EMERGENCY SERVICE WORKERS' COPING IN RESPONSE TO TRAUMATIC EVENTS: ASSOCIATIONS WITH PSYCHIATRIC SYMPTOMS.

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COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

Signature Date 19/12/07

Signed by candidate

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ABSTRACT

Objective: This study aimed to explore the relationship between coping strategies and posttraumatic symptomology in emergency service workers in the Western Cape. Three fundamental coping strategies were assessed: seeking social support, problem-solving, and avoidance. I hypothesised that seeking social support and problem-solving would be associated with decreased levels of psychiatric symptoms, while avoidance would be associated with increased levels of psychiatric symptoms.

Method: This study formed part of a larger cross-sectional epidemiological undertaking within the population of emergency service workers in the Western Cape. Emergency service workers (n = 1 099) from a number of emergency service providers completed a questionnaire covering demographic information, exposure to critical incidents, general mental health, substance use/abuse, impact of traumatic events, coping strategies, and conflict tactics.

Results: Multiple regression analyses were performed to explore the relationships among coping and psychiatric symptoms. The three coping strategies and the control variables could significantly account for 26.5% of the variance in symptoms of general psychiatric symptoms. These variables could account for 39.1% of the variance in symptoms of posttraumatic stress.

Conclusion: The results supported the hypotheses. The strongest association was a positive relationship between the coping strategy of avoidance and psychiatric symptoms. Small negative associations were found between each of the other two coping strategies (seeking social support and problem-solving) and psychiatric symptoms.

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CHAPTER 1

INTRODUCTION

By any measure, but especially in comparison to developed countries, South Africa is a particularly violent country. For example, the homicide rate in Cape Town in 2001 was 82/100 000, while the 2001 rate for homicide among males in England and Wales was 1.1/100 000, and females was 0.4/100 000 (Isserow, 2001; World Health Organisation, 2006). Rates of rape and indecent assault are particularly high in South Africa, with the 2004/2005 ratio for rape being 118.3/100 000 (compared with 45.9/100 000 in the District of Colombia, USA) and the ratio for indecent assault being 217/100 000 (South African Police Service Centre for Crime Information Statistics, 2004/5; Federal Bureau of Investigation, 2002). In addition, it is recognised that sex crimes are underreported, and the figures could be two to three times greater than reported (Edwards, 2005). Crimes against children are also common in the South African context. For example, Ensink, Robertson, Zissis, and Leger (1997) found that 56% of a sample of children living in Khayelitsha had been the direct target of violence.

At least partly as a result of these higher levels of domestic and community violence, it is likely that South Africans have higher rates of exposure to traumatic incidents, which would result in South Africans being at higher risk of developing associated psychopathology.

Critical incident exposure involves exposure to a traumatic event, defined as an encounter with death or life-threatening injury, in which an individual's normal methods of coping are overwhelmed or inadequate (Alexander & Klein, 2001). Possible psychopathological consequences that may result from critical incident exposure include Acute Stress Disorder, Post-Traumatic Stress Disorder (PTSD), and other post-traumatic responses, which may involve the symptoms of hyperarousal, avoidance, and re-experiencing (Edwards, 2005).

Emergency service workers (for example, paramedics, fire fighters and police) are exposed to trauma on a routine basis because of the nature of the work they do. This population provides a key service to society, and as such, the impact of this traumatic exposure on their mental health is of great importance. Emergency service workers have been found to display symptoms of posttraumatic stress and depression following exposure to traumatic incidents (Regehr, Goldberg, & Hughes, 2002). This suggests a need for early intervention and prevention.

Ward, Lombard, and Gwebushe (2006) showed that emergency service workers in South Africa are exposed to more critical incidents than are similar workers in developed countries. For instance, Ward et al. (2006) showed that more than 88% of a sample of emergency service workers in the Western Cape had been exposed to a critical incident in the 2 months prior to their study, whereas only 61.6% of a sample of Swedish ambulance drivers reported having *ever* been exposed to a critical incident in their careers (Jansson, Segeston, & Mattson, 2003).

The Ward et al. (2006) study clearly demonstrated the associations between exposure to critical incidents and posttraumatic symptomology. A significant linear association was found between critical incident exposure and scores on a questionnaire of minor psychiatric disorder and general health. In addition, significant non-linear associations were demonstrated between critical incident exposure and symptoms of posttraumatic stress disorder. The rates of psychopathology that emerged were found to be higher than those found in Scottish and English ambulance drivers. Ward et al. (2006) did not explore the relationship between symptoms and coping. The current study aims to address this gap by re-examining data collected by Ward et al. (2006) in order to specifically explore the possible mediating role that coping could play in the development of post-traumatic symptoms.

CHAPTER 2

LITERATURE REVIEW

2.1. PTSD and trauma-related symptoms

A number of psychiatric disorders can result from critical incident exposure. The primary disorder of interest for the current study is Post Traumatic Stress Disorder (PTSD). This disorder is characterised by three symptom clusters: hyperarousal, avoidance, and re-experiencing (Sadock & Sadock, 2003). According to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR, American Psychiatric Association, 2000), for a full diagnosis of PTSD to be met an individual must have been exposed to a traumatic event that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others. During this event, the person must have experienced intense helplessness, fear, or horror. At least one symptom of re-experiencing phenomena, three symptoms of avoidance and numbing, and two symptoms of increased arousal must be present. The symptoms must have been present for at least 1 month and must have caused significant impairment in daily functioning. Another disorder of relevance to the current study is Acute Stress Disorder (ASD). This has a similar presentation to PTSD but refers to symptoms that occur in the first 4 weeks following critical incident exposure. In some individuals exposed to critical incidents, the full criteria for a diagnosis of PTSD or ASD are not met, yet they display a number of symptoms from the three clusters of hyperarousal, avoidance, and re-experiencing. These individuals will be referred to in this paper as having a partial diagnosis of PTSD.

Hyperarousal is characterised by a state of increased physiological arousal that leads to difficulties in sleeping and concentrating, irritability, and being overly vigilant or easily startled (Sadock & Sadock, 2003). Avoidance as a symptom of post-traumatic stress is understood as

persistent avoidance of stimuli such as thoughts, conversations, places or people associated with the trauma and a numbing of general responsiveness, such as feelings of detachment and restricted affect (Sadock & Sadock, 2003). The symptom of re-experiencing involves recurrent recollections, dreams, flashbacks, and intrusive thoughts or images associated with the critical incident (Sadock & Sadock, 2003).

2.2 Impact of PTSD and other related symptoms

There are a number of further possible consequences of exposure to trauma. In addition to the elevated rates of post-traumatic stress disorders mentioned previously, other psychiatric disorders may present comorbidly. These include major depression, panic disorder, other anxiety disorders, and substance abuse (Halligan & Yehuda, 2000; Kessler, 2000). Functional impairments following traumatic exposure are found in individuals who are diagnosed with PTSD (full or partial) and/or the comorbid disorders listed above; they are also, however, found in individuals who have been exposed to trauma but who do not display symptoms of a psychiatric disorder. In general, the more severe the disorder, the greater the functional impairment (Thorpe & Stein, 2005).

Functional impairments in the individual exposed to a critical incident are found in numerous domains, including work (e.g., productivity and job satisfaction tend to decline), family (e.g., marital instability increases), and social life (e.g., there is increased withdrawal from previously enjoyed activities). Additionally, there is a markedly increased risk of suicide (Kessler, 2000; North et al., 2002).

Alongside the wide-ranging negative effects of traumatic exposure on individuals are the equally wide-reaching and debilitating consequences for society as a whole (Kessler, 2000). The

economic results of critical incident exposure can be severe; for example, Kessler (2000) quoted figures in the United States of $3 Billion lost annually due to PTSD-related work impairment, which includes days off or inability to complete tasks.

With multiple exposures to trauma, the possibility and intensity of difficulties increase. For instance, Seedat, Van Nood, Vythilingum, Stein, and Kaminer (2001, quoted in Edwards, 2005), found that exposure to a larger number of traumas increased the likelihood that a sample of adolescents would present with symptoms indicative of PTSD.

Other than the direct victims of trauma, exposure to traumatic events is reported to be common in a variety of occupations. Individuals at high risk for trauma exposure due to their occupations include journalists who frequently attend crime and accident scenes, military personnel, police, and emergency service workers. Individuals who are in such occupations in South Africa are particularly at risk, given that the rates of crime and violence in this country are so much higher than in other countries (Edwards, 2005).

Edwards (2005) reports on occupational consequences of PTSD among mineworkers. These workers may "often be absent from work, accident prone while at work, generally less efficient at their job, and vulnerable to develop poor interpersonal relations without the underlying cause being recognised" (Edwards, 2005). In addition, Edwards (2005) states that the consequences of traumatising events constitute a significant public health problem in South Africa. It can be hypothesised that exposure to trauma would have similar occupational consequences for emergency service workers.

2.3 Emergency Service Workers

Emergency service workers are a group who are at particular risk for developing psychiatric and functional problems due to exposure to traumatic stressors. Past research tends to have focused on the victims of disasters rather than on those who respond to critical incidents, despite this latter population having higher levels of exposure than the general population to the critical incidents that are implicated in the development of PTSD and other posttraumatic responses (Weiss, Marmar, Metzler, & Ronfeldt, 1995).

Numerous studies have noted a dose-response relationship between trauma exposure and PTSD (Halligan and Yehuda, 2000). Such a relationship places emergency service workers at high risk of developing psychiatric symptoms, and at high risk of developing more severe symptoms, due to the routine exposure to traumatic events that occurs in the line of duty.

Regehr et al. (2002) found that alcohol abuse, mental health stress leave, and the rates at which psychiatric medication was taken all increased following exposure to incidents that paramedics in Canada subjectively experienced as traumatic. Longer-term effects found by Regehr et al. (2002) included reduced capacity to handle stressful events, and greater levels of depression and substance abuse. In addition, Alexander and Klein (2001) found that multiple exposures to critical incidents were associated with burnout in a sample of Scottish ambulance workers.

McFarlane and Bookless (2001) reviewed the literature exploring the effects of PTSD on emergency service workers, and illustrated a number of more specific consequences that the experience of trauma can have on interpersonal relationships. For instance, emotional numbing is one such consequence, which tends to be experienced by others as a loss of empathy or an emotional hardening. This symptom, as well as other posttraumatic symptoms such as

heightened irritability or anxiety, can lead to conflict in the family or among colleagues (McFarlane & Bookless, 2001).

These interpersonal difficulties clearly have an effect on family relationships but can also impair work functioning in a number of ways. For example, a further possible effect of critical incident exposure is a reduction in concern and compassion for others, which could have dramatic effects on the ability of emergency service workers to effectively perform their duties (Alexander et al., 2001).

2.4 Coping

Not all critical incident exposure leads to the development of PTSD. The variability in the development of psychiatric symptoms is due to both situational and individual factors (Yehuda & McFarlane, 1995). Situational factors that play a role in mediating the development of post-traumatic response symptoms include the characteristics of the event, such as the scale and consequences of the critical incident (McCammon, 1996). These factors will not be explored in the current study, as the main area of interest is, broadly, the association between individual factors and mental health.

Mediating individual factors in development of disturbances in functioning following critical incident exposure include appraisal, on-scene coping strategies, post-event coping methods, and social support (McCammon, 1996). Because emergency service workers are commonly exposed to critical events, yet not all of them develop post-traumatic symptomology, it is of interest to investigate the coping strategies they use in the line of duty. Few studies have explored how emergency service workers cope with critical incidents, and of those that have, most have focused on disaster workers, who have been exposed to once-off events (Clohessy &

Ehlers, 1999). There have also been limited explorations of associations between the styles of coping used and post-traumatic symptomology.

Coping is defined as "the thoughts and behaviors used to manage the internal and external demands of situations that are appraised as stressful" (Folkman & Moskowitz, 2004, p. 746-747). Different strategies for coping have emerged from a body of research into this area, and some forms of coping have been found to be more beneficial than others. Coping strategies that prevent emotional processing, such as avoidance, tend to be reliably associated with less positive psychiatric outcomes, while more prosocial coping strategies, such as seeking social support and problem-solving, have inconsistent associations with mental health outcomes: they have been found to be associated with both positive and negative outcomes, and some studies have found no relationship at all (Folkman & Moskowitz, 2004).

In the emergency services, coping can be divided into two areas, on-scene coping and post-event coping. On-scene coping refers to the way in which one approaches the critical incident while it is happening, and includes strategies such as humour and language alteration (Palmer, 1983). Post-event coping includes the strategies that are used, following a critical event, to try and manage stress-response symptoms and to cognitively incorporate intense events into psychic experience (McCammon, 1996). Post-event coping is the area that is of interest to the current study.

Prosocial post-event coping strategies include forms of coping that are thought to be beneficial in reducing the impact of critical incident stress (Hobfoll, Cameron, Monnier, & Gribble, 1997). An example of prosocial post-event coping is accessing social support (McCammon, 1996). Less beneficial post-event coping strategies are those that prevent emotional processing (Lowery & Stokes, 2005). Hobfoll et al. (1997) divide these less beneficial

categories into three areas: individualistic, avoidant, and indirect coping behaviours. These coping strategies may make difficulties resulting from critical incident exposure worse. An example of such a strategy is using alcohol to cope.

North et al. (2002) explored the coping methods used by disaster workers following a once-off critical incident in the United States, and the associations of these methods with later functioning. Their results indicate that prosocial coping methods, such as accessing social support by turning to friends or relatives, are associated with better functioning. Drinking alcohol to cope was shown to be significantly associated with poorer functioning. Clohessy and Ehlers (1999) examined the relationship of coping strategies and responses to intrusive memories within PTSD and other psychiatric conditions in a sample of ambulance workers in the United Kingdom. They found few relationships between PTSD symptom severity and coping strategies, except that mental disengagement, wishful thinking, and dissociation in response to intrusive memories were correlated with symptom severity. They concluded that coping strategies that prevent emotional processing serve to maintain PTSD.

Aldwin and Revenson (1987) found the relationship between coping and mental health to be a bi-directional one, in which those in poorer initial mental health were found to use less beneficial forms of coping, contributing to an ongoing cycle of further symptoms, as maladaptive coping not only increases distress, but also increases the probability of future problems. These authors further found that an individual's sense of whether or not the coping method used was effective determined the impact that the trauma had on the individual. That is, respondents who felt that their attempts to cope with the situation were ineffective demonstrated increased levels of emotional distress. This finding was especially significant in relation to emotion-focused forms of coping.

In the current study, I explored three main forms of coping: seeking social support, problem-solving and avoidance. The reasons for focusing on these strategies is that the instrument used to measure coping in this study, the Coping Strategy Indicator (Amirkhan, 1990), was developed using a factor analysis out of which these three fundamental coping strategies emerged.

Amirkhan (1990) notes that these three fundamental strategies are not exhaustive of the available methods of coping used, but that they do represent those used most widely across individuals and events, and that they seem to correspond to the most basic responses to threat. The same author draws a link between the primitive fight-flight response to threat, and problem-solving and avoidance. He states that problem-solving is a strategy of "direct assault, [which] seems derivative of primitive 'fight' tendencies", while avoidance represents a "panoply of escape responses, [that] seems to derive from ancient 'flight' inclinations" (1990, p. 1073).

Problem-solving, then, is an instrumental form of coping that involves attempts to change in response to the stressor (Amirkhan, 1990). Such coping responses involve efforts to remove or diminish stressors through planning, direct action, information seeking, and seeking instrumental help (Felsten, 1998). Some contradictory findings emerged in the literature with regard to the problem-solving. Felsten (1998) reported a definite trend toward positive outcomes when problem-solving is used as a form of coping. More recently, Haden, Scarpa, Jones, and Ollendick (2007) found no direct effects of problem-focused coping strategies on PTSD symptom severity, which led to their questioning the assumption that problem-solving in the form of purposeful cognitive processing of a traumatic event can be linked directly to less severe PTSD symptoms. This has led to questioning of some of the fundamental assumptions that have guided much of the previous research.

'Avoidance' refers to several forms of coping that involve a variety of emotion-focused responses, all of which tend to contain some level of withdrawal (Amirkhan, 1990). Numerous previous studies have shown that avoidance coping is positively related to PTSD severity (Haden, Scarpa, Jones, & Olledndick, 2007), and is consistently associated with negative outcomes (Felsten, 1998). In addition, trauma-exposed individuals with PTSD report the use of more forms of avoidance coping, which may prevent the processing and resolution of the trauma, leading to poorer outcomes (Lawler, Ouimette, & Dahlstedt, 2005). Furthermore, the use of avoidance can prevent the use of other forms of coping, thus leading to increased distress (Victorson, Farmer, Burnett, Ouellette, & Barocas, 2005).

Seeking social support refers to a prosocial form of coping that emerged in Amirkhan's (1990) factor analysis of coping. The major characteristic of this form of coping is that individuals actively recruit human contact in times of stress. Seeking social support as a form of coping is therefore seen as satisfying a primal urge to access human contact in times of stress (Amirkhan, 1990). Weiss, Marmar, Metzler, and Ronfeldt (1995) found social support to be significantly negatively associated with symptoms of intrusion, avoidance, and hyperarousal as measured by the IES-R in a sample of emergency services personnel. Various studies (House, 1981; Corneil, Beaton, Murphy, Johnson & Pike, 1999; quoted in Lowery & Stokes, 2005) have shown that seeking social support can mitigate the impact of trauma, while other studies (Cohen & Willis, 1985, quoted in Lowery & Stokes, 2005) have shown a "reverse buffering effect", in which the presence of social support, rather than enhancing coping abilities and mental well-being, serves to strengthen the relationship between the stressors and individual distress. Amirkhan (1990) found that social support was significantly positively correlated to depression, and concluded that social support is not uniformly beneficial, as was initially proposed, but

rather that factors such as level of satisfaction with the help received play a role. An alternative interpretation of this finding, since causality could not be implied, is that as an individual experiences more symptoms of depression, so he or she seeks out more social support. Previous studies of emergency service workers have found the support of colleagues to be more beneficial in facilitating coping and in moderating the impact of trauma than the support that is accessed outside of work, although dysfunctional peer support does not facilitate coping (Lowery & Stokes, 2005).

Functional social support has been found to include "(a) emotional or esteem support, (b) informational support (e.g. advice or guidance), (c) social companionship, or (d) instrumental support (e.g., providing a direct resolution to a problem)" (Lowery & Stokes, 2005, p. 172). However, individual characteristics also play a role in how this report is received and the subjective impact that it has on an individual's coping and symptoms (Lowery & Stokes, 2005).

2.5 Conclusion: Research Aims and Hypotheses

There appear to be few studies that have explored the relationship between coping and mental health outcomes, specifically in terms of posttraumatic psychiatric symptomology. The literature that does explore such associations seems to have focused more on large-scale disasters rather than the routine exposure that emergency service workers are exposed to on a daily basis.

The current research analysed previously obtained data to explore the associations between discrete coping strategies (specifically avoidant coping, problem-solving, and social support) and clusters of post-traumatic symptomology (viz., general symptoms of anxiety/depression, as well as three specific symptom clusters of PTSD: hyperarousal, avoidance, and re-experiencing). The aim in doing so was to understand the role that these three

specific forms of coping play in the development of posttraumatic distress. Exploring these associations is a necessary step in understanding the responses of emergency service workers to continued traumatic exposure, and in understanding how they cope with symptoms. Improved knowledge in this area is likely to benefit both clinicians and emergency service workers themselves, and might also have relevance to other trauma-exposed populations.

Three hypotheses were tested in the current study:

1. The first hypothesis (which is in this case the null hypothesis) is that there will be no association between coping strategies and levels of post-traumatic symptoms.
2. The second hypothesis is that the use of prosocial coping methods (e.g., seeking social support) will be associated with fewer posttraumatic symptoms.
3. The third hypothesis is that the use of coping strategies identified by previous literature as less beneficial (e.g., avoidance coping) will be associated with more posttraumatic symptoms.

CHAPTER 3

METHODS

3.1 Research Design

This study is a part of a larger cross-sectional epidemiological investigation of the population of emergency service workers in the Western Cape (Ward, Lombard, & Gwebushe, 2006). A questionnaire containing sections covering demographic information, exposure to critical incidents, general mental health (as measured by the General Health Questionnaire (GHQ-28; Goldberg & Hillier, 1979)), substance use/abuse, impact of events, coping strategies, and conflict tactics was administered to participants on a single occasion.

3.2 Sample

A representative sample of emergency service workers in the Western Cape participated in this study. The emergency services involved in the study included traffic police services, fire services, public and private ambulance services, the South African Red Cross Society, St John's Ambulance, the National Sea Rescue Institute, and the air rescue, fire, and ambulance services of the South African National Defence Force. This sample covers all emergency services in the province, other than one small first aid volunteer service that did not respond to invitations to participate, despite numerous attempts to contact them. Each service was contacted for their approval and consent prior to data collection. Fieldworkers visited each base at times convenient for the staff, and randomly selected from those on duty a number representing 0.3 of the total staff complement of that base. For further details regarding sampling and data collection, please refer to Ward et al. (2006).

The final number of completed, valid questionnaires was 1 099. The overall population was 3 897; thus, the sample fell 70 participants short of the aim of sampling 1 169 (30%) of the population. The final number represents 28% of the emergency service worker population in the Western Cape, and is a large enough sample size to ensure adequate power for analyses.

The demographic details of participants are presented in Table 1 below. A wide age range was represented (18-69 years). The mean number of service years was 8.19 with a median of 6.00.

Table 1. Demographic Characteristics of the Sample

		Frequency (n=1099)	*Percent*
Gender	Male	931	84.7
	Female	158	14.4
HLOE	Less than Gr 8	14	1.3
	Gr 8-12	594	54.8
	Some tertiary	212	19.3
	Degree or diploma	264	24.0
Employment type	Volunteer	161	14.6
	Reservist	23	2.1
	Short-term contract (<1 yr)	87	7.9
	Permanent staff	810	73.7
Home language	English	365	34
	Afrikaans	581	54
	Xhosa	108	10
	Other	22	2
Emergency service type	Provincial ambulance services	278	25.3
	Private ambulance services	33	3.0
	Fire service	326	29.66
	Traffic police	273	24.84
	SA Red Cross	10	0.91
	St John's Ambulance	27	2.46
	National Sea Rescue Institute	96	8.74
	SA National Defence Force	56	5.10

3.3 Procedures

Ethical approval was granted by the Faculty of Health Sciences at the University of Cape Town before the data was collected. In addition, each service involved was contacted for their approval prior to the start of the study. Participation was voluntary, and participants gave written, informed consent for their participation.

Fieldworkers visited each base and randomly selected from the staff members present at that time. The total number of staff interviewed per base represented 0.3 of the total staff at that base. Times of these visits had been prearranged to ensure convenience for the staff of the service. Participation was voluntary, and questionnaires were completed under conditions of confidentiality and anonymity.

Confidentiality and anonymity of data was ensured in that questionnaires were randomly assigned numbers and captured into a dataset before analyses were undertaken. The current research is a secondary analysis of existing data, forming part of a cross-sectional epidemiological investigation, and as such, the researcher was not involved in gathering data. With regards to referral of psychologically distressed workers, the researchers who collected the data originally followed standard ethical guidelines.

3.4 Measuring Instruments

Questionnaires were developed in English and translated into Afrikaans. The translation was checked by back translation. Questionnaires were piloted with each organisation prior to data collection, and as a result, some adjustments were made to scales used. All emergency service workers were fluent in either English or Afrikaans, and questionnaires were administered in the language of the participant's preference. Two time periods were identified in the

questionnaire: the past two months and the past week. The first part of the questionnaire collected demographic characteristics. The remainder of the questionnaire consisted of a number of existing scales, which are described below. Please refer to Appendix A for the questionnaire codebook.

3.4.1 Impact of Event Scale - Revised

The 22-item Impact of Event Scale – Revised (IES-R; Weiss & Marmar, 1997) assesses self-reported symptoms of PTSD according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV; American Psychiatric Association, 1994). This test has three subscales: Intrusion, Avoidance, and Hyperarousal. Responses ranging from "not at all" to "extremely" are coded on a 5-point Likert-type scale. The internal consistency of the instrument has been demonstrated to be high across different population samples with varying levels of traumatic stress symptomology (Hutchings & Devilly, 2006).

3.4.2 General Health Questionnaire

The General Health Questionnaire (GHQ-28; Goldberg & Hillier, 1979) was used to assess the extent to which participants experienced symptoms of anxiety and depression. This 28-item questionnaire was developed to assess minor psychiatric disorders in the community. The scale asks whether the participant has experienced a particular symptom or behaviour recently. Each item is rated on a four-point scale ("less than usual", "no more than usual", "rather more than usual", or "much more than usual"), and scoring is bimodal, i.e. the first two scale options are scored 0 and the second two are scored 1. This method of scoring effectively counts the number of symptoms present. Goldberg et al. (1997) assessed the validity of this scale

across 15 centres and in 11 languages in the developed and the developing world as part of a World Health Organization study on mental illness in general health care. The GHQ-28 was shown to have high validity, with no tendency for countries in the developing world to have lower validity coefficients (Goldberg et al., 1997). The questionnaire detects changes in normal functioning to determine "cases" from "non-cases" ("caseness" on this scale refers to the probability that an individual has a minor psychiatric disorder) (Hardy, Shapiro, Haynes, & Rick, 1999). A score of or greater than 5 is necessary for an individual to qualify as a "case" (Goldberg & Hillier, 1979).

3.4.3 Coping Strategy Indicator

Coping was measured using the Coping Strategy Indicator (CSI; Amirkhan, 1990), a 33-item self-report instrument that covers the strategies of avoidance, problem-solving, and seeking social support. These strategies are believed to be common to a broad array of individuals and circumstances (Amirkhan, 1994). This measure has been shown to have high internal consistency, test-retest reliability, and construct validity within a large heterogeneous North American population, and has been cross-validated with other populations, suggesting that the scale is generalisable across population, cultural, and situational variations (Amirkhan, 1990; Desmond, Shevin, & Maclachlan, 2006).

3.5 Data Analysis

All statistical procedures were performed using the Statistical Package for the Social Sciences (SPSS, version 14.0; SPSS Inc.). As multiple tests were conducted, it was decided that, to reduce the chances of making a Type I error, stricter significance thresholds of 1% should be

used for the data explorations, rather than the conventional 5% alpha level. The 5% alpha level was, however, used for the multiple regression models used to explore the hypotheses. Independent variables were CSI Avoidance, CSI Problem-solving, CSI Seeking Social Support, nature of employment, gender, years of service, and highest level of education. The last four of these were included as control variables, and are referred to as such throughout the document. Reasons for this choice of control variables include (respectively) that men and women have different presentations of symptoms and tend to use different styles of coping (DSM-IV-TR), education can be protective, and that there is a dose-response model of trauma that impacts symptom presentation and coping methods used (Halligan et al., 2000). Employment type (that is, whether the respondent was employed on a full-time, part-time, volunteer or reservist basis) was included in case type of employment affected the amount of critical incident exposure of respondents. Certain demographic variables (such as type of service, home language, and age) were excluded from the analyses, as only the most pertinent variables were chosen based on evidence in the literature. Dependent variables were the IES-R Total and the GHQ Total. The IES-R subscales were not included, as they were found to be too highly correlated with each other (refer to Table 2 on page 26 for the correlation matrix).

3.5.1 Frequencies

Frequencies and other relevant descriptive statistics were obtained for all independent and dependent variables. For the categorical variables (gender, highest level of education, and nature of employment), only frequency was calculated, while means, medians, and standard deviations were also calculated for the continuous variables (years of service, GHQ totals, IES-R Avoidance, IES-R Intrusion, IES-R Hyperarousal, IES-R Total, CSI problem-solving, CSI

avoidance, and CSI social support). This was done to ensure that the data had been adequately cleaned, and was used as a preliminary exploration of variation within variables. The frequency tables are presented in Appendix B.

3.5.2 Missing Values

Missing values were examined to assess whether any values were systematically missing, to explore if data would need to be imputed, and to assess whether sufficient cases would remain to perform the analyses if listwise deletion was required. In total, 167 values within the 1 099 completed questionnaires were missing from the overall sample. On exploration, however, no systematic pattern to the missing data emerged, and so no action was taken.

3.5.3 Outliers

Boxplots were obtained to explore outliers, so that cases could be identified for possible removal if they unnecessarily skewed the data. Some outliers were evident, with a very few participants displaying high levels of symptoms. Such a pattern is to be expected, as symptom severity and presentation can vary widely among the population (DSM-IV-TR). As a result, the outliers were not deleted from the data set to be used for analysis. Boxplots for the dependent (GHQ Total Score, IES-R Total Score) and independent variables (CSI Avoidance, CSI Problem-solving, CSI Social Support) that were used in the multiple regressions are shown in Figures 1 to 5 below.

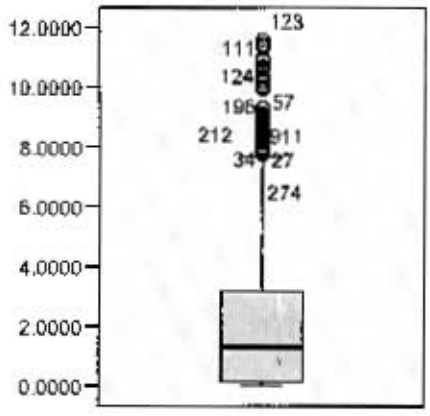

Figure 1: GHQ Total symptoms

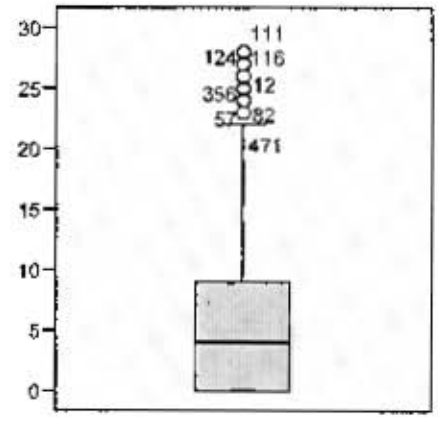

Figure 2:IES-R Total symptoms

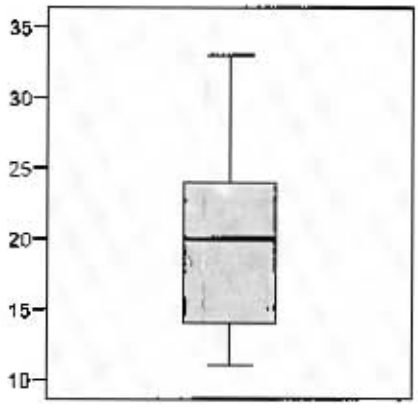

Figure 3: CSI – Seeking social support

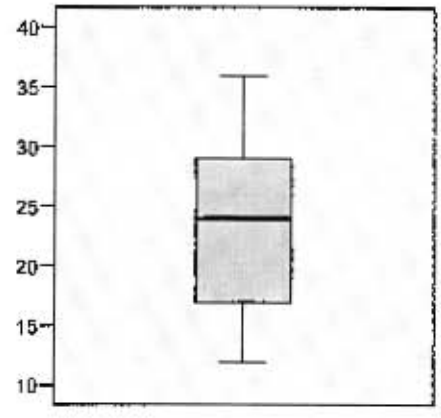

Figure 4: CSI – Problem-solving

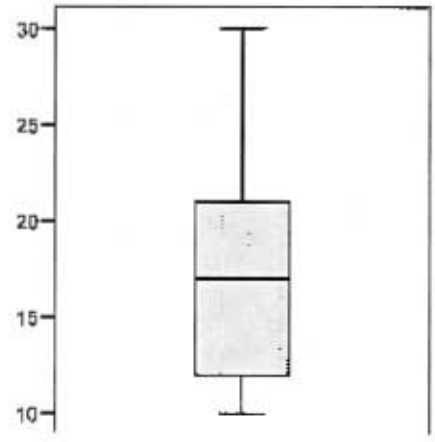

Figure 5: CSI – Avoidance

CHAPTER 4:

RESULTS

4.1 Tests of Normality

It was evident, based on the values of skewness and kurtosis (see Figures 6 and 7 below for normality distributions of the outcome variables, for other variables, please refer to Appendix C), that all of the variables were slightly non-normal in distribution. Because of this fact, Spearman's Rho was used for correlational analyses. For the bivariate analyses, the non-parametric Kruskal-Wallis and Mann-Whitney tests were used. Multiple regressions were to be used to examine the hypotheses. Once completed, the diagnostics on residuals were to be checked, to ensure that the variables did not need to be altered in any way due to deviations from normality.

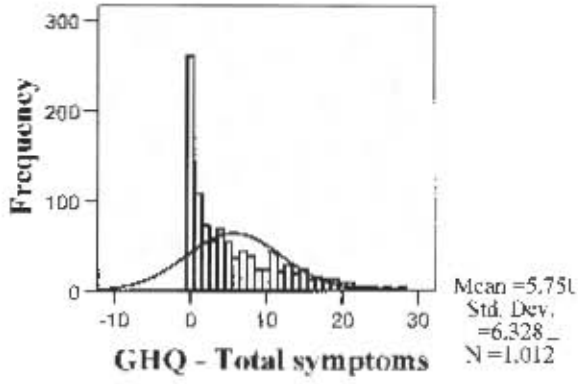

Figure 6: Histogram for GHQ Total symptoms

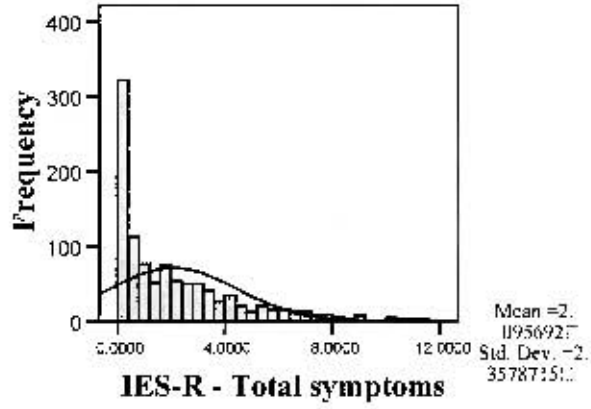

Figure 7: Histogram for IES-R Total symptoms

4.2 Bivariate Associations with the Outcome

Bivariate associations were explored to ensure that some associations existed amongst the independent (including control variables) and dependent variables. If the variables had not been related at this level, then there would have been little to be achieved in continuing to explore associations between them any further using multivariate analyses.

4.2.1 Bivariate Associations of Control Variables with Dependent variables

Spearman's Rho was used to assess associations between the dependent variables and the years of service control variable. There were no significant associations between years of service and the GHQ Total or the IES-R Total. Refer to Table 2 on page 26 for the correlation matrix.

The Kruskal-Wallis test was used to explore associations between the dependent variables and the nature of employment and highest level of education control variables (Tables D1, D2, D3, and D4 in Appendix D). As can be seen in Tables D3 and D4, the IES-R Total and GHQ Total scores were both significantly different across levels of the nature of employment

variable ($p = 0.000$) and with GHQ Total ($p = 0.000$). These results suggest that nature of employment should be retained as a control variable. Neither IES-R Total nor GHQ Total scores were significantly different across levels of the highest level of education variable.

The Mann-Whitney test was used to investigate associations between the dependent variables and the gender control variable. Women differed significantly from men on only the GHQ Total (Table D5 in Appendix D). The effect size of this difference was small, but significant nonetheless, and as a result, gender was retained as a control variable in the final analyses.

Although the control variables years of service and highest level of education did not demonstrate any significant relationship with either of the dependent variables, this lack of relationship is not conclusive with regard to their inclusion or exclusion in further data analyses. Decisions about these two variables were progressively explored while getting a better sense of the data.

Table 2. Spearman's correlation matrix

			Years of Service	GHQ Total symptoms	Avoidance symptoms - IES	Intrusion symptoms - IES	Hyperarousal symptoms - IES	Impact of event scale - revised - TOTAL	CSI - Problem solving	CSI - Social support	CSI - Avoidance coping
Spearman's rho	Years of Service	Correlation Coefficient	1.000	-.022	.037	.070(*)	.060	.054	.006	-.086(**)	.011
		Sig. (2-tailed)	.	.498	.237	.023	.053	.083	.853	.006	.717
		N	1068	985	1034	1041	1043	1019	1022	1027	1031
	GHQ Total symptoms	Correlation Coefficient	-.022	1.000	.438(**)	.486(**)	.520(**)	.498(**)	.195(**)	.171(**)	.475(**)
		Sig. (2-tailed)	.498	.	.000	.000	.000	.000	.000	.000	.000
		N	985	1012	981	988	991	968	971	976	978
	Avoidance symptoms - IES	Correlation Coefficient	.037	.438(**)	1.000	.818(**)	.838(**)	.944(**)	.410(**)	.367(**)	.654(**)
		Sig. (2-tailed)	.237	.000	.	.000	.000	.000	.000	.000	.000
		N	1034	981	1064	1055	1057	1048	1034	1036	1037
	Intrusion symptoms - IES	Correlation Coefficient	.070(*)	.486(**)	.818(**)	1.000	.838(**)	.936(**)	.375(**)	.333(**)	.613(**)
		Sig. (2-tailed)	.023	.000	.000	.	.000	.000	.000	.000	.000
		N	1041	988	1055	1070	1061	1048	1037	1038	1043
	Hyperarousal symptoms - IES	Correlation Coefficient	.060	.520(**)	.838(**)	.838(**)	1.000	.929(**)	.394(**)	.353(**)	.633(**)
		Sig. (2-tailed)	.053	.000	.000	.000	.	.000	.000	.000	.000
		N	1043	991	1057	1061	1074	1048	1041	1044	1045
	Impact of event scale - revised - TOTAL	Correlation Coefficient	.054	.498(**)	.944(**)	.936(**)	.929(**)	1.000	.419(**)	.373(**)	.667(**)
		Sig. (2-tailed)	.083	.000	.000	.000	.000	.	.000	.000	.000
		N	1019	968	1048	1048	1048	1048	1020	1021	1023
	CSI - Problem solving	Correlation Coefficient	.006	.195(**)	.410(**)	.375(**)	.394(**)	.419(**)	1.000	.763(**)	.668(**)
		Sig. (2-tailed)	.853	.000	.000	.000	.000	.000	.	.000	.000
		N	1022	971	1034	1037	1041	1020	1051	1041	1041
	CSI - Social support	Correlation Coefficient	-.086(**)	.171(**)	.367(**)	.333(**)	.353(**)	.373(**)	.763(**)	1.000	.561(**)
		Sig. (2-tailed)	.006	.000	.000	.000	.000	.000	.000	.	.000
		N	1027	976	1036	1038	1044	1021	1041	1056	1046
	CSI - Avoidance coping	Correlation Coefficient	.011	.475(**)	.654(**)	.613(**)	.633(**)	.667(**)	.668(**)	.561(**)	1.000
		Sig. (2-tailed)	.717	.000	.000	.000	.000	.000	.000	.000	.
		N	1031	978	1037	1043	1045	1023	1041	1046	1060

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

4.2.2 Bivariate Associations of Independent Variables with Dependent Variables

I used Spearman's Rho to explore correlations among these variables. All three coping strategies were found to have significant correlations with the two dependent variables. All *p*-values were < 0.001.

As shown in the correlation matrix presented in Table 2, the most significant correlations were between CSI Avoidance and both the IES-R Total and the GHQ Total ($r = 0.667$ and 0.475, respectively). Both other coping strategies (CSI Problem-solving and CSI Seeking Social Support) were also, however, significantly correlated with IES-R Total scores ($r = 0.419$ and 0.373, respectively). The correlations between CSI Problem-solving and CSI Seeking Social Support and the GHQ Total were also significantly small ($r = 0.195$ and 0.171, respectively).

Because of the statistical significance of the correlations, all of these variables were included in the multiple regression analyses. The size of the correlation assisted with deciding on the order in which to include variables when building the model.

4.2.3 Bivariate Associations between Dependent Variables

Using Spearman's Rho, the IES-R subset scores and the IES-R Total were found to be significantly correlated with each other, most likely since they measure different aspects of one construct. The correlation coefficients between these scores were all close to 0.9 (ranging from 0.93 to 0.94, see Table 2), with p=0.000. Consequently, I decided to exclude the IES subsets of symptom scores in the multivariate analyses and to simply use the full scale total.

Table 2 also shows that GHQ Total was significantly correlated with IES-R Total. As a result, I decided to use the two outcomes in different regression models.

4.3 Explorations of Independent Variables

It was important to assess any strong relationships amongst variables because of possible multicollinearity. This exploration was also necessary so that I could identify any variables that could be the source of possible confounds. In assessing these relationships, it became clear which independent and control variables were associated with the outcome, and which independent and control variables were related to each other as well as to the outcome, so that they could be controlled for in the multiple regression analyses.

4.3.1 Control Variables

Chi-square tests of association were used to explore relationships between the different sets of categorical control variables (gender and highest level of education; gender and employment type). Where there were low cell counts, Fisher's Exact tests were used. Results indicated a significant association only between Gender and Employment Type (p= 0.000; Table E1 and E2 in Appendix E). The effect size of this relationship was shown to be small (Cramer's V = 0.208), and as a result, both variables were retained for the multiple regression analyses, while taking note of the possible confounding effects. These confounding effects were taken into account in the final analyses, and diagnostics were used to inform interpretation of the multiple regressions.

The Mann-Whitney test was used to explore the relationship between years of service and gender. The results indicated a significant relationship between the two variables, in that men tended to have significantly more years of service (p = 0.000, (Table E3 in Appendix E). The size of the effect of gender on service years was medium (r = 0.307).). Because the relationship

was not strong in size, and because there were different theoretical reasons for the inclusion of these variables, both were retained.

The Kruskal-Wallis test was used to assess the relationship between Years of service and (i) highest level of education and (ii) type of employment. Years of service was significantly associated with type of employment ($p = 0.000$), but not with highest level of education (Table E4 and E5 in Appendix E).

4.3.2 Independent Variables

Spearman's Rho was used to explore the associations among the independent variables (i.e., the three indices of the CSI). All three coping indices were significantly correlated with each other, which was expected given that they measure aspects of the same construct (coping). However, the correlation coefficients were not strong enough to exclude any of these measures from the final analyses (range 0.56 – 0.76, see Table 2) (Field, 2005).

4.3.3 Independent Variables and Control Variables

Spearman's Rho, the Kruskal-Wallis test, and the Mann-Whitney test were used to explore relationships among these variables. The choice of test depended on whether the variables to be explored were categorical, continuous, or a combination of both.

Spearman's Rho was used to explore the control variables years of service and highest level of education and the 3 independent variables. Years of service was significantly negatively correlated with CSI-Social Support (correlation coefficient = -0.086, $p = 0.006$), indicating possible multicollinearity. Refer to Table 2 for the correlation matrix.). It was decided, however,

that this was not sufficient grounds to reject years of service as a control variable, and diagnostics would be used to explore associations further following the multiple regressions.

Kruskal-Wallis tests were conducted on two categorical control variables to explore whether (i) employment type, and (ii) highest level of education were associated with significant between-group differences when exploring the independent (coping strategies) variables. Results showed that employment type was associated with significant differences on all three independent variables (all p-values = 0.000, Table E6, E7, E8 in Appendix E), and this possible multicollinearity was noted when undertaking the multiple regressions. Of the results for highest level of education, CSI – Avoidance coping and CSI – Seeking Social Support were associated with significant differences among groups (p = 0.008, and 0.006, respectively, please refer to Table E9, E10, and E11 in Appendix E).

The Mann-Whitney test was used to assess the influence of gender on the independent variables. Results showed that females differed significantly from males only on the CSI-Seeking Social Support variable, and that the effect size of this difference was small (p = 0.001, r = -0.125, Table E12 in Appendix E). Gender was therefore retained as a control variable.

In summary, I decided that of the initial control variables, gender and employment type would be retained for the multiple regression analyses, as both were significantly associated with the dependent variables, and it was felt that it was important to allow for effects of the variables individually. Years of service was also retained as a control variable, as there were various theoretical reasons for its inclusion, despite its possible confounding association with employment type. The associations found here for multicollinearity or possible confounding effects were noted, both while building the models and post-hoc, when interpreting output. In

addition, multicollinearity diagnostics (tolerance and VIF) were used during the multiple regression model building to ensure that multicollinearity did not interfere with the procedure.

4.4 Multiple Regression

The regression models were built step by step, and variables that were not significant were eliminated before going on to the next stage. Variables were added in blocks, with the control variables being included first and the CSI variables were then included one at a time. This approach also allowed for evaluation of how the model improved with each step. As there are two outcome variables of interest, the GHQ-Total and the IES-R Total, two models were built, one for each outcome variable. A number of steps were followed to assist with deciding upon the variables to be used in the final model for each dependent variable.

4.4.1 Regression Model: GHQ Total score as outcome

The first step for the GHQ involved inputting only the control variables (employment type, gender, years of service, and highest level of education) as predictors to determine how much variance they could account for in GHQ Total score. Employment type alone caused R^2 to change significantly from 0 to 0.032, with Sig F Change <0.01. When gender was added, R^2 increased by 0.019 (Sig F Change <0.001). The addition of years of service did not increase R^2 at all, demonstrating no effect of years of service on the outcome. Highest Level of Education was the last control variable included, and it increased R^2 by a non-significant 0.002 (Sig F Change = 0.140). As a result, only employment type and gender were retained for the rest of the model-building procedure, while years of service and highest level of education were excluded from further models.

The next step involved adding each CSI variable one at a time, in order of importance based on their bivariate correlations with the outcome. Thus, CSI-Avoidance was included first, as it was most highly correlated with GHQ Total score (Spearman's Rho = 0.475). CSI-Problem-solving (Spearman's Rho = 0.195 correlation with GHQ Total) was then added, and CSI Seeking Social Support was added last (Spearman's Rho = 0.171 correlation with GHQ Total). Each of the three CSI variables was found to contribute significantly to the variance of the outcome (Avoidance: $R^2 = 0.377$, Sig F Change <0.001; Problem-solving: $R^2 = 0.125$, Sig F Change <0.001; and Seeking Social Support: $R^2 = 0.086$, Sig F Change <0.001). Consequently, all three CSI variables were retained for the final model.

The final model for the GHQ therefore included all those variables that had been demonstrated to significantly contribute to explaining variance in GHQ Total score in the model-building steps: employment type, gender, CSI Avoidance, CSI Problem-solving, and CSI Seeking Social Support. The regression model output and coefficients are presented in Table 3 and 4.

Table 3: Final regression model for the GHQ

Model	R	R Square	Adjusted R Square	Adjusted Error of the Estimate	Change Statistics				Sig F Change
					R Square Change	F Change	df1	df2	
5	.515	.265	.259	5.432	.265	48.426	7	941	0.000

a Predictors: (Constant), CSI - Avoidance coping, Gender, E2, E3, E1, CSI - Social support, CSI - Problem solving
b Dependent Variable: GHQ Total symptoms

Table 4: Coefficients for final regression model for the GHQ

Model		Unstandardised Coefficients		Standardised Coefficients	
5		B	Std Error	Beta	Sig
	(Constant)	-3.745	.893		.000
	Employment Type 1	-1.525	.516	-,087	.003
	Employment Type 2	-2.737	1.275	-.061	.032
	Employment Type 3	-.853	.698	-.035	.222
	Gender	2.531	.529	.138	.000
	CSI – Social Support	-.101	.043	-.100	.019
	CSI – Problem-Solving	-.140	.041	-.165	.001
	CSI – Avoidance Coping	.717	.046	.593	.000

Together, the variables entered into the model accounted for 26.5% ($R^2 = 0.265$) of the variance in GHQ Total score. CSI – Avoidance ($b = 0.717$, $t = 15.765$, $p < 0.001$) explained more of the variance in GHQ Total score than did the other CSI variables. CSI – Problem-solving also accounted for a significant portion of the variance ($b = -0.140$, $t = -3.433$, $p < 0.001$), however, as did CSI – Seeking Social Support ($b = -0.101$, $t = -2.341$, $p < 0.005$).

On examining the residuals in this analysis, it was noted that there are discernable lines in the plots where the standardised residuals were plotted against the standardised predicted values, caused by the discrete nature of the GHQ scores. In addition, there were signs of non-constant variance. Because the GHQ was poisson-distributed, a poisson model was run using the log as the link function. In this model, the same variables were found to be significant. Because of this finding, and because the range of GHQ scores was large enough for it to approximate a

continuous variable, the interpretation of the regression model was used. Please refer to the tables in Appendix G for the poisson model.

For this final model, all of the Variance Inflation Factor (VIF) values are less than 10, and the tolerance statistics are above 0.2, which indicates that there is no problem with collinearity within the data (Field, 2006).

4.4.2 Regression Model: IES-R Total score as outcome

A similar procedure as above for the GHQ Total score was followed when deciding upon the variables to include in the final model for the IES-R Total score. The first step was to add each control variable individually. Employment type caused a significant change in R^2 (0.028), with a significant F-statistic (Sig F Change < 0.001). The addition of gender added very little to the utility of the model (Sig F Change = 0.296). As a result, gender was excluded from further model building steps. Years of service also contributed little to explaining the variance in this outcome variable (Sig F Change = 0.724); this control variable was therefore also was excluded from later models. The addition of highest level of education increased the R^2 by 0.06 (Sig F Change <0.005). These results indicate that both gender and highest level of education contributed significantly to the variance seen on the IES-R Total score; consequently, they were retained in further models.

The three CSI variables were then added in order of importance (based on Spearman's Rho from the exploration of bivariate associations with IES-R Total score). CSI - Avoidance was added first (Spearman's Rho = 0.667), then CSI – Problem-Solving (Spearman's Rho = 0.419), and finally CSI - Seeking Social Support (Spearman's Rho = 0.373). Interestingly, when all three CSI variables were added to the model, there were notable changes in both the Problem-solving

and Seeking Social Support's contribution to the variance. CSI Problem-solving, when added to the model without any of the other CSI variables, contributed significantly to the variance (b = 0.99, = 10.327, $p < 0.001$), but when added with the other two CSI variables, the direction of this effect changed, and it was no longer highly significant (b = -0.024, t = -1.772, p = 0.77). Similarly, when CSI - Seeking Social Support was added to the model with only the control variables and no other CSI variables, it contributed significantly to the outcome (b = 0.089, t = 7.719, $p < 0.001$). However, when it was added in the presence of CSI – Avoidance, the significance of the effect was lost and the direction of the relationship changed (b = -0.024, t = -1.669, p = 0.095).

As a result, another model was built in two stages to decide on whether either or both of these variables should be excluded. In the first stage of this new model-building, employment type, highest level of education, and CSI – Avoidance were included. This model accounted for 38.1% of the variance in IES-R Total score (R^2 = 0.381). In the next stage, CSI – Problem-Solving and CSI – Seeking Social Support were added into the model, with very little change in R^2 (= 0.391), although this was still significant (Sig F Change <0.001). This confirmed the inclusion of all three CSI variables in the final regression model.

The final model included employment type, highest level of education, CSI - Avoidance (R^2 = 0.377, Sig F Change <0.001), CSI - Problem-solving (R^2 = 0.125, Sig F Change <0.001), and CSI - Seeking Social Support (R^2 = 0.086, Sig F Change <0.001), as these were all found to contribute significantly to the variance of the outcome. Table 5 and 6 show the final regression model output and the coefficients for the IES-R Total as outcome.

Table 5: Final regression model for the IES-R Total

Model	R	R Square	Adjusted R Square	Std Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
6	.625	.391	.386	1.8589633	.391	90.021	7	983	.000

Table 6: Coefficients for the final regression model for the IES-R Total

Model		Unstandardised Coefficients		Standardised Coefficients	
6		B	Std Error	Beta	Sig
	(Constant)	-2.283	.311		.000
	Employment Type 1	-.124	.176	-.018	.480
	Employment Type 2	-.177	.433	-.010	.683
	Employment Type 3	-.240	.232	-.026	.300
	Gender	.243	.070	.088	.001
	CSI – Social Support	-.024	.014	-.064	.095
	CSI – Problem-Solving	-.024	.014	-.076	.077
	CSI – Avoidance Coping	.315	.015	.694	.000

Together, these variables accounted for 39.1% ($R^2 = 0.391$) of the variance in IES-R Total score. CSI – Avoidance ($b = 0.315$, $t = 20.720$, $p < 0.001$) explained more of the variance in IES-R Total score than did the other CSI variables. There was a negative relationship, of borderline statistical significance, between CSI –Problem-Solving and IES-R Total score, when all other variables were held constant ($b = -0.024$, $t = -1.772$, $p = 0.77$) Similarly, CSI – Seeking

Social Support was negatively related to IES-R Total score, again with borderline significance (b = -0.024, t = -1.669, p = 0.095).

The VIF values for all variables in this model were less than 10, and the tolerance statistics were above 0.2. These collinearity diagnostics confirm that there is no problem with multicollinearity in the data.

CHAPTER 5

DISCUSSION

5.1 Relationship between Coping and Symptoms

The hypotheses being tested were:

1. The null hypothesis: there will be no association between coping strategies and levels of post-traumatic symptoms.
2. That the use of prosocial coping methods (e.g., seeking social support) will be associated with fewer posttraumatic symptoms.
3. That the use of coping strategies identified by previous literature as less beneficial (e.g., avoidance coping) will be associated with more posttraumatic symptoms.

Both final regression models showed that the three CSI coping variables and the control variables accounted for significant amounts of the variance in outcome variables. To better understand each CSI variable's contribution, as well any possible interaction, this discussion will explore results starting with the simple correlational analyses and then the findings of the multiple regressions.

5.1.1 Prosocial Coping

Two prosocial forms of coping were measured in this study. The first is problem-solving, which is an active response to a stressor, and seems to derive from the primitive "fight" response to threat (Amirkhan, 1990; Lowery & Stokes, 2005). The second is seeking social support, which is the active recruitment of human contact, regardless of "the material aid, advice or distraction" that such contact can offer (Amirkhan, 1990). Contrary to hypothesis 2, both problem-solving

and seeking social support were positively correlated with GHQ total scores on the simple correlations; that is, higher problem-solving and social support scores were associated with higher GHQ scores, and not lower GHQ scores, as had been predicted.

This result can be interpreted in a number of ways. Firstly, it is possible that individuals only start to use coping skills after symptoms have set in, so that a certain level of distressing symptoms will need to have been achieved before an individual attempts to seek support or to problem solve. This interpretation is similar those made following findings of other studies, which will be discussed in more detail in the following subsections.

5.1.1.1 Seeking Social Support

Seeking social support has been associated with a variety of outcomes: Some studies show that it is associated with more positive mental health outcomes, some show that it is associated with negative mental health outcomes, and some show that it is not associated with mental health outcomes at all (Folkman & Moskowitz, 2004). It seems that the *type* of social support accessed determines whether the outcome of this form of coping is beneficial or not. For example, evidence indicates that, following traumatic exposure, social support provided by work colleagues can be more beneficial than non-work support, but that only some forms of peer interaction are coping-enhancing, while others are dysfunctional (see Lowery & Stokes, 2005). Amirkhan (1990) found that seeking of support was associated with increased symptomology, and interpreted this as indicating that either social supports are not as consistently beneficial as had been thought, or that those who display symptoms are more likely to seek out social support as they feel unable to cope on their own. Similar conclusions can be applied to the present study.

The instrument used to measure coping in this study (the CSI) does not specify the type of social support sought or utilised, but rather refers to social support as a general construct.

Aldwin and Revenson (1987) have suggested that some coping strategies may serve only to increase or maintain positive mood states, rather than to improve mental health, and perhaps seeking social support is one such strategy. Kaniasty (2005) posits that the positive relationship between received social support and psychological (posttraumatic) distress is logical, given that the presence of psychological suffering acts as a cue for support networks to assist those experiencing distress.

The relationship between seeking social support and psychological symptoms may be more complicated: Carver, Scheier, and Weintraub (1989) posit that not all social support is the same: they argue that seeking social support if it is linked to problem-solving is beneficial, while seeking social support as a form of emotional support alone may be more passive and self-defeating. This argument is furthered by Hobfoll and Schroder (2001), who explored active-prosocial, passive-prosocial, active-asocial, and passive asocial forms of coping and their associations with various outcomes, including depressed mood. Their findings indicated that those who used active-prosocial coping had the best outcomes and the lowest levels of depressed mood, while those who used passive-prosocial or active-asocial forms of coping had intermediate levels of depressed mood and other outcomes, and that those who used passive-asocial coping showed the poorest outcomes. In light of this, it seems that bivariate correlations alone are inadequate in assessing the nuanced relationship of coping, particularly seeking social support and problem-solving, with psychiatric symptoms, and conclusions should be drawn only from multivariate analyses that considers all variables together.

Interestingly, and in keeping with the above theory, when seeking social support was included along with problem-solving and avoidance coping in the multiple regression model, the direction of the relationship between seeking social support and the outcomes changed (for both the IES-R and GHQ total scores), and significance of their effect in the model with the IES-R as outcome was lost. In addition, it is possible that this indicates that individuals do not use one form of coping in isolation, but rather use a combination of methods or resources to attempt to cope following traumatic exposure. In further support of this notion, Hobfall and Schroder (2001) mention that seeking support has been found to be related to avoidance and emotion-focused coping.

The results from the multivariate models for both the GHQ Total score and the IES-R Total score lead to the confirmation of Hypothesis 2, that prosocial coping (in this case, seeking social support) is associated with fewer symptoms. As this demonstrates an association only, and causality cannot be inferred, both directions of causality could be inferred. That is, one might posit that as efforts at seeking social support increase, so symptom levels decrease, or one might posit that as symptom levels increase, so attempts to seek social support decrease.

The results presented here are similar to those found in a study of student paramedics by Lowery and Stokes (2005), which demonstrated that peer social support did not significantly contribute to trauma-related symptoms. Lowery and Stokes (2005) only measured dysfunctional peer support, whereas the current study does not specify the type of social support accessed. Amirkhan (1990) acknowledged that a shortcoming in the CSI is that the quality of social support is not assessed.

5.1.1.2 Problem-solving

Problem-solving, as explored using the CSI, refers to an instrumental form of coping in which the individual attempts to manipulate aspects of the situation (Amirkhan, 1990). Studies that have explored the relationship between the problem-solving coping strategy and mental health outcomes have produced inconsistent results. Some indicate that problem-focused coping is associated with decreased levels of emotional distress, while others have found the opposite, and still others have demonstrated no effects (Aldwin & Revenson, 1987).

The positive bivariate association found between symptoms and problem-solving in the current study is contrary to Hypothesis 1, which stated that prosocial forms of coping would be associated with fewer symptoms (i.e., lower scores) on the outcome measures. However, as was noted in the previous section dealing with the seeking social support coping strategy, bivariate associations in and of themselves do not seem to adequately capture the relationship between coping and psychological outcomes, as forms of coping are rarely used in isolation.

The multivariate analysis showed that problem-solving has a significant negative relationship with the GHQ Total score, and a non-significant negative relationship with the IES-R total score. This indicates that problem-solving as a coping strategy is more related to the outcome of general psychiatric symptoms, and less so to specific PTSD symptoms. The negative relationship indicates that as the use of problem-solving as a coping strategy increases, so symptoms decrease; or vice-versa, that is, as symptoms increase, so the use of problem-solving as a coping strategy decreases.

Aldwin and Revenson (1987) reported similar findings, in that "instrumental action" was the only coping strategy among those explored that showed a negative relationship to level of symptoms. Endler and Parker (1994) demonstrated similar relationships between task-oriented

0.315, $\beta = 0.694$), lead to acceptance of Hypothesis 2: that avoidance coping is associated with higher symptom levels. Again, as causality cannot be implied, both possibilities for this association need to be considered. Firstly, the results could mean that as an individual avoids more, his or her symptoms increase. The second interpretation is that as an individual experiences more symptoms resulting from the trauma, he or she will start to use more avoidance tactics. Clohessy and Ehlers (1999) further note that cognitive and emotional avoidance, wishful thinking and denial may be adaptive at the time of the trauma, but become more potentially damaging as time progresses and such forms of coping are maintained. The results of their exploration into the relationship between coping, response to intrusive memories, and psychiatric symptoms indicated that avoidance strategies such as wishful thinking and emotional disengagement were significantly and positively correlated with symptom levels, and wishful thinking accounted for 27.9% of symptom severity when all other variables were held constant. Such forms of coping are thought to prevent the emotional processing of traumatic memories, which disallows such memories from being worked through and put in the past. Similarly, Dirkzwager, Bramsen, and van der Ploeg (2003) found that more use of avoidance strategies such as wishful thinking was associated with more psychiatric symptoms in former peacekeepers, and suggested that training that teaches those exposed to traumas to use more active, prosocial strategies rather than avoidant strategies could be beneficial in preventing or decreasing PTSD symptoms.

Dirkzwager et al. (2003) further suggest that successful coping requires initial avoidance due to the short-term benefits that this has in terms of reducing anxiety and stress, as well as more active coping, which tends to increase distress in the short-term, but leads to more appropriate resolution of the problem.

5.2 Limitations and Recommendations for Future Research

There were a number of possible limitations to the current study that need to be noted prior to concluding and making recommendations. Firstly, this study used a cross sectional design. A longitudinal study would be better able to more accurately assess the causal relationship between mental health and maladaptive coping strategies. Aldwin and Revenson (1987), for example, discuss the possibility that this relationship is a cyclical one, in which the greater the initial level of emotional distress and the greater the severity of the stressor, the more likely an individual is to use maladaptive coping strategies, thereby increasing emotional distress. Future research could utilise a longitudinal study design, which would enable the gathering of baseline data so that initial levels of distress and coping methods used could be measured against later symptomology, coping methods and critical incident exposure. This would assist in gaining a more textured understanding of the complex interplay of the variables involved in the development of symptomology following critical incident exposure and the influence of coping on this interplay and development. In addition, statistical methods such as Structural Equation Modelling, which are sensitive to reciprocal relationships that may exist, would be better suited to exploring how variables influence each other. Structural equation modelling was not used in the current study, as this study aimed to first establish whether associations existed among coping methods and psychiatric symptomology. Exploring the nature of the associations is an area for further research.

Secondly, sampling may have been an issue in that the findings from this study may not be generalisable beyond emergency service workers, as there may be characteristics unique to this population. One such characteristic could relate to the support environment, in which

support can only be accessed through specific channels and must be avoided in others, as well as the avoidance of emotional processing that is thought to be a part of the environment (see, for example, Lowery & Stokes, 2005). Another such characteristic could be the very specific class of training that emergency service workers receive, which may teach specific methods for problem-solving. Furthermore, there may well be distinctive effects specific to such large-scale exposure to critical incidents. For example, coping may be overwhelmed as a result of repeated exposure, leading to relationships between high levels of symptoms and coping. Additionally, those workers who were absent on the day of data collection may have been away on stress leave, which could lead to an inaccurate representation of the population and its characteristics in terms of coping and symptomology.

The instruments used could also present areas of limitation within this study. The instrument used to measure coping (the CSI) does not specify the type of social support that is accessed, rather asking the respondent to agree or disagree with statements such as "went to a friend for advice", or "accepted sympathy and understanding from friends who had the same problem". Further research should consider using an instrument that measures the *type* of social support accessed, as well as the perceived *efficacy* of this support, as some forms of support have been shown to be beneficial, some to be damaging, and others to have no effect at all (Lowery & Stokes, 2005). Amirkhan (1990), the developer of the CSI recommends that, because the instrument does not represent the full range of responses possible within the fundamental strategies delineated, and that the three fundamental strategies are not exhaustive and other modes of coping may be used, that any rich analysis of coping would need to use supplemental measures. That this was not done in the current study represents a further limitation, in that other methods of coping may have been able to explain greater variance in symptom levels.

In addition, the Impact of Event Scale, as well as the revised IES-R, was developed for measuring acute stress response syndromes and is less sensitive after an extended period of time has elapsed since the traumatic event and in which symptomatic distress may only be mild (Weiss, Marmar, Metzler, & Ronfeldt, 1995). Future studies should consider using a more sensitive instrument.

5.3 Conclusion and Clinical Implications

This study adds to a growing body of literature that suggests that the relationship between symptoms and coping is not as straightforward as might previously have been thought. The positive correlation between avoidance coping and symptoms suggests that as symptoms increase, so avoidance coping increases, or that as avoidance coping increases, so symptoms increase. The negative correlation between (i) seeking social support and symptoms, and (ii) problem-solving and symptoms suggest that as use of these forms of coping increases, so symptoms decrease, or that when there are fewer symptoms present, individuals use more of these forms of coping.

Although this study is flawed in terms of its cross-sectional design, both the results and the literature indicate that emergency services could benefit from introducing both pre-service and in-service training that assists workers in not using methods that are avoidant, as well as not using the more damaging forms of social support and problem-solving. Because poorer mental health is associated with on-the-job mistakes, which in turn, increase vulnerability to the development of PTSD, helpful forms of social support could be integrated into a "buddy system" in which workers are teamed up and are able to monitor each other for the development of psychiatric symptoms. In addition, emergency services could benefit from implementing

employee assistance programmes. Implementation of such programmes would need to be sensitively handled so that confidentiality can be assured, stigma around accessing such services reduced, and acceptability to the workers themselves improved so that they feel more able to freely access this support.

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APPENDIX A:

CODEBOOK FOR QUESTIONNAIRES

Emergency Services Project
Code Book
14 August 2002

	Municipality	1 = West Coast District Municipality 2 = Boland District Municipality 3 = Overberg District Municipality 4 = Garden Route/Klein Karoo District Municipality 5 = Central Karoo District Municipality 6 = Cape Town Unicity	1
	Number	Range 0000 – 9999 *A. Code from right*	2-5
	Language	*B. 1 = English* 2 = Afrikaans	6
		Section 1	
1.	What is your gender?	1 = Male 2 = Female	7
2.	What is your age?	Range 18-65	8,9
3.	What is your highest level of education?	1 = Less than Std 6 2 = Std 6 – 10 3 = Some tertiary education (university, technikon) but did not graduate 4 = Degree or diploma	10
4.	What is your home language?	01 = English 02 = Afrikaans 03 = Xhosa 04 = Other (specify: ____)	11, 12
7.	What service are you with?	01 = EMS (provincial ambulance service) 02 = Private ambulance service 03 = Fire service 04 = Traffic police (Cape Town, municipal) 05 = Traffic police (municipal, not Cape Town) 06 = Traffic police (provincial) 07 = SA Red Cross (Disaster relief) 08 = SA Red Cross (Ambulance service) 09 = St John's Ambulance 10 = NSRI	13,14

		11 = SANDF 12 = Other	
8.	What is the nature of your employment with the emergency service?	1 = Volunteer 2 = Reservist 3 = Short-term contract (one year or less) 4 = Permanent staff	15
9.	How many years have you served in this service?	Years	16, 17
10.	What is your rank?	01 = junior frontline staff 02 = shift leader 03 = senior staff	18, 19
	SECTION 2		
1.	In the past two months, have you been feeling perfectly well and in good health?	1 = Better than usual 2 = Same as usual 3 = Worse than usual 4 = Much worse than usual	20
2.	In the past two months, have you been feeling in need of vitamins or a "tonic"?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	21
3.	In the past two months, have you been feeling run down and out of sorts?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	22
4.	In the past two months, have you felt that you are ill?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	23
5.	In the past two months, have you been getting any headaches?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	24
6.	In the past two months, have you been getting a feeling of tightness or pressure in your head?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	25
7.	In the past two months, have you been having hot or cold spells?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	26
8.	In the past two months, have you lost much sleep	1 = Not at all 2 = No more than usual	27

	over worry?	3 = More than usual 4 = Much more than usual	
9.	In the past two months, have you had difficulty in staying asleep once you have fallen asleep?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	28
10.	In the past two months, have you felt constantly under strain?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	29
11.	In the past two months, have you been getting edgy and bad-tempered?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	30
12.	In the past two months, have you been getting scared or panicky for no good reason?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	31
13.	In the past two months, have you felt that everything is too much for you?	1 = Not at all 2 = No more than usual 2 = More than usual 4 = Much more than usual	32

14.	In the past two months, have you been feeling nervous and strung-up all the time?	1 = Not at all 2 = No more than usual 3 = More than usual 4= Much more than usual	33
15.	In the past two months, have you been managing to keep yourself busy and occupied?	1 = More so than usual 2 = Same as usual 3 = Less than usual 4 = Much less than usual	34
16.	In the past two months, have you been taking longer over the things that you do?	1 = Quicker than usual 2 = Same as usual 3 = Longer than usual 4 = Much longer than usual	35
17.	In the past two months, have you felt on the whole that you were doing things well?	1 = Better than usual 2 = About the same 3 = Less than usual 4 = Much less well	36
18.	In the past two months, have you been satisfied with the way you've carried out your tasks?	1 = More so than usual 2 = Same as usual 3 = Less than usual 4 = Much less than usual	37
19.	In the past two months, have you felt that you are playing a useful part in things?	1 = More so than usual 2 = Same as usual 3 = Less than usual 4 = Much less than usual	38
20.	In the past two months, have you felt capable of making decisions about things?	1 = More so than usual 2 = Same as usual 3 = Less than usual 4 = Much less than usual	39
21.	In the past two months, have you been able to enjoy your normal day-to-day activities?	1 = More so than usual 2 = Same as usual 3 = Less than usual 4 = Much less than usual	40
22.	In the past two months, have you been thinking of yourself as a worthless person?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	41
23.	In the past two months, have you felt that life is entirely hopeless?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	42
24.	In the past two months,	1 = Not at all	43

	have you felt that life isn't worth living?	2 = No more than usual 3 = More than usual 4 = Much more than usual	
25.	In the past two months, have you thought of the possibility that you might do away with yourself?	1 =Definitely not 2 =I don't think so 3 =Has crossed my mind 4 = Definitely not	44
26.	In the past two months, have you found at times you couldn't do anything because your nerves were too bad?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	45
27.	In the past two months, have you found yourself wishing you were dead and away from it all?	1 = Not at all 2 = No more than usual 3 = More than usual 4 = Much more than usual	46
28.	In the past two months, have you found that the idea of taking your own life kept coming into your own mind?	1 =Definitely not 2 =I don't think so 3 =Has crossed my mind 4 = Definitely not	47
SECTION 3			
1.	Do you ever drink alcoholic beverages?	1 = Yes 2 = No	48
2.	Have you ever felt that you should cut down on your drinking?	1 = Yes 2 = No 3 = Not applicable	49
3.	Have people annoyed you by criticising your drinking?	1 = Yes 2 = No 3 = Not applicable	50
4.	Have you ever felt bad or guilty about your drinking?	1 = Yes 2 = No 3 = Not applicable	51

5.	Have you ever had a drink first thing in the morning (an eye-opener or "regmaker") to steady your nerves or get rid of a hangover?	1 = Yes 2 = No 3 = Not applicable	52
6.	Do you ever use any other addictive substances (besides alcohol and tobacco)? (E.g. dagga, mandrax, heroine, crack or cocaine, Xtasy)	1 = Yes 2 = No	53
7.	Do you ever use prescription drugs without a doctor or a nurse telling you to do so?	1 = Yes 2= No	54

8.	Do you ever use over-the-counter medicines (for example, "Grandpa" headache tablets, sleeping tablets, diet pills or cough mixture) to give you a "high" or a "good feeling"?	1 = Yes 2 = No	55
	SECTION 4		
1.	Have you experienced **<u>focused attention</u>** (feeling able to attend to a task you want to do, without many distractions from within yourself)?	1 = Definitely true 2 = True 3 = Not true 4 = Definitely not true	56
2.	Have you experienced **<u>productivity</u>** (a feeling of being able to stay at work until a task is finished, do something new to solve problems, or express yourself creatively)?	1 = Definitely true 2 = True 3 = Not true 4 = Definitely not true	57
3.	Have you experienced **<u>responsible caretaking</u>** (feeling that you are doing what you should to take care of yourself or someone else)?	1 = Definitely true 2 = True 3 = Not true 4 = Definitely not true	58
4.	Have you experienced **<u>sensory pleasure</u>** (being able to enjoy bodily senses, enjoyable intellectual activity, doing things you ordinarily like, such as listening to music, enjoying the outdoors, lounging in a hot bath)?	1 = Definitely true 2 = True 3 = Not true 4 = Definitely not true	59

5.	Have you experienced **sharing** (being able to commune with others in an empathetic, close way, as in talking, walking, going out, or just being together?	1 = Definitely true 2 = True 3 = Not true 4 = Definitely not true	60

SECTION 5			
1.	Serious injury to self while actively performing your duty	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	61
2.	Threat of serious injury to self while actively performing your duty (that did not result in actual serious injury)	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	62
3.	Death of a fellow emergency worker while actively performing your duty	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	63
4.	Serious injury to fellow emergency worker while actively performing your duty (that did not result in death)	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	64
5.	Threat of injury or threat of death to fellow emergency worker while actively performing your duty (that did not result in actual serious injury or death)	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	65
6.	Suicide or attempted suicide by fellow emergency worker	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	66
7.	Responded to incident involving three or more deaths	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	67
8.	Responded to incident involving one or two deaths	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	68
9.	Responded to incident involving multiple serious injuries (three or more	1 = Happened once 2 = Happened twice 3 = Happened three or more times	69

	victims sustained serious injuries)	4 = NA	
10.	Incident requiring police protection while on duty	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	70

11.	Verbal or physical threat by public while on duty (that did not require police protection)	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	71
12	Incident involving serious injury or death to children	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	72
13.	Incident involving severe threat to children (that did not result in actual serious injury or death to children)	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	73
14.	Victim(s) known to you	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	74
15.	Failure after extensive effort	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	75
16.	Critical (negative) media interest	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	76
17.	Close contact with burned or mutilated victim	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	77
18.	Removing dead body or bodies	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	78
19.	Incident necessitating search or rescue involving serious risk to yourself	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	79
20.	Prolonged extrication of trapped victim with life-threatening injuries	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	80
21.	Use of deadly force by police at an incident	1 = Happened once 2 = Happened twice 3 = Happened three or more times	81

		4 = NA	
22.	Exposure to extremely hazardous materials	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	82

23.	Exposure to blood and body fluids (not needle-stick injuries)	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	83
24.	Critical equipment failure or lack of equipment in any of the above situations	1 = Happened once 2 = Happened twice 3 = Happened three or more times 4 = NA	84
25.	In the past two months, after how many of these incidents did you receive a team debriefing?	0 = Never – I did not experience any such incident 1 = My team was not offered debriefing 2= My team was offered debriefing but I did not attend 3 = I Have attended one team debriefing 4 = I have attended two team debriefings 5 = I have attended three or more team debriefings	85
26.	In the past two months, after how many of these incidents did you receive individual counselling or debriefing?	0 = Never – I did not experience any such incident 1 = I was not offered debriefing 2 = I was offered debriefing but I did not attend 3 = I have attended one individual debriefing 4 = I have attended two individual debriefings 5 = I have attended three or more individual debriefings	86
27.	Any reminder brought back feelings about it.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	87
28.	I had trouble staying asleep.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	88
29.	Other things kept making me think about it.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	89
30.	I felt irritable and angry.	0 = Not at all 1 = A little bit 2 = Moderately	90

		3 = Quite a bit 4 = Extremely	
31.	I avoided letting myself get upset when I thought about it or was reminded of it.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	91

32.	I thought about it when I didn't mean to.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	92
33.	I felt as if it hadn't happened or wasn't real.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	93
34.	I stayed away from reminders about it.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	94
35.	Pictures about it popped into my mind.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	95
36.	I was jumpy and easily startled.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	96
37.	I tried not to think about it.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	97
38.	I was aware that I still had a lot of feelings about it, but I didn't deal with them.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	98
39.	My feelings about it were kind of numb.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	99
40.	I found myself acting or feeling as though I was back at that time.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	100

41.	I had trouble falling asleep.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	101

42.	I had waves of strong feelings about it.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	102
43.	I tried to remove it from my memory.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	103
44.	I had trouble concentrating.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	104
45.	Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	105
46.	I had dreams about it.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	106
47.	I felt watchful or on-guard.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	107
48.	I tried not to talk about it.	0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely	108
49.	To what extent did you let your feelings out to a friend or co-worker?	3 = A lot 2 = A little 1 = Not at all	109
50.	To what extent did you rearrange things around you so that your problem had the best chance of	3 = A lot 2 = A little 1 = Not at all	110

	being resolved?		
51.	To what extent did you brainstorm all possible solutions before deciding what to do?	3 = A lot 2 = A little 1 = Not at all	111

52.	To what extent did you try to distract yourself from the problem?	3 = A lot 2 = A little 1 = Not at all	112
53.	To what extent did you accept sympathy and understanding from someone else	3 = A lot 2 = A little 1 = Not at all	113
54.	To what extent did you do all you could to keep others from seeing how bad things really were?	3 = A lot 2 = A little 1 = Not at all	114
55.	To what extent did you talk to people about the situation because talking about it made you feel better?	3 = A lot 2 = A little 1 = Not at all	115
56.	To what extent did you set some goals for yourself to deal with the situation?	3 = A lot 2 = A little 1 = Not at all	116
57.	To what extent did you weigh your options very carefully?	3 = A lot 2 = A little 1 = Not at all	117
58.	To what extent did you daydream about better times?	3 = A lot 2 = A little 1 = Not at all	118
59.	To what extent did you try different ways to solve the problem until you found one that worked?	3 = A lot 2 = A little 1 = Not at all	119
60.	To what extent did you confide your fears and worries to a friend, co-worker or relative	3 = A lot 2 = A little 1 = Not at all	120
61.	To what extent did you spend more time than usual alone?	3 = A lot 2 = A little 1 = Not at all	121
62.	To what extent did you tell people about the situation because just talking about it helped you to come up with	3 = A lot 2 = A little 1 = Not at all	122

	solutions?		
63.	To what extent did you think about what needed to be done to straighten things out?	3 = A lot 2 = A little 1 = Not at all	123

64.	To what extent did you turn your full attention to solving the problem?	3 = A lot 2 = A little 1 = Not at all	124
65.	To what extent did you form a plan of action in your mind?	3 = A lot 2 = A little 1 = Not at all	125
66.	To what extent did you watch television more than usual?	3 = A lot 2 = A little 1 = Not at all	126
67.	To what extent did you go to someone (friend or professional) in order to help you feel better?	3 = A lot 2 = A little 1 = Not at all	127
68.	To what extent did you stand firm and fight for what you wanted in the situation?	3 = A lot 2 = A little 1 = Not at all	128
69.	To what extent did you avoid being with people in general?	3 = A lot 2 = A little 1 = Not at all	129
70.	To what extent did you bury yourself in a hobby or sports activity to avoid the problem?	3 = A lot 2 = A little 1 = Not at all	130
71.	To what extent did you go to a friend or co-worker to help you feel better about the problem?	3 = A lot 2 = A little 1 = Not at all	131
72.	To what extent did you go to a friend or co-worker for advice on how to change the situation?	3 = A lot 2 = A little 1 = Not at all	132
73.	To what extent did you accept sympathy and understanding from friends or co-workers who had the same problem?	3 = A lot 2 = A little 1 = Not at all	133
74.	To what extent did you sleep more than usual?	3 = A lot 2 = A little 1 = Not at all	134

75.	To what extent did you daydream about how things could have been different?	3 = A lot 2 = A little 1 = Not at all	135

76.	To what extent did you identify with characters in novels or movies (i.e., feel that they were in some way similar or in a similar situation)?	3 = A lot 2 = A little 1 = Not at all	136
77.	To what extent did you try to solve the problem?	3 = A lot 2 = A little 1 = Not at all	137
78.	To what extent did you wish that people would just leave you alone?	3 = A lot 2 = A little 1 = Not at all	138
79.	To what extent did you accept help from a friend, co-worker or relative?	3 = A lot 2 = A little 1 = Not at all	139
80.	To what extent did you seek reassurance from those who know you best?	3 = A lot 2 = A little 1 = Not at all	140
81.	To what extent did you try to carefully plan a course of action rather than acting on impulse?	3 = A lot 2 = A little 1 = Not at all	141
82.	List three things that you find most stressful about being an	**Working conditions** **100** Time Pressure 101 Environmental Conditions 102 Boredom 103	142-144 145-147 148-

	emergency worker.	Low Salary	104	150
		Lack of Equipment	105	151-
		Uniforms	106	153
		Overworked	107	154-
		Working in Shifts	108	156
		Sleeping Patterns	109	157-
		Being away from the family while working shifts	110	159
		Many hours without food	111	160-
		Pressure	112	162
		No time for social life	113	163-
		Personal Safety	114	165
		Dangerous Situations	115	
		Danger: Community violence	116	
		Contracting diseases	117	
		Crime Rate	118	
		Identification	119	
		Racism	120	
		Lack of manpower	121	
		No job security	122	
		Future of service profession	123	
		No communication	124	
		personal	125	
		Professionalism	126	
		No training	127	
		No de-briefing	128	
		Working alone	129	
		Politics	130	
		Legal	131	
		Negativity	132	
		Gangs	134	
		Identification	133	
		Squatter camps fires	136	
		Co-workers:problems	**200**	
		Lack of communication	201	
		Incompetant co-workers	202	
		No teamwork	203	
		Management	**300**	
		Too much pressure from management	301	
		Management is incompetant	302	
		Management making decisions and satff feeling powerless	303	
		Perception that management does not care	304	

		Management does not listen	305	
		Managements people skills	306	
		The way managemenat treats EMS staff	307	
		Changes in service structures	308	
		Co-operation between different services	309	
		No recognition	310	
		The public	**400**	
		Dealing with the public	401	
		The way the public treats staff	402	
		Attitude of the public	403	
		Abuse from the public	404	
		Crowd control	405	
		No appreciation from the public	406	
		Criticism from the public	407	
		No understanding of what the job entails	408	
		Dealing with family members	409	
		Road users	410	
		Wanting to help people but they refuse	411	
		Drunken drivers	412	
		Critical Incidents	**500**	
		Medical Emergencies	501	
		Not being able to save lives	502	
		Consoling family members at the scene	503	
		Exposure to many incidents	504	
		Injuries	505	
		Injuries to vulnerable people	506	
		Many people losing their belongings	507	
		People trapped in firews	508	
		Loss of life	509	
		Watching helplessly and not being able to save lives	510	
		Organisational issues	511	
		Talking about traumatic incidents	512	
		Accidents	513	
		Gruesome accidents	514	
		Death of patient	515	
		Unnecessary loss of lives	516	
		Death	517	
		Death of Co-worker	518	
		Dealing with death	519	
		death of a friend	520	

		Fear of the unknown: not knowing what to expect	521	
		Responding to a call	522	
		Making decisions	523	
		Notifying the family of Patients death	524	
		Sight of blood	525	
		Alcohol related problems	526	
		Working with corpses	527	
		Rape	528	
		Not saving lives after repeated attempts	529	
		Fire	530	
		Burns	531	
		No stress	600	
		No comment	700	
		Cannot be coded	800	
		Enjoy job	900	
		No response	0	
		Critique of questionnaire	901	

SECTION 6			
1.	A co-worker insulted or swore at me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	166
2.	A co-worker threw something at me that could hurt me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	167
3.	A co-worker twisted my arm or pulled my hair.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	168
4.	A co-worker pushed or shoved me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	169
5.	A co-worker used a knife or a gun on me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	170
6.	A co-worker punched or hit me with something that could hurt.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	171
7.	A co-worker destroyed something belonging to me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	172
8.	A co-worker choked me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	173
9.	A co-worker shouted or yelled at me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	174
10.	A co-worker slammed me against a wall.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	175
11.	A co-worker beat me up.	1 = Happened three or more times 2 = Happened twice	176

		3 = Happened once 4 = Never happened	
12.	A co-worker called me fat or ugly.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	177

13.	A co-worker grabbed me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	178
14.	A co-worker burned or scalded me on purpose.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	179
15.	A co-worker stomped out of the room during a disagreement with me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	180
16.	A co-worker slapped me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	181
17.	A co-worker said something to spite me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	182
18.	A co-worker threatened to hit or throw something at me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	183
19.	A co-worker kicked me.	1 = Happened three or more times 2 = Happened twice 3 = Happened once 4 = Never happened	184
20.	Is there anything else that you think would be important for the researchers to know about your work and how it affects you?	**Working conditions** **100** Time Pressure 101 Environmental Conditions 102 Boredom 103 Low Salary 104 Lack of Equipment 105 Uniforms 106 Overworked 107 Working in Shifts 108 Sleeping Patterns 109 Being away from the family while working shifts 110 Many hours without food 111 Pressure 112 No time for social life 113	170-172 173-175 176-178 179-181 182-184 185-187 189-191 192-194

		Personal Safety	114	
		Dangerous Situations	115	
		Danger: Community violence	116	
		Contracting diseases	117	
		Crime Rate	118	
		Identification	119	
		Racism	120	
		Lack of manpower	121	
		No job security	122	
		Future of service profession	123	
		No communication	124	
		personal	125	
		Professionalism	126	
		No training	127	
		No de-briefing	128	
		Working alone	129	
		Politics	130	
		Legal	131	
		Negativity	132	
		Gangs	132	
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		Changes in service structures	308	
		Co-operation between different services	309	
		No recognition	310	
		The public	**400**	

		Dealing with the public	401	
		The way the public treats staff	402	
		Attitude of the public	403	
		Abuse from the public	404	
		Crowd control	405	
		No appreciation from the public	406	
		Criticism from the public	407	
		No understanding of what the job entails	408	
		Dealing with family members	409	
		Road users	410	
		Wanting to help people but they refuse	411	
		Drunken drivers	412	
		Critical Incidents	**500**	
		Medical Emergencies	501	
		Not being able to save lives	502	
		Consoling family members at the scene	503	
		Exposure to many incidents	504	
		Injuries	505	
		Injuries to vulnerable people	506	
		Many people losing their belongings	507	
		People trapped in firews	508	
		Loss of life	509	
		Watching helplessly and not being able to save lives	510	
		Organisational issues	511	
		Talking about traumatic incidents	512	
		Accidents	513	
		Gruesome accidents	514	
		Death of patient	515	
		Unnecessary loss of lives	516	
		Death	517	
		Death of Co-worker	518	
		Dealing with death	519	
		death of a friend	520	
		Fear of the unknown: not knowing what to expect	521	
		Responding to a call	522	
		Making decisions	523	
		Notifying the family of Patients death	524	
		Sight of blood	525	
		Alcohol related problems	526	
		Working with corpses	527	
		Rape	528	
		Not saving lives after repeated attempts	529	
		Fire	530	

		Burns	531	
		No stress	600	
		No comment	700	
		Cannot be coded	800	
		Enjoy job	900	
		No response	000	
		Critique of questionnaire	901	

APPENDIX B:

DESCRIPTIVE STATISTICS AND FREQUENCIES

Table B1: Frequencies for gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	931	84.7	85.5	85.5
	Female	158	14.4	14.5	100.0
	Total	1089	99.1	100.0	
Missing	System	10	.9		
Total		1099	100.0		

Table B2: Frequencies for highest level of education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than Std 6	14	1.3	1.3	1.3
	Std 6 -10	594	54.0	54.8	56.1
	Some tertiary education but did not graduate	212	19.3	19.6	75.6
	Degree or diploma	264	24.0	24.4	100.0
	Total	1084	98.6	100.0	
Missing	System	15	1.4		
Total		1099	100.0		

Table B3: Frequencies for nature of employment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Volunteer	161	14.6	14.9	14.9
	Reservist	23	2.1	2.1	17.0
	Short-term contract (one year or less)	87	7.9	8.0	25.1
	Permanent staff	810	73.7	74.9	100.0
	Total	1081	98.4	100.0	
Missing	System	18	1.6		
Total		1099	100.0		

Table B4: Descriptive statistics for all continuous variables

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Years of Service	1068	35	0	35	8.19	6.814
GHQ Total symptoms	1012	28	0	28	5.75	6.328
Impact of event scale - revised - TOTAL	1048	11.5893	.0000	11.5893	2.095692	2.3578715
CSI - Problem-solving	1051	24	12	36	23.45	7.515
CSI - Social support	1056	22	11	33	19.62	6.311
CSI - Avoidance coping	1060	20	10	30	17.05	5.228
Gender	1089	1	1	2	1.15	.352
HLOE	1084	3	1	4	2.67	.857
Nature of Employment	1081	3	1	4	3.43	1.087
Valid N (listwise)	889					

APPENDIX C:

NORMALITY STATISTICS

Table C1: Values of skewness and kurtosis for all variables

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Years of Service	1068	1.123	.075	.929	.150
GHQ Total symptoms	1012	1.203	.077	.799	.154
Impact of event scale - revised - TOTAL	1048	1.434	.076	1.779	.151
CSI - Problem-solving	1051	-.114	.075	-1.211	.151
CSI - Social support	1056	.266	.075	-.960	.150
CSI - Avoidance coping	1060	.202	.075	-1.121	.150
Gender	1089	2.018	.074	2.077	.148
HLOE	1084	.566	.074	-1.190	.148
Nature of Employment	1081	-1.613	.074	.854	.149
Valid N (listwise)	889				

Figure C1: Histogram for years of service

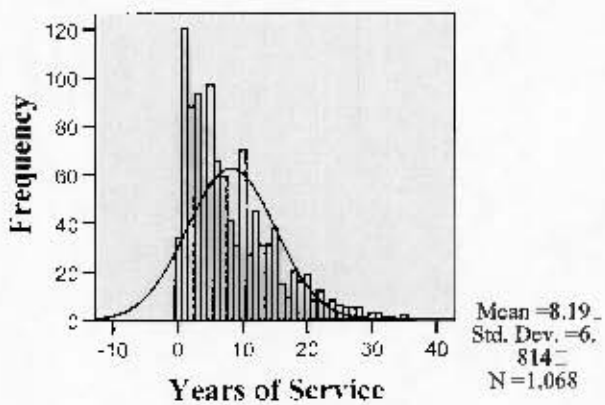


Figure C2: Histogram for IES-R Avoidance symptoms

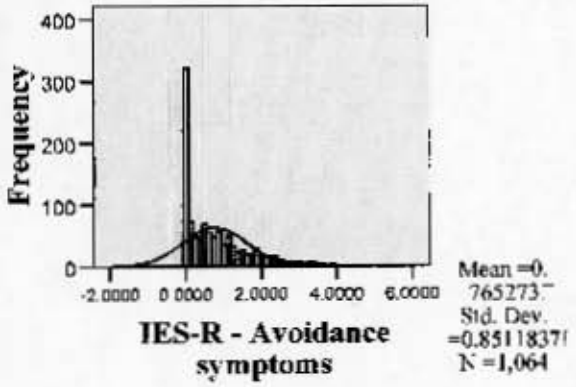


Figure C3: Histogram for IES-R Intrusion

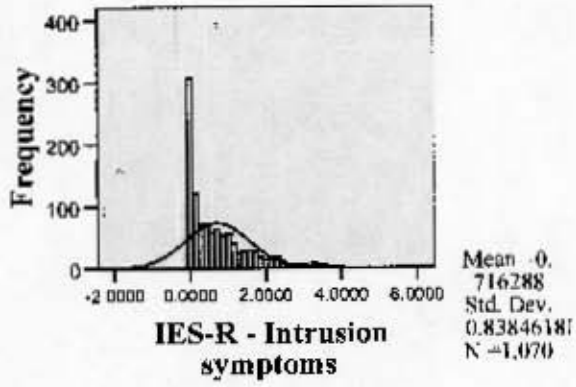


Figure C4: Histogram for IES-R Hyperarousal

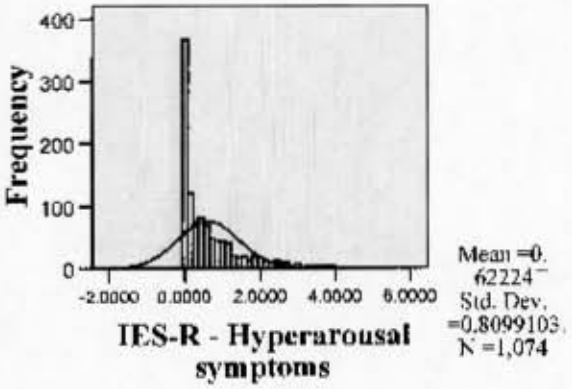


Figure C5: Histogram for CSI- Problem-Solving

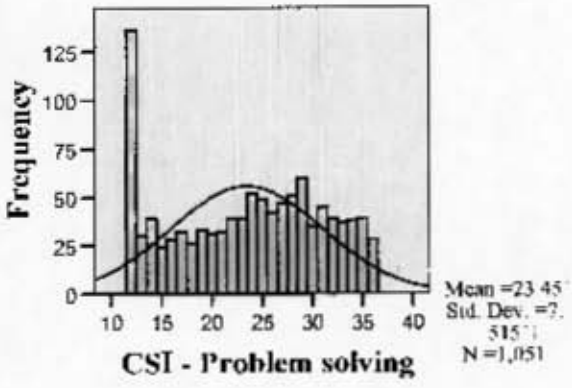


Figure C5: Histogram for CSI- Social Support

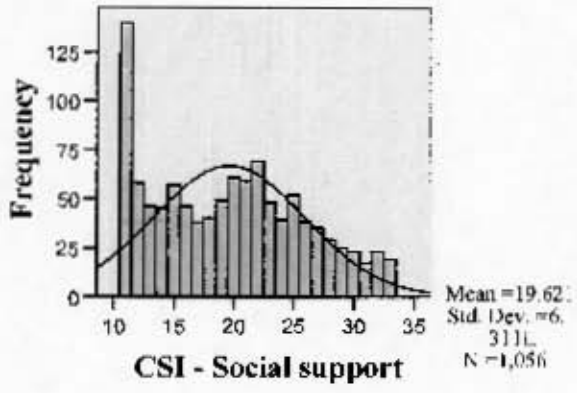
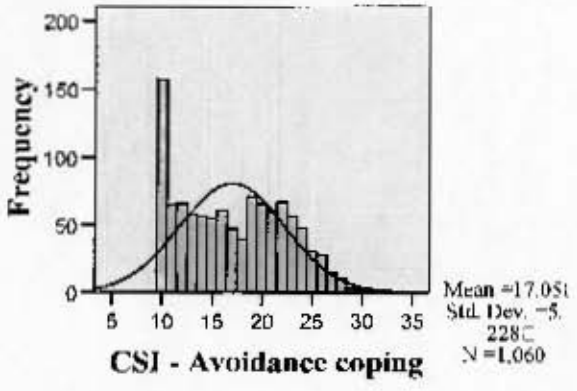


Figure C6: Histogram for CSI – Avoidance Coping



APPENDIX D:

BIVARIATE ASSOCIATIONS

Table D1: Kruskal-Wallis Test for IES-R Total and highest level of education (HLOE)

Ranks

	HLOE	N	Mean Rank
Impact of event scale – revised - TOTAL	Less than Std 6	11	411.59
	Std 6 -10	646	588.32
	Some tertiary education but did not graduate	231	608.61
	Degree or diploma	291	585.70
	Total	1179	

Test Statistics (a, b)

	Impact of event scale - revised - TOTAL
Chi-Square	3.800
Df	3
Asymp. Sig.	.284

a Kruskal Wallis Test
b Grouping Variable: HLOE

Table D2: Kruskal-Wallis Test for GHQ Total and highest level of education

Ranks

	HLOE	N	Mean Rank
Total symptoms	Less than Std 6	11	308.64
	Std 6 -10	545	490.61
	Some tertiary education but did not graduate	197	535.55
	Degree or diploma	246	500.90
	Total	999	

Test Statistics(a,b)

	Total symptoms
Chi-Square	8.571
df	3
Asymp. Sig.	.036

a Kruskal Wallis Test
b Grouping Variable: HLOE

Table D3: Kruskal-Wallis Test for IES-R Total and nature of employment

Ranks

	Nature of Employment	N	Mean Rank
Impact of event scale – revised - TOTAL.	Volunteer	183	450.64
	Reservist	31	548.60
	Short-term contract (one year or less)	103	593.82
	Permanent staff	851	613.47
	Total	1168	

Test Statistics (a, b)

	IES-R Total
Chi-Square	35.790
Df	3
Asymp. Sig.	.000

a Kruskal Wallis Test
b Grouping Variable: Nature of Employment

Table D4: Kruskal-Wallis Test for GHQ Total and nature of employment

Ranks

	Nature of Employment	N	Mean Rank
Total symptoms	Volunteer	155	394.15
	Reservist	22	403.66
	Short-term contract (one year or less)	76	494.02
	Permanent staff	748	526.71
	Total	1001	

Test Statistics(a,b)

	Total symptoms
Chi-Square	30.222
df	3
Asymp. Sig.	.000

a Kruskal Wallis Test
b Grouping Variable: Nature of Employment

Table D5: Mann-Whitney Test for IES-R Total and GHQ total by gender

Ranks

	Gender	N	Mean Rank	Sum of Ranks
IES-R Total	Male	891	518.38	461874.00
	Female	147	526.31	77367.00
	Total	1038		
GHQ Total symptoms	Male	859	491.04	421807.00
	Female	144	567.35	81699.00
	Total	1003		

a Grouping Variable: Gender

Test Statistics(a)

	IES-R Total	GHQ Total symptoms
Mann-Whitney U	64488.000	52437.000
Wilcoxon W	461874.000	421807.000
Z	-.298	-2.954
Asymp. Sig. (2-tailed)	.766	.003

APPENDIX E

EXPLORATIONS OF MULTICOLLINEARITY

Table E1: Chi-Square Tests of association for gender and highest level of education

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.390(a)	3	.335	.329		
Likelihood Ratio	5.429	3	.143	.170		
Fisher's Exact Test	2.993			.384		
Linear-by-Linear Association	.008(b)	1	.927	.960	.486	.040
N of Valid Cases	1083					

a 1 cells (12.5%) have expected count less than 5. The minimum expected count is 2.04.
b The standardized statistic is -.092.

Table E2: Chi-Square Tests of association for gender and nature of employment

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	46.380(a)	3	.000	.000		
Likelihood Ratio	39.429	3	.000	.000		
Fisher's Exact Test	40.682			.000		
Linear-by-Linear Association	19.282(b)	1	.000	.000	.000	.000
N of Valid Cases	1073					

a 1 cells (12.5%) have expected count less than 5. The minimum expected count is 3.37.
b The standardized statistic is -4.391.

Table E3: Mann-Whitney Test for years of service by gender

Ranks

	Gender	N	Mean Rank	Sum of Ranks
Years of Service	Male	907	568.39	515527.00
	Female	152	300.94	45743.00
	Total	1059		

a Grouping Variable: Gender

Test Statistics(a)

	Years of Service
Mann-Whitney U	34115.000
Wilcoxon W	45743.000
Z	-10.000
Asymp. Sig. (2-tailed)	.000

Table E4: Kruskal-Wallis Test for years of service and highest level of education

Ranks

	HLOE	N	Mean Rank
Years of Service	Less than Std 6	12	584.54
	Std 6 -10	579	525.47
	Some tertiary education but did not graduate	207	488.95
	Degree or diploma	256	560.60
	Total	1054	

Test Statistics(a,b)

	Years of Service
Chi-Square	6.824
df	3
Asymp. Sig.	.078

a Kruskal Wallis Test
b Grouping Variable: HLOE

Table E5: Kruskal-Wallis Test for years of service and nature of employment

Ranks

	Nature of Employment	N	Mean Rank
Years of Service	Volunteer	156	419.77
	Reservist	23	286.46
	Short-term contract (one year or less)	79	167.76
	Permanent staff	795	590.70
	Total	1053	

Test Statistics(a,b)

	Years of Service
Chi-Square	179.684
df	3
Asymp. Sig.	.000

a Kruskal Wallis Test
b Grouping Variable: Nature of Employment

Table E6: Kruskal-Wallis Test for nature of employment and CSI – Problem-Solving

Ranks

	Nature of Employment	N	Mean Rank
CSI - Problem-solving	Volunteer	154	370.61
	Reservist	21	504.12
	Short-term contract (one year or less)	79	530.27
	Permanent staff	780	545.57
	Total	1034	

Test Statistics(a,b)

	CSI - Problem-solving
Chi-Square	44.492
df	3
Asymp. Sig.	.000

a Kruskal Wallis Test
b Grouping Variable: Nature of Employment

Table E7: Kruskal-Wallis Test for nature of employment and CSI – Seeking Social Support

Ranks

	Nature of Employment	N	Mean Rank
CSI - Social support	Volunteer	151	398.24
	Reservist	21	537.81
	Short-term contract (one year or less)	82	558.51
	Permanent staff	785	538.92
	Total	1039	

Test Statistics(a,b)

	CSI - Social support
Chi-Square	29.531
df	3
Asymp. Sig.	.000

a Kruskal Wallis Test
b Grouping Variable: Nature of Employment

Table E8: Kruskal-Wallis Test for nature of employment and CSI – Avoidance

Ranks

	Nature of Employment	N	Mean Rank
CSI - Avoidance coping	Volunteer	153	336.06
	Reservist	22	482.14
	Short-term contract (one year or less)	80	522.89
	Permanent staff	788	559.13
	Total	1043	

Test Statistics(a,b)

	CSI - Avoidance coping
Chi-Square	71.065
df	3
Asymp. Sig.	.000

a Kruskal Wallis Test
b Grouping Variable: Nature of Employment

Table E9: Kruskal-Wallis Test for highest level of education and CSI-Avoidance

Ranks

	HLOE	N	Mean Rank
CSI - Avoidance coping	Less than Std 6	13	327.54
	Std 6 -10	573	547.34
	Some tertiary education but did not graduate	206	505.06
	Degree or diploma	255	496.87
	Total	1047	

a Kruskal Wallis Test
b Grouping Variable: HLOE

Test Statistics(a,b)

	CSI - Avoidance coping
Chi-Square	11.829
df	3
Asymp. Sig.	.008

Table E10: Kruskal-Wallis Test for highest level of education and CSI- Seeking Social Support

Ranks

	HLOE	N	Mean Rank
CSI - Social support	Less than Std 6	13	333.54
	Std 6 -10	568	545.37
	Some tertiary education but did not graduate	207	516.14
	Degree or diploma	255	484.31
	Total	1043	

Test Statistics(a,b)

	CSI - Social support
Chi-Square	12.631
Df	3
Asymp. Sig.	.006

a Kruskal Wallis Test
b Grouping Variable: HLOE

Table E11: Kruskal-Wallis Test for highest level of education and CSI – Problem-solving

Ranks

	HLOE	N	Mean Rank
CSI - Problem-solving	Less than Std 6	13	357.42
	Std 6 - 10	565	542.08
	Some tertiary education but did not graduate	205	502.81
	Degree or diploma	255	491.14
	Total	1038	

Test Statistics(a,b)

	CSI - Problem-solving
Chi-Square	9.956
Df	3
Asymp. Sig.	.019

a Kruskal Wallis Test
b Grouping Variable: HLOE

Table E12: Mann-Whitney Test for gender and CSI variables

Ranks

	Gender	N	Mean Rank	Sum of Ranks
CSI - Problem-solving	Male	895	521.13	466408.50
	Female	147	523.77	76994.50
	Total	1042		
CSI - Social support	Male	899	512.05	460334.00
	Female	149	599.61	89342.00
	Total	1048		
CSI - Avoidance coping	Male	903	524.29	473433.50
	Female	149	539.90	80444.50
	Total	1052		

Test Statistics(a)

	CSI - Problem-solving	CSI - Social support	CSI - Avoidance coping
Mann-Whitney U	65448.500	55784.000	65277.500
Wilcoxon W	466408.500	460334.000	473433.500
Z	-.099	-3.277	-.583
Asymp. Sig. (2-tailed)	.921	.001	.560

a Grouping Variable: Gender

APPENDIX F
MODEL-BUILDING

Table F1: GHQ Model 1

Model Summary (c)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.178(a)	0.032	0.029	6.261	0.032	10.595	3	969	0.000	
2	.225(b)	0.051	0.047	6.202	0.019	19.326	1	968	0.000	
3	.226(c)	0.051	0.046	6.205	0.000	0.180	1	967	0.671	
4	.230(d)	0.053	0.047	6.201	0.002	2.184	1	966	0.140	1.915

a. Predictors: (Constant), E3, E2, E1

b. Predictors: (Constant), E3, E2, E1, Gender

c. Predictors: (Constant), E3, E2, E1, Gender, Years of Service

d. Predictors: (Constant), E3, E2, E1, Gender, Years of Service, HLOE

e. Dependent Variable: Total symptoms

Table F2: ANOVA for GHQ model 1

ANOVA (c)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,245.837	3	415.279	10.595	.000(a)
	Residual	37,978.966	969	39.194		
	Total	39,224.804	972			
2	Regression	1,989.250	4	497.313	12.928	.000(b)
	Residual	37,235.554	968	38.466		
	Total	39,224.804	972			
3	Regression	1,996.194	5	399.239	10.370	.000(c)
	Residual	37,228.610	967	38.499		
	Total	39,224.804	972			

4	Regression	2,080.188	6	346.698	9.016	.000(d)
	Residual	37,144.616	966	38.452		
	Total	39,224.804	972			

a. Predictors: (Constant), E3, E2, E1

b. Predictors: (Constant), E3, E2, E1, Gender

c. Predictors: (Constant), E3, E2, E1, Gender, Years of Service

d. Predictors: (Constant), E3, E2, E1, Gender, Years of Service, HLOE

e. Dependent Variable: Total symptoms

Table F3: Coefficients for GHQ model 1

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	6.344	0.231		27.490	0.000		
	E1	-3.017	0.566	-0.170	-5.335	0.000	0.982	1.018
	E2	-3.010	1.386	-0.069	-2.173	0.030	0.994	1.006
	E3	-0.706	0.788	-0.029	-0.896	0.371	0.984	1.016
2	(Constant)	3.525	0.681		5.180	0.000		
	E1	-3.285	0.564	-0.185	-5.828	0.000	0.970	1.030
	E2	-3.711	1.382	-0.085	-2.686	0.007	0.980	1.020
	E3	-1.285	0.792	-0.052	-1.623	0.105	0.957	1.045
	Gender	2.548	0.580	0.141	4.396	0.000	0.955	1.047
3	(Constant)	3.713	0.812		4.575	0.000		

	E1	-3.317	0.569	-0.187	-5.829	0.000	0.953	1.050
	E2	-3.763	1.388	-0.086	-2.712	0.007	0.973	1.028
	E3	-1.369	0.816	-0.055	-1.677	0.094	0.901	1.109
	Gender	2.491	0.595	0.138	4.185	0.000	0.906	1.103
	Years of Service	-0.013	0.031	-0.014	-0.425	0.671	0.859	1.164
4	(Constant)	2.823	1.010		2.794	0.005		
	E1	-3.396	0.571	-0.192	-5.946	0.000	0.944	1.059
	E2	-3.891	1.390	-0.089	-2.800	0.005	0.969	1.032
	E3	-1.419	0.816	-0.057	-1.738	0.083	0.900	1.111
	Gender	2.497	0.595	0.138	4.198	0.000	0.906	1.103
	Years of Service	-0.017	0.031	-0.018	-0.527	0.598	0.855	1.169
	HLOE	0.347	0.234	0.047	1.478	0.140	0.985	1.015

a. Dependent Variable: Total symptoms

Table F4: Residuals Statistics for GHQ model 1

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.74	9.19	5.77	1.463	973
Std. Predicted Value	-2.755	2.334	0.000	1.000	973
Standard Error of Predicted Value	0.251	1.456	0.478	0.219	973
Adjusted Predicted Value	1.72	9.30	5.77	1.464	973

Residual	-9.187	22.302	0.000	6.182	973
Std. Residual	-1.481	3.597	0.000	0.997	973
Stud. Residual	-1.490	3.604	0.000	1.000	973
Deleted Residual	-9.297	22.401	0.000	6.220	973
Stud. Deleted Residual	-1.491	3.627	0.001	1.001	973
Mahal. Distance	0.593	52.597	5.994	7.914	973
Cook's Distance	0.000	0.037	0.001	0.002	973
Centered Leverage Value	0.001	0.054	0.006	0.008	973

a. Dependent Variable: Total symptoms

Table F5: Model Summary for GHQ model 2

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.474(a)	0.225	0.221	5.554	0.225	55.943	5	964	0.000	2.017

a. Predictors: (Constant), CSI - Avoidance coping, Gender, E2, E3, E1

b. Dependent Variable: Total symptoms

Table F6: ANOVA for GHQ model 2

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8,627.658	5	1,725.532	55.943	.000(a)
	Residual	29,734.034	964	30.844		
	Total	38,361.692	969			

a. Predictors: (Constant), CSI - Avoidance coping, Gender, E2, E3, E1

b. Dependent Variable: Total symptoms

Table F15: Coefficients for GHQ model 4

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	2.051	0.881		2.327	0.020		
	E1	-2.991	0.570	-0.169	-5.243	0.000	0.947	1.056
	E2	-3.866	1.407	-0.087	-2.747	0.006	0.979	1.022
	E3	-1.507	0.770	-0.062	-1.957	0.051	0.961	1.041
	Gender	2.450	0.586	0.135	4.178	0.000	0.945	1.059
	CSI - Social support	0.080	0.032	0.080	2.491	0.013	0.961	1.041

a. Dependent Variable: Total symptoms

Table F16: Residuals Statistics for GHQ model 4

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.52	9.60	5.77	1.519	968
Std. Predicted Value	-2.798	2.523	0.000	1.000	968
Standard Error of Predicted Value	0.236	1.472	0.428	0.229	968
Adjusted Predicted Value	1.53	9.63	5.77	1.520	968
Residual	-9.519	21.733	0.000	6.146	968
Std. Residual	-1.545	3.527	0.000	0.997	968
Stud. Residual	-1.554	3.530	0.000	1.000	968
Deleted Residual	-9.628	21.769	0.000	6.179	968

Stud. Deleted Residual	-1.555	3.551	0.001	1.002	968
Mahal. Distance	0.424	54.191	4.995	7.987	968
Cook's Distance	0.000	0.044	0.001	0.002	968
Centered Leverage Value	0.000	0.056	0.005	0.008	968

a. Dependent Variable: Total symptoms

Table F17: Model Summary for GHQ model 5 (FINAL MODEL)

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.515(a)	0.265	0.259	5.432	0.265	48.426	7	941	0.000	1.993

a. Predictors: (Constant), CSI - Avoidance coping, Gender, E2, E3, E1, CSI - Social support, CSI - Problem solving

b. Dependent Variable: Total symptoms

Table F18: ANOVA for GHQ Model 5 (FINAL MODEL)

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10,001.274	7	1,428.753	48.426	.000(a)
	Residual	27,763.015	941	29.504		
	Total	37,764.289	948			

a. Predictors: (Constant), CSI - Avoidance coping, Gender, E2, E3, E1, CSI - Social support, CSI - Problem solving

b. Dependent Variable: Total symptoms

Table F19: Coefficients for GHQ Model 5 (FINAL MODEL)

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	Sig.
1	(Constant)	-3.745	0.893		0.000
	E1	-1.525	0.516	-0.087	0.003
	E2	-2.737	1.275	-0.061	0.032
	E3	-0.853	0.698	-0.035	0.222
	Gender	2.531	0.529	0.138	0.000
	CSI - Social support	-0.101	0.043	-0.100	0.019
	CSI - Problem solving	-0.140	0.041	-0.165	0.001
	CSI - Avoidance coping	0.717	0.046	0.593	0.000

a. Dependent Variable: Total symptoms

Table F20: Residuals Statistics for GHQ Model 5 (FINAL MODEL)

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-2.31	14.73	5.74	3.248	949
Std. Predicted Value	-2.480	2.767	0.000	1.000	949
Standard Error of Predicted Value	0.213	1.352	0.459	0.194	949
Adjusted Predicted Value	-2.36	14.72	5.74	3.251	949
Residual	-13.446	20.364	0.000	5.412	949
Std. Residual	-2.475	3.749	0.000	0.996	949
Stud. Residual	-2.490	3.754	0.000	1.000	949
Deleted Residual	-13.605	20.421	0.000	5.454	949

Stud. Deleted Residual	-2.497	3.781	0.001	1.002	949
Mahal. Distance	0.458	57.757	6.993	8.275	949
Cook's Distance	0.000	0.028	0.001	0.002	949
Centered Leverage Value	0.000	0.061	0.007	0.009	949

a. Dependent Variable: Total symptoms

Table F21: Model Summary for IES-R model 1

Model Summary (e)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.168(a)	0.028	0.025	2.3228258	0.028	9.672	3	1,000	0.000	
2	.171(b)	0.029	0.025	2.3227153	0.001	1.095	1	999	0.296	
3	.171(c)	0.029	0.025	2.3237330	0.000	0.125	1	998	0.724	
4	.183(d)	0.034	0.028	2.3197732	0.004	4.410	1	997	0.036	1.797

a. Predictors: (Constant), E3, E2, E1

b. Predictors: (Constant), E3, E2, E1, Gender

c. Predictors: (Constant), E3, E2, E1, Gender, Years of Service

d. Predictors: (Constant), E3, E2, E1, Gender, Years of Service, HLOE

e. Dependent Variable: Impact of event scale - revised - TOTAL

Table F22: ANOVA for IES-R model 1

ANOVA (e)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	156.555	3	52.185	9.672	.000(a)
	Residual	5,395.520	1,000	5.396		
	Total	5,552.075	1,003			
2	Regression	162.463	4	40.616	7.528	.000(b)
	Residual	5,389.611	999	5.395		

	Total	5,552.075	1,003			
3	Regression	163.139	5	32.628	6.042	.000(c)
	Residual	5,388.936	998	5.400		
	Total	5,552.075	1,003			
4	Regression	186.871	6	31.145	5.788	.000(d)
	Residual	5,365.204	997	5.381		
	Total	5,552.075	1,003			

a. Predictors: (Constant), E3, E2, E1
b. Predictors: (Constant), E3, E2, E1, Gender
c. Predictors: (Constant), E3, E2, E1, Gender, Years of Service
d. Predictors: (Constant), E3, E2, E1, Gender, Years of Service, HLOE
e. Dependent Variable: Impact of event scale - revised - TOTAL

Table F23: Coefficients for IES-R model 1

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.316	0.084		27.633	0.000		
	E1	-1.111	0.209	-0.167	-5.315	0.000	0.983	1.017
	E2	-0.508	0.514	-0.031	-0.988	0.323	0.994	1.006
	E3	-0.361	0.294	-0.039	-1.228	0.220	0.985	1.015
2	(Constant)	2.067	0.252		8.196	0.000		
	E1	-1.133	0.210	-0.170	-5.393	0.000	0.974	1.027
	E2	-0.580	0.518	-0.035	-1.119	0.264	0.976	1.024

	E3	-0.406	0.297	-0.043	-1.368	0.172	0.964	1.037
	Gender	0.225	0.215	0.033	1.046	0.296	0.958	1.044
3	(Constant)	2.010	0.300		6.706	0.000		
	E1	-1.124	0.212	-0.169	-5.299	0.000	0.957	1.045
	E2	-0.565	0.520	-0.034	-1.085	0.278	0.970	1.031
	E3	-0.380	0.306	-0.041	-1.243	0.214	0.910	1.099
	Gender	0.242	0.221	0.036	1.099	0.272	0.910	1.099
	Years of Service	0.004	0.012	0.012	0.354	0.724	0.865	1.155
4	(Constant)	1.532	0.376		4.076	0.000		
	E1	-1.164	0.213	-0.175	-5.476	0.000	0.950	1.053
	E2	-0.624	0.520	-0.038	-1.200	0.231	0.967	1.034
	E3	-0.429	0.306	-0.046	-1.401	0.162	0.904	1.106
	Gender	0.253	0.220	0.038	1.150	0.251	0.910	1.099
	Years of Service	0.003	0.012	0.008	0.236	0.814	0.863	1.159
	HLOE	0.181	0.086	0.066	2.100	0.036	0.985	1.015

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F24: Residuals Statistics for IES-R model 1

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	0.805995	2.789230	2.118401	0.4316386	1,004
Std. Predicted Value	-3.041	1.554	0.000	1.000	1,004

Standard Error of Predicted Value	0.092	0.545	0.176	0.082	1,004
Adjusted Predicted Value	0.816335	2.820934	2.118652	0.4323194	1,004
Residual	-2.7892301	9.6499100	0.0000000	2.3128243	1,004
Std. Residual	-1.202	4.160	0.000	0.997	1,004
Stud. Residual	-1.209	4.178	0.000	1.000	1,004
Deleted Residual	-2.8209341	9.7331963	-0.0002505	2.3276423	1,004
Stud. Deleted Residual	-1.209	4.213	0.001	1.002	1,004
Mahal. Distance	0.580	54.412	5.994	8.079	1,004
Cook's Distance	0.000	0.054	0.001	0.003	1,004
Centered Leverage Value	0.001	0.054	0.006	0.008	1,004

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F25: Model Summary for IES-R Model 2

Model Summary(c)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.164(a)	0.027	0.024	2.3370128	0.027	9.526	3	1,029	0.000	
2	.181(b)	0.033	0.029	2.3313924	0.006	5.967	1	1,028	0.015	1.770

a. Predictors: (Constant), E3, E2, E1

b. Predictors: (Constant), E3, E2, E1, HLOE

c. Dependent Variable: Impact of event scale - revised - TOTAL

Table F26: ANOVA for IES-R model 2

ANOVA (c)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	156.085	3	52.028	9.526	.000(a)
	Residual	5,620.016	1,029	5.462		

	Total	5,776.102	1,032			
2	Regression	188.520	4	47.130	8.671	.000(b)
	Residual	5,587.582	1,028	5.435		
	Total	5,776.102	1,032			

a. Predictors: (Constant), E3, E2, E1

b. Predictors: (Constant), E3, E2, E1, HLOE

c. Dependent Variable: Impact of event scale - revised - TOTAL

Table F27: Coefficients for IES-R model 2

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.316	0.083		27.781	0.000		
	E1	-1.094	0.208	-0.163	-5.253	0.000	0.982	1.018
	E2	-0.507	0.517	-0.030	-0.981	0.327	0.994	1.006
	E3	-0.393	0.281	-0.043	-1.398	0.162	0.984	1.016
2	(Constant)	1.768	0.239		7.395	0.000		
	E1	-1.133	0.208	-0.169	-5.438	0.000	0.977	1.024
	E2	-0.564	0.516	-0.034	-1.093	0.275	0.992	1.008
	E3	-0.442	0.281	-0.049	-1.573	0.116	0.979	1.021
	HLOE	0.208	0.085	0.075	2.443	0.015	0.989	1.011

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F28: Residuals Statistics for IES-R model 2

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	0.843266	2.600309	2.117740	0.4274041	1,033
Std. Predicted Value	-2.982	1.129	0.000	1.000	1,033
Standard Error of Predicted Value	0.089	0.534	0.143	0.077	1,033
Adjusted Predicted Value	0.852720	2.610145	2.117727	0.4278505	1,033
Residual	-2.6003089	9.5915403	0.0000000	2.3268699	1,033
Std. Residual	-1.115	4.114	0.000	0.998	1,033
Stud. Residual	-1.117	4.130	0.000	1.000	1,033
Deleted Residual	-2.6101451	9.6646433	0.0000129	2.3371210	1,033
Stud. Deleted Residual	-1.118	4.162	0.001	1.002	1,033
Mahal. Distance	0.500	53.140	3.996	7.516	1,033
Cook's Distance	0.000	0.072	0.001	0.003	1,033
Centered Leverage Value	0.000	0.051	0.004	0.007	1,033

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F29: Model Summary for IES-R Model 3

Model Summary (b)

					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.614(a)	0.377	0.374	1.8828731	0.377	121.514	5	1,004	0.000	1.807

a. Predictors: (Constant), CSI - Avoidance coping, E3, E2, HLOE, E1

b. Dependent Variable: Impact of event scale - revised - TOTAL

Table F30: ANOVA for IES-R Model 3

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,153.960	5	430.792	121.514	.000(a)
	Residual	3,559.392	1,004	3.545		
	Total	5,713.352	1,009			

a. Predictors: (Constant), CSI - Avoidance coping, E3, E2, HLOE, E1

b. Dependent Variable: Impact of event scale - revised - TOTAL

Table F31: Coefficients for IES-R Model 3

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-3.259	0.291		-11.184	0.000		
	E1	-0.106	0.176	-0.016	-0.606	0.545	0.915	1.093
	E2	-0.218	0.427	-0.013	-0.510	0.610	0.991	1.009
	E3	-0.288	0.234	-0.031	-1.231	0.219	0.978	1.022
	HLOE	0.268	0.070	0.096	3.840	0.000	0.985	1.015
	CSI - Avoidance coping	0.277	0.012	0.608	23.574	0.000	0.932	1.073

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F32: Residuals Statistics for IES-R Model 3

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-0.441670	5.740182	2.140046	1.4610773	1,010
Std. Predicted Value	-1.767	2.464	0.000	1.000	1,010
Standard Error of Predicted Value	0.073	0.450	0.132	0.061	1,010
Adjusted Predicted Value	-0.468407	5.781834	2.139967	1.4613330	1,010
Residual	-4.4513516	8.7944250	0.0000000	1.8782021	1,010
Std. Residual	-2.364	4.671	0.000	0.998	1,010
Stud. Residual	-2.385	4.688	0.000	1.000	1,010
Deleted Residual	-4.5289245	8.8600349	0.0000784	1.8884144	1,010
Stud. Deleted Residual	-2.390	4.738	0.001	1.003	1,010
Mahal. Distance	0.501	56.596	4.995	7.706	1,010
Cook's Distance	0.000	0.061	0.001	0.003	1,010
Centered Leverage Value	0.000	0.056	0.005	0.008	1,010

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F33: Model Summary for IES-R Model 4

Model Summary (b)

					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.354(a)	0.125	0.121	2.2169052	0.125	28.674	5	1,001	0.000	1.871

a. Predictors: (Constant), CSI - Problem solving, E2, E3, HLOE, E1

b. Dependent Variable: Impact of event scale - revised - TOTAL

Table F34: ANOVA for IES-R Model 4

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	704.625	5	140.925	28.674	.000(a)
	Residual	4,919.583	1,001	4.915		
	Total	5,624.208	1,006			

a. Predictors: (Constant), CSI - Problem solving, E2, E3, HLOE, E1

b. Dependent Variable: Impact of event scale - revised - TOTAL

Table F35: Coefficients for IES-R Model 4

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-0.697	0.334		-2.087	0.037		
	E1	-0.641	0.206	-0.096	-3.118	0.002	0.925	1.081
	E2	-0.526	0.503	-0.031	-1.046	0.296	0.991	1.009
	E3	-0.403	0.272	-0.044	-1.478	0.140	0.979	1.022
	HLOE	0.238	0.082	0.086	2.897	0.004	0.985	1.015
	CSI - Problem solving	0.099	0.010	0.314	10.327	0.000	0.944	1.060

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F36: Residuals Statistics for IES-R Model 4

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	0.083044	3.805529	2.123102	0.8369123	1,007
Std. Predicted Value	-2.438	2.010	0.000	1.000	1,007

Standard Error of Predicted Value	0.085	0.533	0.155	0.072	1,007
Adjusted Predicted Value	0.084104	3.831048	2.123347	0.8367852	1,007
Residual	-3.8055286	9.4077063	0.0000000	2.2113891	1,007
Std. Residual	-1.717	4.244	0.000	0.998	1,007
Stud. Residual	-1.722	4.254	0.000	1.000	1,007
Deleted Residual	-3.8310480	9.4519920	-0.0002444	2.2229581	1,007
Stud. Deleted Residual	-1.724	4.290	0.001	1.002	1,007
Mahal. Distance	0.495	57.132	4.995	7.665	1,007
Cook's Distance	0.000	0.070	0.001	0.003	1,007
Centered Leverage Value	0.000	0.057	0.005	0.008	1,007

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F37: Model Summary for IES-R Model 5

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.293(a)	0.086	0.081	2.2801165	0.086	18.779	5	1,002	0.000	1.844

a. Predictors: (Constant), CSI - Social support, E2, E3, HLOE, E1

b. Dependent Variable: Impact of event scale - revised - TOTAL

Table F38: ANOVA for IES-R Model 5

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	488.164	5	97.633	18.779	.000(a)
	Residual	5,209.329	1,002	5.199		
	Total	5,697.493	1,007			

a. Predictors: (Constant), CSI - Social support, E2, E3, HLOE, E1
b. Dependent Variable: Impact of event scale - revised - TOTAL

Table F39: Coefficients for IES-R Model 5

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-0.058	0.341		-0.171	0.865		
	E1	-0.865	0.210	-0.128	-4.122	0.000	0.951	1.052
	E2	-0.659	0.517	-0.039	-1.274	0.203	0.992	1.008
	E3	-0.514	0.278	-0.056	-1.846	0.065	0.978	1.023
	HLOE	0.229	0.085	0.083	2.710	0.007	0.984	1.017
	CSI - Social support	0.089	0.012	0.237	7.719	0.000	0.967	1.034

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F40: Residuals Statistics for IES-R Model 5

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	0.286855	3.801297	2.135027	0.6962549	1,008
Std. Predicted Value	-2.654	2.393	0.000	1.000	1,008
Standard Error of Predicted Value	0.088	0.548	0.159	0.075	1,008
Adjusted Predicted Value	0.290546	3.794034	2.135166	0.6963637	1,008
Residual	-3.7121444	9.4134340	0.0000000	2.2744488	1,008

Std. Residual	-1.628	4.128	0.000	0.998	1,008
Stud. Residual	-1.635	4.145	0.000	1.000	1,008
Deleted Residual	-3.7416546	9.4885969	-0.0001394	2.2866590	1,008
Stud. Deleted Residual	-1.636	4.179	0.001	1.002	1,008
Mahal. Distance	0.494	57.129	4.995	7.673	1,008
Cook's Distance	0.000	0.061	0.001	0.003	1,008
Centered Leverage Value	0.000	0.057	0.005	0.008	1,008

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F41: Model Summary for IES-R Model 6 (FINAL MODEL)

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.625(a)	0.391	0.386	1.8589633	0.391	90.021	7	983	0.000

a. Predictors: (Constant), CSI - Avoidance coping, E3, E2, HLOE, E1, CSI - Social support, CSI - Problem solving

b. Dependent Variable: Impact of event scale - revised - TOTAL

Table F42: ANOVA for IES-R Model 6 (FINAL MODEL)

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,177.635	7	311.091	90.021	.000(a)
	Residual	3,396.997	983	3.456		
	Total	5,574.632	990			

a. Predictors: (Constant), CSI - Avoidance coping, E3, E2, HLOE, E1, CSI - Social support, CSI - Problem solving

b. Dependent Variable: Impact of event scale - revised - TOTAL

Table F43: Coefficients for IES-R Model 6 (FINAL MODEL)

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	-2.823	0.311		0.000
	E1	-0.124	0.176	-0.018	0.480
	E2	-0.177	0.433	-0.010	0.683
	E3	-0.240	0.232	-0.026	0.300
	HLOE	0.243	0.070	0.088	0.001
	CSI - Social support	-0.024	0.014	-0.064	0.095
	CSI - Problem solving	-0.024	0.014	-0.076	0.077
	CSI - Avoidance coping	0.315	0.015	0.694	0.000

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F44: Residuals Statistics for IES-R Model 6 (FINAL MODEL)

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-0.528157	5.856225	2.131072	1.4831154	991
Std. Predicted Value	-1.793	2.512	0.000	1.000	991
Standard Error of Predicted Value	0.075	0.460	0.156	0.060	991

Adjusted Predicted Value	-0.551360	5.871127	2.130708	1.4835647	991
Residual	-4.2922850	8.6206684	0.0000000	1.8523795	991
Std. Residual	-2.309	4.637	0.000	0.996	991
Stud. Residual	-2.330	4.656	0.000	1.000	991
Deleted Residual	-4.3698273	8.6909952	0.0003642	1.8664970	991
Stud. Deleted Residual	-2.335	4.706	0.001	1.003	991
Mahal. Distance	0.618	59.704	6.993	7.945	991
Cook's Distance	0.000	0.050	0.001	0.003	991
Centered Leverage Value	0.001	0.060	0.007	0.008	991

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F45: Model Summary for IES-R Model 7 (confirming final model 6)

Model Summary(c)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.617(a)	0.381	0.377	1.8723109	0.381	121.046	5	985	0.000	
2	.625(b)	0.391	0.386	1.8589633	0.010	8.098	2	983	0.000	1.830

a. Predictors: (Constant), CSI - Avoidance coping, E3, E2, HLOE, E1

b. Predictors: (Constant), CSI - Avoidance coping, E3, E2, HLOE, E1, CSI - Social support, CSI - Problem solving

c. Dependent Variable: Impact of event scale - revised - TOTAL

Table F46: ANOVA for IES-R Model 7 (confirming final model 6)

ANOVA(c)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,121.667	5	424.333	121.046	.000(a)
	Residual	3,452.965	985	3.506		
	Total	5,574.632	990			
2	Regression	2,177.635	7	311.091	90.021	.000(b)

Residual	3,396.997	983	3.456		
Total	5,574.632	990			

a. Predictors: (Constant), CSI - Avoidance coping, E3, E2, HLOE, E1
b. Predictors: (Constant), CSI - Avoidance coping, E3, E2, HLOE, E1, CSI - Social support, CSI - Problem solving
c. Dependent Variable: Impact of event scale - revised - TOTAL

Table F47: Coefficients for IES-R Model 7 (confirming final model 6)

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-3.256	0.292		-11.133	0.000		
	E1	-0.075	0.176	-0.011	-0.427	0.669	0.915	1.093
	E2	-0.203	0.436	-0.012	-0.466	0.641	0.990	1.010
	E3	-0.267	0.233	-0.029	-1.146	0.252	0.978	1.022
	HLOE	0.254	0.070	0.091	3.611	0.000	0.984	1.016
	CSI - Avoidance coping	0.278	0.012	0.613	23.585	0.000	0.932	1.073
2	(Constant)	-2.823	0.311		-9.082	0.000		
	E1	-0.124	0.176	-0.018	-0.707	0.480	0.909	1.100
	E2	-0.177	0.433	-0.010	-0.408	0.683	0.988	1.012
	E3	-0.240	0.232	-0.026	-1.037	0.300	0.975	1.025

HLOE	0.243	0.070	0.088	3.488	0.001	0.982	1.018
CSI - Avoidance coping	0.315	0.015	0.694	20.720	0.000	0.552	1.810
CSI - Problem solving	-0.024	0.014	-0.076	-1.772	0.077	0.336	2.974
CSI - Social support	-0.024	0.014	-0.064	-1.669	0.095	0.428	2.337

a. Dependent Variable: Impact of event scale - revised - TOTAL

Table F48: Residuals Statistics for IES-R Model 7 (confirming final model 6)

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-0.528157	5.856225	2.131072	1.4831154	991
Residual	-4.2922850	8.6206684	0.0000000	1.8523795	991
Std. Predicted Value	-1.793	2.512	0.000	1.000	991
Std. Residual	-2.309	4.637	0.000	0.996	991

a. Dependent Variable: Impact of event scale - revised - TOTAL

APPENDIX G
RESIDUALS

Poisson analysis

Model Information

Dependent Variable	Total symptoms
Probability Distribution	Normal
Link Function	Log

Case Processing Summary

	N	Percent
Included	949	86.4%
Excluded	150	13.6%
Total	1099	100.0%

Categorical Variable Information

			N	Percent
Factor	E1	.00	805	84.8%
		1.00	144	15.2%
		Total	949	100.0%
	E2	.00	930	98.0%
		1.00	19	2.0%
		Total	949	100.0%
	E3	.00	881	92.8%
		1.00	68	7.2%
		Total	949	100.0%
	Gender	Male	819	86.3%
		Female	130	13.7%
		Total	949	100.0%

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Total symptoms	949	0	28	5.74	6.312
Covariate	CSI - Problem-solving	949	12	36	23.28	7.447
	CSI – Social support	949	11	33	19.44	6.245
	CSI - Avoidance coping	949	10	30	16.98	5.216

Goodness of Fit(b)

	Value	df	Value/df
Deviance	27961.944	941	29.715
Scaled Deviance	27961.944	941	
Pearson Chi-Square	27961.944	941	29.715
Scaled Pearson Chi-Square	27961.944	941	
Log Likelihood(a)	-14853.045		
Akaike's Information Criterion (AIC)	29722.089		
Finite Sample Corrected AIC (AICC)	29722.242		
Bayesian Information Criterion (BIC)	29760.932		
Consistent AIC (CAIC)	29768.932		

Dependent Variable: Total symptoms
Model: (Intercept), avoid, socsup, probsolv, gender, Emp3, Emp2, Emp1
a The full log likelihood function is displayed and used in computing information criteria.
b Information criteria are in small-is-better form.

Omnibus Test(a)

Likelihood Ratio Chi-Square	df	Sig.
9802.345	7	.000

Dependent Variable: Total symptoms
Model: (Intercept), avoid, socsup, probsolv, gender, Emp3, Emp2, Emp1
a Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Wald Chi-Square	df	Sig.
(Intercept)	19.573	1	.000
avoid	7410.537	1	.000
socsup	143.052	1	.000
probsolv	274.039	1	.000
gender	1133.702	1	.000
Emp3	70.222	1	.000
Emp2	114.433	1	.000
Emp1	435.653	1	.000

Dependent Variable: Total symptoms
Model: (Intercept), avoid, socsup, probsolv, gender, Emp3, Emp2, Emp1

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
	Lower	Upper	Wald Chi-Square	Df	Sig.	Lower	Upper
(Intercept)	-.275	.0749	-.422	-.129	13.521	1	.000
avoid	.102	.0012	.100	.104	7410.537	1	.000
socsup	-.014	.0011	-.016	-.011	143.052	1	.000
probsolv	-.019	.0011	-.021	-.017	274.039	1	.000
[gender=1]	-.403	.0120	-.427	-.380	1133.702	1	.000
[gender=2]	0(a)	.	.	.	.	.	.
[Emp3=.00]	.180	.0215	.138	.223	70.222	1	.000
[Emp3=1.00]	0(a)	.	.	.	.	.	.
[Emp2=.00]	.679	.0634	.554	.803	114.433	1	.000
[Emp2=1.00]	0(a)	.	.	.	.	.	.
[Emp1=.00]	.472	.0226	.427	.516	435.653	1	.000
[Emp1=1.00]	0(a)	.	.	.	.	.	.
(Scale)	1(b)						

Dependent Variable: Total symptoms
Model: (Intercept), avoid, socsup, probsolv, gender, Emp3, Emp2, Emp1
a Set to zero because this parameter is redundant.
b Fixed at the displayed value.