated with caution.

4.8 Improvements and Future Directions

Improvements to this study could be made in several areas, such as by using a larger or more representative sample, and by using different measurement methods and questionnaires, for example qualitative measures such as interviews or critical incident technique. Also, other dependent variables could be used, which are more appropriate to workplace stress scenarios, such as job satisfaction or organisational commitment.

Another important improvement that could be made to this study, would be the inclusion of more varied independent variables, particularly those related to the workplace, such as job characteristics and psychosocial stressors, for example, job demands, levels of control, workplace social support, levels of reward, bullying etc. Also, more individual characteristics could be used as independent variables, such as personality, locus of control, attributional style, age, etc. Finally, some possible confounding variables could be included as covariates, such as those mentioned in the previous section. Using more job characteristics and individual differences as IVs would explain more variance in health outcomes, and could enable better prediction of levels of mental health.

5. CONCLUSION

The results of this study showed that a five factor structure for coping styles based on a factor

analysed version of 40 items from the revised WCCL was the best fit for this sample, which supports the factor structure found by Vitaliano et al. [50]. This shows that a two factor problem focused vs emotion focused coping solution, is not an accurate conceptualisation of how people really cope. Indeed five factors are probably too limited to capture the complexities of dealing. More research into transaction and its relationships with various outcomes is necessary.

The results also show strong relationships between certain coping styles and health outcomes, with some forms better predicting certain outcomes than others. While there appear to be no significant differences between men and women for absolute mental health outcomes, and gender did not significantly predict any dependent variables, there do seem to be differences in the endorsement of certain coping styles, as well as differences in which coping methods predict specific health outcomes. The fact that between 10% to 40% of the variance in health outcomes was explained by coping suggests that more research should be done with other independent variables, as well as more on gender differences in other dependent variables.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Falkum E, Olff M, Aasland OG. Revisiting the factor structure of the ways of coping checklist: A three-dimensional view of the problem-focused coping scale. A study among Norwegian physicians. *Personality and Individual Differences*. 1997;22(2): 257-267.
2. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*. 1989;56:267-283.
3. Lazarus RS, Folkman S. Stress, Appraisal and Coping. New York: Springer; 1984.
4. Tennen H, Herzberger S, Nelson HF. Depressive attributional style: The role of self-esteem. *Journal of Personality*. 1987;55:631-660.

5. Tennant C. Work related stress and depressive disorders. *Journal of Psychosomatic Research*. 2001;51:697-704.
6. Gabriel P. *Mental Health in the Workplace*. International Labour Office, Geneva; 2000.
7. Folkman S, Lazarus RS. An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behaviour*. 1980;21:219-239.
8. Folkman S, Lazarus RS, Gruen RJ, DeLongis A. Appraisal, coping, health status, & psychological symptoms. *Journal of Personality and Social Psychology*. 1986;50(3):571-579.
9. Briner RB, Harris C, Daniels K. How do work stress and coping work? Toward a fundamental theoretical reappraisal. *British Journal of Guidance & Counselling*. 2004;32(2):223-234.
10. Cox T, Griffiths A, Rial-Gonzales E. *Research on Work-related Stress*, Office for Official Publications of the European Communities: Luxembourg; 2000.
11. Cox T, Griffiths A. The nature and measurement of work stress: Theory and practice. In: Wilson JR, Corlett EN, et al. (eds.) *Evaluation of human work: a practical ergonomics methodology*. Taylor & Francis, London. 1995;783-803.
12. Cox T, Ferguson E. Individual differences, stress and coping. In: Cooper, C.L. & Payne, R. (eds.) *Personality and Stress: Individual Differences in the Stress Process*. Wiley; 1991.
13. Aldwin C, Folkman S, Schaefer C, Coyne JC, Lazarus RS. Ways of coping: A process measure. In: 88th annual meeting of the American Psychological Association. Montreal, Quebec, Canada, September 1980.
14. Folkman S, Lazarus RS. Stress processes and depressive symptomatology. *Journal of Abnormal Psychology*. 1986;95(2):107.
15. Cronkite RC, Moos RH. Life context, coping processes, and depression. In: Beckham, E. E., & Leber, W. R. (eds.) *Handbook of Depression*. New York: The Guilford Press. 1995;567-582.
16. Whatley SL, Foreman AC, Richards S. The relationship of coping style to dysphoria, anxiety, and anger. *Psychological Reports*. 1998;83:783-791.
17. Zeidner M. Personal and contextual determinants of coping and anxiety in an evaluative situation: A prospective study. *Personality and Individual Differences*. 1994;16(6):899-918.
18. Haghishatgou H, Peterson C. Coping and depressive symptoms among Iranian students. *The Journal of Social Psychology*. 1994;135(22):175-180.
19. Lease SH. Occupational role stressors, coping, support, and hardiness as predictors of strain in academic faculty: An emphasis on new and female faculty. *Research in Higher Education*. 1999;40(3):285-307.
20. Welbourne JL, Eggerth D, Hartley TA, Andrew ME, Sanchez F. Coping strategies in the workplace: Relationships with attributional style and job satisfaction. *Journal of Vocational Behavior*. 2007;70:312-325.
DOI:10.1016/j.jvb.2006.10.006
21. Diong SM, Bishop GD, Enkelmann HC, Tong WMW, Why YP, Ang JCH, et al. Anger, stress, coping, social support and health: Modelling the relationships. *Psychology and Health*. 2005;20:467-495.
22. Cooper CL, Dewe PJ, O'Driscoll MP. *Organizational stress: A review and critique of theory, research, and applications*. Sage Publications; 2001.
23. Biggam FH, Power KG, MacDonald RR. Coping with the occupational stressors of police work: A study of Scottish officers. *Stress and Health*. 1997;13(2):109-115.
24. Torkelson E, Muhonen T. The role of gender and job level in coping with occupational stress. *Work & Stress*. 2004;18(3):267-274.
25. Carver CS, Scheier MF. Situational coping and coping dispositions in a stressful transaction. *Journal of Personality and Social Psychology*. 1994;66(1):184.
26. Lazarus RS, Folkman S. *Stress, appraisal, and coping*. New York: Springer; 1984.
27. Sowa CJ, Lustman PJ. Gender differences in rating stressful events, depression, and depressive cognition. *Journal of clinical Psychology*. 1984;40:1334-1337.

28. Nolen-Hoeksema S. Sex differences in depression. Stanford University Press; 1990.
29. Beck AT. Depression: Clinical, experimental, and theoretical aspects. University of Pennsylvania Press; 1967.
30. McDermott RJ, Hawkins WE, Littlefield EA, Murray S. Health correlates of depression among university students. *Journal of American College of Health*. 1989;38(3): 115-119.
31. Nolan R, Wilson VL. Gender and depression in an undergraduate population. *Psychological Reports*. 1994;3: 1327-1330.
32. King DA, Buchwald AM. Sex differences in subclinical depression: Administration of the Beck Depression Inventory in public and private disclosure situations. *Journal of Personality and Social Psychology*. 1982;42(5):963.
33. Bender E. Women cite depression as barrier to job success. *Psychiatric News*; 2004.
34. Brems C. Women and depression: A comprehensive analysis. In Beckham, E. E., & Leber, W. R. (Eds.) *Handbook of Depression*. The Guildford Press. 1995;539-566.
35. Gianakos I. Predictors of coping with work stress: The influences of sex, gender role, social desirability, and locus of control. *Sex Roles*. 2002;46:149-158.
36. Karasek R, Theorell T. Healthy work: Stress, productivity and the reconstruction of working life. New York: Basic Books; 1990.
37. Snow DL, Swan SC, Raghavan C, Connell CM, Klein I. The relationship of work stressors, coping and social support to psychological symptoms among female secretarial employees. *Work & Stress*. 2003;17(3):241-263.
38. Brems C, Johnson ME. Problem-solving appraisal and coping style: The influence of sex-role orientation and gender. *The Journal of Psychology*. 1989;123(2):187-194.
39. Oltmanns TF, Emery RE. Abnormal psychology (2nd ed.). New Jersey: Prentice-Hall; 1998.
40. Portello YY, Long BC. Appraisals and Coping with workplace interpersonal stress: A model for women managers. *Journal of Counselling Psychology*. 2001;48(2):144-156.
41. Narayanan L, Shanker M, Spector PE. Stress in the workplace: A comparison of gender and occupations. *Journal of Organizational Behavior*. 1999;20:63-73.
42. Vagg PR, Spielberger CD, Wasala CF. Effects of organizational level and gender on stress in the workplace. *International Journal of Stress Management*. 2002;9(4): 243-261.
43. Klag S, Bradley G. The role of hardiness in stress and illness: An exploration of the effect of negative affectivity and gender. *British Journal of Health Psychology*. 2004;9(2):137-161.
44. Boggiano AK, Barrett M. Gender differences in depression in college students. *Sex Roles*. 1991;25:595-605.
45. Jick TD, Mitz LF. Sex differences in work stress. *Academy of Management Review*. 1985;10(3):408-420.
46. Dewe PJ, Guest DE. Methods of Coping with stress at work: A conceptual analysis and empirical study of measurement issues. *Journal of Organizational Behaviour*. 1990;11:135-150.
47. Vitaliano PP, Russo J, Carr JE, Maiuro RD, Becker J. The ways of coping checklist: Revision and psychometric properties. *Multivariate Behavioral Research*. 1985;20(1):3-26.
48. Dewe P. A closer examination of the patterns when coping with work-related stress: Implications for measurement. *Journal of Occupational and Organizational Psychology*. 2003;76(4): 517-524.
49. Faul F, Erdfelder E. GPOWER: A priori, post-hoc, and compromise power analyses for MS-DOS [Computer program]. Bonn, FRG: Bonn University, Department of Psychology; 1992.
50. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*. 1983;67(6): 361-370.
51. Crawford JR, Henry JD, Crombie C, Taylor EP. Normative data for HADS from a large non-clinical sample. *British Journal of Clinical Psychology*. 2001;40:429-434.
52. Ray C, Weir WR, Phillips S, Cullen S. Development of a measure of symptoms in

- chronic fatigue syndrome: The profile of fatigue-related symptoms (PFRS). Psychology and Health. 1992;7(1):27-43.
53. Mundfrom DJ, Shaw DG, Ke TL. Minimum sample size recommendations for conducting factor analyses. International Journal of Testing. 2005;5(2):159-168.
54. Floyd FJ, Widaman KF. Factor analysis in the development and refinement of clinical assessment instruments. Psychological Assessment. 1995;7(3):286.
55. Soper D. Statistical Power Calculator. Available:<https://www.danielsoper.com/stacalc>

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