The Influence of Social Support on the Relationship Between Posttraumatic Stress Disorder and Comorbid Mental Disorders, Suicidal Behaviour and Physical and Mental Health Functioning

by

Hayley K. Chartrand

A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

in partial fulfillment of the requirements of the degree

MASTER OF ARTS

Department of Psychology

University of Manitoba

Winnipeg

Abstract

This study examined the influence of social support on the relationship between posttraumatic stress disorder and comorbid psychopathology, suicidal behaviour, and mental and physical health functioning in the general population. Data came from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) (N=34,653). Results showed a differential impact of posttraumatic stress disorder and social support depending on gender. For men, social support had a moderating effect, where social support had a greater influence on the prevalence of comorbid psychopathology for men with posttraumatic stress disorder compared to those without the disorder. In contrast, social support had an additive effect for women, where social support was associated with decreased psychopathology and posttraumatic stress disorder was associated with increased psychopathology. This study suggests that social support should be included in the treatment of men with posttraumatic stress disorder and encouraged among women regardless of mental disorder diagnosis.

Acknowledgements

I would like to acknowledge my committee members: Dr. James Bolton (advisor), Dr. Michael Ellery (co-advisor), Dr. Jitender Sareen (internal member), and Dr. Laurence Katz (external member) for their invaluable assistance, guidance, and mentorship throughout this process.

I would also like to acknowledge the Canadian Institutes of Health Research (CIHR) Fredrick Banting and Charles Best Canada Graduate Scholarship – Masters Award, and the CIHR Health Professional Student Research Award for funding the current research.

Table of Contents

List of Tables

List of Figures

INTRODUCTION

I. Posttraumatic Stress Disorder and Comorbid Mental Disorders

Posttraumatic stress disorder (PTSD) first appeared with a standardized and consistently defined description in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association, 1980). Although other versions of this disorder, such as “shell shock,” have existed prior to DSM-III, trauma based psychopathologies did not appear in the earlier, psychodynamically oriented DSM I or DSM II. Hence, with the DSM-III, a standardized definition of PTSD allowed for better research on the psychological effects of trauma on mental health because a consistent definition allowed for comparisons to be made between studies. In order to receive a diagnosis of PTSD, according to DSM-IV diagnostic criteria, an individual must experience a traumatic event to which he or she responds with fear, helplessness, or horror and has symptoms from three distinct clusters consisting of reexperiencing, avoidance, and hyperarousal for at least one month (American Psychiatric Association, 1994). Reexperiencing involves repeated and intrusive memories related to the trauma through thoughts and dreams. Symptoms of avoidance refer to attempts to avoid situations that are reminders of the trauma. Symptoms of hyperarousal consist of irritability, reduced concentration and exaggerated startle response among others(American Psychiatric Association, 1994).

PTSD is a common mental disorder with a lifetime prevalence between 7% to 12% in the general population (Seedat & Stein, 2001; Kessler, Sonnega, Bromet et al., 1995; Breslau, 2002; Kessler, Delmer, Frank, et al., 2005). Gender differences exist in the rate and type of trauma exposure and prevalence of PTSD. Men are more likely to be

exposed to a traumatic event sometime during their life, while women are more likely to be exposed to more invasive traumas (e.g., sexual assault) and are more likely to be diagnosed with PTSD (Kessler et al., 1995; Keane, Marshall, & Taft, 2006; Olff, Langeland, Draijer, et al., 2007). Prevalence rates of PTSD in the general population are twice as high for women (10.4%) compared to men (5.0%) (Kessler et al., 1995). PTSD, in general population samples, has been found to be consistently comorbid with a number of Axis I disorders (Seedat & Stein, 2001; Kessler et al., 1995), particularly depression, anxiety disorders and substance use disorders (Seedat & Stein, 2001; Breslau, 2002; Kessler, 2000). Kessler and colleagues (1995) found that 59% of men and 44% of women with PTSD also met criteria for three or more mental disorders. In fact, compared with other anxiety disorders, PTSD has a greater history of comorbid depression, alcohol and substance use disorders, and suicide attempts and non-suicidal self-injury (Bruce, Weisberg, Dolan et al., 2001). PTSD is also associated with increased medical utilization (Greenberg, Sisitsky, Kessler, et al., 1999), occupational impairment (Stein, Walker, Hazen, & Forde, 1997; Breslau, 2001), disability (Sareen et al., 2007; Sareen, Cox, Clara, & Asmundson, 2005), and suicidal ideation, non-suicidal self-injury and suicide attempts (Bolton & Robinson, 2010; Nepon, Belik, Bolton, & Sareen, 2010; Sareen et al., 2007; Bruce et al., 2001; Chartrand, Sareen, Toews et al., 2012).

PTSD is also a significant predictor of subjective ratings of poor health functioning (Asmundson, Stein, & McCreary, 2002; Schnurr & Spiro, 1999; Frayne, Seaver, Loveland et al., 2004). In fact, Zayfert and colleagues (2002) found that PTSD and major depressive disorder were equally impairing to overall mental health functioning and both were significantly worse than panic disorder and generalized

anxiety disorder. PTSD was also associated with significantly worse physical health functioning compared to panic disorder, generalized anxiety disorder and major depressive disorder.

II. Current Models to Explain Transition from Stress to the Development of Mental and Physical Disorders

A number of theories have been proposed to explain the transition from stress to the development of mental disorders. One theory that has been predominantly featured in the literature is that chronic stress leads to the development of mental disorders through the activation of the hypothalamic-pituitary-adrenocortical (HPA) axis (Miller, Chen, & Zhou, 2007). The HPA axis is activated during acute stress, where the hypothalamus secretes corticotrophin-releasing hormone (CRH) through the influence of serotonin from the amygdala. Then CRH stimulates the pituitary to release adrenocorticotropic hormone (ACTH) which produces glucocorticoids, like cortisol, in the adrenal cortex. Cortisol functions by halting many of the body's metabolic, neuronal and immune reactions in order to conserve energy to cope with the acute stressor (Meewisse et al., 2007). Prolonged exposure to cortisol is thought to lead to tissue damage and dysregulation of biological systems (Miller et al., 2007). The development of mood and anxiety disorders is hypothesized to result from dendritic retraction and decreases in spine number in order to protect neurons from apoptosis caused by prolonged exposure to increased cortisol levels (Gorman & Docherty, 2010). Alternatively, stress can also lead to mental disorders through declines in cortisol output, as is found with PTSD (Miller et al., 2007). Chronic stress leads to a deregulated pattern of hormone secretion, with lower than normal morning levels of cortisol and higher than normal secretion levels throughout the rest of

the day (Miller et al., 2007). The opposite is true in healthy individuals with the highest level of cortisol in the morning and lowest in the evening. Individuals who develop PTSD experience a rebound effect of cortisol, where when chronic stress first begins the HPA axis is activated, but with time cortisol secretion rebounds to below normal (Miller et al., 2007). Considering the substantial impairments associated with exposure to chronic stress it is extremely important to identify protective factors that may attenuate the burden of chronic stress on physical and mental health. One such putative factor is social support.

III. Social Support and Comorbid Mental Disorders

In the literature, social support is conceptualized in two broad domains: structural support and functional support (Lett, Blumenthal, Babyak et al., 2009). Structural support refers to the size, type and frequency of contact with an individual's social network (i.e., friends, family, acquaintances, co-workers, neighbours). Functional support is the perceived support provided by an individual's social network. The four types of functional support are: appraisal support, i.e., advice or guidance when coping with problems; self-esteem support, i.e., others' indicating that you are valued; tangible support, i.e., availability of material resources; and belonging support, i.e., feeling one is part of a group with common interests (Hyman, Gold, & Cott, 2003). Perceived social support is often considered a better measure because a larger social support network is not necessarily reflective of greater or higher quality support (Hyman, Gold, & Cott, 2003). Moreover, studies that have directly compared the contributions of functional support to structural support have found that distress is influenced more by functional support than by structural support (Kaniasty & Norris, 1992; Norris & Kaniasty, 1996).

Research to date examining the influence of social support on levels of distress has consistently shown significant negative associations between social support and psychopathology (Kaniasty & Norris, 2008). Social support appears to be an important protective factor against psychiatric morbidity (Vaananen, Vahtera, Pantti, & Kivimaki, 2005; Dalgard, Bjork, & Tambs, 1995). However, social support has been found to have differential influence depending on gender. Women tend to have larger social networks than men (Mclaughlin, Vagenas, Pachana, et al., 2010). Men who are single, separated or divorced are also less likely to have large social networks, have fewer social interactions, and are less likely to maintain contact with their children and other family members compared to those who are married (Amato, 2000). In addition, high levels of perceived social support have been found to contribute independently to specific health practices (i.e., adherence to routine medical attention, healthy diet, exercise) among women but not for men (Jackson, 2006). Men and women do not differ on average in the amount of social support they provide for their partners; however, women provide better support when their husbands experience greater stress (Neff & Karney, 2005). In constrast, men display both support and negativity towards their wives when they experience greater stress (Neff & Karney, 2005). Also, low perceived partner support was associated with higher depression scores among women only, whereas high partner support was associated with lower depression scores among men and women (Choi & Ha, 2011).

Moak and Agrawal (2009) used data from a nationally representative US sample to examine the influence of perceived social support on psychiatric comorbidity. They found that higher levels of perceived social support were associated with decreased likelihoods of major depressive disorder, generalized anxiety disorder, social phobia and

alcohol abuse and dependence. For individuals with major depressive disorder, more perceived social support significantly predicted fewer depressive symptoms (George, Blazer, Hughes, &, Fowler, 1989). Studies looking at social support and depression have found that individuals with high levels of perceived social support experience more rapid symptom improvement and are less likely to experience recurrences of depression (Frasure-Smith, Lesperance, Gravel et. al., 2000). Conversely, lack of perceived social support has been found to predict more depressive symptoms and onset of major depressive disorder (Stice, Ragan, & Randall, 2004; Paykel, 1994). Perceived social support from colleagues and supervisors at work was also associated with decreased risk of absence due to psychiatric illness (Stansfeld, Rael, Head et al., 1997) and improved mental health (Vaananen et al., 2005).

IV. The Relationship between Social Support and Posttraumatic Stress Disorder

Perceived social support has been associated with the onset, severity and remission of PTSD. One of the most consistent findings in trauma research has been the inverse relationship between symptoms of PTSD and perceived social support (Clapp and Beck, 2009). Individuals with higher levels of perceived social support have less severe PTSD symptomatology and individuals with lower levels of perceived social support have more severe symptoms of PTSD (Clapp and Beck, 2009). Perceived positive social support has been shown to act both as a protective buffer against the development of PTSD and as a mechanism of remission of PTSD symptoms (Charuvastra, & Cloitre, 2008). Individuals who experience a traumatic event and receive high levels of social support are less likely to develop PTSD compared to those who receive low levels of social support (Declercq & Palmans, 2006). This relationship has been found in

childhood sexual abuse survivors (Hyman, Gold, & Cott, 2003) and combat veterans (Fontana, Rosenheck, & Horvath, 1997). Individuals with higher levels of perceived social support also have less severe PTSD symptoms (Regehr, Hemsworth, & Hill, 2001; Haden, Scarpa, Jones et al., 2007). The protective influence of perceived social support on PTSD symptoms was found for combat veterans (Pietrzak, Johnson, Goldstein et al, 2009), former peacekeepers (Dirkzwager, Henk, & van der Ploeg, 2003), survivors of childhood abuse and adult rape (Schumm, Briggs-Phillips, & Hobfoll, 2006), victims of community violence (Scarpa, Haden, & Hurley, 2006), and victims of sexual and physical violence (Glass, Perrin, Campbell, & Soeken, 2007).

Lack of perceived social support is also associated with the development of PTSD following trauma. In two recent meta-analyses examining the risk factors for PTSD in trauma-exposed adults a lack of social support was shown to be among the strongest predictors of new onset PTSD (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). Also, lack of social support led to an increased risk of PTSD for Vietnam veterans (Boscarino, 1995), victims of civil, religious and national conflicts (Jovanovic, Aleksandric, Dunjic et al., 2004) and victims of road traffic accidents (Holeva, Tarrier, & Wells, 2001). Gender differences have been found in the relationship between social support and PTSD symptomatology among trauma-exposed individuals. The effects of social support on PTSD symptoms at 6 months and 2 years after trauma exposure were significantly greater for women than men, where women who had lower social support reported greater symptoms of PTSD than men (Andrews, Brewin, & Rose, 2003; Ahern, Galea, Fernadez, et al., 2004).

There is a paucity of research examining PTSD, social support and suicidal thoughts and behaviour. Although research supports the association between PTSD and suicidal behaviour (Stein et al., 1997; Sareen et al., 2007) and the inverse relationship between social support and suicidal thoughts and behaviour (Chioqueta & Stiles, 2007; Kaslow et al., 2005; Montross, Zisook, & Kasckow, 2005) no studies have examined their interrelations in the general population. Two recent studies examined the relationship between PTSD, social support and suicidal thoughts and behaviour in samples of treatment-seeking Iraq and Afghanistan war veterans. These studies found that PTSD significantly diminished the protective effect of social support on suicidal thoughts and behaviour (Jakipcak et al., 2010; Pietrzak et al., 2011). This may indicate that the buffering effects of social support may be less pronounced in veterans with PTSD compared to those without PTSD; however, it is unknown whether these results can generalize to non-veteran samples.

V. Theoretical Models to Explain Influence of Social Support on Mental Health

Several theoretical models have been proposed in the literature to help explain the influence of social support on mental and physical health. The most influential theoretical model is the “stress buffering model”. This model, as described by Cohen and Hoberman (1983), hypothesizes that the availability of social support wholly or partially protects an individual against the pathogenic effects of high levels of life stress. Cohen and Wills (1985) described two possible points where social support may interfere with the hypothesized casual link between stress and mental disorders. The first point where social support may interfere is by preventing the appraisal of an event as stressful. Specifically, the perception that others will provide needed resources may improve the person’s

perceived ability to cope with the situation(s) or may redefine the potential for harm posed by the event(s) (Cohen & Wills, 1985). The second point that social support may interfere is by reducing the impact of the stress appraisal through eliminating (or reducing) the stress reaction or by directly influencing physiological processes (Cohen & Wills, 1985). Support for the influence of social support on physiological processes comes from animal research. Studies have shown that positive social interactions modulate the HPA axis and influence recovery from injuries and illnesses (DeVries et al., 2007). Hamsters and mice that form social bonds are protected from adverse reactions from stress and heal more quickly than socially isolated animals because the physical contact experienced in their pair bonds releases oxytocin, which leads to the suppression of the HPA axis and facilitates wound healing (DeVries et al., 2007). Social housing (i.e., two or more animals living in one primary enclosure, as opposed to single housing, where a lone animal lives in one primary enclosure) appears to have an alternative mechanism for its influence on stroke-induced neuronal death,involving suppression of the inflammatory response that accompanies stroke (DeVries et al., 2007). Both pair bonds and social housing highlight the direct influence of social support on physiological processes.

The “stress buffering model” has been applied in the literature to help explain the consistent and strong relationship between PTSD and social support (Charuvastra, & Cloitre, 2008). However, there is some debate in the literature regarding the timing of how they influence each other. While the “stress buffering model” posits that perceived positive social support acts as both a protective buffer against the development of PTSD and as a mechanism of remission of PTSD symptoms, there is also growing support in the

literature for an alternative theory called the “erosion model.” The erosion model posits that symptoms of PTSD (e.g., social withdrawal, numbing, excessive anger) contribute to the erosion of social support over time by leading to a decrease in the quality and quantity of social support individuals with PTSD receive. The erosion model hypothesizes that the strong relationship between social support and PTSD is due to symptoms of PTSD leading to decreased social support and not increased social support leading to decreased PTSD symptoms (Clapp & Beck, 2009; King et al., 2006; Laffaye et al., 2008). Support for the erosion model comes from a study by King et al. (2006) that directly tested the stress buffering and erosion models. King et al. (2006) measured PTSD severity and social support in a sample of Gulf War veterans (N=2249) initially after returning from combat and again five years later. They found that initial PTSD predicted subsequent decreases in social support, but that social support failed to predict later PTSD, after controlling for initial PTSD severity.

VI. Personality Disorders

Personality disorders have been found to be strongly associated with PTSD (Pietrzak et al., 2011; Bollinger et al., 2000; Dunn et al., 2004; Gomez-Beneyto et al., 2006; Malta et al., 2002; Shea et al, 2000; Southwich et al., 1993; Yen et al., 2002; Pagura et al., 2010). A general population sample in the U.S. found associations between PTSD and borderline, schizotypal, and narcissistic personality disorders (Pietrzak et al., 2001). Yen and colleagues (2002) found the highest rate of PTSD among borderline personality disorder (51%) compared to other personality disorders. In addition, personality disorders are also associated with dysfunctional coping strategies which include lack of social support seeking (Bijttebier & Vertommen, 1999). The pattern of lack of social support

seeking and the tendency to engage in avoidant copying was found among all cluster A personality disorders, borderline personality disorder, and avoidant personality disorder (Bijttebier & Vertommen, 1999). Antisocial personality disorder was found to be solely associated with lack of social support seeking only (Bijttebier & Vertommen, 1999). With the association between personality disorders and PTSD and lack of social support seeking, a review of the literature that describes the stability of personality disorders was justified. This review was conducted in order to determine whether personality disorder diagnoses should or should not have been included as covariates in this study. However the results of a number of longitudinal studies that have examined the stability of personality disorder diagnoses and symptoms overtime have found that personality disorder symptoms are, "in fact, notably unstable and plastic," (Wright, Pincus, & Lenzenweger, 2011). These studies in both clinical and community samples have found a significant decline in the number of individuals meeting diagnostic criteria overtime (Wright, et al., 2011). For example, the Collaborative Longitudinal Personality Disorders Study (CLPS) found significant diagnostic changes over a two year period. Only 44% of individuals met criteria every month during year one and rates of remission (fewer than two criteria throughout the past year) were 20% during year one and ranged from 20% to 40% at year two (Clark, 2007). The Longitudinal Study of Personality Disorders (LSPD), using a sample of college students over a four-year period, found that the number of personality disorder diagnostic criteria decreased on average by 1.4 per year (Clark, 2007). Given the instability of personality disorder diagnoses, especially over a short period of time (i.e., two to four years), personality disorders were not included as covariates in this study. Also, the personality disorder diagnoses in the NESARC are

lifetime and all other measures in the current study are past-year; therefore, the inclusion of personality disorders would have also detracted from the temporal relationships of variables in the study.

VII. Limitations of Previous Research

Despite the growing number of studies that have examined the relationship between social support and PTSD, there are still a number of limitations in the literature. First, studies have mainly focused on specific types of trauma (e.g., combat, motor vehicle accidents, and intimate partner abuse) and have not been able to evaluate models that include a variety of other traumatic experiences in the same study (Boscarino, 1995; Fontana et al., 1997; Pietrzak et al., 2009; Holeva et al., 2001; Glass et al., 2007). The current study addressed this limitation by looking at a general population sample which has experienced a wide variety of traumas that have led individuals to develop PTSD. Second, other studies have examined the relationship between social support and PTSD in specific sub-samples of the population like veterans (Boscarino, 1995; Fontana et al., 1997; Pietrzak et al., 2009), college students (Haden et al., 2007) and firefighters (Regehr et al., 2001), which limits the generalizability of the results. The current study addressed this limitation by using a population-based American sample. Third, previous studies that have examined social support and PTSD have used clinical samples, which tend to be treatment-seeking (Jovanovic et al., 2009; Glass et al., 2007; Hyman et al., 2003), or have been limited by small sample sizes, i.e., fewer than 200 participants (Jovanovic et al., 2009; Haden et al., 2007; Regehr et al., 2001). The current study used a large sample of 34,653 people from the general US population, which allowed for more statistical power. Fourth, the literature to date has focused mainly on social support and the development of

subsequent PTSD, and had not readily examined the influence of social support on those who already have PTSD (Hyman et al., 2003, Holeva et al., 2001; Declercq & Palmans, 2006). This study focused on examining the influence of social support on those who already have a PTSD diagnosis. An additional strength of this study was the use of structured clinical interviews based on DSM-IV criteria to diagnose PTSD and other mental disorders, rather than self-report of the presence or absence of a diagnosis. Also, this study used perceived social support which is considered a better measure of social support. Studies that have directly compared the contributions of perceived social support to structural support have found that distress is influenced more by perceived social support than by structural support (Kaniasty & Norris, 1992; Norris & Kaniasty, 1996).

VIII. The Purpose of The Current Study

The purpose of the current study was to examine the influence of social support on the relationship between PTSD and comorbid mental disorders, suicidal behaviour, and physical and mental health functioning. Specifically, I determined whether social support moderated these relationships (Figure 1) or acted as an independent predictor along with PTSD. To determine whether social support moderated these relationships, regression models were used to test whether an interaction model (i.e., PTSD x social support) better accounted for the relationship between PTSD and comorbid mental disorders, suicidal behaviour, and physical and mental health functioning compared to an additive model (i.e., PTSD + social support) (Tabachnick & Fidell, 2007; Rose et al. 2004). Both additive and interaction models were examined in this study and this approach was justified for three reasons. First, this study was exploratory; therefore, I needed to include both additive and interactive effects because it was unknown how

PTSD and social support would relate to comorbid disorders, suicide attempts and quality of life. It may have been that social support was associated with lower odds of mental disorders regardless of a PTSD diagnosis or not. Or it could have been that people under stress (i.e. people with PTSD) would benefit even more from social support than those without the disorder (as the stress buffering hypothesis describes). Because of this lack of clarity in the literature, examinations of both additive and interaction effects were warranted. Previous research supports the significant influence of social support (e.g., Moak & Agrawal, 2009; Frasure-Smith, Lesperance, Gravel et. al., 2000) and PTSD (e.g., Seedat & Stein, 2001; Breslau, 2002; Kessler, 2000) on psychopathology, suicidal behaviour and mental and physical health functioning when they are examined separately. However, it was unknown whether both social support and PTSD would interact in their influence on psychopathology, suicidal behaviour and mental and physical health functioning (interaction model) or remain both significant, but independent predictors (additive model). A second justification for this approach was that the examination of both interactive and additive effects is advocated in the literature. It is suggested that if a multiplicative regression analysis reveals no significant interaction effect the effects of the constituent variables (i.e., social support and PTSD) should be estimated by reverting to an additive model to test for main effects (Cramer & Appelbaum, 1980; Finney et al., 1984; Mitchell et al., 1983; Schaefer et al., 1981). In fact, Craemer and Appelbaum (1980) suggest that the additive model estimates are statistically more powerful and precise, and have less error. This approach is supported by others (Mitchell et al., 1983; Schaefer et al., 1981). The third justification for this approach was that interaction effects are hard to detect. Research has shown that although

experimentalists frequently detect interaction effects, nonexperimentalists conducting field research have found moderator effects to be extremely difficult to detect (McClelland & Judd, 1993). Research designs have been criticized for regularly failing to have sufficient power to detect true interactions (Overall et al., 1981). Moreover, because research supports the differential influence of social support on men and women (Andrews, et al., 2003; Ahern, et al., 2004; Choi & Ha, 2011; Neff & Karney, 2005; Jackson, 2006), effects in the current study were examined within each gender (i.e., stratified by gender).

There are several reasons why stratifying the analyses by gender is justified despite not testing for a significant interaction with gender. First, as mentioned previously, it is often difficult to detect significant interaction effects due to lack of power and not because a true interaction does not exist (Overall et al., 1981). Second, there is something to be learned by examining men and women separately. Men and women have been found in previous research to be influenced differently by social support (Andrews et al., 2003; Ahern et al., 2004; Choi & Ha, 2011; Neff & Karney, 2005; Jackson, 2006), to have different rates of PTSD (Kessler et al., 1995) and to experience different types of trauma (Kessler et al., 1995; Keane, Marshall, & Taft, 2006; Olff, Langeland, Draijer, et al., 2007). Due to the fact they are influenced differently by both the independent variable (PTSD) and the moderating variable (social support) in this study, it is prudent not to assume that theses variable will relate in the same way to the dependent variables (i.e., mental disorders, suicidal behaviour, and physical and mental health functioning) among the two genders. Third, there is a precedence in the literature for stratifying analyses by gender without testing for a significant interaction (Bolton et

al., 2008; Sareen et al, 2012; Afifi et al., 2010). Finally, the Canadian Institutes of Health Research (CIHR) "expects that all research applicants will integrate gender and sex into their research designs when appropriate," (CIHR, 2012). This requirement of CIHR shows the importance of examining the influence of gender and supports the argument that a statistically significant gender interaction term is not required to conduct analyses stratified by gender. Examination of these relationships using a nationally representative American sample formed the basis of my Master's level research.

All measures in my study are self-report measures which have a number of important strengths. First, self-report measures are the only way to measure emotional states, attitudes, plans and other constructs that are perceptual in nature (Haeffel & Howard, 2010; Williamson, 2007). Second, there is evidence that self-report may be superior to behavioural measures when estimating behavioural outcomes (Haeffel & Howard, 2010). Many studies have found that the construct validity coefficients of self-report measures were superior to those of behavioural measures when estimating behavioural outcomes (Howard, Maxwell, Wiener, et al., 1980; Cole, Howard, & Maxwell, 1981, Cole Lazarick, & Howard, 1987). Third, self-report measures often outperform other measurement techniques in predicting future outcomes (Haeffel & Howard, 2010). Self-report measures are excellent predictors of moods, emotions and psychopathology (Haeffel & Howard, 2010). The use of self-report measures was well suited to my study, since I was examining whether knowing an individual's level of perceived social support would help to predict the relationship between PTSD and other comorbid mental disorders. Overall, self-report measures are considered an important

measurement tool because of their ability to predict important outcomes (Haeffel & Howard, 2010).

The variables that influence self-report measures of social support are not currently well understood. One study discussed the possible influence of depressed mood on an individual's perception of social support. The study supported the influence of symptoms of depression on an individual's perception of social interactions (Vranceanu, Gallo, & Bogart, 2009). This was believed to be due to the negative cognitive bias found with depression where events, interaction, and the self are interpreted through a negative lens (Beck, 2005). Because of negative cognitive bias depressed individuals are likely to misinterpret ambiguous interactions as conflictive and may perhaps rate their level of social support lower. Studies using mood manipulation techniques and samples of depressed college students or older adults have found that mood had a significant effect on perceived social support, where depressed individuals scored lower on perceived social support than non-depressed individuals (Cohen, Towbes, & Flocco, 1988; Slavin & Compas, 1989; Brummett, Barefoot, Siegler, et al., 2000). In contrast, received social support, which is considered to be a more objective measure of social support compared to perceived social support, was not affected by mood.

There is also evidence that PTSD may also have posttraumatic negative cognitions, like negative attributions about the self, others, and the world. These may contribute to a negative network orientation (Clapp & Beck, 2009). A negative network orientation is where individuals with PTSD experience their social network as rejecting or ineffective, which may then result in beliefs that utilization of support is inappropriate, useless or dangerous (Clapp & Beck, 2009). Because of the influence of depressed mood

on perceived social support, it is important to consider the possibility of a bi-directional relationship between social support, major depressive disorder, or PTSD. Higher levels of social support may lead to decreased odds of major depressive disorder and PTSD, but the reverse may also be true, where depressed mood or PTSD may lead to lower levels of social support. The inability to parse out the directionality is unfortunately a limitation of my study's cross-sectional design.

IX. Hypotheses

Hypothesis 1: Comorbidity

My first hypothesis was that social support, as measured by twelve items from the Interpersonal Support Evaluation List (ISEL; Cohen & Hoberman, 1983) would moderate the relationship between PTSD and mental disorders diagnosed according to DSM-IV criteria based on the Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV; Grant et al., 2003). To determine whether social support moderated the relationship between PTSD and mental disorders, regression models were used to test whether an interaction model (i.e., PTSD x social support) better accounted for the relationship between PTSD and comorbid mental disorders compared to an additive model (i.e., PTSD + social support) (Tabachnick & Fidell, 2007; Rose et al. 2004). This was an exploratory study; no study to date had looked at social support as a moderator between PTSD and mental disorders. However, some studies had looked at PTSD (Sareen et al., 2007) and social support (Moak & Agrawal, 2009) independently and their association with mental disorders. Based on previous studies, I hypothesized that social support would moderate the relationship between PTSD and major depressive disorder, bipolar I, panic disorder, social phobia, alcohol use disorder, and drug use

disorder. Specifically, I predicted that individuals with PTSD who have higher levels of perceived social support would have decreased odds of having a comorbid mental disorder, while individuals with PTSD who had lower levels of perceived social support would have increased odds of having a comorbid mental disorder. In terms of gender effects, I predicted that for men an interaction model (i.e., PTSD x social support) would better account for the relationship between PTSD and comorbid mental disorders compared to an additive model (i.e., PTSD + social support). Because women tend to have larger social networks than men (Mclaughlin, Vagenas, Pachana, et al., 2010; Amato, 2000), social support would have equivocal benefits for those women with and without PTSD. Also, although men and women do not differ on average in the amount of social support they provide for their partners, women provide better support when their husbands experienced greater stress, while men displayed both support and negativity towards their wives when they experienced greater stress (Neff & Karney, 2005). I expected this increased negativity from a woman's partner when she has PTSD to detract from the high level of social support she experiences normally.

Hypothesis 2: Suicide Attempts

My second hypothesis was that social support, as measured by twelve items from the Interpersonal Support Evaluation List (ISEL; Cohen & Hoberman, 1983) would moderate the relationship between PTSD diagnosed according to DSM-IV criteria based on the Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV; Grant et al., 2003) and self-reported suicidal behaviour. To determine whether social support moderated the relationship between PTSD and suicidal behaviour, regression models were used to test whether an interaction model (i.e., PTSD x social

support) better accounted for the relationship between PTSD and suicidal behaviour compared to an additive model (i.e., PTSD + social support) (Tabachnick & Fidell, 2007; Rose et al. 2004). I predicted that individuals with PTSD who have higher levels of perceived social support would have decreased odds of suicidal behaviour, while individuals with PTSD who have lower levels of perceived social support would have increased odds of suicidal behaviour. In terms of gender effects, for reasons stated above, I predicted that for men an interaction model (i.e., PTSD x social support) would better account for the relationship between PTSD and suicidal behavior compared to an additive model (i.e., PTSD + social support) and the reverse for women.

Hypothesis 3: Mental and Physical Health Functioning

Finally, my third hypothesis was that social support, as measured by twelve items from the Interpersonal Support Evaluation List (ISEL; Cohen & Hoberman, 1983) would moderate the relationship between PTSD diagnosed according to DSM-IV criteria based on the Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV; Grant et al., 2003) and mental and physical health functioning as measured by the Medical Outcomes Study 12-Item Short-Form Health Survey (SF-12; Ware, 1996). To determine whether social support moderated the relationship between PTSD and mental and physical health functioning, regression models were used to test whether an interaction model (i.e., PTSD x social support) better accounted for the relationship between PTSD and mental and physical health functioning compared to an additive model (i.e., PTSD + social support) (Tabachnick & Fidell, 2007; Rose et al. 2004). I predicted that as the level of perceived social support increased for individuals with PTSD so would mental and physical health functioning. In contrast, as the level of

perceived social support decreased for individuals with PTSD, so would mental and physical health functioning. In terms of gender effects, for reasons stated above, I predicted that for men an interaction model (i.e., PTSD x social support) would better account for the relationship between PTSD and mental and physical health functioning compared to an additive model (i.e., PTSD + social support) and the reverse for women.

METHOD

I. Sample

The data for my study came from the National Epidemiological Survey on Alcohol and Related Conditions (NESARC; Grant, Kaplan, Shepard, & Moore, 2003). The NESARC is a nationally representative survey of the adult non-institutionalized, civilian population from the 50 United States. The survey was conducted by the United States Census Bureau under the direction of the National Institute on Alcohol Abuse and Alcoholism (NIAAA) (Grant, Kaplan, Shepard, & Moore, 2003). The NESARC consists of two waves of interviews that took place in 2001-2002 and then again in 2004-2005. The assessments were conducted face-to-face by trained lay interviewers using computer-assisted software. For the purpose of my study, only wave 2 data were considered because PTSD and social support were not assessed at wave 1. The wave 2 sample consists of 34,653 people, ranging in age from 21 to 99 years old. The response rate for the NESARC from wave 1 was 81% and the cumulative response rate for wave 2 was 70.2% (Grant & Kaplan, 2005). The data from wave 2 of the NESARC is representative of US civilian population based on region, age, race-ethnicity and sex for the 2000 Census (Ruan, Goldstein, Chou et al., 2008).

II. Measures

a) Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV)

The AUDADIS-IV is a fully structured diagnostic interview designed for use by lay interviewers to assess DSM-IV diagnostic criteria for alcohol, drug, and mental disorders in both clinical and general populations (Grant, Dawson, & Hasin, 2001). In the NESARC wave 2, the Axis I disorders assessed by the AUDADIS-IV were: PTSD, drug abuse and dependence, nicotine dependence, alcohol abuse and dependence, panic disorder, specific phobia, social anxiety disorder, generalized anxiety disorder, bipolar I, bipolar II, major depressive disorder and dysthymia. The Axis II disorders assed by the AUDADIS-IV at wave 2 were: schizotypal, narcissistic and borderline personality disorder. The other seven personality disorders were assessed at Wave 1. The test-retest reliability of the AUDADIS in the U.S. general population for nicotine dependence (kappa values = 0.60 to 0.63), and other substance-related disorders (kappa values =0.66 to 0.97) were good to excellent, while mood disorders (kappa values = 0.58 to 0.65) and anxiety disorders (kappa values = 0.40 to 0.52) were fair to good (Ruan, Goldstein, & Chou et al., 2008). Also, test-retest reliability coefficients for PTSD, borderline, narcissistic and schizotypal personality disorders were in the fair to good range (kappa values = 0.63 to 0.77). Internal consistency of symptom scales associated with PTSD, borderline, narcissistic and schizotypal personality disorders fell within the good range (alpha = 0.75 to 0.89; Ruan, Goldstein, & Chou et al., 2008). (See Appendix A for examples of items from the PTSD module).

b) Twelve items from the Interpersonal Support Evaluation List (ISEL)

Twelve items were drawn from a larger pool of questions that make up the Interpersonal Support Evaluation List (ISEL). These twelve items were selected, by the creators of the NESARC survey, from the larger measure so that participants of Wave 2 of the NESARC were not overburdened with additional questions. The full ISEL is an extensive inventory that provides multi-item scales assessing perceived availability of appraisal (confidant/informational) support, tangible (instrumental) support, self-esteem (esteem) support, and belonging (social companionship) support (Cohen & Wills, 1985). Responses to each item were rated by participants on a 1 to 4 point scale, which ranged from 1 being definitely true, to 4 being definitely false. Items are phrased in both directions (i.e., increasing and decreasing perceived social support). Factor analyses of the 12 items used in the current study showed that all 12 items loaded on a single factor of perceived social support, with individual items loadings ranging from 0.44 to 0.66 (Moak & Agrawal, 2009) (See Appendix B). In my study, social support was examined as a dichotomous variable (high social support vs. low social support). The total score on the twelve items from the ISEL was dichotomized into high and low social support based on a median split (low social support: score of 0 to 6; high social support: score of 7 to 12). This method has been used in previous studies to correct problems with non-normally distributed scores and loss of statistical power (Sareen et al., 2007).

c) Past Year Suicidal Behaviour

Suicidal behaviour was assessed in the NESARC through asking about suicide attempts. Participants were asked, “In your ENTIRE life did you EVER attempt suicide?” and replied either “yes” or “no.” A past-year suicide attempt variable was created by

subtracting the respondent's age at Wave 2 from the age that the respondent attempted suicide. A difference in age of 0 or 1 year was coded as a past year suicide attempt.

d) Medical Outcomes Study 12-Item Short-Form Health Survey (SF-12)

Mental and physical health functioning were measured in the NESARC using the SF-12 (Ware, Kosinski, & Keller, 1996). The SF-12 is a generic health measure and is not targeted at a specific age or disease group. All items on the SF-12 were selected from the original SF-36 Health Survey. The resulting 12-item short-form (SF-12) achieved excellent multiple R squares of 0.91 and 0.92 in predictions of the SF-36 Physical Component Summary and SF-36 Mental Component Summary scores (Ware, Kosinski, & Keller, 1996). Two week test-retest correlations were 0.89 for the 12-item Physical Component Summary and 0.76 for the 12-item Mental Component Summary, which are good to excellent according to the developers (Ware, Kosinski, & Keller, 1996). (See Appendix C).

III. Research Design

My study examined a dichotomous past year PTSD variable as a predictor variable, a dichotomous social support variable as the moderator variable and predictor variable, specific mental disorders and suicide attempts as dichotomous outcome variables, and mental and physical health functioning as continuous outcome variables. My outcome variables consisted of past year mental disorders (DVs: drug use disorder, nicotine dependence, alcohol use disorder, panic disorder, specific phobia, social anxiety disorder, generalized anxiety disorder, bipolar I, bipolar II, major depressive disorder, and dysthymia), past year suicidal behaviour (DV: attempted suicide in past year), and current mental and physical health functioning (DVs: mental health functioning, physical

health functioning). In my study, I also controlled for the influence of sociodemographics (income, ethnicity, region, marital status, education, and urbanicity), Axis I disorders, and severity of PTSD as defined by number of PTSD symptoms. Number of symptoms was used as a proxy measure for severity and has been used in previous studies (e.g., Chartrand, Robinson, & Bolton, in press). Axis I disorders were entered as aggregate variables, i.e. any anxiety disorder (minus PTSD), any mood disorder, and any substance use disorder. This improved model stability in comparison to entering all disorders individually. Adjusting for these confounding variables was important in order to isolate the unique variance accounted for by social support on PTSD comorbidity, suicidal behaviour, and mental and physical health functioning.

IV. Planned Analyses

In order to examine the influence of social support on the relationship between PTSD and comorbid mental disorders, suicidal behaviour, and mental and physical health functioning, I conducted hierarchical regression models for each specific mental disorder, suicide attempts and mental and physical health functioning. These hierarchical regressions were performed to test the significance of both additive and interaction models; where moderation analyses tested the interaction models. Moderation analyses are used to examine whether a variable (i.e. social support) is a protective or resource factor. A protective factor either improves negative outcomes or promotes adaptive functioning. A protective factor only exists in the context of a stressor (i.e. PTSD); in contrast, a resource factor has a positive influence regardless of the presence or absence of a stressor (i.e. both with and without PTSD) (Rose et al., 2004). A protective factor is a moderation effect, tested by comparing an interactional model (protective factor) and an

additive model (resource factor). Moderation analyses use regression models to test whether a variable is a moderator by determining if an interaction model better accounts for the relationship between the independent and outcome variable compared to an additive model (Tabachnick & Fidell, 2007; Rose et al. 2004). For example, to test whether social support moderated the relationship between PTSD and major depressive disorder (MDD), I compared a model with PTSD and social support entered separately (main effects) with MDD as the outcome to a model that included both main effects and the interaction term between PTSD and social support with MDD as the outcome variable. If the interaction term (PTSD x social support) were significant, I would conclude that social support moderated the relationship between PTSD and MDD.

Logistic regression was required because the dependent variables are dichotomous (Tabachnick & Fidel, 2007). The regression models with mental and physical health functioning used linear regression because the dependent variables are continuous. In step 1, I regressed the outcome variable of interest (e.g., MDD) on PTSD and social support. In step 2, I added the PTSD x social support interaction term. Finally, in step 3 of the hierarchical regressions, I added the covariates (e.g., sociodemographics). For each of the analyses, I conducted three separate models: 1) unadjusted, 2) adjusting for sociodemographics (i.e., gender, age, ethnicity, marital status, region, income, education, and urbanicity), and 3) adjusting for sociodemograhphics, severity of PTSD (i.e., number symptoms of PTSD), and Axis I disorders (i.e., drug use disorder, nicotine dependence, alcohol use disorder, panic disorder, specific phobia, social anxiety disorder, generalized anxiety disorder, bipolar I, bipolar II, major depressive disorder, and dysthymia), excluding the variable of interest. This study did not correct of multiple

comparisons; however, this approach is justified due to this study's exploratory nature. In fact, according to Bender and Lange (2001) they "…prefer that data of exploratory studies be analyzed without multiplicity adjustment." Since my study is exploratory I did not want to miss any possible significant associations by being too conservative with my significance level. Further replication of these results is required to draw more firm conclusions. To address the concern of multiple comparisons, three levels of significance are provided ($p < .05$, $p < .01$, and $p < .001$) as noted in the footnotes of each table, so that the more conservative reader can interpret the findings with this in mind.

RESULTS

The prevalence in Wave 2 of the NESARC of PTSD, no PTSD, low social support and high social support among mental disorders and suicide attempts can be found in Table 1. A total of 2,496 (6.5%) individuals had PTSD, 32,157 (93.5%) individuals did not have PTSD, 32,627 (95.4%) individuals had high social support, and 1,868 (4.6%) had low social support. Among individuals with PTSD, there was a higher prevalence of all mental disorders compared to individuals without PTSD. Major depressive disorder had the highest prevalence n=858 (33.9%) (χ^2 = 153.60***) among individuals with PTSD. There was also a higher prevalence of all mental disorders, except alcohol use disorder, among individuals with low social support compared to high social support. Major depressive disorder also had the highest prevalence n=400 (20.8%) (χ^2 = 72.93***) among individuals with low social support.

Hypothesis 1:Comorbidity

Table 2 illustrates hierarchical logistic regressions models of PTSD and social support with mental disorders among the entire NESARC Wave 2 sample. There was one

significant simple effect for PTSD. After adjusting for sociodemographic factors, any Axis I mental disorder (excluding variable of interest) and severity of PTSD, having PTSD was associated with significantly decreased odds of bipolar II disorder (AOR =0.60, 95% CI 0.41-0.88, p<.05). Also, there were a number of significant simple effects for social support. High social support was associated with significantly decreased likelihood of bipolar I disorder (AOR =0.64, 95% CI 0.49-0.85, p<.01), social anxiety disorder (AOR =0.37, 95% CI 0.29-0.47, p<.001), specific phobia (AOR =0.79, 95% CI 0.65-0.97, p<.05), and nicotine dependence (AOR =0.79, 95% CI 0.67-0.94, p<.01). In contrast, high social support was associated with significantly increased odds of an alcohol use disorder (AOR =1.51, 95% CI 1.18-1.93, p<.01). There were also a number of significant additive effects. Having PTSD significantly increased the odds of having dysthymia (AOR =1.91, 95% CI 1.27-2.88, p<.01), generalized anxiety disorder (AOR =1.82, 95% CI 1.40-2.37, p<.001), and any anxiety disorder (AOR =1.20, 95% CI 1.02-1.41, p<.05), while having high social support significantly decreased the odds of having dysthymia (AOR =0.41, 95% CI 0.31-0.56, p<.001), generalized anxiety disorder (AOR =0.58, 95% CI 0.44-0.76, p<.001), and any anxiety disorder (AOR =0.61, 95% CI 0.51-0.73, p<.001). A significant interaction was found between PTSD and social support for predicting major depressive disorder (AOR =2.96, 95% CI 1.60-5.45, p<.001). The influence of social support was greater for individuals with PTSD compared to no PTSD, where the difference in prevalence of major depressive disorder was much greater between high and low social support groups for individuals with PTSD compared to those without PTSD (See Figure 2). Another significant interaction was found between PTSD and social support for predicting any mood disorder (AOR =1.67, 95% CI 1.12-

2.49, p<.05). The influence of social support was greater for individuals with PTSD compared to no PTSD, where the difference in prevalence of any mood disorder was much greater between high and low social support groups for individuals with PTSD compared to those without PTSD (See Figure 3). My hypothesis that social support would significantly moderate the relationship between PTSD and comorbid mental disorders was partially supported. I had predicted that a significant moderation effect would be found for major depressive disorder, bipolar I, panic disorder, social phobia, alcohol use disorder, and drug use disorder; however, only significant moderation analyses were found for major depressive disorder and any mood disorder.

Hypothesis 2:Suicide Attempts

Table 3 displays hierarchical logistic regressions models of PTSD and social support with suicide attempts among the entire NESARC Wave 2 sample. In the adjusted models (with the same covariates as in previous analyses), having high social support was associated with a decreased likelihood of a suicide attempt (AOR =0.54, 95% CI 0.29-0.98, p<.05). My hypothesis that social support would significantly moderate the relationship between PTSD and suicide attempts was not supported because in the adjusted models only a simple effect of social support was found.

Hypothesis 3:Mental and Physical Health Functioning

The next set of analyses examined the relationship between PTSD and social support and mental and physical health functioning. Table 4 shows that social support is associated with increased physical health functioning (adjusted Beta Coefficient and SE: 2.91(0.40), p<.001). An additive effect was found for mental health functioning. Having PTSD significantly decreased mental health functioning (adjusted Beta Coefficient and SE: -

2.13(0.39), p<.001), while having high social support significantly increased mental health functioning (adjusted Beta Coefficient and SE: 5.37(0.38), p<.001). My hypothesis that social support would significantly moderate the relationship between PTSD and mental and physical health functioning was not supported. In the adjusted models, a simple effect of social support was found for physical health functioning and an additive effect of social support and PTSD was found for mental health functioning.

Hypothesis 1:Comorbidity

Table 5 illustrates hierarchical logistic regressions models of PTSD and social support with mental disorders among women. There were a number of significant simple effects for social support. After adjusting for sociodemographic factors, any Axis I mental disorder (excluding variable of interest), and severity of PTSD high social support was associated with significantly decreased likelihood of bipolar I disorder (AOR =0.57, 95% CI 0.40-0.81, p<.01), social anxiety disorder (AOR =0.32, 95% CI 0.24-0.43, p<.001), and any anxiety disorder (AOR =0.63, 95% CI 0.52-0.78, p<.001). There were also a number of significant additive effects. Having PTSD significantly increased the odds of having dysthymia (AOR =2.42, 95% CI 1.56-3.74, p<.001), major depressive disorder (AOR =1.34, 95% CI 1.09-1.65, p<.01), generalized anxiety disorder (AOR =1.68, 95% CI 1.28-2.21, p<.001), and any mood disorder (AOR =1.43, 95% CI 1.19-1.73, p<.001), while having high social support significantly decreased the odds of having dysthymia (AOR =0.35, 95% CI 0.23-0.53, p<.001), major depressive disorder (AOR =0.59, 95% CI 0.47-0.76, p<.001), generalized anxiety disorder (AOR =0.52, 95% CI 0.38-0.71, p<.001), and any mood disorder (AOR =0.49, 95% CI 0.40-0.62, p<.001). A significant interaction was found between PTSD and social support for predicting

panic disorder (AOR =1.96, 95% CI 1.02-3.77, p<.05). The influence of social support was greater for women with PTSD compared to no PTSD, where the difference in prevalence of panic disorder was much greater between high and low social support groups for women with PTSD compared to those without PTSD (See Figure 4). My hypothesis that women would have a significant additive effect of social support and PTSD for comorbid mental disorders was supported. I found significant additive effects of social support and PTSD for dysthymia, major depressive disorder, generalized anxiety disorder, and any mood disorder among women.

Hypothesis 2:Suicide Attempts

Table 6 displays hierarchical logistic regressions models of PTSD and social support with suicide attempts among women. After adjusting for sociodemographics, Axis I mental disorders and severity of PTSD there were no longer any significant associations between PTSD, social support and suicide attempts. My hypothesis that women would have a significant additive effect of social support and PTSD for suicide attempts was not supported because in the adjusted models no significant effects remained.

Hypothesis 3:Mental and Physical Health Functioning

Table 7 shows that social support is associated with increased physical health functioning (adjusted Beta Coefficient and SE: 3.17(0.54), p<.001) among women. Also, an additive effect was found for mental health functioning. Having PTSD significantly decreased mental health functioning (adjusted Beta Coefficient and SE: -2.05(0.43), p<.001) among women, while having high social support significantly increased mental health functioning (adjusted Beta Coefficient and SE: 5.98(0.48), p<.001) among women.

My hypothesis that women would have a significant additive effect of social support and PTSD for physical and mental health functioning was partially supported. I found significant additive effects of social support and PTSD for mental health functioning among women, but only a simple effect of social support of physical health functioning.

Hypothesis 1:Comorbidity

Table 8 illustrates hierarchical logistic regressions models of PTSD and social support with mental disorders among men. In terms of simple effects, having PTSD was associated with significantly decreased odds of bipolar II disorder (AOR =0.50, 95% CI 0.25-0.98, p<.05) and significantly increased odds of generalized anxiety disorder (AOR =2.33, 95% CI 1.29-4.20, p<.01) among men. There were also a number of significant simple effects for social support. Even after adjusting for sociodemographic factors, any Axis I mental disorder (excluding variable of interest), and severity of PTSD high social support was associated with significantly decreased likelihood of social anxiety disorder (AOR =0.45, 95% CI 0.28-0.72, p<.01), any anxiety disorder (AOR =0.58, 95% CI 0.43-0.79, p<.001), and nicotine dependence (AOR =0.73, 95% CI 0.57-0.94, p<.05) among men. In contrast, high social support was associated with significantly increased odds of an alcohol use disorder (AOR =1.65, 95% CI 1.20-2.29, p<.01). Surprisingly, after adjusting for sociodemographics, Axis I mental disorders (excluding the variable of interest) and severity of PTSD there were no longer any significant additive effects between PTSD, social support and mental disorders among men. However, there were a number of significant interactions between PTSD, social support and mental disorders among men. A significant interaction was found between PTSD and social support for predicting major depressive disorder (AOR =9.25, 95% CI 2.56-33.34, p<.001). The

influence of social support was greater for men without PTSD compared to those with PTSD, where the difference in prevalence of major depressive disorder was much greater between high and low social support groups for individuals without PTSD compared to those with PTSD (See Figure 5). A second significant interaction was found between PTSD and social support for predicting bipolar I disorder (AOR =0.24, 95% CI 0.06-0.99, p<.05). The influence of social support was far greater for men with PTSD compared to those without PTSD, where the difference in prevalence of bipolar I disorder was much greater between high and low social support groups for men with PTSD compared to those without PTSD (See Figure 6). The final significant interaction was found between PTSD and social support for predicting any mood disorder (AOR =2.98, 95% CI 1.34-6.66, p<.01). The influence of social support was greater for men with PTSD compared to those without PTSD, where the difference in prevalence of any mood disorder was greater between high and low social support groups for men with PTSD compared to those without PTSD (See Figure 7). My hypothesis that social support would significantly moderate the relationship between PTSD and comorbid mental disorders among men was supported. I found a significant moderating effect of social support for major depressive disorder, bipolar I disorder, and any mood disorder among men.

Hypothesis 2:Suicide Attempts

Table 9 displays hierarchical logistic regressions models of PTSD and social support with suicide attempts among men. After adjusting for sociodemographics, Axis I mental disorders and severity of PTSD there were no longer any significant associations between PTSD, social support and suicide attempts. My hypothesis that men would have

a significant moderating effect of social support on PTSD and suicide attempts was not supported because in the adjusted models no significant effects remained.

Hypothesis 3:Mental and Physical Health Functioning

Table 10 shows a significant interaction between PTSD and social support for predicting physical health functioning (adjusted Beta Coefficient and SE: 5.14(2.26), $p<.05$) among men. The influence of social support was greater for men with PTSD compared to those without PTSD, where the difference in physical health functioning was much greater between high and low social support groups for men with PTSD compared to those without PTSD (See Figure 8). Also, an additive effect was found for mental health functioning. Having PTSD significantly decreased mental health functioning (adjusted Beta Coefficient and SE: -2.19(0.68), $p<.01$) among men, while having high social support significantly increased mental health functioning (adjusted Beta Coefficient and SE: 4.59(0.62), $p<.001$) among men. My hypothesis that social support would significantly moderate the relationship between PTSD and mental and physical health functioning among men was partially supported. I found a significant moderating effect of social support for physical health functioning among men, but an additive effect of social support and PTSD for mental health functioning.

DISCUSSION

There were five novel findings that emerged in my study. First, in the overall sample there was an additive effect of PTSD and social support for anxiety disorders, where having PTSD increased the likelihood of an anxiety disorder and having high social support decreased the likelihood of an anxiety disorder. In addition, the overall sample had an interaction between PTSD and social support for mood disorders, where

the influence of social support was greater among those with PTSD compared to those without PTSD. Second, in the overall sample, and among men, having higher social support was associated with increased odds of an alcohol use disorder. Third, in both men and women, and among the entire sample, there was an additive effect of PTSD and social support for mental health functioning. Having high levels of social support was associated with increased mental health functioning, while having PTSD was associated with decreased mental health functioning. Fourth, among women an additive effect was found for PTSD and social support for predicting mood disorders. Having high levels of social support was associated with a decreased likelihood of a mood disorder, while having PTSD was associated with an increased likelihood of a mood disorder. Finally, my findings suggest that among men there is an interactive effect of PTSD and social support for mood disorders, where the influence of social support is greater among those with PTSD compared to those without PTSD. Taken together, these findings suggest that social support and PTSD have differential effects for men and women when it comes to mood disorders.

The finding that, in the overall sample, there was an additive effect of PTSD and social support for anxiety disorders is supported by a number of previous studies that have found an association with PTSD and comorbid anxiety disorders (Seedat & Stein, 2001; Breslau, 2002; Kessler, 2000). In addition, the findings are supported by research that high social support is associated with decreased odds of an anxiety disorder (Moak & Agrawal, 2009). My study extends previous research by examining the influence of both PTSD and social support on anxiety disorders in the same study and demonstrating that

both effects remain even after accounting for other Axis I disorders, sociodemographic factors, and severity of PTSD.

This is the first study to demonstrate that there is an interaction between PTSD and social support for mood disorders, where higher levels of social support have a greater influence for individuals with PTSD compared to those without PTSD. These findings could be considered to be consistent with "the stress buffering model." The stress buffering model states that the availability of social support protects an individual against the pathogenic effects of high levels of life stress (Cohen & Hoberman, 1983). My findings maybe consistent with this model because PTSD can be thought of as a high level of life stress and not having PTSD can be classified as having a low level of life stress. The validity of this low level of life stress group is increased further by adjusting for other Axis I disorders that could also increase life stress. I found that the high level of life stress group (i.e. PTSD group) had a larger difference between high and low social support for the association with mood disorders than the low level of life stress group (i.e., no PTSD group). I could not directly test "the stress buffering model" or the "erosion model" due to my cross-sectional design; therefore, I cannot conclude that my findings support "the stress buffering model." A temporal measure of social support and PTSD is needed to test either model, but my findings justify further exploration with a longitudinal design.

Also found among the overall sample and among both men and women was an additive effect of PTSD and social support for mental health functioning. The association between high social support and increased mental health functioning is supported by a study where social support from colleagues and supervisors at work was associated with

improved mental health (Vaananen et al., 2005). My findings are also supported by studies that have found that PTSD is a significant predictor of subjective ratings of poor health functioning (Asmundson, Stein, & McCreary, 2002; Schnurr & Spiro, 1999; Frayne, Seaver, Loveland et al., 2004). Furthermore, Zayfert et al. (2002) found that PTSD and major depressive disorder were equally impairing to overall mental health functioning, and both were significantly worse than panic disorder and generalized anxiety disorder. However, these studies did not examine the collective influence of PTSD and social support.

The overall sample, as well as among men, was found to have increased odds of an alcohol use disorder with high social support versus low social support. This finding may seem counterintuitive, but there is support for this finding in the addiction literature. Cooper et al. (1992) found that there is substantial overlap in drinking motives. People who use alcohol as a way of coping with negative emotions also use alcohol to enhance emotional experience and to increase affiliation. Thus, people with an alcohol use disorder may also have high levels of social support because they use alcohol for social motives. Also, individuals form social ties with those who have drinking habits similar to their own (Bullers, Cooper, & Russell, 2001). It is also possible that some of the individuals with an alcohol use disorder are also in treatment for their addiction. Best practices for treatment of alcohol use disorders include behavioural therapies, such as: behavioural relapse prevention programs, community reinforcement, marital behavioural therapy, social skills training, and stress management interventions (Health Canada, 1999). However, many therapists also encourage their clients to attend Alcoholics Anonymous meetings (Health Canada, 1999) and Alcoholics Anonymous has long been

considered the most widely sought form of help for alcohol disorders in the United States (McCrady & Miller, 1993). In Alcoholics Anonymous there is a strong social component and individuals rely on the support of the group to achieve and maintain sobriety (Humphreys, Kaskutas, & Weisner, 1998). Due to the popularity of Alcoholics Anonymous and its strong social support component it is possible that part of the association of alcohol use disorders with high social support can be explained by involvement in Alcoholics Anonymous.

In contrast to men, social support was not associated with increased odds of an alcohol use disorder among women. There are two potential reasons for this. One, women have larger social networks than men (Mclaughlin, Vagenas, Pachana, et al., 2010); therefore, it may be that women both with and without alcohol use disorders have high levels of social support and this is why no significant effect of social support was found. Two, heavy drinking among women is viewed as less socially acceptable than among men. In fact, more disapproval for female intoxication is expressed by both men and women (Gomberg, 1993). Klein (1994) found that college women had a decreased tolerance of the misuse of alcohol with advancing year in school, while men were more accepting of alcohol abuse than women at all levels of their college education. It may be that women with an alcohol use disorder receive lower levels of social support due to the erosion of their social network because of friends and family members rejection of their alcohol use.

Finally, there was an interaction or additive effect for mood disorders depending on gender. For women, there was an additive effect of PTSD and social support for mood disorders. In contrast, for men there was an interactive effect between PTSD and social

support for mood disorders. Women may have experienced an additive effect because they tend to have larger social networks than men (Mclaughlin, Vagenas, Pachana, et al., 2010; Amato, 2000). It may be that social support is important for women regardless of the level of stress in their lives and that women both with and without PTSD derive benefits from social support. On the contrary, men perhaps do not require high levels of social support when they are not under stress, but when they do encounter stress, such as posttraumatic stress, social support becomes important to protect against further psychopathology, like developing a comorbid mood disorder. Also, although men and women do not differ on average in the amount of social support they provide for their partners, women provide better support when their husbands experience greater stress while men display both support and negativity towards their wives when they experience greater stress (Neff & Karney, 2005). It may be that the increased negativity a woman experiences from her partner when she has PTSD detracts from the protective benefits of social support which is why the interactive effects for mood disorders are not observed for women.

I. Limitations

The present findings should be interpreted within the context of certain limitations. The first limitation was that the NESARC data are cross-sectional, therefore, I was unable to make causal inferences about an increase in social support causing the decreased chance of developing comorbid mental disorders. Future research can address this limitation by using a longitudinal design. Furthermore, although the stress buffering and erosion models provided the theoretical basis for the examination of the influence of social support on the relationship between PTSD and comorbid psychopathology,

suicidal behaviour and mental and physical health functioning, neither model could be directly tested. My thesis study examined these variables cross-sectionally and these models can only be tested using a longitudinal design. Unfortunately because of this I am unable to comment whether my findings supported either model. A second limitation of my study is that all measures were self-report measures and were thus subject to the limitations of self-report measures. There are certain weaknesses observed with self-report measures such as: social desirability bias leading to over-or underreporting (Palmer, Graham, Taylor et al., 2002), random recall error (Palmer et al., 2002), lack of insight influencing reporting (Atkinson, Zibin, & Chuang, 1997), misinterpretation of questions (Williamson, 2007), self-report measures being based on respondent's perception of reality (Williamson, 2007), and inaccurate reports of one's own cognitive processes (Nisbett & Wilson, 1977).

Social desirability biases can affect the results of self-report measures by respondents editing their responses to questions instead of answering truthfully. Individuals are usually motivated to edit their responses in setting where there are legal or other types of consequences to their answers (Williamson, 2007). My study was less affected by social desirability biases because respondents' answers were autonomous and responses were not analyzed on an individual level; therefore, respondents should not have been motivated to edit their answers. Recall bias can influence responses when self-report measures ask for experiences over a period of time rather than the current situation (Williamson, 2007). Random recall error is a limitation of any study using self-report where individuals are reporting symptoms and events from their past. My study did attempt to minimize random recall error by restricting all my variables to the past year.

Individuals' responses may be affected by lack of insight into the extent of their symptoms or the salience of events in their lives (Atkinson et al., 1997). This may have been a problem for certain variables in my study, like reporting symptoms that lead to diagnoses of mental disorders. It is possible as well, that respondents may misinterpret questions. My study was less affected by this because questions are posed by an interviewer which allows the opportunity for respondents to answer in their own words and ask for clarification when needed. In fact, interviews are found to produce more valid results than questionnaires for self-reports requiring respondents to answer questions about moods or feelings (Morrison & Hunt, 1996). Finally, the fact that self-report measures are based on respondent's perception of reality and that reports of one's own cognitive processes are inaccurate were less of a concern in my study. I was interested in the respondent's perception of social support rather than the objective level of social support. Also, my study did not measure respondents' cognitive processes, so the finding that they are inaccurate had limited impact on this study. If this study did look at cognitive processes, like asking respondents to rate the frequency they thought about social support in the past year, than errors would likely occur by either over or under reporting the frequency. The over or under reporting of frequency of cognitive processes occurs because a greater degree of self-awareness is required to report cognitive processes (Haeffel & Howard, 2010). A final limitation in this research is that the diagnoses of PTSD and the other mental disorders in the NESARC were determined by trained lay interviewers as opposed to clinicians. Trained lay interviewers' assessments may not be as accurate as those of practicing clinicians. However, research has shown

moderate to good concordance between the CIDI and SCID for most mental disorders (Haro et al., 2006).

II. Conclusion

The current study, together with previous research, provides preliminary support that gender differences exist with social support and PTSD and suggests that mood disorders are associated with additive or interactive effects depending on gender. Social support seems to have positive benefits for men and women; however, the extent of the benefit and degree of influence of social support may not be as straightforward as previously thought.

III. Implications

This study has implications for mental health care service. In understanding the differential influence of social support among men and women, we may improve the health care system by incorporating social support programs in a gender-sensitive way. For instance, men may require interventions to increase their social support during times of stress, such as when they are experiencing posttraumatic stress. Women, in contrast, may benefit from social support interventions regardless of their level of stress; however, they may not experience the degree of improvement that men do during times of stress.

There are a number of ways that social support can be incorporated into interventions for PTSD. One way is by encouraging clients to become members of support groups for individuals with similar problems. For example, it may be helpful for an individual who experienced childhood abuse to participate in a support group with members who also experienced childhood abuse. Another way to incorporate social support is by offering group treatment for PTSD. This could potentially increase social

support through building relationships with other people who have PTSD and are going through treatment as well. Alternatively, social support can be increased in an individual's social network through members of an individual's family or significant other attending therapy with the individual with PTSD. Family or couples therapy for PTSD could help increase social support by family members and partners working together to help the person with PTSD to improve their symptoms. Finally, the importance of interpersonal relationships can be the focus of PTSD therapy even if it is individual psychotherapy. In interpersonal psychotherapy (IPT) part of the focus in therapy can be increasing social support through improving the relationships in an individual with PTSD's social network.

Social support can also be incorporated through policy. This could be accomplished through policy that encourages health care providers to promote social support as a potential method to reduce comorbidity. Also, public mental health campaigns in the general population could be used to promote the benefits of social support for improving mental health functioning. Social support is associated with reduced odds of mood disorders in a general sample and among men with PTSD; therefore, implementing strategies in interventions or policy to increase social support could potentially reduce comorbid mood disorders. This reduction in comorbidity could potentially help alleviate the strain of more complex conditions on individuals with PTSD and the overall health care system.

REFERENCES

Afifi, T.O., Cox, B.J., Martens, P.J., Sareen, J., & Enns, M.W. (2010). Demographic and social variables associated with problem gambling among men and women in Canada. *Psychiatry Research*, 178, 395-400.

Ahern, J., Galea, S., Fernandez, W.G., Koci, B., Waldman, R., & Vlahov, D. (2004). Gender, social support, and posttraumatic stress in postwar Kosovo. *The Journal of Nervous and Mental Disease*, 192, 762-770.

Amato, P. (2000). The consequences of divorce for adults and children. *Journal of Marriage and the Family*, 62, 1269-1287.

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders: DSM-III* (3rd ed.). Washington, DC: APA.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders: DSM-IV* (4th ed.). Washington, DC: APA.

Andrews, B., Brewin, C.R., & Rose, S. (2003). Gender, social support, and PTSD in victims of violent crime. *Journal of Traumatic Stress*, 16, 421-427.

Asmundson, G.J.G., Stein, M.B., & McCreary, D.R. (2002). Posttraumatic stress disorder symptoms influence health status of deployed peacekeepers and nonemployed military personnel. *Journal of Nervous and Mental Diseases*, 190, 807-815.

Atkinson, M., Zibin, S., & Chuang, H. (1997). Characterizing quality of life among patients with chronic mental illness : A critical examination of the self-report methodology. *American Journal of Psychiatry*, 154, 99-105.

Beck, A. T. (2005). The current state of cognitive therapy. *Archives of General Psychiatry*, 62, 953-959.

Bender, R., & Lange, S. (2001). Adjusting for multiple testing-when and how? *Journal of Clinical Epidemiology*, 54, 343-349.

Bijttebier, P., & Vertommen, H. (1999). Coping strategies in relation to personality disorders. *Personality and Individual Differences*, 26, 847-856.

Bollinger, A.R., Riggs, D.S., Blake, D.D., & Ruzek, J.I. (2000). Prevalence of personality disorders among combat veterans with posttraumatic stress disorder. *Journal of Traumatic Stress*, 13, 255-270.

Bolton, J.M., Belik, S.-L., Enns, M.W., Cox, B.J., & Sareen, J. (2008). Exploring the correlates of suicide attempts among individuals with major depressive disorder: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, 69, 1139-1149.

Bolton, J.M., & Robinson, J. (2010). Population-attributable fraction of Axis I and Axis II mental disorders for suicide attempts: Findings from a representative sample of the adult, noninstitutionalized US population. *American Journal of Public Health*, 100, 2473-2480.

Boscarino, J.A. (1995). Post-traumatic stress and associated disorders among Vietnam veterans: The significance of combat exposure and social support. *Journal of Traumatic Stress*, 8, 317-336.

Breslau, N. (2001). Outcomes of PTSD. *Journal of Clinical Psychiatry*, 62, 55-59.

Breslau, N. (2002). Epidemiologic studies of trauma, posttraumatic stress disorder, and other psychiatric disorders. *Canadian Journal of Psychiatry*, 47, 923-929.

Brewin, C.R., Andrews, B., & Valentine, J.D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*, 748-766.

Bruce, S.E., Weisberg, R.B., Dolan, R.T., et al. (2001). Trauma and posttraumatic stress disorder in primary care patients. *Primary Care Companion Journal of Clinical Psychiatry*, 3, 211-217.

Brummett, B.H., Barefoot, J.C., Siegler, I.C., & Steffens, D.C. (2000). Relation of subjective and received social support to clinical and self-report assessments of depressive symptoms in an elderly population. *Journal of Affective Disorders*, 61, 41-50.

Bullers, S., Cooper, M.L., & Russell, M. (2001). Social network drinking and adult alcohol involvement a longitudinal exploration of the direction of influence. *Addictive Behaviors*, 26, 181-199.

Chartrand, H.K, Sareen, J., Toews, M., & Bolton, J.M. (2012). Suicide attempts versus non-suicidal self-injury among individuals with anxiety disorders in a nationally representative sample. *Depression and Anxiety*, 29, 172-179.

Chartrand, H.K., Robinson, J., & Bolton, J.M. (In press). A Longitudinal Population-Based Study Exploring Treatment Utilization and Suicidal Ideation and Behavior in Major Depressive Disorder. *Journal of Affective Disorders.*

Charuvastra, A., & Cloitre, M. (2008). Social Bonds and Posttraumatic Stress Disorder. *Annual Review of Psychology, 59*, 301-328.

Chioqueta, A.P., & Stiles, T.C. (2007). The relationship between psychological buffers, hopelessness, and suicidal ideation: Identification of protective factors. *Crisis*, 28, 67-73.

Choi, N.G., & Ha, J-H. (2011). Relationship between spouse/partner support and depressive symptoms in older adults: Gender difference. *Aging & Mental Health*, 15, 307-317.

Canadian Institutes of Health Research (CIHR) (2012, July). Gender, sex and health research guide: A tool for CIHR applicants. *Canadian Institutes of Health Research*, Retrieved from http://www.cihr-irsc.gc.ca/e/32019.html.

Clapp, J.D., & Beck, J.G. (2009). Understanding the relationship between PTSD and social support: the role of negative network orientation. *Behaviour Research and Therapy*, *47*,231-244.

Clark, L.A. (2007). Assessment and diagnosis of personality disorder: Perennial issues and an emerging reconceptualization. *Annual Review of Psychology*, 58, 227-257.

Cohen, S., & Hoberman, H.M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Social Psychology*, 13, 99-125.

Cohen, S., & Wills, T.A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98, 310-357.

Cohen, L.H., Towbes, L.C., & Flocco, R. (1988). Effects of induced mood on self-reported life events and perceived and received social support. *Journal of Personality and Social Psychology*, 55, 669-674.

Cole, D.A., Howard, G.S., & Maxwell, S.E. (1981). The effects of mono versus multiple operationalization in construct validation efforts. *Journal of Consulting and Clinical Psychology*, 49, 395-405.

Cole, D.A., Lazarick, D.M., & Howard, G.S. (1987). Construct validity and the relation between depression and social skill. *Journal of Counselling Psychology*, 34, 315-321.

Cooper, M.L., Russell, M., Skinner, J.B., & Windle, M. (1992). Development and validation of a three-dimensional measure of drinking motives. *Psychological Assessment*, 4, 123-132.

Cramer, E.M., & Appelbaum, M.I. (1980). Nonorthogonal analysis of variance – once again. *Psychological Bulletin*, 87, 51-57.

Dalgard, O.S., Bjork, S., & Tambs, K. (1995). Social support, negative life events and mental health. *British Journal of Psychiatry*, 166, 29-34.

Declercq, F., & Palmans, V. (2006). Two subjective factors as moderators between critical incidents and the occurrence of post traumatic stress disorders: 'Adult attachment' and'perception of social support'. *Psychology and Psychotherapy*, 79, 323-337.

DeVries, A.C., Craft, T.K.S., Glasper, E.R., Neigh, G.N., & Alexander, J.K. (2007). 2006 Curt P. Richter award winner Social influences on stress responses and health. *Psychoneuroendocrinology*, 32, 587-603.

Dirkzwager, A.J.E., Bramsen, I., & van der Ploeg, H.M. (2003). Social support, coping, life events, and posttraumatic stress symptoms among former peacekeepers: A prospective study. *Personality and Individual Differences*, 34, 1545-1559.

Dunn, N.J., Yanasak E., Schillaci, J., et al. (2004). Personality disorders in veterans with posttraumatic stress disorder and depression. *Journal of Traumatic Stress*, 17, 75-82.

Finney, J.W., Mitchell, R.E., Cronkite, R.C., & Moos, R. H. (1984). Methodological issues in estimating main and interactive effects: Examples from coping/social support and stress field. *Journal of Health and Social Behavior*, 25, 85-98.

Frasure-Smith, N., Lesperance, F., Gravel, G., et al. (2000). Social support, depression, and mortality during the first year after myocardial infarction. *Circulation*, 101, 1919-1924.

Fontana, A., Rosenheck, R., & Horvath, T. (1997). Social support and psychopathology in the War Zone. *Journal of Nervous and Mental Disease*, 185, 675-681.

Frayne, S.M., Seaver, M.R., Loveland, A. et al. (2004). Burden of medical illness in women with depression and posttraumatic stress disorder. *Archives of Internal Medicine*, 164, 1306-1312.

George, L.K., Blazer, D.G., Hughes, D.C., & Fowler, N. (1989). Social support and the outcome of major depression. *British Journal of Psychiatry*, 154, 478-485.

Glass, N., Perrin, N., Campbell, J.C., & Soeken, K. (2007). The protective role of tangible support on post-traumatic stress disorder symptoms in urban women survivors of violence. *Research in Nursing and Health*, 30, 558-568.

Gomberg, E.L. (1993). Women and alcohol: Use and abuse. *Journal of Nervous and Mental Disease*, 181, 211-219.

Gomez-Beneyto, M., Salazar-Fraile, J., Marti-Sanjuan, V., & Gonzalez-Lujan, L. (2006). Posttraumatic stress disorder in primary care with special reference to personality disorder comorbidity. *British Journal of General Practice*, 56, 349-354.

Gorman, J.M., & Docherty, J.P. (2010). A hypothesized role for dendritic remodelling in the etiology of mood and anxiety disorders. *Journal of Neuropsychiatry and Clinical Neuroscience*, 22, 256-264.

Grant, G.F., Dawson, D.A., & Hasin, D.S. (2001). The Alcohol Use Disorder and Associated Disabilites Interview Schedule-DSM-IV Version. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Grant, G.F., Kaplan, K., Shepard, J., & Moore, T. (2003). Source and accuracy statement: Wave 1 national epidemiologic survey on alcohol and related conditions (NESARC). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Grant, B.F., & Kaplan, K.D. (2005). Source and accuracy statement for the Wave 2 national epidemiologic survey on alcohol and related conditions (NESARC). Rockville, Maryland: National Institute on Alcohol Abuse and Alcoholism.

Greenberg, P.E., Sisitsky, T., Kessler, R.C. et al. (1999). The economic burden of anxiety disorders in the 1990s. *Journal of Clinical Psychiatry*, 60, 427-435.

Haden, S.C., Scarpa, A., Jones, R.T., & Ollendick, T.H. (2007). Posttraumatic stress disorder symptoms and injury: The moderating role of perceived social support and coping for young adults. *Personality and Individual Differences*, 42, 1187-1198.

Haeffel, G.J., & Howard, G.S. (2010). Self-report: Psychology's four-letter word. *The American Journal of Psychology*, 123, 181-188.

Haro, J.M., Arbabzadeh-Bouchez, S., Brugha, T.S., De Girolamo, G., Guyer, M.E., Jin, R….Kessler, R.C. (2006). Concordance of the Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) with a standardized clinical assessments in the WHO Word Mental Health Surveys. *International Journal of Methods in Psychiatric Research*, 15, 167-180.

Health Canada. (1999). Best practices: Substance abuse treatment and rehabilitation. Ottawa: Minister of Public Works and Government Services Canada. Retrieved from http://www.hc-sc.gc.ca/hc-ps/alt_formats/hecs-sesc/pdf/pubs/adp-apd/bp-mp-abuse-abus/bp_substance_abuse_treatment-eng.pdf.

Holeva, V., Tarrier, N., & Wells, A. (2001). Prevalence and predictors of acute stress disorder and PTSD following road traffic accidents: Thought control strategies and social support. *Behavior Therapy*, 32, 65-83.

Howard, G.S., Maxwell, S.E., Wiener, R.L., Boynton, K.S., & Rooney, W.M. (1980). Is a behavioural measure the best estimate of behavioural parameters? Perhaps not. *Applied Psychological Measurement*, 4, 293-311.

Humphreys, K., Kaskutas, L.A., & Weisner, C. (1998). The alcoholics anonymous affiliation scale: Development, reliability, and norms for diverse treated and untreated populations. Alcoholism: Clinical and Experimental Research, 22(5), 974-978

Hyman, S.M., Gold, S.N., & Cott, M.A. (2003). Forms of social support that moderate PTSD in childhood sexual abuse survivors. Journal of Family Violence, 18, 295-300.

Jackson, T. (2006). Relationships between perceived close social support and health practices within community samples of American women and men. *The Journal of Psychology*, 140, 229-246.

Jakipcak, M., Vannoy, S., Imel, Z., et al. (2010). Does PTSD moderate the relationship between social support and suicide risk in Iraq and Afghanistan war veterans seeking mental health treatment? *Depression and Anxiety*, 27, 1001-1005.

Jovanovic, A.A., Alekandric, B.V, Dunjic, D., & Todorovic, V.S. (2004). Family hardiness and social support as predictors of post-traumatic stress disorder. *Psychiatry, Psychology and Law*, 11, 263-268.

Kaniasty, K., & Norris, F.H. (1992). Social support and victims of crime: Matching event, support, and outcome. *American Journal of Community Psychology*, 20, 211-241.

Kaniasty, K., & Norris, F.H. (2008). Longitudinal linkages between perceived social support and posttraumatic stress symptoms: Sequential roles of social causation and social selection. *Journal of Traumatic Stress*, 21, 274-281.

Kaslow, N.J., Sherry, A., Bethea, K., et al. (2005). Social risk and protective factors for suicide attempts in low income African American men and women. *Suicide and Life Threatening Behavior*, 35, 400-412.

Keane, T.M., Marshall, A.D. & Taft, C.T. (2006). Posttraumatic stress disorder: Etiology, epidemiology, and treatment outcome. *Annual Review of Clinical Psychology*, 2, 161-197.

Kessler, R.C., Sonnega, A., Bromet, E., et al. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 52, 1048-1060.

Kessler, R.C. (2000). Posttraumatic stress disorder: The burden to the individual and to society. *Journal of Clinical Psyciatry*, 61, 4-12.

Kessler, R.C., Delmer, O., Frank, R.G., et al. (2005). Prevalence and treatment of mental disorders, 1990 to 2003. *New England Journal of Medicine*, 352, 2515-2523.

King, D.W., Taft, B., King, L.A., et al. (2006). Directionality of the association between social support and posttraumatic stress disorder: A longitudinal investigation. *Journal of Applied Social Psychology*, 36, 2980-2992.

Klein, H. (1994). Changes in college students' use and abuse of alcohol, and in their attitudes towards drinking over the course of their college years. *Journal of Youth and Adolescence*, 23, 251-269.

Laffaye, B., Cavella, S., Drescher, K., & Rosen, C. (2008). Relationships among PTSD symptoms, social support, and support source in veterans with chronic PTSD. *Journal of Traumatic Stress*, 21, 394-401.

Lett, H.S., Blumenthal, J.A., Babyak, M.A., et al. (2009).Dimensions of social support and depression in patients at increased psychosocial risk recovering from myocardial infarction. *International Journal of Behavioral Medicine*, 16, 248-258.

Malta, L.S., Blanchard, E.B, Taylor, A.E., Hickling, E.J., & Freidenberg, B.M. (2002). Personality disorders and posttraumatic stress disorder in motor vehicle accident survivors. *Journal of Nervous and Mental Disease*, 190, 767-774.

McClelland, G.H., & Judd, C.M. (1993). Statistical difficulties of detecting interactions an moderator effects. *Psychological Bulletin*, 114, 376-390.

McCrady, B.S., & Miller, W.R. (Eds.) (1993). Alcoholics Anonymouns: Opportunities and alternatives. New Brunswick, NJ, Rutgers Center of Alcohol Studies.

McLaughlin, D., Vagenas, D., Pachana, N.A., Begum, N., & Dobson, A. (2010). Gender differences in social network size and satisfaction in adults in their 70s. *Journal of Health Psychology*, 15, 671-679.

Meewisse, M.-L., Reitsma, J.B., De Vries, G.-J., Gersons, B.P.R., & Olff, M. (2007). Cortisol and post-traumatic stress disorder in adults: Systematic review and meta-analysis. *British Journal of Psyhchiatry*, 191, 387-392.

Miller, G.E., Chen, E., & Zhou, E.S. (2007). If it goes up, must it come down ? Chronic stress and hypothalamic-Pituitary-Adrenocortical Axis in Humans. *Psychological Bulletin*, 133, 25-45.

Mitchell, R.E., Cronkite, R.C., & Moos, R.H. (1983). Stress, coping and depression among married couples. *Journal of Abnormal Psychology*, 92, 433-448.

Moak, Z.B., & Agrawal, A. (2009). The association between perceived interpersonal social support and physical and mental health: results from the national epidemiological survey on alcohol and related conditions. *Journal of Public Health*, doi:10.1093/pubmed/fdp093.

Montross, L.P., Zisook, S., Kasckow, J. (2005). Suicide among patients with schizophrenia: a consideration of risk and protective factors. *Annals of Clinical Psychiatry*, 17, 173-182.

Morrison, A.T., & Hunt, H.T. (1996). Reals, roles and demand features: A critical look at interview versus questionnaire measures of subjective states. *Canadian Psychology*, 37, 112-129.

Neff, L.A., & Karney, B.R. (2005). Gender differences in social support: A question of skill or responsiveness? *Journal of Personality and Social Psychology*, 88, 79-90.

Nepon, J., Belik, S.L., Bolton J.M., & Sareen, J. (2010). The relationship between anxiety disorders and suicide attempts: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Depression and Anxiety*, 27, 791-798.

Nisbett, R. E., & Wilson, T.D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Reviews*, 84, 231-259.

Norris, F.H., & Kaniasty, K. (1996). Received and perceived social support in times of stress: a test of the social support deterioration deterrence model. *Journal of Personal Social Psychology,* 71, 498-511.

Olff, M., Langeland, W., Draijer, N., & Gersons, B.P.R. (2007). Gender differences in posttraumatic stress disorder. *Psychological Bulletin*, 133, 183-204.

Overall, J.E., Lee, D.M., & Hornick, C.W. (1981). Comparisons of two strategies for analyses of variance in nonorthogonal designs. *Psychological Bulletin*, 90, 367-375.

Ozer, E.J., Best, S.R., Lipsey, T.L., & Weiss, D.S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. *Psychological Bulletin, 129*, 52-73.

Pagura, J., Stein, M.B., Bolton, J.M., Cox, B.J., Grant, B., & Sareen, J. (2010). Comorbidity of borderline personality disorder and posttraumatic stress disorder in the U.S. population. *Journal of Psychiatric Research*, 44, 1190-1198.

Palmer, R.F., Graham, J.W., Taylor, B., & Tatterson, J. (2002). Construct validity in health behaviour research: Interpreting latent variable models involving self-report and objective measures. *Journal of Behavioral Medicine*, 25, 525-550.

Paykel, E.S. (1994). Life events, social support and depression. *Acta Psychiatrica Scandinavica*, 377, 50-58.

Pietrzak, R.H., Goldstein, R.B., Southwick, S.M., & Grant, B.F. (2011). Personality disorders associated with full and partial posttraumatic stress disorder in the U.S. population: Results from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Psychiatric Research*, 45, 678-686.

Pietrzak, R.H., Johnson, D.C., Goldstein, M.B., Malley, J.C., & Southwick, S.M. (2009). Psychological resilience and postdeployment social support protect against traumatic stress and depressive symptoms in soldiers returning form operations Enduring Freedom and Iraqi Freedom. *Depression and Anxiety*, 26, 745-751.

Pietrzak, R.H., Russo, A.R., Ling, Q., & Southwick, S.M. (2011). Suicidal ideation in treatment-seeking Veterans of Operations Enduring Freedom and Iraqi Freedom: The role of coping strategies, resilience and social support. *Journal of Psychiatric Research*, 45, 720-726.

Regehr, C., Hemsworth, D., & Hill, J. (2001). Individual predictors of posttraumatic distress: A structural equation model. *Canadian Journal of Psychiatry*, 46, 156-161.

Rose, B.M., Holmbeck, G.N., Coakley, R.M., & Franks, E.A. (2004). Mediator and moderator effects in developmental and behavioural pediatric research. *Developmental and Behavioral Pediatrics*, 25, 58-67.

Ruan, W.J., Goldstein, R.B., Chou, S.P. et al. (2008). The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): Reliability of new psychiatric diagnostic modules and risk factors in a general population sample. *Drug and Alcohol Dependence*, 92, 27-36.

Sareen, J., Cox, B.J., Clara, I., & Asmundson, G.J.G. (2005). The relationship between anxiety disorders and physical disorders in the U.S. national comorbidity survey. *Depression and Anxiety*, 21, 193-202.

Sareen, J., Cox, B.J, Stein, M.B., Afifi, T.O., Fleet, C., & Asmundson, G.J.G. (2007). Physical and Mental Comorbidity, Disability, and Suicide Behavior Associated With Posttraumatic Stress Disorder in a Large Community Sample. *Psychosomatic Medicine, 69*, 242-248.

Sareen, J., Henriksen, C.A., Bolton, S.-L., Afifi, T.O., Stein, M.B., & Asmundson, G.J. (2012). Adverse childhood experiences in relation to mood and anxiety disorders in a population-based sample of active military personnel. *Psychological Medicine*, Epub: doi:10.1017 /S003329171200102X.

Scarpa, A., Haden, S.C., & Hurley, J. (2006). Community violence victimization and symptoms of posttraumatic stress disorder. *Journal of Interpersonal Violence*, 21, 446-469.

Schaefer, C., Coyne, J.C., & Lazarus, R.S. (1981). Health related functions of social support. *Journal of Health and Social Behavior*, 4, 381-406.

Schnurr, P.P., & Spiro, A. (1999). Combat exposure, PTSD symptoms, and health behaviors as predictors of self-reported physical health in older veterans. *Journal of Nervous and Mental Disease*, 187, 353-359.

Schumm, J.A., Briggs-Phillips, M., & Hobfoll, S.E. (2006). Cumulative interpersonal traumas and social support as risk and resiliency factors in predicting PTSD and depression among inner-city women. *Journal of Traumatic Stress*, 19, 825-836.

Seedat, S., & Stein, M. B. (2001). Post-traumatic stress disorder: A review of recent findings. *Current Psychiatry Reports*, 3, 288-294.

Shea, M.T., Zlotnick, C., Dolan, R., et al. (2000). Personality disorders, history of trauma, and posttraumatic stress disorder in subjects with anxiety disorder. *Comprehensive Psychiatry*, 41, 315-325.

Slavin, L.A., & Compas, B.E. (1989). The problem of confounding social support and depressive symptoms: A brief report on a college sample. *American Journal of Community Psychology*, 17, 57-66.

Southwick, S.M., Yehuda, R., & Giller Jr, E.L. (1993). Personality disorders in treatment-seeking combat veterans with posttraumatic stress disorder. American Journal of Psychiatry, 150, 1020-1023.

Stansfeld, S.A., Rael, E.G.S., Head, J. et al. (1997). Social support and psychiatric sickness absence: a prospective study of British civil servants. *Psychological Medicine*, 27, 35-48.

Stein, M.B., Walker, J.R., Hazen, A.L., & Forde, D.R. (1997). Full and partial posttraumatic stress disorder: Findings from a community survey. *American Journal of Psychiatry*, 154, 1114-1119.

Stice, E., Ragan, J., & Randall, P. (2004). Prospective relations between social support and depression: Differential directions of effects for parent and peer support? *Journal of Abnormal Psychology*, 113, 155-159.

Tabachnick, B.G., & Fidel, L.S. (2007). Using Multivariate Statistics. Fifth Edition. Allyn and Bacon. Boston: MA.

Vaananen, A., Vahtera, J., Pantti, J., & Kivimaki, M. (2005). Sources of social support as determinatns of psychiatric morbidity after severe life events prospective cohort study of female employees. *Journal of Psychosomatic Research*, 58, 459-467.

Vranceanu, A-M., Gallo, L.C., & Bogart, L.M. (2009). Depressive symptoms and momentary affect: The role of social interaction variables. *Depression and Anxiety*, 26, 464-470.

Ware, J.E., Kosinski, M., & Killer, S.D. (1996). A 12-item Short-Form Health Survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care*, 34, 220-233.

Williamson, A. (2007). Using self-report measures in neurobehavioural toxicology: Can they be trusted? *Neuro Toxicology*, 28, 227-234.

Wright, A.G.C., Pincus, A.L., & Lenzenweger, M.F. (2011). Development of personality and the remission and onset of personality pathology. *Journal of Personality and Social Psychology*, 101, 1351-1358.l

Yen, S., Shea, M.T., Battle, C.L., et al. (2002). Traumatic exposure and posttraumatic stress disorder in borderline, schizotypal, avoidant, and obsessive-compulsive personality disorders: Findings form the Collaborative Longitudinal Personality Disorders Study. *Journal of Nervous and Mental Disease*, 190, 510-518.

Zayfert, C., Dums, A.R., Ferguson, R.J., & Hegel, M.T. (2002). Health functioning impairments associated with posttraumatic stress disorder, anxiety disorders, and depression. *Journal of Nervous and Mental Disease*, 190, 233-240.

Figure 1

Social Support as a Moderator of the Relationship between PTSD and Mental Disorders, Suicidal Behaviour, and Mental and Physical Health Functioning

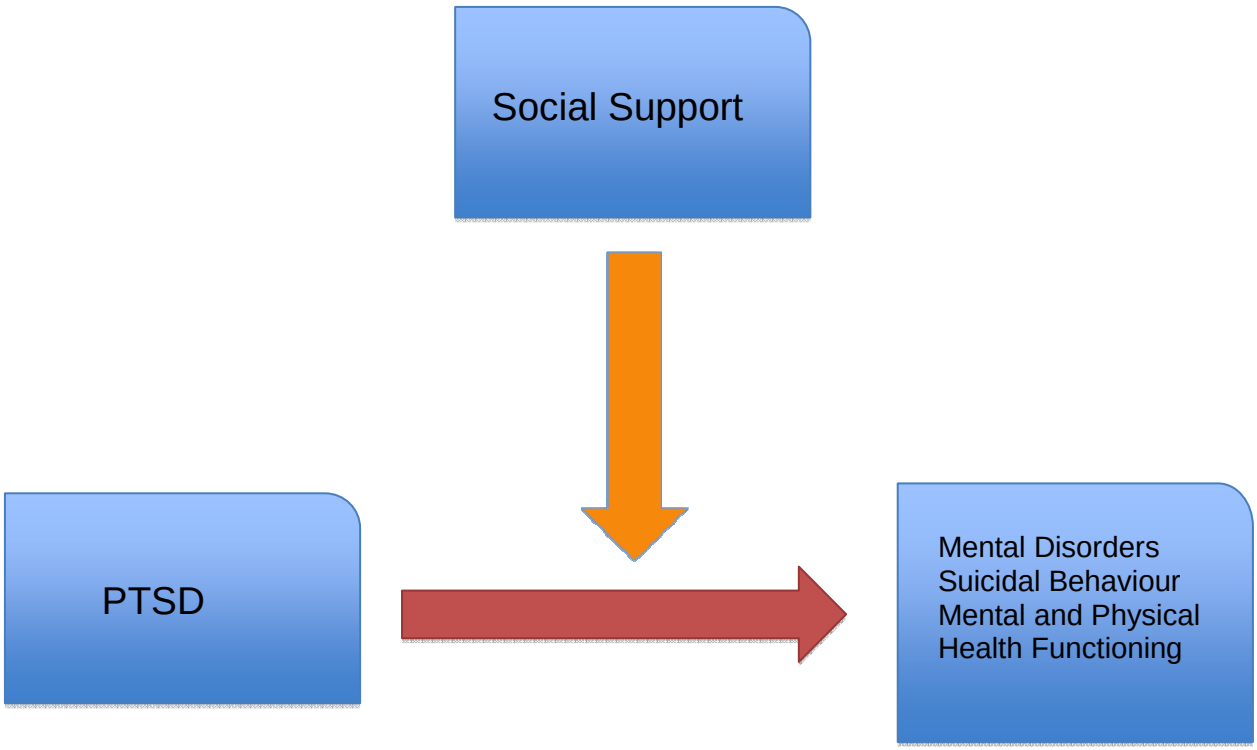

Figure 2

Prevalence of MDD as a function of Level of Social Support and PTSD

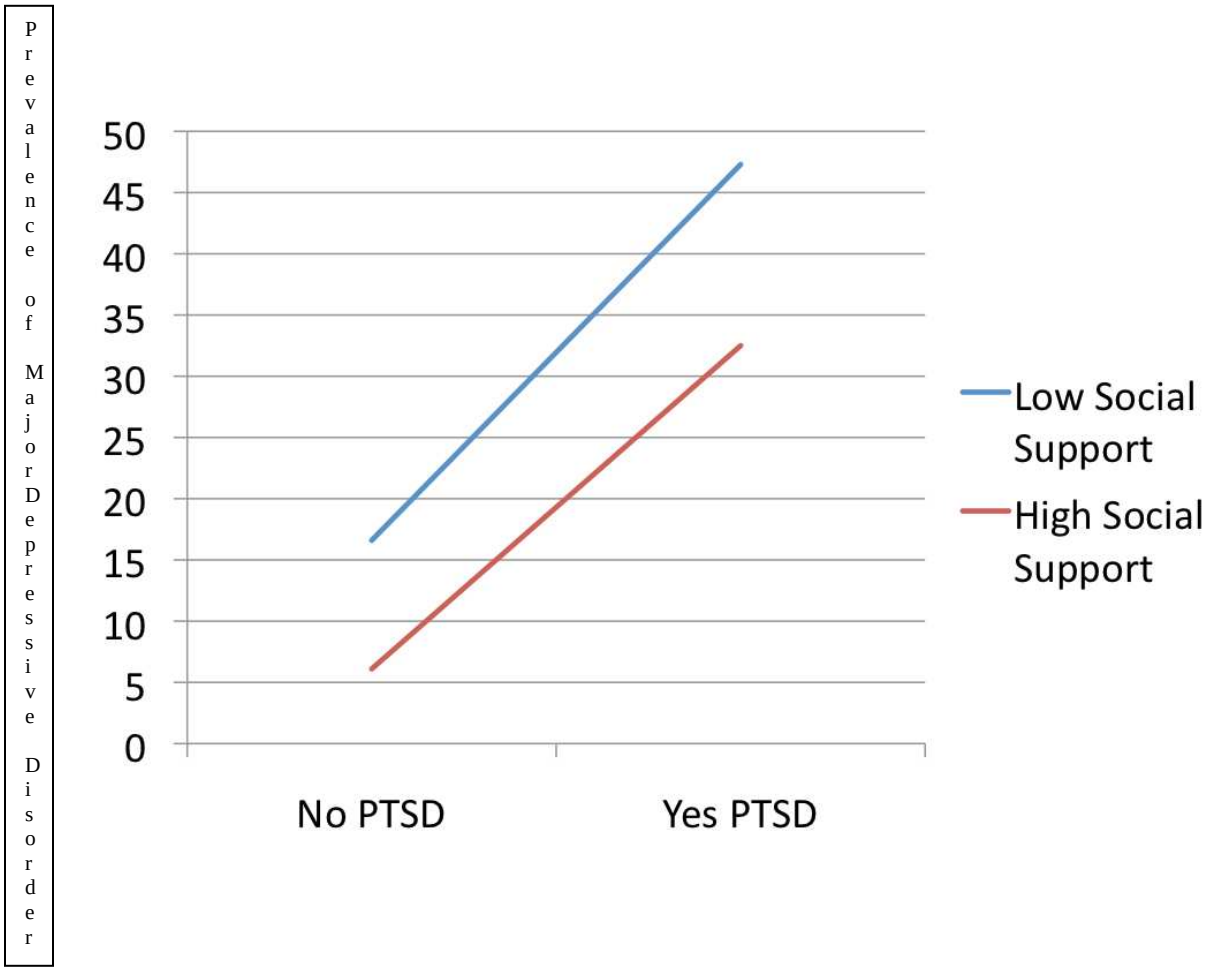

Figure 3

Prevalence of Any Mood Disorder as a Function of Level of Social Support and PTSD

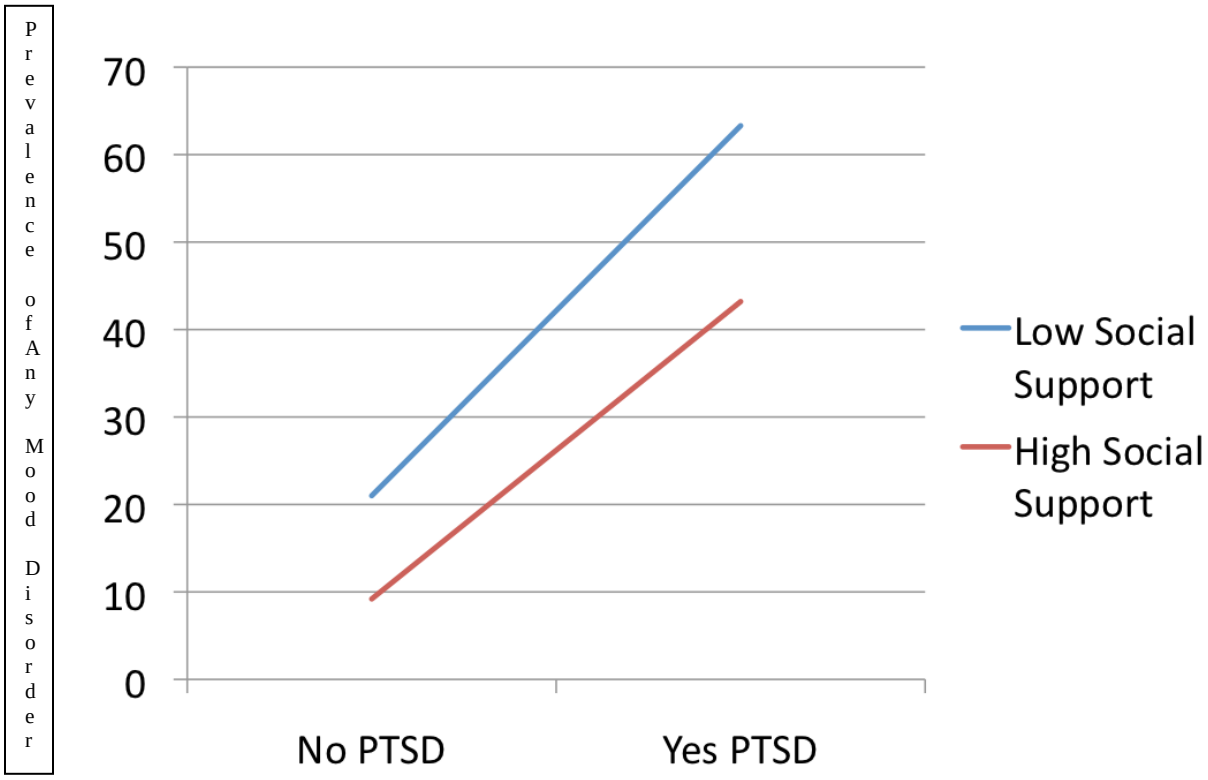

Figure 4

Among Women Prevalence of Panic Disorder as a Function of Level of Social Support and PTSD

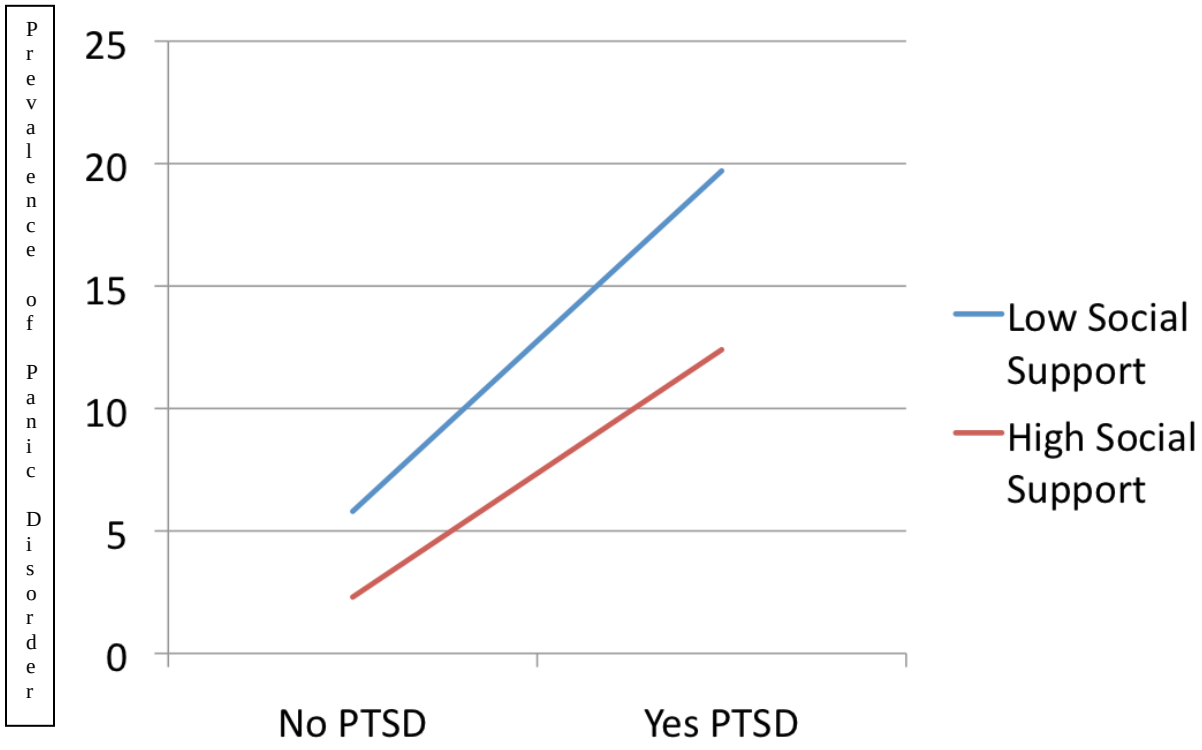

Figure 5

Among Men Prevalence of Major Depressive Disorder as a Function of Level of Social Support and PTSD

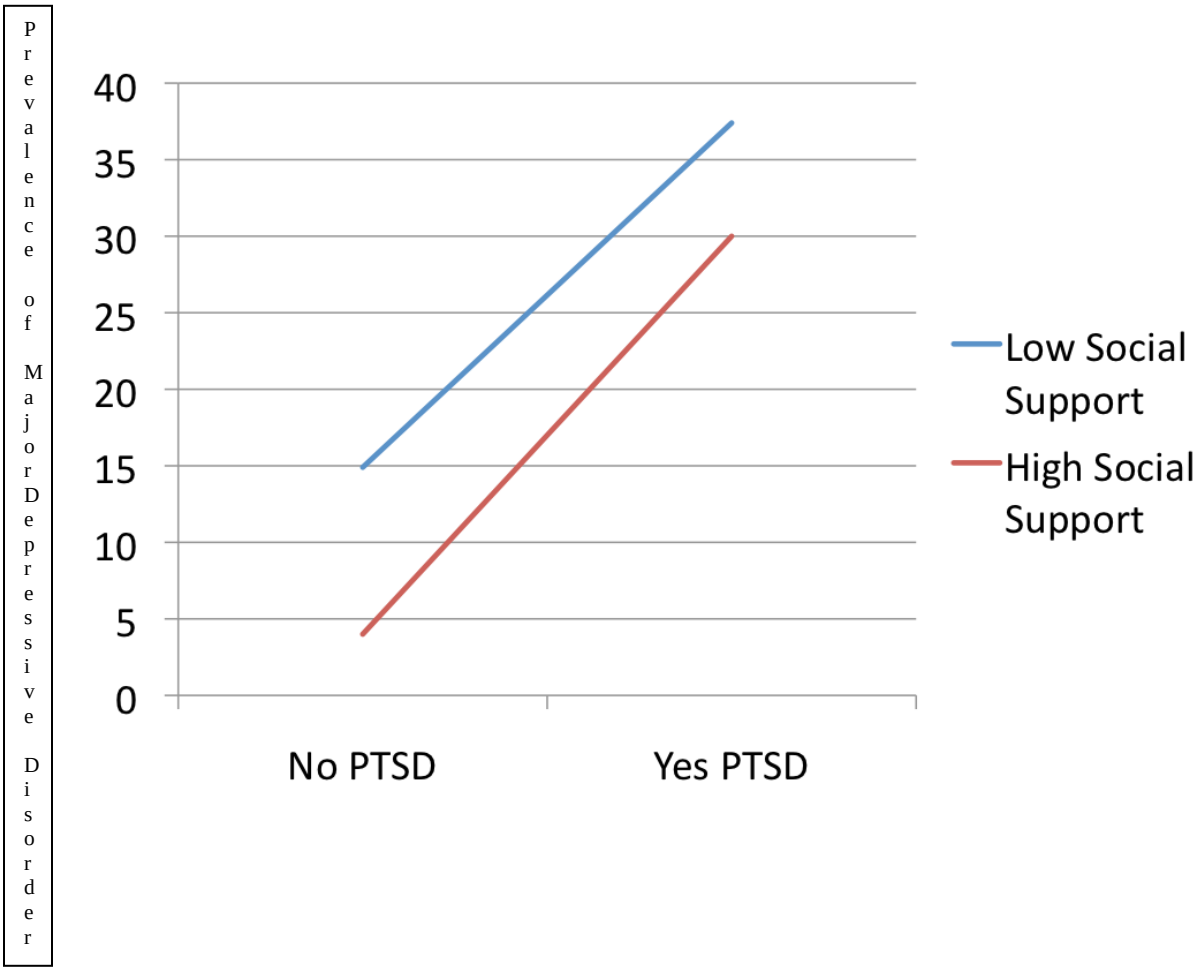

Figure 6

Among Men Prevalence of Bipolar I Disorder as a Function of Level of Social Support and PTSD

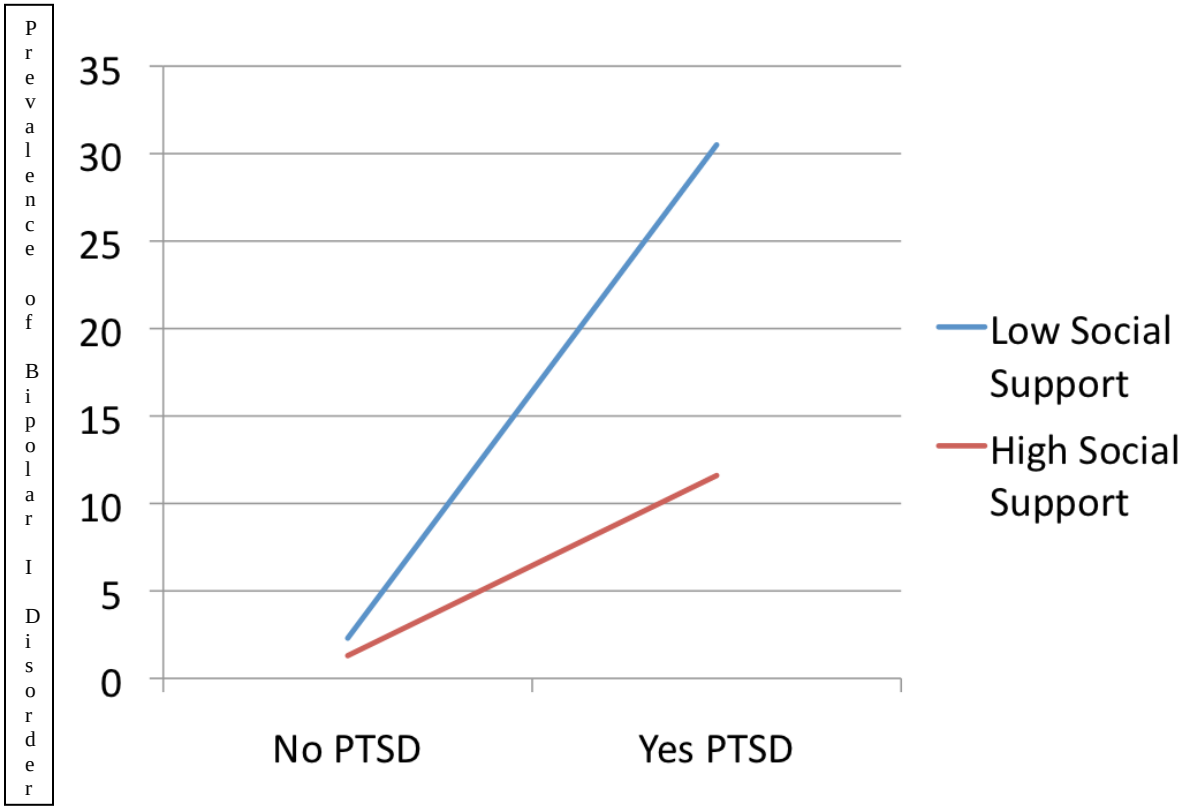

Figure 7

Among Men Prevalence of Any Mood Disorder as a Function of Level of Social Support and PTSD

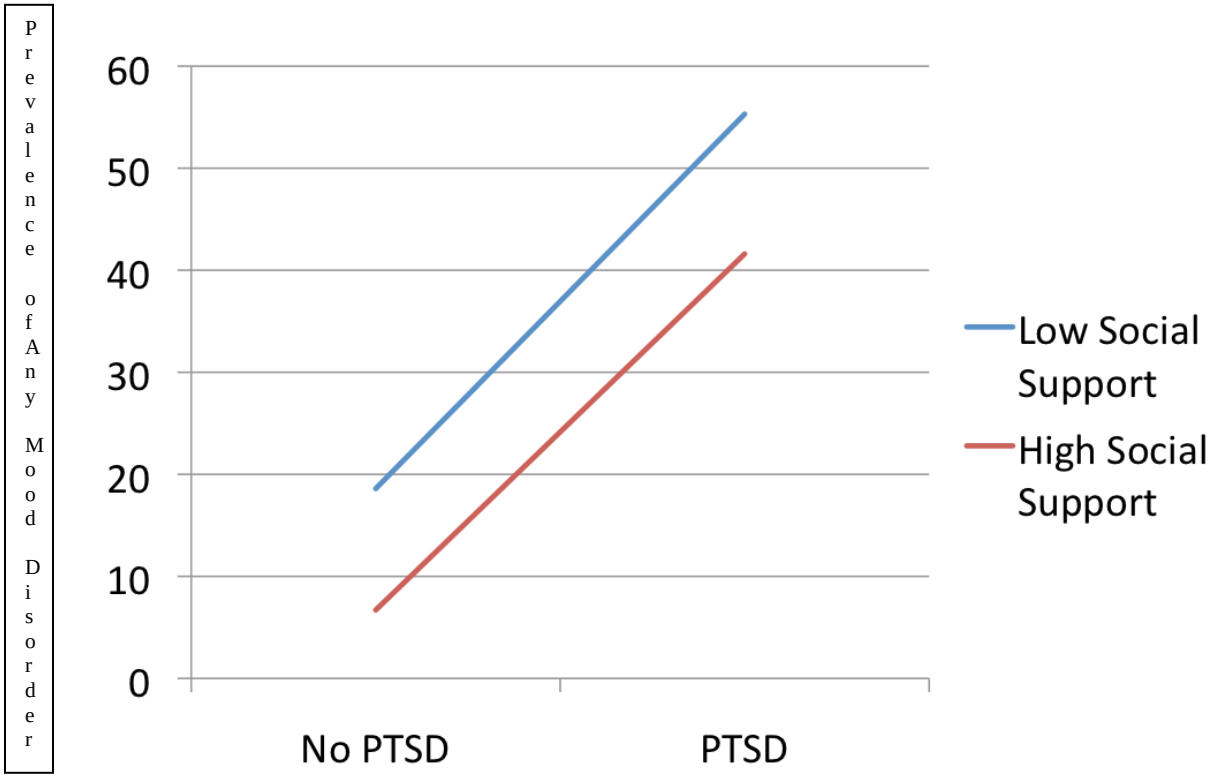

Figure 8

Prevalence of High Physical Health Functioning as a Function of Level of Social Support and PTSD

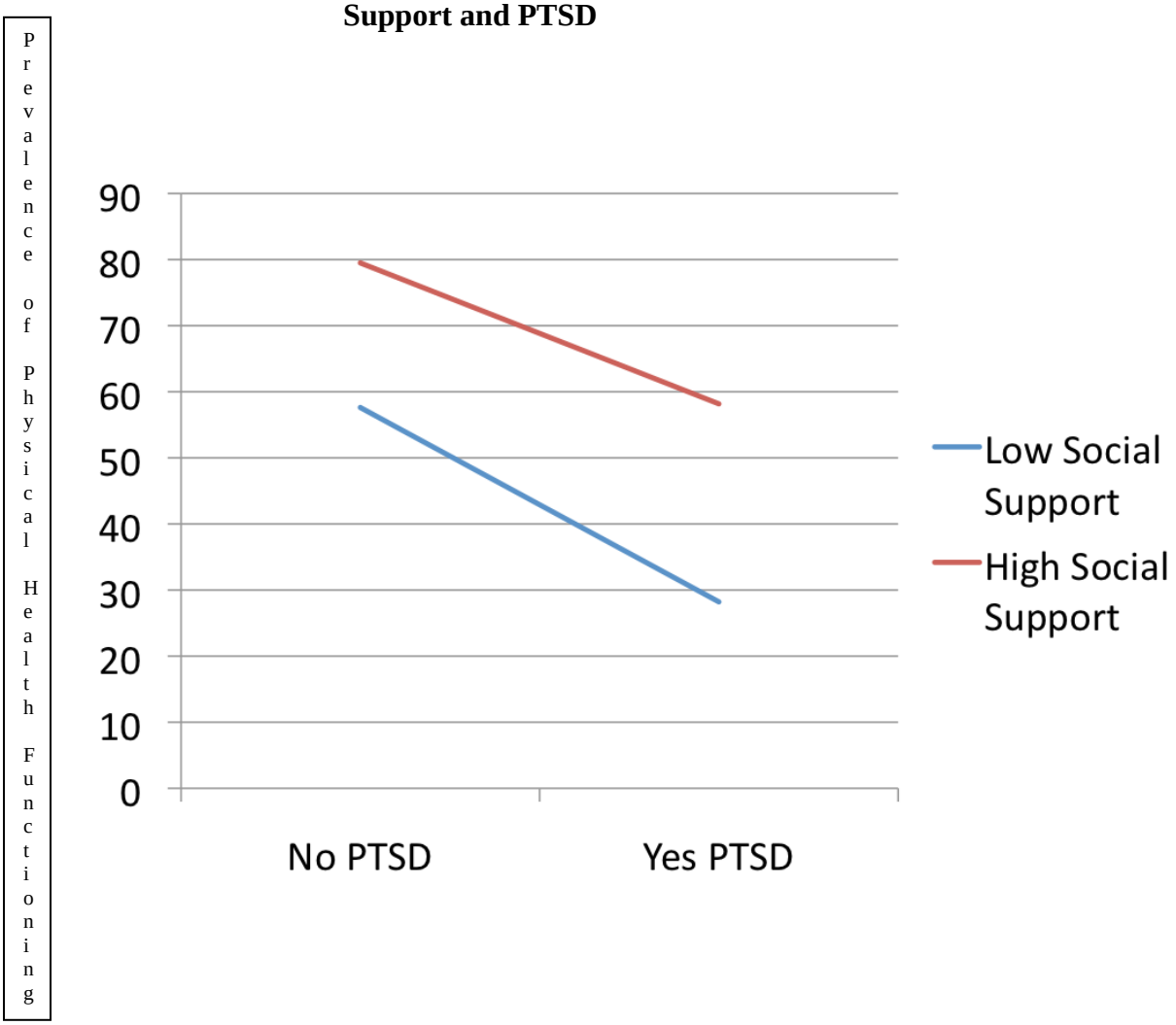

Table 1

Table 1: Prevalence of No Posttraumatic Stress Disorder, Posttraumatic Stress Disorder, Low Social Support and High Social Support among Mental Disorders and Suicide Attempts.

Variables	No PTSD	PTSD	χ^2	Low Social Support	High Social Support	χ^2
Mental Disorders						
Major Depressive Disorder	2165(6.5)	858(33.9)	153.60***	400(20.8)	2619(7.7)	72.93***
Dysthymia	299(0.8)	179(6.8)	73.99***	119(5.8)	359(1.0)	36.89***
Bipolar I Disorder	467(1.4)	277(11.2)	75.06***	118(6.0)	626(1.9)	26.27***
Bipolar II Disorder	388(1.2)	98(4.0)	28.79***	35(1.8)	451(1.3)	2.10
Any Mood Disorder	3229(9.7)	1139(45.1)	161.06***	502(26.7)	3859(11.3)	66.64***
Social Anxiety Disorder	631(1.9)	314(12.1)	88.99***	187(9.7)	757(2.2)	54.27***
Specific Phobia	2127(6.4)	631(23.5)	114.13***	250(12.8)	2506(7.3)	25.16***
Generalized Anxiety Disorder	866(2.7)	497(19.9)	116.94***	206(10.9)	1155(3.5)	56.63***
Panic Disorder	613(1.9)	337(13.0)	90.89***	130(6.4)	820(2.4)	25.28***
Any Anxiety Disorder	3479(10.5)	1082(42.3)	150.98***	453(23.7)	4104(12.0)	60.74***
Alcohol Use Disorder	2814(9.4)	328(14.3)	20.41***	143(7.6)	2993(9.8)	6.93*

Nicotine Dependence	3837(12.8)	675(29.2)	93.73***	344(20.5)	4167(13.6)	26.16***
Drug Use Disorder	616(2.1)	132(6.3)	31.63***	56(3.6)	691(2.3)	5.03*
Any Substance Use Disorder	6021(20.0)	884(38.0)	92.48***	437(25.4)	6460(21.0)	9.40**
Suicide Attempts	72(0.2)	48(2.1)	22.36***	31(1.4)	89(0.3)	12.83***

[1]Percentages are column percents. For example, among those with past-year posttraumatic stress disorder, 33.9% had past-year major depressive disorder.

Table 2

Table 2: Hierarchical Logistic Regression Models of Posttraumatic Stress Disorder and Social Support on Comorbid Mental Disorders.

Variables	OR	AOR-1	AOR-2
Mental Disorders			
Out come: Major Depressive Disorder			
Step 1			
PTSD	7.10(6.29-8.01)***	5.64(4.96-6.42)***	1.34(1.10-1.63)**
Social Support	0.36(0.30-0.43)***	0.39(0.32-0.47)***	0.52(0.42-0.64)***
Step 2			
PTSD X Social Support	1.65(1.10-2.47)*	1.93(1.27-2.94)**	2.96(1.60-5.45)***
Step 3			
Covariates			
Out come: Dysthymia			
Step 1			
PTSD	8.15(6.22-10.67)***	6.19(4.65-8.25)***	1.91(1.27-2.88)**
Social Support	0.20(0.15-0.27)***	0.27(0.20-0.36)***	0.41(0.31-0.56)***
Step 2			
PTSD X Social Support	1.28(0.73-2.25)	1.36(0.77-2.40)	1.17(0.61-2.25)
Step 3			
Covariates			
Out come: Bipolar I Disorder			
Step 1			
PTSD	8.26(6.71-10.18)***	6.57(5.26-8.19)***	1.18(0.88-1.60)
Social Support	0.38(0.29-0.50)***	0.42(0.32-0.56)***	0.64(0.49-0.85)**
Step 2			
	0.97(0.54-1.72)	1.12(0.62-2.04)	0.92(0.47-1.78)

PTSD X Social Support			
Step 3			
Covariates			
Out come: Bipolar II Disorder			
Step 1			
PTSD	3.49(2.65-4.59)***	2.96(2.19-3.99)***	0.60(0.41-0.88)*
Social Support	0.84(0.56-1.25)	0.91(0.61-1.36)	1.23(0.82-1.86)
Step 2			
	2.15(0.74-6.28)	2.54(0.85-7.59)	2.69(0.85-8.46)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Any Mood Disorder			
Step 1			
PTSD	7.39(6.60-8.28)***	6.06(5.37-6.83)***	1.42(1.19-1.70)***
Social Support	0.39(0.33-0.46)***	0.41(0.35-0.49)***	0.47(0.39-0.57)***
Step 2			
	1.15(0.82-1.62)	1.33(0.94-1.87)	1.67(1.12-2.49)*
PTSD X Social Support			
Step 3			
Covariates			
Out come: Social Anxiety Disorder			
Step 1			
PTSD	6.59(5.59-7.77)***	5.37(4.51-6.39)***	1.19(0.94-1.52)
Social Support	0.25(0.20-0.31)***	0.26(0.20-0.33)***	0.37(0.29-0.47)***
Step 2			
	1.01(0.62-1.63)	1.18(0.73-1.93)	1.11(0.65-1.87)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Specific Phobia			

Step 1			
PTSD	4.38(3.86-4.97)***	3.59(3.14-4.11)***	0.93(0.78-1.11)
Social Support	0.61(0.51-0.74)***	0.60(0.49-0.74)***	0.79(0.65-0.97)*
Step 2			
	0.64(0.41-1.00)	0.69(0.44-1.10)	0.73(0.45-1.19)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Generalized Anxiety Disorder			
Step 1			
PTSD	8.54(7.33-9.94)***	6.81(5.76-8.06)***	1.82(1.40-2.37)***
Social Support	0.36(0.28-0.45)***	0.38(0.29-0.49)***	0.58(0.44-0.76)***
Step 2			
	1.46(0.98-2.19)	1.57(1.04-2.39)*	1.49(0.93-2.40)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Panic Disorder			
Step 1			
PTSD	7.56(6.33-9.03)***	5.73(4.71-6.96)***	1.01(0.76-1.33)
Social Support	0.46(0.35-0.60)***	0.50(0.37-0.68)***	0.82(0.61-1.11)
Step 2			
	1.20(0.68-2.11)	1.40(0.77-2.55)	1.32(0.69-2.55)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Any Anxiety Disorder			
Step 1			
PTSD	6.07(5.44-6.76)***	5.01(4.45-5.63)***	1.20(1.02-1.41)*
Social Support	0.50(0.42-0.59)***	0.50(0.42-0.59)***	0.61(0.51-0.73)***
Step 2			
	0.78(0.53-1.14)	0.86(0.58-1.28)	0.89(0.59-1.35)

PTSD X Social Support			
Step 3			
Covariates			
Out come: Alcohol Use Disorder			
Step 1			
PTSD	1.64(1.39-1.94)***	1.87(1.57-2.23)***	0.97(0.77-1.23)
Social Support	1.38(1.10-1.73)**	1.22(0.96-1.55)	1.51(1.18-1.93)**
Step 2			
	1.02(0.59-1.79)	1.20(0.66-2.19)	1.28(0.70-2.35)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Nicotine Dependence			
Step 1			
PTSD	2.73(2.43-3.07)***	2.43(2.14-2.76)***	1.01(0.83-1.21)
Social Support	0.67(0.57-0.79)***	0.72(0.60-0.85)***	0.79(0.67-0.94)**
Step 2			
	0.87(0.60-1.25)	0.96(0.66-1.41)	1.04(0.71-1.54)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Drug Use Disorder			
Step 1			
PTSD	3.05(2.40-3.89)***	2.91(2.24-3.80)***	0.79(0.55-1.14)
Social Support	0.69(0.48-1.00)*	0.71(0.48-1.06)	0.91(0.61-1.37)
Step 2			
	1.12(0.56-2.26)	1.38(0.67-2.88)	1.48(0.70-3.13)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Any Substance Use Disorder			

Step 1			
PTSD	2.42(2.19-2.69)***	2.42(2.15-2.72)***	1.02(0.86-1.21)
Social Support	0.84(0.72-0.98)*	0.83(0.71-0.97)*	0.95(0.81-1.12)
Step 2			
	0.85(0.57-1.26)	0.97(0.64-1.47)	1.09(0.71-1.68)
PTSD X Social Support			
Step 3			
Covariates			

OR: Unadjusted
AOR-1: Adjusted for sociodemographics
AOR-2: Adjusted for sociodemographics, Axis I disorders, and PTSD severity
* $p < .05$
** $p < .01$
*** $p < .001$

Table 3

Table 3: Hierarchical Logistic Regression Models of Posttraumatic Stress Disorder and Social Support on Suicide Attempts.

Variables	OR	AOR-1	AOR-2
Suicide Attempts			
Out come: Suicide Attempts			
Step 1			
PTSD	8.73(5.34-14.28)***	5.92(3.28-10.71)***	0.86(0.41-1.80)
Social Support	0.28(0.16-0.49)***	0.36(0.20-0.67)**	0.54(0.29-0.98)*
Step 2			
PTSD X Social Support	1.90(0.65-5.57)	2.58(0.82-8.13)	2.39(0.72-7.89)
Step 3			
Covariates			

OR: Unadjusted
AOR-1: Adjusted for sociodemographics
AOR-2: Adjusted for sociodemographics, Axis I disorders, and PTSD severity
* $p < .05$
** $p < .01$
*** $p < .001$

Table 4

Table 4: Hierarchical Logistic Regression Models of Posttraumatic Stress Disorder and Social Support on Mental and Physical Health Functioning.

Variables	Beta Coefficient (SE)	Beta Coefficient (SE)-1	Beta Coefficient (SE)-2
Mental and Physical Health Functioning			
Out come: Physical Health Functioning			
Step 1			
PTSD	-3.87(0.31)***	-3.61(0.31)***	-0.70(0.37)
Social Support	5.97(0.42)***	3.11(0.41)***	2.91(0.40)***
Step 2			
PTSD X Social Support	0.16(1.21)	1.10(1.09)	0.71(1.06)
Step 3			
Covariates			
Out come: Mental Health Functioning			
Step 1			
PTSD	-8.04(0.32)***	-7.12(0.32)***	-2.13(0.39)***
Social Support	7.49(0.39)***	6.59(0.38)***	5.37(0.38)***
Step 2			
PTSD X Social Support	2.63(1.27)*	2.23(1.22)	1.12(1.26)
Step 3			
Covariates			

OR: Unadjusted
Beta Coefficient (SE)-1: Adjusted for sociodemographics
Beta Coefficient (SE)-2: Adjusted for sociodemographics, Axis I disorders, and PTSD severity
* p < .05
** p < .01
*** p < .001

Table 5

Table 5: Hierarchical Logistic Regression Models of Posttraumatic Stress Disorder and Social Support on Comorbid Mental Disorders Among Women.

Variables	OR	AOR-1	AOR-2
Mental Disorders Among Women			
Out come: Major Depressive Disorder			
Step 1			
PTSD	5.64(4.94-6.43)***	4.93(4.29-5.67)***	1.34(1.09-1.65)**
Social Support	0.42(0.34-0.52)***	0.43(0.34-0.54)***	0.59(0.47-0.76)***
Step 2			
PTSD X Social Support	1.23(0.78-1.92)	1.43(0.91-2.27)	1.79(0.99-3.25)
Step 3			
Covariates			
Out come: Dysthymia			
Step 1			
PTSD	7.15(5.38-9.49)***	6.13(4.54-8.29)***	2.42(1.56-3.74)***
Social Support	0.19(0.13-0.28)***	0.24(0.16-0.36)***	0.35(0.23-0.53)***
Step 2			
PTSD X Social Support	1.17(0.59-2.30)	1.25(0.63-2.45)	1.06(0.50-2.22)
Step 3			
Covariates			
Out come: Bipolar I Disorder			
Step 1			
PTSD	7.06(5.41-9.20)***	5.63(4.26-7.44)***	1.27(0.89-1.80)
Social Support	0.34(0.25-0.48)***	0.37(0.25-0.54)***	0.57(0.40-0.81)**
Step 2			
	1.34(0.66-2.69)	1.81(0.92-3.59)	1.62(0.80-3.30)

PTSD X Social Support			
Step 3			
Covariates			
Out come: Bipolar II Disorder			
Step 1			
PTSD	3.54(2.54-4.94)***	2.97(2.08-4.24)***	0.67(0.42-1.08)
Social Support	0.86(0.51-1.47)	1.01(0.58-1.74)	1.40(0.80-2.46)
Step 2			
	1.93(0.57-6.53)	2.60(0.75-8.97)	2.66(0.75-9.49)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Any Mood Disorder			
Step 1			
PTSD	5.98(5.27-6.78)***	5.29(4.65-6.02)***	1.43(1.19-1.73)***
Social Support	0.43(0.35-0.52)***	0.43(0.34-0.53)***	0.49(0.40-0.62)***
Step 2			
	0.92(0.61-1.38)	1.08(0.72-1.61)	1.26(0.77-2.05)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Social Anxiety Disorder			
Step 1			
PTSD	5.77(4.67-7.13)***	4.92(3.95-6.12)***	1.32(1.00-1.76)
Social Support	0.24(0.18-0.32)***	0.22(0.16-0.31)***	0.32(0.24-0.43)***
Step 2			
	0.97(0.54-1.74)	1.16(0.65-2.07)	0.99(0.55-1.77)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Specific Phobia			

Step 1			
PTSD	3.63(3.15-4.19)***	3.33(2.87-3.86)***	0.97(0.78-1.20)
Social Support	0.65(0.52-0.82)***	0.62(0.49-0.80)***	0.83(0.65-1.06)
Step 2			
PTSD X Social Support	0.73(0.43-1.23)	0.81(0.48-1.38)	0.89(0.52-1.53)
Step 3			
Covariates			
Out come: Generalized Anxiety Disorder			
Step 1			
PTSD	6.48(5.46-7.69)***	5.85(4.87-7.01)***	1.68(1.28-2.21)***
Social Support	0.35(0.26-0.46)***	0.35(0.26-0.47)***	0.52(0.38-0.71)***
Step 2			
PTSD X Social Support	1.33(0.83-2.14)	1.36(0.84-2.18)	1.26(0.73-2.15)
Step 3			
Covariates			
Out come: Panic Disorder			
Step 1			
PTSD	5.76(4.67-7.12)***	4.75(3.77-5.99)***	0.86(0.62-1.18)
Social Support	0.45(0.32-0.63)***	0.48(0.33-0.70)***	0.80(0.55-1.16)
Step 2			
PTSD X Social Support	1.53(0.86-2.71)	1.92(1.06-3.47)*	1.96(1.02-3.77)*
Step 3			
Covariates			
Out come: Any Anxiety Disorder			
Step 1			
PTSD	4.82(4.24-5.47)***	4.35(3.81-4.98)***	1.17(0.97-1.41)
Social Support	0.53(0.44-0.64)***	0.51(0.41-0.62)***	0.63(0.52-0.78)***

Step 2			
	0.89(0.57-1.36)	1.01(0.65-1.56)	1.18(0.73-1.89)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Alcohol Use Disorder			
Step 1			
PTSD	2.30(1.87-2.83)***	1.99(1.59-2.49)***	1.06(0.78-1.45)
Social Support	1.28(0.91-1.80)	0.98(0.67-1.42)	1.22(0.84-1.78)
Step 2			
	1.00(0.48-2.08)	1.60(0.75-3.41)	1.60(0.75-3.41)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Nicotine Dependence			
Step 1			
PTSD	2.84(2.47-3.27)***	2.31(1.99-2.69)***	1.04(0.84-1.29)
Social Support	0.71(0.57-0.88)**	0.74(0.58-0.94)*	0.86(0.68-1.09)
Step 2			
	0.75(0.50-1.13)	0.88(0.57-1.36)	0.92(0.59-1.43)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Drug Use Disorder			
Step 1			
PTSD	3.79(2.69-5.35)***	2.92(1.99-4.27)***	0.84(0.51-1.40)
Social Support	0.67(0.40-1.11)	0.60(0.34-1.06)	0.91(0.52-1.58)
Step 2			
	1.22(0.45-3.27)	2.16(0.79-5.92)	2.33(0.85-6.35)
PTSD X Social Support			
Step 3			

Covariates

Out come: Any Substance Use Disorder			
Step 1			
PTSD	2.83(2.50-3.21)***	2.35(2.05-2.70)***	1.06(0.88-1.28)
Social Support	0.82(0.67-1.00)*	0.78(0.62-0.97)*	0.92(0.74-1.16)
Step 2			
PTSD X Social Support	0.71(0.47-1.08)	0.91(0.60-1.38)	0.99(0.64-1.53)
Step 3			
Covariates			

OR: Unadjusted
AOR-1: Adjusted for sociodemographics
AOR-2: Adjusted for sociodemographics, Axis I disorders, and PTSD severity
* $p < .05$
** $p < .01$
*** $p < .001$

Table 6

Table 6: Hierarchical Logistic Regression Models of Posttraumatic Stress Disorder and Social Support on Suicide Attempts Among Women.

Variables	OR	AOR-1	AOR-2
Suicide Attempts Among Women			
Out come: Suicide Attempts			
Step 1			
PTSD	6.55(3.59-11.94)***	4.78(2.38-9.58)***	0.82(0.34-1.94)
Social Support	0.33(0.16-0.65)**	0.40(0.18-0.89)*	0.64(0.30-1.38)
Step 2	2.23(0.63-7.98)	3.58(0.91-14.08)	3.49(0.82-14.82)
PTSD X Social Support			
Step 3			
Covariates			

OR: Unadjusted
AOR-1: Adjusted for sociodemographics
AOR-2: Adjusted for sociodemographics, Axis I disorders, and PTSD severity
* $p < .05$
** $p < .01$
*** $p < .001$

Table 7

Table 7: Hierarchical Logistic Regression Models of Posttraumatic Stress Disorder and Social Support on Mental and Physical Health Functioning Among Women.

Variables	Beta Coefficient (SE)	Beta Coefficient (SE)-1	Beta Coefficient (SE)-2
Mental and Physical Health Functioning Among Women			
Out come: Physical Health Functioning			
Step 1			
PTSD	-2.82(0.38)***	-3.16(0.35)***	-0.70(0.46)
Social Support	6.55(0.55)***	3.46(0.54)***	3.17(0.54)***
Step 2	-2.10(1.26)	-0.63(1.15)	-1.09(1.14)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Mental Health Functioning			
Step 1			
PTSD	-7.51(0.35)***	-6.94(0.36)***	-2.05(0.43)***
Social Support	8.10(0.52)***	7.32(0.52)***	5.98(0.48)***
Step 2	3.42(1.24)**	2.87(1.18)*	1.63(1.11)
PTSD X Social Support			
Step 3			
Covariates			

OR: Unadjusted
Beta Coefficient (SE)-1: Adjusted for sociodemographics
Beta Coefficient (SE)-2: Adjusted for sociodemographics, Axis I disorders, and PTSD severity
* $p < .05$
** $p < .01$
*** $p < .001$

Table 8

Table 8: Hierarchical Logistic Regression Models of Posttraumatic Stress Disorder and Social Support on Comorbid Mental Disorders Among Men.

Variables	OR	AOR-1	AOR-2
Mental Disorders Among Men			
Out come: Major Depressive Disorder			
Step 1			
PTSD	9.29(7.43-11.63)***	8.15(6.40-10.39)***	1.40(0.88-2.23)
Social Support	0.28(0.21-0.38)***	0.33(0.24-0.46)***	0.40(0.26-0.62)***
Step 2			
PTSD X Social Support	3.05(1.43-6.53)**	3.49(1.60-7.61)**	9.25(2.56-33.34)***
Step 3			
Covariates			
Out come: Dysthymia			
Step 1			
PTSD	8.58(4.97-14.83)***	6.28(3.46-11.40)***	1.05(0.41-2.71)
Social Support	0.24(0.15-0.38)***	0.35(0.22-0.57)***	0.65(0.35-1.18)
Step 2			
PTSD X Social Support	2.03(0.65-6.35)	2.12(0.67-6.68)	1.88(0.45-7.80)
Step 3			
Covariates			
Out come: Bipolar I Disorder			
Step 1			
PTSD	10.81(7.70-15.17)***	8.69(6.16-12.26)***	1.10(0.59-2.02)
Social Support	0.44(0.28-0.69)***	0.50(0.31-0.81)**	0.74(0.42-1.32)

Step 2			
	0.53(0.19-1.45)	0.46(0.16-1.31)	0.24(0.06-0.99)*
PTSD X Social Support			
Step 3			
Covariates			
Out come: Bipolar II Disorder			
Step 1			
PTSD	3.51(2.12-5.82)***	3.03(1.80-5.11)***	0.50(0.25-0.98)*
Social Support	0.80(0.36-1.76)	0.80(0.37-1.73)	1.05(0.48-2.32)
Step 2			
	2.99(0.31-28.49)	2.87(0.28-29.07)	3.26(0.29-36.84)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Any Mood Disorder			
Step 1			
PTSD	9.41(7.57-11.69)***	8.36(6.66-10.50)***	1.44(1.02-2.04)*
Social Support	0.34(0.26-0.44)***	0.39(0.29-0.52)***	0.44(0.31-0.62)***
Step 2			
	1.82(0.89-3.72)	inf(inf-inf)	2.98(1.34-6.66)**
PTSD X Social Support			
Step 3			
Covariates			
Out come: Social Anxiety Disorder			
Step 1			
PTSD	7.90(5.71-10.93)***	6.39(4.64-8.82)***	0.95(0.57-1.57)
Social Support	0.27(0.18-0.40)***	0.33(0.21-0.50)***	0.45(0.28-0.72)**
Step 2			
	1.14(0.44-2.99)	1.30(0.49-3.47)	1.52(0.51-4.53)
PTSD X Social Support			
Step 3			
Covariates			

Out come: Specific Phobia			
Step 1			
PTSD	5.01(3.86-6.49)***	4.58(3.51-5.99)***	0.84(0.58-1.20)
Social Support	0.56(0.40-0.78)**	0.56(0.39-0.80)**	0.71(0.48-1.05)
Step 2			
PTSD X Social Support	0.44(0.19-1.01)	0.44(0.19-1.01)	0.40(0.15-1.04)
Step 3			
Covariates			
Out come: Generalized Anxiety Disorder			
Step 1			
PTSD	12.49(9.20-16.95)***	10.51(7.65-14.44)***	2.33(1.29-4.20)**
Social Support	0.38(0.25-0.58)***	0.45(0.29-0.70)***	0.75(0.44-1.27)
Step 2			
PTSD X Social Support	1.95(0.88-4.31)	2.12(0.94-4.80)	2.21(0.66-7.36)
Step 3			
Covariates			
Out come: Panic Disorder			
Step 1			
PTSD	11.07(7.92-15.46)***	9.21(6.50-13.05)***	1.57(0.88-2.82)
Social Support	0.49(0.31-0.78)**	0.59(0.36-0.97)*	0.95(0.55-1.63)
Step 2			
PTSD X Social Support	0.65(0.21-2.01)	0.76(0.24-2.38)	0.59(0.17-2.12)
Step 3			
Covariates			
Out come: Any Anxiety Disorder			
Step 1			

PTSD	7.88(6.49-9.58)***	7.04(5.78-8.59)***	1.33(0.96-1.84)
Social Support	0.45(0.35-0.59)***	0.48(0.36-0.63)***	0.58(0.43-0.79)***
Step 2			
	0.52(0.26-1.07)	0.54(0.27-1.09)	0.00(0.00-inf)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Alcohol Use Disorder			
Step 1			
PTSD	1.91(1.52-2.41)***	1.72(1.36-2.17)***	0.87(0.64-1.19)
Social Support	1.41(1.04-1.90)*	1.35(0.98-1.86)	1.65(1.20-2.29)**
Step 2			
	1.04(0.47-2.32)	1.17(0.50-2.76)	1.26(0.54-2.93)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Nicotine Dependence			
Step 1			
PTSD	3.14(2.53-3.88)***	2.62(2.12-3.24)***	0.97(0.71-1.32)
Social Support	0.62(0.49-0.78)***	0.69(0.55-0.87)**	0.73(0.57-0.94)*
Step 2			
	0.97(0.45-2.06)	1.06(0.48-2.31)	1.12(0.49-2.54)
PTSD X Social Support			
Step 3			
Covariates			
Out come: Drug Use Disorder			
Step 1			
PTSD	3.57(2.48-5.14)***	2.84(1.92-4.21)***	0.74(0.40-1.36)
Social Support	0.68(0.42-1.09)	0.77(0.47-1.28)	0.93(0.54-1.59)
Step 2			
	0.99(0.37-2.67)	1.02(0.36-2.94)	0.97(0.31-3.01)

PTSD X Social Support			
Step 3			
Covariates			
Out come: Any Substance Use Disorder			
Step 1			
PTSD	2.84(2.34-3.46)***	2.49(2.04-3.04)***	0.96(0.74-1.25)
Social Support	0.83(0.66-1.05)	0.87(0.69-1.10)	0.97(0.76-1.25)
Step 2			
	1.10(0.49-2.49)	1.25(0.52-3.04)	1.41(0.56-3.58)
PTSD X Social Support			
Step 3			
Covariates			

OR: Unadjusted
AOR-1: Adjusted for sociodemographics
AOR-2: Adjusted for sociodemographics, Axis I disorders, and PTSD severity
* $p < .05$
** $p < .01$
*** $p < .001$

Table 9

Table 9: Hierarchical Logistic Regression Models of Posttraumatic Stress Disorder and Social Support on Suicide Attempts Among Men.

Variables	OR	AOR-1	AOR-2
Suicide Attempts Among Men			
Out come: Suicide Attempts			
Step 1			
PTSD	13.56(5.98-30.76)***	10.03(3.93-25.62)***	1.11(0.32-3.87)
Social Support	0.21(0.09-0.53)**	0.29(0.10-0.82)*	0.37(0.13-1.03)
Step 2	1.30(0.20-8.54)	1.08(0.14-8.10)	0.97(0.13-7.39)
PTSD X Social Support			
Step 3			
Covariates			

OR: Unadjusted
AOR-1: Adjusted for sociodemographics
AOR-2: Adjusted for sociodemographics, Axis I disorders, and PTSD severity
* $p < .05$
** $p < .01$
*** $p < .001$

Table 10

Table 10: Hierarchical Logistic Regression Models of Posttraumatic Stress Disorder and Social Support on Mental and Physical Health Functioning Among Men.

Variables	Beta Coefficient (SE)	Beta Coefficient (SE)-1	Beta Coefficient (SE)-2
Mental and Physical Health Functioning Among Men			
Out come: Physical Health Functioning			
Step 1			
PTSD	-5.45(0.64)***	-4.74(0.59)***	-0.99(0.74)
Social Support	5.26(0.62)***	2.67(0.58)***	2.58(0.58)***
Step 2	5.04(2.49)*	5.19(2.32)*	5.14(2.26)*
PTSD X Social Support			
Step 3			
Covariates			
Out come: Mental Health Functioning			
Step 1			
PTSD	-8.13(0.62)***	-7.40(0.62)***	-2.19(0.68)**
Social Support	6.69(0.63)***	5.66(0.63)***	4.59(0.62)***
Step 2	-0.30(2.82)	-0.65(2.86)	-1.41(3.26)
PTSD X Social Support			
Step 3			
Covariates			

OR: Unadjusted
Beta Coefficient (SE)-1: Adjusted for sociodemographics
Beta Coefficient (SE)-2: Adjusted for sociodemographics, Axis I disorders, and PTSD severity
* p < .05
** p < .01
*** p < .001

Appendix A
PTSD Module in the AUDADIS-IV

Section 12 - Traumatic Experiences (Continued)

5a. In your ENTIRE life... (Repeat phrase frequently)		b. How old were you the FIRST time this happened?	c. How many times did this happen in your life?	d. How old were you the MOST RECENT time this happened?
(19) Other than during a terrorist attack, did you EVER see someone being badly injured or killed or did you EVER unexpectedly see a dead body?	1 ☐ Yes → 2 ☐ No - SKIP to (20)	_____ Age	1 ☐ Once - SKIP to (20) OR _____ Number	_____ Age - Go to (20)
(20) Not counting a terrorist attack, did someone very close to you EVER die unexpectedly, for example, they were killed in an accident, murdered, committed suicide or had a fatal heart attack?	1 ☐ Yes → 2 ☐ No - SKIP to (21)	_____ Age	1 ☐ Once - SKIP to (21) OR _____ Number	_____ Age - Go to (21)
(21) Did someone very close to you EVER have ANY OTHER serious or life-threatening illness, accident or injury?	1 ☐ Yes → 2 ☐ No - SKIP to (22)	_____ Age	1 ☐ Once - SKIP to (22) OR _____ Number	_____ Age - Go to (22)
(22) Did someone very close to you EVER have ANY OTHER extremely stressful experience or trauma, like being physically assaulted, mugged, raped, kidnapped, or involved in a serious fire, flood, earthquake, tornado or hurricane?	1 ☐ Yes → 2 ☐ No - SKIP to (23)	_____ Age	1 ☐ Once - SKIP to (23) OR _____ Number	_____ Age - Go to (23)
(23) Did YOU EVER have ANY OTHER extremely stressful or traumatic experiences like the ones we just talked about but I haven't yet mentioned?	1 ☐ Yes → 2 ☐ No - SKIP to Check Item 12.1	_____ Age	1 ☐ Once - SKIP to Check Item 12.1 OR _____ Number	_____ Age - Go to Check Item 12.1

CHECK ITEM 12.1	What is the sum of all items marked "Yes" in 5, column a (excluding 5, column a, 13a-18a) and items marked "Yes" in 1a, 2a, 3a, and 4a?	0 ☐ None - SKIP to Section 13 1 ☐ One - SKIP to 7a 2 ☐ Two or more
	(SHOW FLASHCARD 42) **6. You just mentioned some extremely stressful events that happened to you or someone very close to you at some time in your life.** **Which of these experiences would you single out as the WORST stressful event? Please just tell me the number to the left of the event on the card.**	☐☐
7a.	**Now I'd like to ask you a few questions about the ways (that/that worst) stressful event may have affected you.** **At the time that (worst) event happened, did you feel extremely frightened, helpless, or horrified about what was happening?**	1 ☐ Yes 2 ☐ No
b.	**At the time (that/that worst) event happened, did you think you or someone very close to you might die, be seriously injured or permanently disabled?**	1 ☐ Yes 2 ☐ No
CHECK ITEM 12.2	Is "Yes" marked in 7a or 7b?	1 ☐ Yes 2 ☐ No - SKIP to Section 13

Appendix B

12 items from ISEL

27.	Now I'm going to read you a few statements and I would like to know how well they describe you. Look at the categories on the card and tell me how true or how false these statements are about you.	
(a)	If I wanted to go on a trip for a day, like to the country, city, mountains or beach, I would have a hard time finding someone to go with me.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true
(b)	I feel that there is no one I can share my most private worries and fears with.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true
(c)	If I were sick, I know I would find someone to help me with my daily chores.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true
(d)	There is someone I can turn to for advice about handling problems with my family.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true
(e)	If I decide one afternoon that I would like to go to a movie that evening, I could easily find someone to go with me.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true
(f)	When I need suggestions on how to deal with a personal problem, I know someone I can turn to.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true
(g)	I don't often get invited to do things with others.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true
(h)	If I had to go out of town for a few weeks, it would be difficult to find someone who would look after my house or apartment, like taking care of my plants, garden or pets, getting the mail or watching the house in general.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true

	(i)	If I wanted to have lunch with someone, I could easily find someone to join me.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true

Section 2D - Background Information II (Continued)

27.	(j)	If I were stranded 10 miles from home, someone I know would come and get me.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true
	(k)	If a family crisis arose, it would be difficult to find someone who could give me good advice about how to handle it.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true
	(l)	If I needed some help in moving to a new house or apartment, I would have a hard time finding someone to help me.	1 ☐ Definitely false 2 ☐ Probably false 3 ☐ Probably true 4 ☐ Definitely true

Appendix C

SF-12 Health Survey

SF-12 HEALTH SURVEY

INSTRUCTIONS: This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.

Please answer every question by marking one box. If you are unsure about how to answer, please give the best answer you can.

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
☐	☐	☐	☐	☐

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	Yes, Limited A Lot	Yes, Limited A Little	No, Not Limited At All
2. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐	☐	☐
3. Climbing **several** flights of stairs	☐	☐	☐

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	YES	NO
4. **Accomplished less** than you would like	☐	☐
5. Were limited in the **kind** of work or other activities	☐	☐

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

		YES	NO
6.	**Accomplished less** than you would like	☐	☐
7.	Didn't do work or other activities as **carefully** as usual	☐	☐

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐	☐	☐	☐	☐

These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks -

		All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
9.	Have you felt calm and peaceful?	☐	☐	☐	☐	☐	☐
10.	Did you have a lot of energy?	☐	☐	☐	☐	☐	☐
11.	Have you felt downhearted and blue?	☐	☐	☐	☐	☐	☐

12. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
☐	☐	☐	☐	☐