

**THE PREVALENCE AND CORRELATES OF POSTTRAUMATIC STRESS  
DISORDER IN A NATIONAL SAMPLE OF CANADIANS**

By © Benjamin Tyler Reitsma

A dissertation submitted

to the School of Graduate Studies in partial fulfillment of the

requirements for the degree of

**Doctorate of Psychology, Department of Psychology, Faculty of Science**

Memorial University of Newfoundland

**December 2023**

St. John's, Newfoundland and Labrador

## **Abstract**

Exposure to traumatic events is an unfortunately ubiquitous experience across the Canadian population, and a significant minority of those exposed to trauma develop Posttraumatic Stress Disorder (PTSD). Individuals meeting a diagnosis of PTSD often experience a range of complications, including poorer health outcomes, comorbid mental health diagnoses, less frequent employment, and lower income. A majority of PTSD research has been conducted in the United States, and often relates specifically to combat veterans. Understanding the prevalence and complexity of PTSD diagnosis in a Canadian, non-military sample is important to better recognize the clinical needs of those affected by PTSD. The objective of this study was to examine the prevalence and correlates of self-reported PTSD diagnoses in a community sample of Canadian adults. Using data from the Canadian Community Health Survey – Mental Health (2012), the prevalence of PTSD was 1.8% with the majority of those being women (66.1%). Individuals reporting a diagnosis of PTSD (n= 425) were then compared to age- and gender-matched controls without PTSD on demographic variables and rates of psychiatric comorbidities. Individuals with PTSD were more likely to have also experienced a Major Depressive Episode, suicidal ideation, or met criteria for alcohol dependence, cannabis dependence, or non-cannabis drug dependence (each for both lifetime and within the last 12 months), as well as lifetime cannabis abuse. They were also more likely to have reported comorbid Bipolar I Disorder or Bipolar II Disorder (lifetime and 12-month prevalence) and Generalized Anxiety Disorder (12-month prevalence). Those with PTSD were more likely to be divorced/separated, less likely to be married, more likely to report incomes under 20,000 dollars per year, and less likely to report incomes above 50,000 dollars per year. Gender differences were also noted among those with PTSD. Men with PTSD were more likely to meet criteria for

lifetime cannabis abuse or dependence, alcohol dependence (both lifetime and 12-month prevalence), as well as a yearly income over \$50,000. Women with PTSD were more likely to meet criteria for Generalized Anxiety Disorder or Major Depressive Episode (lifetime), and more likely to report suicidal ideation (both lifetime and 12-month prevalence). Women with PTSD were also more likely to report an income under \$20,000. The implications of these findings and study limitations are discussed.

*Keywords:* Trauma, PTSD, CCHS, comorbidity

## General Summary

When individuals face stressful or frightening situations, the brain's natural fear response system is activated. Once the danger is gone, the system turns off. Traumatic events, such as actual or threatened death, serious injury, or sexual violence, are different from life stressors in that they are more intense and often overwhelm a person's fear response system, impairing their ability to cope in the moment. Experiencing or witnessing a traumatic event is a common occurrence over the course of one's life, with nearly two thirds of Canadians reporting at least one lifetime exposure. Although it can be hard to deal with at first, most people are able to handle these difficult situations and eventually get back to their normal lives. However, a small but significant number of those exposed to trauma go on to develop PTSD. These individuals experience several complications as a result of the diagnosis, and often face significant life struggles. Most research on PTSD has been done in the United States and has focused on veterans. It is important to study PTSD in Canadians who are not in the military so that we can better understand how to help them, and this study aimed to explore the prevalence of PTSD, as well as associated conditions and characteristics, in such a community sample.

The findings indicated that 1.8% of people in the community sample had been diagnosed with PTSD. Those with PTSD were more likely to have experienced Major Depressive Episodes, suicidal ideation, or issues with alcohol and substance abuse than those without a diagnosis. They were also more likely to have Bipolar I, Bipolar II, or Generalized Anxiety Disorders, less likely to be married, and had lower income. Among those with PTSD, men were more likely to have substance abuse issues, while women were more likely to have experienced suicidal ideation or Major Depressive Episodes, Generalized Anxiety Disorder, and lower income. These findings highlight how important it is for clinicians to assess for PTSD, especially among those

most vulnerable, as its presence can complicate treatment and worsen long term outcomes if not properly acknowledged and addressed.

## **Acknowledgements**

At long last, this saga is finally over. My PsyD cohort-mate Stacy once said that during every dissertation, one has to eventually slay a dragon. Truer words were never spoken. Like all dissertations, this represents more than simply the document enclosed herein. Years of writing and revising, surviving on a Rock in the middle of the ocean, growing roots in two separate provinces... one heck of a battle.

Firstly, I'd like to thank my supervisor, Dr. Jacqueline Hesson, for her support, guidance, and especially her relentless optimism. She came to my rescue, worked with me to come up with a new project, provided motivation and support during times of self-doubt, and never gave up on me as I toiled on this project through numerous challenges (including a global pandemic – didn't see that one coming) to get to this moment. I thank her for the extraordinary amount of effort she put in to ensure that I was able to meet my deadlines. I have been truly fortunate to have you as a supervisor, Dr. Hesson, and it was an absolute pleasure working with you.

Thank you as well to Dr. Pam Button for her thoughtful feedback and encouragement, especially as I neared the end, and Dr. Ken Fowler for making sure he took the time that I know he didn't have. The detail-oriented edits they both provided were crucial in the completion of this document. I want to thank them for appreciating the time crunch and ensuring that they were always there, ready to help, when I most needed it.

I would also like to thank my two cohorts, both PsyD and Residency. To the PsyD cohort, JARKTS, I will always remember our time together fondly. You were integral in making the most out of our time on the Rock, supporting each other through navigating the challenges of the program. Long may your big jib draw. The membership of my Residency cohort quickly evolved from a collection of students becoming professionals into a group of friends who stuck

around in the Prairies for a few more great years until a pandemic scattered us across the country. But even still, I appreciate all of the help and support you provided. Between thoughtful packages in the mail, music recommendations, trips to stationery stores, escape rooms, and timely Bob Newhart references, you made sure I never lost sight of who I am or where I was going. And reminded me to see the forest and not get focused on the trees. Or hyperfixate on the bark on this one particular tree. Sometimes I need someone to remind me to STOP IT, and I'm glad you never buried me alive in a box.

Lastly, I would like to thank my parents, Doug and Marlene Reitsma. I know it hasn't been easy since I moved away from Ontario. Distance is hard. Following the winds that lifted me out East, and then out West, always taking me from where my roots had taken in. But it helps to recognize that the wind is merely a force that moves, showing you what it is that you cling to when it comes. I'll always cling to you guys. I couldn't have done this without your endless love and support throughout this long and arduous journey. I was good, I did good, and now I'll probably get around to having fun.

...and thank you for fighting the urge to keep asking "is it done yet?"

No one writing anything ever wants to hear that question.

## Table of Contents

Abstract	ii
General Summary	iv
Acknowledgements	vi
Table of Contents	viii
List of Tables	x
Chapter 1: Introduction	1
Chapter 2: Literature Review	2
2.1 Trauma	2
2.1.1 Definition of Trauma	2
2.1.2 Theories of Trauma	4
2.2 Posttraumatic Stress Disorder (PTSD)	7
2.2.1 History of Post Traumatic Stress Disorder (PTSD) Diagnosis	7
2.2.2 Theoretical models of PTSD	11
2.2.3 Diagnostic Considerations	14
2.2.4 Prevalence	16
2.2.5 Risk Factors	18
2.2.6 Impacts of PTSD	26
2.3 PTSD and Comorbid Disorders	29
2.3.1 PTSD and Major Depressive Disorder	30
2.3.2 PTSD and Bipolar Disorder	32
2.3.3 PTSD and Generalized Anxiety Disorder	34
2.3.4 PTSD and Substance Use	35
2.4 Current Study	39
Chapter 3: Methods	41
3.1 Participants	41
3.2 Data Collection Method	42



3.3 Instrument Description	43
3.4 Measures	43
3.5 Data Analysis	49
Chapter 4: Results	51
4.1 Prevalence of PTSD	51
4.2 Comparison of the Prevalence (lifetime and 12-month) of Psychiatric Disorders and Suicidal Thoughts in the PTSD and Control Groups	51
4.3 Assessment of Sociodemographic Variables	54
4.4 Comparison of the Prevalence (lifetime and 12-month) of Psychiatric Disorders and Suicidal Thoughts in the Males and Females with PTSD	55
4.5 Comparison of Sociodemographic Variables in Males and Females with PTSD	58
Chapter 5: Discussion	59
5.1 Summary of Findings	59
5.2 Clinical Implications	65
5.3 Strengths of the Current Study	68
5.4 Limitations	69
5.5 Future Research	72
5.6 Conclusion	73
References	75

## **List of Tables**

Table 1	Age Distribution Frequencies for Individuals With and Without PTSD	118
Table 2	Frequencies and Chi-Square Results for Lifetime Prevalence of Psychiatric Disorders in Individuals with PTSD and Controls	119
Table 3	Frequencies and Chi-Square Results for 12-Month Prevalence of Psychiatric Disorders in Individuals with PTSD and Controls	120
Table 4	Frequencies and Chi-Square Results for Sociodemographic Variables of Individuals with PTSD and Controls	121
Table 5	Age Distribution Frequencies for Males and Females with PTSD	122
Table 6	Frequencies and Chi-Square Results for Lifetime Prevalence of Psychiatric Disorders in Males and Females with PTSD	123
Table 7	Frequencies and Chi-Square Results for 12-Month Prevalence of Psychiatric Disorders in Males and Females with PTSD	124
Table 8	Frequencies and Chi-Square Results for Sociodemographic Variables of Males and Females with PTSD	125

## **Introduction**

Epidemiological studies have shown that the experience of traumatic events is a common experience in the Western world (Benjet, et al., 2016; Statistics Canada, 2022). Despite this frequency, the majority of those exposed to trauma are able to effectively cope with the experience, with a significant minority of those exposed to traumatic events going on to develop PTSD (Statistics Canada, 2022; Van Ameringen, Mancini, Patterson, & Boyle, 2008). A recent study conducted by Statistics Canada (2022) indicated that 5% of Canadians reported having a diagnosis of PTSD made by a health professional. Several theoretical models exist to explain the development of PTSD and its subsequent impact on functioning in order to better guide research into effective treatments (Lissek & van Meurs, 2015).

Studies have shown that individuals with PTSD often experience an array of functional difficulties related to the diagnosis (Jellestad, Vital, Malamud, Taeymans, & Mueller-Pfeiffer, 2021). Individuals with PTSD are also more likely to meet criteria for a number of comorbid disorders, the existence of which can often complicate treatment and recovery (Qassem, Aly-ElGabry, Alzarouni, Abdel-Aziz, & Arnone, 2021). While a growing body of research exists into the treatment of PTSD, a substantial proportion of studies involve work with military veterans, often in the United States, or are based on samples from clinical settings (Tortella-Fellu, et al., 2019). The current study sought to examine the prevalence and correlates of PTSD in a Canadian, non-military, community-based sample.

## Literature Review

### 2.1 Trauma

#### 2.1.1 *Definition of Trauma*

Exposure to traumatic events over the course of one's life is a relatively common experience, with research showing that up to 90% of individuals in developed countries may have experienced at least one qualifying event (Benjet, et al., 2016). While various definitions exist in research literature, clinical experience, and across cultures, traumatic events usually share basic commonalities (Benjet, et al., 2016; North, Suris, Smith, & King, 2016). Traumatic events involve exposure to an external event that results in the experience of threatened death, serious injury, or sexual violence (American Psychiatric Association, 2013; Benjet, et al., 2016; Firmin, Pugh, Turkelson, Annecharico, & Sohn, 2015). Traumatic events can be differentiated from the experience of life stressors by their more extreme nature, and involve a loss of control over the stress reaction that overwhelms an individual's capacity for coping with the emotional experience (Black & Flynn, 2021; van der Kolk, 2014). Traumatic events are also distinguished from stressors in that traumatic events typically involve a severe loss of control over the situation itself (North, Suris, Smith, & King, 2016).

Debate about the potential impact of traumatic events, however, existed long before the Diagnostic and Statistical Manual of Mental Disorders (DSM) (Horwitz, 2018). Prior to World War I, such debate had explored biological predispositions towards weakness or specific physical maladies as explanations for why some individuals were affected by various traumatic experiences (Black & Flynn, 2021; Friedman, Resick, Bryant, & Brewin, 2011; Horwitz, 2018). When considering the symptoms of individuals that had been involved in horrific train accidents in the late 1800s, physicians began recognizing the similarities to psychological symptoms that

were often grouped under the then-accepted term of hysteria (Black & Flynn, 2021). At the time, the symptoms of victims of traumatic events were considered to have experienced a physical trauma and that the symptoms experienced were from a medical origin, as opposed to the psychological nature of hysteria (Black & Flynn, 2021; Horwitz, 2018). This clinical picture began shifting when clinicians such as Jean-Martin Charcot began hypothesizing that the observed constellation of symptoms was related to the individual's response to traumatic events, rather than due to an injury sustained during them (Black & Flynn, 2021; van der Kolk, 2014). This work was continued by Pierre Janet, who recognized that many patients were often unable to recount explicit memories of traumatic events, but instead would experience intense emotional responses that interfered with their ability to interact with either the memories of the events or their current environment (Black & Flynn, 2021; van der Kolk, 2014).

Subsequent to the major military events of the early 20th century, researchers began to recognize that the symptoms observed in a significant number of soldiers returning from combat may have been related to the extreme stressors of their experiences (Horwitz, 2018). Freud himself revised his theories of dreams and unconscious processes as a result of his observations that former soldiers experienced recurrent, distressing dreams of traumatic events from the war that served no wish-fulfillment purpose (Freud, 1933; Horwitz, 2018). However, even after WWI common perceptions of the root cause of the clinical presentation continued to be that of susceptibility to anxiety, which perpetuated the image of sufferers as being somehow psychologically weaker than their non-affected compatriots (Friedman, Resick, Bryant, & Brewin, 2011; Horwitz, 2018). Soldiers without any distinct physical injuries that were affected by fatigue, dissociation, or other physical symptoms were described as having "shell shock," a diagnosis that was attributed to the stressors placed on the body from exposure to the explosives

and weapons used during the war (Black & Flynn, 2021). Such soldiers were often labelled as having been unfit for combat prior to their service (van der Kolk, 2014); however, these descriptions were insufficient to explain why some soldiers did not experience these symptoms despite equivalent or greater exposure to combat (Black & Flynn, 2021; van der Kolk, 2014). As well, after World War II researchers and physicians were seeing similar responses in individuals who had experienced traumatic wartime events that were not combat-focused (Black & Flynn, 2021). One of the distinguishing features of those suffering from what would eventually be labelled as Posttraumatic Stress Disorder (PTSD) was that individuals would respond to stimuli with similar physiological arousal as that associated with the original event, and the reaction would appear as though the event were still occurring (Black & Flynn, 2021; Horwitz, 2018; van der Kolk, 2014). In these moments, a sensory experience in the current environment would trigger a memory of similar sensory experience from the traumatic event, and the current situation would connect physiological responses and stressful symptoms to the person's active memory of the traumatic event as if the trauma was occurring (Horwitz, 2018; van der Kolk, 2014). These reactions can be seen as the body continuing, in the present, to defend against a threat that belongs to the past (van der Kolk, 2014).

### ***2.1.2 Theories of Trauma***

In order to better understand why only some of those exposed to traumatic events go on to develop PTSD, theories of trauma were developed to guide the research.

**Biological.** Biological theories of trauma focus on the neurological substrates that underpin the body's responses to stress (Black & Flynn, 2021). These theories suppose that traumatic experiences, and the body's response to them, can cause physical changes in the brain and body that may lead to long-term physical and psychological effects (Black & Flynn, 2021;

Bremner, 2006; van der Kolk, 2014). Animal models of trauma have indicated that traumatic experiences not only alter the behaviour of those exposed, but also lead to changes in the brain volume and function of a number of specific brain areas that are involved in stress response, impulse control and decision making, emotion regulation, and the creation of memories (Bremner, 2006). Biological models of trauma focus on the body's response pattern to stressors or threats, and how these systems, when overloaded due to a traumatic event, become hypersensitive and more likely to respond to subsequent stressors (Bremner, 2006; Perry, Pollard, Blakley, Baker, & Vigilante, 1995; van der Kolk, 2014).

A key component of these biological models is that trauma can cause dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis (Perry, Pollard, Blakley, Baker, & Vigilante, 1995). The HPA axis is a complex neurological and hormone system that becomes activated when a stressor or threat is perceived in the environment and drives the body's responses to protect itself from harm (Black & Flynn, 2021; Bremner, 2006; Perry, Pollard, Blakley, Baker, & Vigilante, 1995; van der Kolk, 2014). When an individual experiences a traumatic event, the HPA axis can become overwhelmed and dysregulated, making it more sensitive to activation by subsequent stressors and leading to chronic overactivation of the system (Black & Flynn, 2021; Perry, Pollard, Blakley, Baker, & Vigilante, 1995; van der Kolk & Yehuda, 2006; van der Kolk, 2014).

**Cognitive.** Cognitive theories of trauma focus on how the brain processes and stores information under normal circumstances, and how traumatic events alter the larger-order frameworks, often referred to as schemas, through which the individual processes subsequent events and information (Black & Flynn, 2021; Lissek & van Meurs, 2015). Under normal conditions, the brain's natural fear response system is activated in response to specific external threats, and deactivated once the immediate threat is no longer present (Foa, 2011; van der Kolk

& Yehuda, 2006). The individual's beliefs about the world are not altered as a result of the normal processes, since their actions were able to successfully navigate the threat (van der Kolk, 2014). For traumatic events, the intensity of the situation can lead to this normal response being unable to produce effective action, and as such the traumatic event fundamentally alters the belief structure of the individual's appraisal of the world and its inherent risks (Foa, 2011; Lissek & van Meurs, 2015; van der Kolk, 2014). Cognitive models of trauma contend that the changes to the individual's schema for the world also lead to maladaptive appraisals of the environment, in that previously neutral aspects of the traumatic event become associated with the intense fear-based response from the event, much like traditional conditioned learning (Black & Flynn, 2021; Dalgleish, 2004; Foa, 2011; Lissek & van Meurs, 2015). Individuals are then unable to process their memories of the traumatic event because of their extreme physiological reactions to what are now encoded as significant sources of danger to be avoided (Black & Flynn, 2021; Foa, 2011). Maintaining the maladaptive beliefs about the dangers of the environment mimics the processes meant to ensure the individual's safety following the overwhelming stressor, even when this interpretation is no longer adaptive (Dalgleish, 2004; Foa, 2011; van der Kolk, 2014). The overgeneralization of danger makes hypervigilance more likely, and the inability of the individual to process the memories of the trauma make habituation, the cognitive process by which emotional responses become less intense over repeated exposures, less likely to occur (Dalgleish, 2004; Foa, 2011; van der Kolk & Yehuda, 2006).

## **2.2 Posttraumatic Stress Disorder**

### ***2.2.1 History of Posttraumatic Stress Disorder (PTSD) Diagnosis***

The first appearance of the diagnosis of PTSD in the DSM did not occur until its inclusion in the Third Edition of the manual (American Psychiatric Committee on Nomenclature



and Statistics, 1980). While the potential psychological impacts of traumatic events were recognized prior to this publication, and discussed above, individuals presenting with various trauma-related anxiety prior to this inclusion were only given temporary diagnoses (Gross Stress Reaction in the First Edition, Situational Reaction in the Second Edition) (American Psychiatric Association. Committee on Nomenclature and Statistics, 1952; American Psychiatric Association. Committee on Nomenclature and Statistics, 1968; Friedman, Resick, Bryant, & Brewin, 2011). At the time, the thinking was that the responses observed were specifically related to the event itself, and as such were not expected to persist (Horwitz, 2018). Any individual who continued to demonstrate symptoms after engaging in treatment was then thought to be experiencing another underlying condition that was driving the anxiety (Friedman, Resick, Bryant, & Brewin, 2011; Horwitz, 2018). These conceptualizations, however, did not take into account the impact that the event had on fundamentally changing the way the individual experienced the world around them, which led to symptoms becoming more generalized and not limited specifically to exposure to the specific event (Friedman, Resick, Bryant, & Brewin, 2011; Horwitz, 2018). While ensuing research in the field had identified trauma syndromes similar to the modern PTSD diagnosis, until the conceptualization and inclusion in the DSM-III these syndromes were identified not by the clusters of symptoms, but by the traumatic event causing the reaction (Friedman, Resick, Bryant, & Brewin, 2011). Such events were often specific to combat experiences, and as such treatment and research was primarily limited to these populations (Brunello, et al., 2001). The significant number of individuals with combat-related difficulties continued to grow with subsequent military conflicts, and research into the difficulties observed in veterans led to the recognition that the primary driver for the syndrome was the intensity of the traumatic experience (Horwitz, 2018). As researchers and clinicians

alike began to recognize similar syndromes in others outside of the sphere of combat, the definition of trauma began to broaden; researchers started to recognize that the experiences of acutely stressful events, regardless of the specific nature of the events, led to similar clinical presentations (Breslau, 2009; Brunello, et al., 2001; Friedman, Resick, Bryant, & Brewin, 2011; Horwitz, 2018). In particular, researchers began to notice that the acute stress reactions of individuals with combat experience presented with similar symptoms to those detailed in some of Freud's earlier work regarding the impacts of early childhood trauma (Horwitz, 2018). Expanding the definition of trauma allowed clinicians to better recognize the presenting symptoms in greater numbers of people who had experienced traumatic events and thus meet criteria for the disorder (American Psychiatric Committee on Nomenclature and Statistics, 1980; American Psychiatric Association, 2013; Breslau, 2009; Brunello, et al., 2001; Kessler, 2000). The name PTSD was introduced in the Third edition of the DSM and has remained consistent since (North, Suris, Smith, & King, 2016). It was classified as an anxiety disorder in the DSM-III, DSM-III-R, DSM-IV, and DSM-IV-TR, although its inclusion in this section was not without controversy considering the explicit inclusion of a criterion relate to an external stressful event (Friedman, Resick, Bryant, & Brewin, 2011; Horwitz, 2018; North, Suris, Smith, & King, 2016). In the DSM-5, the diagnosis was moved from the Anxiety Disorders section to a newly created Trauma- and Stressor-Related Disorders section to better reflect the uniqueness of such diagnoses (American Psychiatric Association, 2013; North, Suris, Smith, & King, 2016).

**Changes across editions.** Since its inclusion in the DSM-III, the diagnosis of PTSD has gone through several changes. One of the main differences between the DSM-III and DSM-IV criteria for PTSD was the definition of the traumatic event (American Psychiatric Association, 2000; North, Suris, Smith, & King, 2016). In the DSM-III, the criteria specified that a traumatic

event was considered to be a catastrophic stressor outside the range of usual human experience that would be markedly distressing to almost anyone (American Psychiatric Committee on Nomenclature and Statistics, 1980). In the DSM-IV, this definition was changed to one that involved actual or threatened death or serious injury, or threat to the physical integrity of self or others, regardless of whether the event was catastrophic, common, or rare (American Psychiatric Association, 2000). This change broadened the scope of potential trauma exposure and allowed for more individual variability in the perception of trauma (North, Suris, Smith, & King, 2016). As well, the inclusion of additional potential symptoms in the DSM-IV criteria meant the diagnosis was more inclusive and flexible, which allowed for more comprehensive assessment and treatment of PTSD and reflected the advances in research and clinical practice regarding trauma and its effects on survivors (North, Suris, Smith, & King, 2016). However, the DSM-IV also included the addition of a duration and a functional impairment criterion that were not present in the original diagnoses, further refining the applicability of the diagnosis (North, Suris, Smith, & King, 2016).

While no changes were made to the diagnostic criteria for PTSD diagnosis between DSM-IV and DSM-IV-TR, the criteria in the Fourth Edition, Text Revision (DSM-IV-TR) underwent noteworthy changes during the development of the Fifth Edition (American Psychiatric Association, 2013). In the Fourth Edition, the criterion describing the initial traumatic event(s) was less explicit than the current definition, and the current diagnosis no longer includes a description of the subjective reaction to the stressor (American Psychiatric Association, 2013; North, Suris, Smith, & King, 2016). The changes also involved the reorganizing of symptom clusters and the inclusion of additional symptoms (e.g. angry outbursts, reckless or self-destructive behaviour) (American Psychiatric Association, 2013). Of the

changes, one of the most notable of these reorganizations is the splitting of Criterion C in DSM-IV-TR (avoidance of related stimuli and numbing of general responsiveness) into two separate criteria, which necessitates the experience of both features for an official diagnosis. The changes made to the diagnostic criteria of PTSD across each of the DSM editions shows the relative instability of the diagnostic criteria as research and clinical experience continue to refine the understanding of what is a relatively newer and complex disorder (American Psychiatric Association, 2013; North, Suris, Smith, & King, 2016). The continued changes reflect the evolving understanding of trauma and its consequences on mental health, and also have implications for the prevalence and diagnosis of PTSD in different populations and settings (North, Suris, Smith, & King, 2016).

**Current DSM-5 diagnostic criteria for PTSD.** The psychological effects of traumatic events on an individual can vary widely (American Psychiatric Association, 2013). A diagnosis of PTSD using the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association, 2013) involves meeting eight distinct diagnostic criteria (see Appendix A for complete criteria). The first involves exposure to a traumatic event(s) involving real or threatened death, sexual violence, or serious injury. Criterion B involves the presence of intrusion symptoms (such as intrusive memories, flashbacks, or physiological reactions to cues that resemble aspects of the traumatic event) that cause psychological distress. The third criteria involves persistent avoidance of stimuli associated with the traumatic event, including avoidance of both internal associations (thoughts, memories, feelings) and external reminders of the traumatic event. The diagnosis also includes symptoms of negative alterations in cognitions and mood, as well as marked alterations in arousal and reactivity (Criteria D and E). The diagnosis specifies that the duration of the disturbances must be longer than one month, cause significant

distress or impairment of functioning, and not be attributable to other conditions (American Psychiatric Association, 2013).

### ***2.2.2 Theoretical Models of PTSD***

**Neurobiological.** Neurobiological models focus on how the experience of trauma induces changes in the brain and the nervous system via a surge of stress hormones, which lead to strong learned associations between the trauma and both relevant and neutral details from the traumatic event (Bryant, 2019; Pitman, et al., 2012). These associations interfere with the integration of the memories of the event, as all of the related details serve as triggers for the fear response and subsequently contribute to the development and maintenance of PTSD symptoms (Bryant, 2019; Pitman, et al., 2012). There is also evidence that those with PTSD experience changes in the brain areas associated with these fear-based responses (Bryant, 2019). A meta-analysis conducted by Logue et al. (2018) analyzed data across 16 cohorts to compare the relative volumes of subcortical brain structures of trauma-exposed individuals with and without PTSD, and found that those with current PTSD had significantly smaller hippocampi, a brain region important to the formation of memories and fear learning (Logue, et al., 2018). The neurobiological theories of PTSD can thus be thought of as the maladaptive activation of a fear-based threat detection system, one that, while adaptive in the face of an actual threat, is instead producing dysfunctional responses due to inappropriate activation and associated with specific neurobiological changes in the system itself (Rau & Fanselow, 2007; van der Kolk, 2014).

**Genetic.** Given that trauma is a near-ubiquitous experience, there is a distinct difference in the responses of individuals who present with symptoms of PTSD (Van Ameringen, Mancini, Patterson, & Boyle, 2008). Various theoretical models have been used to conceptualize the symptoms and potential underlying mechanisms associated with PTSD diagnosis. While the

concept of maladaptive fear conditioning is a core component of all models of PTSD, the models attempt to better explain the constellation of symptoms to inform the development of successful interventions (Bryant, 2019). Genetic models of PTSD look to identify specific genetic markers that could indicate increased risk or susceptibility to the disorder in traumatic situations (Bryant, 2019). While studies have found specific genes that are associated with functional impairments following exposure to stress (for example, Hartley et al. (2012) identified a specific allele that appears to reduce serotonin function and interfere with extinction learning), genetic models alone do not appear to provide a consistent framework for explaining the development of PTSD (Bryant, 2019). Instead, genetic models have been developed as a means of identifying potential vulnerability to PTSD through a genetic/environmental interaction (Bryant, 2019). While traumatic events do not directly alter an individual's genetic makeup, extreme stressors are thought to affect gene expression such that the way proteins are transcribed can become either more or less easily accessible, depending on the impact of the trauma, which then alters the functioning of the biological system (Coplan, Chanatry, & Rosenblum, 2017; Zannas, Provençal, & Binder, 2015). This process provides at least a partial explanation for how previous exposure to trauma can lead to PTSD after subsequent traumatic events, as protein translation can be influenced by external factors that change the phenotypic expression of the genes, which can then change the subsequent response to future events and stressors (Coplan, Chanatry, & Rosenblum, 2017).

**Cognitive.** Lissek and van Meurs (2015) outlined some of the generally recognized learning-based models of PTSD in their review of the literature. One of the core components of PTSD psychopathology in learning-based models is the concept of maladaptive fear-associated learning (Lissek & van Meurs, 2015). In this perspective, individuals who are exposed to a

traumatic event experience a form of maladaptive conditional learning processes during and after the traumatic experience that alters their experience of all associated stimuli following the event (Lissek & van Meurs, 2015; Quirk, Milad, & Santini, 2007). Subsequent exposure to previously neutral stimuli then become conditioned to elicit an anxiety response, often with the intensity of the initiating situation, leading to re-experiencing of the anxiety of the triggering event and/or avoidance of the stimuli likely to produce this reaction (Lissek & van Meurs, 2015; Quirk, Milad, & Santini, 2007). One of the arguments against classical conditioning as being the sole source of the symptomatology of PTSD is the fact that the fear-based responses elicited by previously neutral stimuli are resistant to extinction, a core principle of classical learning theories (Lissek & van Meurs, 2015). This resistance is not simply due to the avoidance of the stimuli themselves, as evidenced by the lack of success from simple exposure-based cognitive therapies for the neutral stimuli now associated with the trauma reaction (Foa, 2011; Lissek & van Meurs, 2015). Research on learning models of trauma has found that extinction does not appear to remove the associations produced, but instead forms a separate conditioned response that reduces the impact of the problematic associations (Foa, 2011). Cognitive theories expand on the idea of associative learning by also considering the impact that the traumatic event has on the cognitive appraisals of the individual's environment following the trauma (Foa, 2011; van der Kolk & Yehuda, 2006). From this perspective, most individuals exposed to a traumatic event see a reduction in symptoms over the months following the exposure, as they are able to properly associate the experience with a time-limited event and thus their sensory and cognitive systems habituate to the environment (Foa, 2011; Foa, Stein, & McFarlane, 2006). As mentioned above, some individuals exposed to traumatic events may continue to reappraise their environment as hostile or threatening, which serves to maintain the fear response to the triggering stimuli (Foa,

2011; van der Kolk, 2014). As such, neurobiological approaches to the treatment of PTSD focus on the individual's relationships with the details and events associated with the traumatic event to reduce their impact on future appraisals (Foa, 2011).

### ***2.2.3 Diagnostic Considerations***

**DSM-5 versus ICD-10.** While the previous discussions have primarily focused on DSM diagnosis, the DSM is not the only classification system in existence for diagnosing PTSD. The International Classification for Diseases (ICD) is another diagnostic manual published by the World Health Organization as a means of standardizing formal disease diagnoses across all health modalities, not only psychological (Firmin, Pugh, Turkelson, Annecharico, & Sohn, 2015; World Health Organization, 2022). While both systems of classification recognize that the underlying cause of the disorder as being driven by the experience of a traumatic event and the presence of specific symptoms that persist for at least one month after the event, the DSM is more specific in its descriptions of qualifying symptoms (Firmin, Pugh, Turkelson, Annecharico, & Sohn, 2015). The ICD-10 diagnosis of PTSD specifies that a person must have experienced a qualifying traumatic event (similar to those identified in the DSM criteria above), as well as the subsequent symptoms of re-experiencing the traumatic event in vivid memories, dreams, or flashbacks; avoidance of stimuli associated with the trauma or numbing of responsiveness; and increased arousal or anxiety (World Health Organization, 2015). In comparison to the DSM-5, the ICD-10 only includes these three symptom clusters, which have the avoidance/numbing and negative alterations in cognition/mood symptoms combined into one symptom category, similar to the symptom organization in the DSM-IV-TR (American Psychiatric Association, 2000; Firmin, Pugh, Turkelson, Annecharico, & Sohn, 2015; World Health Organization, 2015). Another difference between the two classification systems is the specificity of symptoms



required for diagnosis (Firmin, Pugh, Turkelson, Annecharico, & Sohn, 2015). The DSM-5 has more specific and detailed criteria for each symptom cluster than ICD-10, which can lead to fewer diagnoses due to increased specificity (Firmin, Pugh, Turkelson, Annecharico, & Sohn, 2015). However, the increased specificity of the DSM can also have benefits for the individuals presenting with symptoms of PTSD, as the DSM specifiers for dissociative symptoms allow for more specific treatment targets than the more generic criteria in the ICD-10 (American Psychiatric Association, 2013; Firmin, Pugh, Turkelson, Annecharico, & Sohn, 2015). The DSM-5 also requires a higher number of symptoms from each cluster than ICD-10; for example, DSM-5 requires at least one avoidance symptom (such as avoiding external reminders or distressing memories/thoughts/feelings) as well as two or more negative alterations in cognitions and mood (such as persistent distorted cognitions about the cause or consequences of the trauma, feelings of detachment or estrangement, or persistent inability to experience positive emotions), while ICD-10 only requires one feature of avoidance/numbing (such as avoiding stimuli or numbing responsiveness) (American Psychiatric Association, 2013; Firmin, Pugh, Turkelson, Annecharico, & Sohn, 2015; World Health Organization, 2015).

**Cultural perspectives of trauma.** In addition to the diagnostic criteria used for the two classification systems mentioned, research has shown that diagnostic factors may have distinct cultural aspects as well (Patel & Hall, 2021). A review conducted by Hinton and Lewis-Fernández explored symptoms of PTSD in different cultural contexts (2011). They found that the biologically-driven symptoms, such as autonomic arousal, hypervigilance, and re-experiencing, tended to be more universal across cultures, but emotional and behavioural symptoms showed a wide variability (Hinton & Lewis-Fernández, 2011). The authors suggested that behavioural expressions of traumatic reactions may be culturally mediated, as some responses or actions are

more acceptable within a given culture and are thus more likely to be demonstrated (Hinton & Lewis-Fernández, 2011). While the DSM-5 identifies the potential for cultural variability, and includes a separate semi-structured interview for the evaluation of culture-related diagnostic issues, these are not required for assessment or diagnosis (American Psychiatric Association, 2013). As such, the specificity of the symptom clusters required for diagnosis of PTSD may be more culturally-bound than expected, as trauma reactions across cultures may involve different symptom presentations that are not captured within the language of the DSM criteria (Patel & Hall, 2021).

#### ***2.2.4 Prevalence***

As noted above, traumatic experiences are a common occurrence globally (Koenen, et al., 2017; Van Ameringen, Mancini, Patterson, & Boyle, 2008; de Vries & Olf, 2009), with studies estimating the prevalence of exposure to trauma as high as 70% (Benjet, et al., 2016). Only a proportion of those exposed to traumatic events goes on to develop PTSD (American Psychiatric Association, 2013; Benjet, et al., 2016; Breslau, Peterson, Poisson, Schultz, & Lucia, 2004; Duckers, Alisic, & Brewin, 2016; Tortella-Fellu, et al., 2019; Van Ameringen, Mancini, Patterson, & Boyle, 2008). As such, the development of PTSD is considered a disordered response, since most individuals exposed to a traumatic event do not develop persistent symptoms that merit diagnosis (Brunello, et al., 2001). The rates of PTSD diagnosis following exposure to a traumatic event vary internationally due to a wide range of factors, and estimates of prevalence in North America have ranged from 6 to 9% (Sareen, 2014; Stein, Walker, Hazen, & Forde, 1997). Difference in international rates of PTSD diagnoses have been attributed to availability of resources to provide diagnoses, and may also vary due to cultural differences in the presentation of trauma reactions (Patel & Hall, 2021). As mentioned above, there is some

research suggesting that suffering defined through a Western cultural lens is less likely to be found in other cultural environments that may identify, express, or explain similar symptoms or experiences in a different way (Patel & Hall, 2021). There may also exist some difficulty with the application of PTSD criteria in some countries or communities where ongoing stressors such as conflict, poverty, food insecurity, or the threat of physical or political violence render the endorsement of PTSD criteria less applicable for diagnosis (Patel & Hall, 2021). The experience of such chronic stressors may also reduce the ability of the individual to cope with additional, less intense stressors, and thus relevant symptoms of PTSD may go undiagnosed because the reaction may be towards less traditionally traumatic events (Patel & Hall, 2021). Larger scale studies comparing international rates of PTSD are also challenging because of the differences that exist in the use of diagnostic tools (for example, DSM versus ICD-10) and methodologies (surveys that report diagnoses versus those that use symptom questionnaires to estimate probable diagnoses) (Benjet, et al., 2016). As well, differences in language and culture can produce differences in interpretation of the core concepts of trauma being investigated when comparing rates of PTSD across countries (Duckers, Alisic, & Brewin, 2016; Patel & Hall, 2021).

Additional studies have found that Canada is among the nations with the highest national lifetime rates of PTSD in the general population (Duckers, Alisic, & Brewin, 2016). A study in 2008 using the Canadian Community Health Survey (CCHS) estimated the national lifetime prevalence rate to be 9.2% (Van Ameringen, Mancini, Patterson, & Boyle, 2008). These numbers are similar to recent findings from the Survey on Mental Health and Stressful Events (SMHSE) conducted from August to December 2021 (Statistics Canada, 2022). Researchers conducted a telephone sample of Canadians across the 10 provinces and found that 8% of the survey respondents met criteria for PTSD based on their self-report of experienced symptoms

within the previous month, though only 5% of respondents reported having received a diagnosis of PTSD from a mental health professional (Statistics Canada, 2022). Of note, the sampling procedure for this survey excluded individuals living on reserves, in institutions, and those living in the territories, but did not specifically exclude those full-time members of the Canadian Forces (Statistics Canada, 2022). Given that the history of the disorder was driven by research involving individuals returning from service in the military, primarily in the United States, it is important to recognize the presence or absence of military personnel in such large-scale sampling. Much of our knowledge of the disorder comes through research from the United States, and despite cultural similarities, Canada has notable differences that can limit generalizability (Van Ameringen, Mancini, Patterson, & Boyle, 2008). For example, Canada has a smaller military than the US, even after accounting for the difference in population, and experiences lower rates of violent crime (Van Ameringen, Mancini, Patterson, & Boyle, 2008). However, in their comparison of prevalence rates of PTSD across countries, the data from Duckers, Alisic, and Brewin's (2016) study showed that Canada still had a higher rate of PTSD diagnoses than the United States.

### ***2.2.5 Risk Factors***

Given that only a proportion of individuals who experience a traumatic event go on to develop PTSD, previous research has sought to identify pre-traumatic risk factors to help identify individuals who may be at greater risk of developing the disorder following exposure to a traumatic event (Brewin, Andrews, & Valentine, 2000; Duckers, Alisic, & Brewin, 2016; Holeva, Tarrier, & Wells, 2001; Ozer, Best, Lipsey, & Weiss, 2003; Perrin, et al., 2014; Tortella-Fellu, et al., 2019; Van Ameringen, Mancini, Patterson, & Boyle, 2008).

**Gender.** Gender is commonly identified as a risk factor related to development of PTSD, with studies showing that individuals with PTSD diagnoses following traumatic event exposure are often women (Atwoli, Stein, Koenen, & McLaughlin, 2015; Breslau, Peterson, Poisson, Schultz, & Lucia, 2004; Lilly, Pole, Best, Metzler, & Marmar, 2009; Olf, Langeland, Draijer, & Gersons, 2007; Olf, 2017; Sareen, 2014; Tortella-Fellu, et al., 2019). Olf and colleagues (2007) suggested a number of possibilities for such a gender difference, including the possibility that women in community samples may endure different types of trauma, or may feel a greater sense of a loss of control as a result of the exposure. The researchers noted that the increased risks of PTSD in women did not appear to be due to a difference in rates of exposure to traumatic events, as men were more likely to be exposed to trauma than women (Olf, Langeland, Draijer, & Gersons, 2007). They reported that women have higher rates of exposure to specific types of traumas, such as interpersonal assaults, which have been shown to be more likely to lead to PTSD (Bryant, 2019; Creamer, Burgess, & McFarlane, 2001; Foa, Stein, & McFarlane, 2006; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Liu, et al., 2017; Olf, 2017; Olf, Langeland, Draijer, & Gersons, 2007). This is similar to the findings of the recent Canadian SMHSE survey, wherein the most frequent traumatic event reported by respondents was sexual assault (14%) among those who met probable criteria for PTSD based on their reported symptoms (Statistics Canada, 2022). However, exposure to specific traumas does not seem to fully account for the observed gender effect (Foa, Stein, & McFarlane, 2006; Olf, 2017; Olf, Langeland, Draijer, & Gersons, 2007; Tolin & Foa, 2006). A meta-analysis conducted by Tolin and Foa (2006) explored sex differences in the susceptibility to PTSD across a number of potential risk factors. The researchers looked at differences in PTSD diagnoses between males and females within specific types of traumatic events. Their analysis also found that sex

differences existed in the likelihood of experiencing certain types of trauma; men were more likely to have experienced accidents, nonsexual assault, witnessing death or severe injury, combat, or disaster, while women were more likely to experience sexual assault or child sexual abuse. However, their review found that within each specific type of traumatic event women appeared to exhibit greater rates of PTSD than men (Tolin & Foa, 2006). Tortella-Feliu et al. (2019) conducted an umbrella review of meta-analyses examining risk factors for the development of PTSD. They found that gender, as well as identifying as indigenous (specifically in North America), was a significant pre-traumatic risk factor for the development of PTSD after exposure to trauma in their review (Tortella-Fellu, et al., 2019).

An experimental study conducted by Inslicht et al. (2012) examined gender differences in conditioned fear responses in individuals diagnosed with PTSD. The researchers presented participants with PTSD diagnoses with visual stimuli that were either paired or not paired with an electrical shock as an aversive stimulus and measured their skin conductance levels, a measure of sweat activity that is often used as a measure of fear-based physiological response. They found that women with PTSD diagnoses demonstrated greater fear conditioning than men, meaning that they acquired the conditioned fear response more quickly (Inslicht, et al., 2012). Attempting to find potential drivers behind these observed differences, a study by Christiansen and Hansen (2015) examined the impact of a number of pre-, peri-, and post-traumatic risk factors more commonly seen in females on PTSD symptom severity using a mediation model. The researchers proposed that the gender differences in PTSD severity were mediated by differences in a combination of associated risk factors. Their study examined a cohort of bank employees exposed to bank robberies and included questionnaire surveys both a week and six months after the event. Participants were asked to identify whether they experienced intense

emotional responses of fear, horror, or helplessness during the event, measured the intensity of their PTSD symptoms using a trauma questionnaire, and completed the Posttraumatic Cognition Inventory, a questionnaire assessing self-blame and negative cognitions about the self and the world (Beck, et al., 2004). Their analysis found that “peritraumatic fear, horror, and helplessness” and “negative posttraumatic cognitions related to self and the world,” (e.g. “I can't rely on myself;” “Nothing good can happen to me anymore;” “The world is a dangerous place”) both variables that presented significantly more often in females, emerged as specific risk factors that explained significant portion of the variance in the mediation model (Christiansen & Hansen, 2015).

Interestingly, Brewin, Andrews, and Valentine (2000) conducted a meta-analysis of studies of individuals exposed to trauma in adulthood and found that this gender effect was observed in civilian-based studies but was not present among combat-specific populations. While the authors did not provide a specific hypothesis for this distinction, they speculated that male veterans may have simply had greater exposure to traumatic situations, and the increased exposure may have offset the traditional gender differences in these studies (Brewin, Andrews, & Valentine, 2000); it is also possible that the relevant exposure to trauma among military populations is more uniform, and that the aforementioned heterogeneity among types of trauma in community samples may disproportionately or differentially affect women (Olf, Langeland, Draijer, & Gersons, 2007; Street, Gradus, Giasson, Vogt, & Resick, 2013). Accordingly, a study by Lilly et al. (2009) also sought to explore why the observed gender differences in PTSD rates or symptom severity are not seen in military and police studies. Previous research has shown that female police officers may be less likely to differ from their male counterparts in a number of pre- or peritraumatic factors, including self-ratings of social desirability, PTSD symptoms,

exposure to critical incidents, or peritraumatic dissociation (Pole, et al., 2001). Lilly et al. (2009) compared female police officers to civilian women in terms of their responses to traumatic events to explore whether the gender effect was diminished when comparing a population of women who resemble men in these particular factors (Lilly, Pole, Best, Metzler, & Marmar, 2009). They found that the female police officers reported a higher number of assaultive and traumatic events, but that the civilian group reported more frequent PTSD symptoms with higher severity. The authors posited that the between-gender differences in rates of PTSD may be a result of gender differences in the experienced intensity of emotions. The researchers suggested that civilian women were more likely to experience peritraumatic dissociation symptoms (such as altered time perception, disorientation, depersonalization, or derealization), and highlighted that an increased risk of experiencing dissociation symptoms subsequently increases one's risk of developing PTSD (Lilly, Pole, Best, Metzler, & Marmar, 2009; Ozer, Best, Lipsey, & Weiss, 2003). As well, Lilly et al. (2009) suggested that the training these groups have gone through may help to reduce the intensity of the emotional experiences surrounding combat- or service-related traumatic events, and the women in these groups subsequently experience less peritraumatic distress and smaller gender differences in PTSD expression.

**Previous exposure to trauma.** Another frequently identified risk factor is previous exposure to a traumatic event, both for subsequent exposure to traumatic events and the development of PTSD (Benjet, et al., 2016; Breslau, Davis, & Andreski, 1995; Breslau, Peterson, Poisson, Schultz, & Lucia, 2004; Breslau, Peterson, & Schultz, 2008). Breslau, Davis, and Andreski (1995) conducted a study wherein they explored a set of prospective risk factors for exposure to traumatic events in an urban setting in an initial survey and conducted follow-up interviews three years later to better evaluate the impact of said risk factors. These factors had



been identified in a retrospective study, and consisted of sex, race, education, personality traits, family history of psychiatric problems, and a baseline history of past exposure to trauma. The authors sought to evaluate them in a prospective study to reduce the likelihood that the measurement of the factors (specifically education and personality traits) would not be confounded by the effects of the trauma. They found that childhood exposure to trauma was a predictor of exposure to subsequent trauma, and that the effect of this early exposure as a risk factor occurred independently of the set of other risk factors (Breslau, Davis, & Andreski, 1995). Benjet et al. (2016) conducted a review of World Mental Health (WMH) surveys to further examine the prevalence of traumatic events and identify potential risk factors. The WMH surveys are a set of evaluative epidemiological surveys that were developed by the World Health Organization to better analyze mental health and disorder prevalence worldwide using uniform measurements to form comparable data sets (Harvard Medical School Department of Health Care Policy, 2005). The authors sought to explore the prevalence of exposure to traumatic events worldwide and whether exposure to specific types of traumatic events were related to increased risk of subsequent exposure (Benjet, et al., 2016). Their study indicated that over 70% of respondents, across 24 countries, had experienced at least one traumatic event in their lifetime, and the experience of a traumatic event was associated with subsequent exposures (Benjet, et al., 2016). Of the different types of traumatic events they examined, they found that exposure to interpersonal violence held the strongest association with subsequent exposures (Benjet, et al., 2016). The authors stated that such revictimization could occur because those previously exposed to trauma are more likely to be identified by perpetrators due to being more psychologically vulnerable (lower self-esteem, less assertive, or more socially isolated), thus leading to a selection bias for revictimization (Benjet, et al., 2016; Grauerholz, 2000). The

authors suggested that this group may be more exposed to risky environments because of subsequent behaviour changes as well, such as alcohol use, which increase the risk of vehicle accidents and assaults (Benjet, et al., 2016; Foran & O'Leary, 2008). They could also be more likely to be exposed to subsequent traumas because of the nature of their environment, as those living in conflict zones are more exposed to unexpected death of loved ones or exposure to dead bodies, and those in high-crime areas may be more likely to be the victim of assaults or muggings (Benjet, et al., 2016).

**Socioeconomic factors.** Other studies have found that socioeconomic factors such as marriage, household income, and education have served as pretraumatic risk factors (Atwoli, Stein, Koenen, & McLaughlin, 2015; Benjet, et al., 2016; Breslau, Davis, & Andreski, 1995; Breslau, Peterson, Poisson, Schultz, & Lucia, 2004; Brewin, Andrews, & Valentine, 2000; Contractor, et al., 2015). For example, Atwoli et al. (2015) examined WMH survey data to allow for evaluation of a broad range of risk factors, traumatic events, and outcomes of traumatic event exposure across countries. They found significant variation in the relationships between socioeconomic risk factors and traumatic event exposure between countries, but that individuals with lower education and lower income were more likely to experience trauma exposure in countries with lower overall traumatic event exposure rates (as opposed to low-income or postconflict countries like South Africa, where the high prevalence rates of traumatic events reduced the impact of such differences) (Atwoli, Stein, Koenen, & McLaughlin, 2015). The Breslau, Davis, and Andreski (1995) study described above also found that those with lower levels of education were more likely to be exposed to traumatic events. In a review of the literature, Hatch and Dohrenwend (2007) conducted a thorough review of the literature on the demographic distribution of risks of exposure to traumatic events to identify potential groups that

could benefit from proactive intervention after exposure to trauma. The authors found that research has consistently identified low income, low education, and low occupational status groups are more likely to be exposed to traumatic events regardless of type. They suggested that low SES may be a risk factor for the frequency of exposure to traumatic life events due, at least in part, to the reduced availability of resources and opportunities (Hatch & Dohrenwend, 2007). In contrast to the Hatch and Dohrenwend study, the Benjet et al. (2016) study discussed above found that the relationship between education and traumatic event exposure varied by the type of traumatic event. Those with lower education were more likely to be exposed to interpersonal violence or to cause or witness bodily harm, which the authors suggested may be related to the increased likelihood of military service, whereas those with higher education were more likely to experience vehicular accidents and sexual assaults (Benjet, et al., 2016). This study also identified marriage status as a protective factor and surmised that individuals who are married may be less likely to be exposed to traumatic events due to the decreased alone time outside the home and increased likelihood of having higher income and thus fewer life stressors. Kim et al. (2022) also examined the impacts of SES on both PTSD and cardiovascular disease and explored whether SES served as a modifier for the relationship between PTSD and cardiovascular outcome. Their study used a national longitudinal database to obtain information on medical service utility, and identified participant cases through insurance claims by identifying the relevant ICD-10 codes. The study identified 53,749 individuals with at least one record of PTSD diagnosis for their analytic sample, and their results showed that the association between PTSD and cardiovascular disease was stronger in the groups with lower insurance premiums. Kim et al. (2022) suggested that individuals in higher SES brackets may be more able to access proper treatments, coping strategies, or resources, and that in contrast those in lower SES brackets were

less able to access proper resources and thus were more exposed to adverse effects of both PTSD and their health conditions.

### ***2.2.6 Impacts of PTSD***

PTSD has long been associated with significant functional impairment (Sareen, et al., 2007; Stein, Walker, Hazen, & Forde, 1997; Taft, et al., 2011). McFarlane (2010) reported that individuals with PTSD are more prone to experience progressive dysfunction as a result of the physiological changes associated with PTSD, in that they become more likely to show increasingly intense responses to a wider range of stimuli over time. As discussed above, studies have also shown that a diagnosis of PTSD increases one's likelihood of exposure to a subsequent trauma (Breslau, Peterson, & Schultz, 2008; McFarlane, 2010). With this increased exposure comes a further increased likelihood of disability (Breslau, Peterson, & Schultz, 2008; Farr, et al., 2015). Individuals with PTSD are more likely to experience significant difficulties with a number of facets of daily life, including physical health issues (Farr, et al., 2015; McFarlane, 2010; Scott, et al., 2013), employment issues (Smith, Schnurr, & Rosenheck, 2005), and intimate relationships (Taft, et al., 2011; Sprague & Olf, 2014). More recent literature continues to support these findings, including a meta-analysis conducted by Jellestad et al. (2021) that indicated significant impairments across most areas of daily functioning for individuals with PTSD when compared to those without a diagnosis.

**Health Outcomes.** A cross-sectional and longitudinal study of adults in the Boston area was conducted by Farr et al. (2015) to examine the impact of early life adversity (such as abuse or neglect) and PTSD severity on multiple health outcomes. The researchers recruited 158 participants to form a representative sample of the general population and were able to follow up with 55 for the longitudinal component 2.5 years later. They found that PTSD severity scores

were significantly correlated with a number of health-related variables associated with poorer physical health, such as Body Mass Index, obesity, and insulin resistance. The researchers also identified PTSD symptom severity continued to be significantly related to the poorer physical health of subjects upon follow-up (Farr, et al., 2015). As discussed above, Kim et al. (2022) also examined the relationships between PTSD and cardiovascular disease, socioeconomic status and found that individuals with PTSD diagnoses had increased risk of cardiovascular disease and related mortality (Kim, Tsai, Sumner, & Jung, 2022). Previously mentioned research by Atwoli et al. (2015) also indicated that PTSD is associated with significant impacts on the quality of life of those afflicted, which can lead to increased burden on healthcare and other community services (Atwoli, Stein, Koenen, & McLaughlin, 2015; McFarlane, 2010). As well, numerous studies have found specific neurological changes in individuals with PTSD diagnoses, including reduced hippocampal volume and increased sensitivity of the limbic system and amygdala, indicating that the experience of trauma and development of PTSD leads to physical neurological changes in the brain (Brunello, et al., 2001). As these structures are directly involved in emotional processing, this increased sensitivity may lead to heightened emotional responses and difficulties regulating emotions, as well as contributing to exaggerated responses to potential threats or triggers (Ramel, et al., 2007). In addition, Sareen et al. (2005) used data from the US National Comorbidity Survey to examine the associations between each of the anxiety disorder diagnoses and suicidal ideation. They found that PTSD was the only anxiety disorder associated with suicidal ideation and suicide attempts (Sareen, Houlihan, Cox, & Asmundson, 2005).

**Employment.** Research has shown that individuals with PTSD diagnoses have a lower probability of employment (Smith, Schnurr, & Rosenheck, 2005; Sripada, et al., 2018). Mueser et al. (2004) examined the impact of PTSD comorbidity on work outcomes in individuals with

comorbid mental illnesses. The study included 174 participants with significant mental illnesses, 28 of whom also had diagnoses of PTSD, who completed a two-year vocational rehabilitation program. They found that those with PTSD experienced poorer employment outcomes than those without a diagnosis even when participating in supportive programs (Mueser, Essock, Haines, Wolfe, & Xie, 2004). The authors suggested that individuals with PTSD may experience increased levels of distress which interfere with their ability to participate in the programs themselves, as well as the ability to retain employment once they are even able to obtain it (Mueser, Essock, Haines, Wolfe, & Xie, 2004). Such difficulties with maintaining employment can be compounded when the traumatic event(s) occur in the context of the sufferer's work-related duties. Stergiopoulos et al. (2011) conducted a systemic review of studies examining individuals with work-acquired PTSD diagnoses, and found that those who did not return to work in this population were less likely to respond to interventions, and highlighted that, considering PTSD symptoms involve avoidance of the triggering environment, psychotherapy-based interventions that are centered in the workplace itself may be more effective at reducing symptoms and thus improving employment outcomes for those with work-related PTSD (Mueser, Essock, Haines, Wolfe, & Xie, 2004). Smith, Schnurr, and Rosenheck (2005) investigated whether the employment outcomes of individuals with PTSD showed any relation to symptom severity. The authors looked at 325 participants in US Department of Veterans Affairs programs for treatment of PTSD and their reported employment and income status. The researchers examined whether treatment that produced a reduction in symptom severity without ameliorating the disorder conferred any changes in individuals' employment outcomes, and found that a clinically relevant reduction in PTSD symptoms was associated with an increase in the probability of employment (Smith, Schnurr, & Rosenheck, 2005). This suggests that while

PTSD can have a significant impact on an individual's employment status, reduction in symptoms can lead to incremental gains in employment functioning even if the disorder itself is not completely alleviated (Smith, Schnurr, & Rosenheck, 2005).

### **2.3 PTSD and Comorbid Disorders**

While PTSD can be debilitating on its own, studies have found that the level of impairment is exacerbated by the presence of comorbid disorders (Green, et al., 2006; Müller, et al., 2014; Qassem, Aly-ElGabry, Alzarouni, Abdel-Aziz, & Arnone, 2021). A study conducted by Galatzer-Levy, Nickerson, Litz, and Marmar (2013) used Latent Class Analysis to investigate disorder clusters and relative symptom severity. The authors found that, among individuals with PTSD and comorbid mood, anxiety, and substance abuse disorders, the rates of suicidal ideation were over two times as high as those who met criteria for PTSD alone (Galatzer-Levy, Nickerson, Litz, & Marmar, 2013). However, Sareen et al. (2005) also examined the lifetime incidence of anxiety disorders as independent variables predicting suicidal ideation and suicide attempts in a community sample. The researchers found that meeting lifetime criteria for a diagnosis of PTSD was the only anxiety disorder that was uniquely associated with participants' reports of lifetime suicidal ideation and suicide attempts, and this association was maintained even after controlling for comorbid mood disorders (Sareen, Houlahan, Cox, & Asmundson, 2005). The increased risk of suicidality seen in individuals with PTSD and comorbid psychological disorders also appears to persist even when controlling for the impact of the comorbid disorders themselves (Krysinska & Lester, 2010).

#### ***2.3.1 PTSD and Major Depressive Disorder***

While some symptom overlap exists between the diagnoses of Major Depressive Disorder (MDD; See Appendix D) and PTSD (Contractor, et al., 2015; Müller, et al., 2014;

Spitzer, First, & Wakefield, 2006), the two remain discrete disorders with different etiologies (American Psychiatric Association, 2013). Notably, while a diagnosis of MDD may follow a traumatic event, the diagnosis should not be made if the individual presents with intrusion symptoms or persistent avoidance of the stimuli associated with the traumatic event (Criteria B or C). As well, even though MDD involves alterations in mood, changes in arousal, or markedly diminished interest in activities, in PTSD the symptoms are specifically related to the traumatic event (American Psychiatric Association, 2013). Previous studies have identified significant comorbidity between the two disorders. Campbell and colleagues (2007) examined the prevalence of probable PTSD diagnoses among individuals who had accessed Veterans' Affairs clinics for depression. Using computer-assisted telephone interviewing, the researchers identified a sample of patients that met criteria for depression using a symptom screening tool and examined characteristics of those who met criteria for depression alone compared to those who also met criteria for PTSD (Campbell, et al., 2007). They found that 36% of their respondents met criteria for comorbid PTSD, and that the respondents who met the screener criteria for PTSD showed more severe symptoms of depression, as well as increased outpatient health care visits for emotional issues (Campbell, et al., 2007). Other studies have examined the longitudinal association between PTSD and MDD in urban neighbourhoods in Detroit (Horesh, Lowe, Galea, Uddin, & Koenen, 2015; Horesh, et al., 2017). In 2015, Horesh et al. examined longitudinal relationships between specific PTSD symptom clusters and MDD using the large-scale Detroit Neighborhood Health Study, which involved telephone assessments of Detroit-area residents across three time points, each one year apart. The researchers found that PTSD hyperarousal symptoms were the most consistently associated with MDD, and that all symptoms showed associations over time (Horesh, Lowe, Galea, Uddin, & Koenen, 2015). A meta-analysis



conducted by Gootzeit and Markon (2011) suggested that some of the relationship between PTSD and MDD may be related to overlap in the symptom criteria of both disorders, with some of the variance of the depressive symptoms mapping onto that of the emotional numbing criteria of PTSD. They found that the symptom descriptions of alterations in mood existed within both diagnoses, this particular symptom cluster accounted for a large component of the overlap between the two diagnoses, while the avoidance and re-experiencing symptoms remained exclusive to PTSD (Gootzeit & Markon, 2011). Price and van Stolck-Cooke (2015) also examined the symptoms of MDD, PTSD, and Generalized Anxiety Disorder (GAD) to explore interrelations and distinctions between them with factor analysis. They found that the hyperarousal symptoms of PTSD were associated with somatic symptoms of MDD, and suggested that the symptoms of irritability, difficulty concentrating, and sleep disruption may be representative of a general negative affective response factor that applies to the presence of any of the disorders (Price & van Stolck-Cooke, 2015).

PTSD may also serve as a risk factor for subsequent onset of MDD (Horesh, et al., 2017; Post, Zoellner, Youngstrom, & Feeny, 2011). Horesh et al. (2017) explored long-term associations between PTSD and MDD symptoms using the same data set from the Detroit Neighborhood Health Study data described above, and found that diagnosis of either disorder at the earliest time period served as a risk factor for the diagnosis of the other at subsequent follow-ups (Horesh, et al., 2017). Qassem and colleagues (2021) recently looked at the prevalence of PTSD and comorbidities in a community sample in England. The researchers examined data from the Adult Psychiatric Morbidity Survey, a large population study that surveyed a representative sample of 7403 residents in the United Kingdom. They found that MDD was the most common PTSD comorbidity, and that increasing MDD symptom severity

was associated with the likelihood of a probable PTSD diagnosis (Qassem, Aly-ElGabry, Alzarouni, Abdel-Aziz, & Arnone, 2021). Previous research has also shown that individuals with comorbid MDD and PTSD tend to have an increased risk of suicide and greater functional impairment (Green, et al., 2006; Post, Zoellner, Youngstrom, & Feeny, 2011). Green et al. (2006) examined women recruited for a MDD treatment study and were followed for one year after. A total of 267 participants were studied, and 91 of them were diagnosed with PTSD. The PTSD population demonstrated lower baseline functioning and remained more impaired than the non-PTSD group at the conclusion of the study, despite demonstrating improvement of MDD symptoms through treatment. The PTSD group also showed reduced social and physical functioning at both baseline and follow-up (Green, et al., 2006).

### ***2.3.2 PTSD and Bipolar Disorder***

Bipolar Disorder (BD) is another illness that shows some symptom overlap with PTSD (See Appendix F), with an estimated lifetime prevalence of 0.6-0.8% for BDI and 0.8-1.1% for BDII (American Psychiatric Association, 2013; Merikangas, et al., 2007). As with MDD, BD symptom overlap with PTSD primarily surrounding the mood disturbances and changes in sleep patterns, as well as the aforementioned overlap between PTSD and symptoms of a Major Depressive Episode (American Psychiatric Association, 2013). For differential diagnosis of the two disorders, it is important to assess whether the symptoms are episodic experiences or cyclical patterns, as well as whether details related to a traumatic event appear to function as a specific trigger for any of the related symptoms (American Psychiatric Association, 2013). Despite the relatively low frequency of individuals diagnosed with BD, the disorder accounts for significant health care-related costs, especially for those with BDI (Fan, et al., 2020; Merikangas, et al., 2007; Otto, et al., 2004; Simon, et al., 2021). For example, Simon et al. (2021) conducted a

study following a cohort of 91 individuals diagnosed with BD to estimate the costs and economic burden associated with the diagnosis, and found that, based on the health care costs and productivity losses associated with the disorder, the population-level economic burden to the UK was approximately £6.43 billion for 2018–2019 despite a prevalence rate of 0.8% (Simon, et al., 2021). While studies have shown significant associations between PTSD and BD, including a reported lifetime comorbidity rate as high as 16-40%, there is limited exploration of the relative challenges faced for those who present with comorbid PTSD and BD (Carter, et al., 2017; Fan, et al., 2020; Merikangas, et al., 2007; Quarantini, et al., 2010). Some studies have shown that individuals diagnosed with PTSD and comorbid BDI tend to experience more severe symptoms of BDI and for a longer duration (Fan, et al., 2020; Quarantini, et al., 2010). Quarantini et al. (2010) examined a sample of 355 individuals with BDI seeking treatment to determine if those with comorbid PTSD demonstrated increased risk of suicide, more rapid cycling of their BDI symptoms, and whether the PTSD diagnosis more significantly impacted their scores on a quality of life measure. They found that those with comorbid PTSD reported a lower quality of life, were more likely to have BDI symptoms qualify as rapid cycling, and had higher rates of suicide attempts. The authors noted these differences were specific to PTSD diagnoses, as they also included a measure of trauma history and found differences did not exist due to exposure to traumatic events alone (Quarantini, et al., 2010). Fan et al. (2020) specifically examined suicide risk factors among individuals diagnosed with both PTSD and BD, noting that suicide-related events were more common among individuals with both diagnoses. Carter and colleagues (2017) examined the association between PTSD and BD relating to suicidal ideation and risk as well, noting the possibility that PTSD may go underdiagnosed in the BD population. Similarly to Fan et al., Carter and colleagues (2017) also found that individuals with PTSD and comorbid BDI

were at even higher risk for suicide than those without a PTSD diagnosis, while those with BDII did not demonstrate the same difference. As such, the importance of proper evaluation and diagnosis of PTSD for individuals with BD can not be understated (Carter, et al., 2017; Dilsaver, Benazzi, Akiskal, & Akiskal, 2007; Otto, et al., 2004).

### ***2.3.3 PTSD and Generalized Anxiety Disorder***

Compared to other comorbidities, the association between PTSD and Generalized Anxiety Disorder (GAD) has received relatively little attention in the research (Price & van Stolck-Cooke, 2015). This is despite their significant comorbidity (Contractor, et al., 2015; Grant, Beck, Marques, Palyo, & Clapp, 2008; Kessler, Chiu, Demler, & Walters, 2005). Previous research has indicated that the comorbidity could be related to symptom overlap between the two diagnoses (Contractor, et al., 2015); indeed, both PTSD and GAD were characterized as anxiety disorders in the DSM-IV-TR (American Psychiatric Association, 2013). However, studies have found that both PTSD and GAD are potential discrete responses to traumatic events and can develop as independent diagnoses (Ayazi, Lien, Eide, Swartz, & Hauff, 2014; Grant, Beck, Marques, Palyo, & Clapp, 2008). Grant et al (2008) used confirmatory factor analysis to explore participants' symptom overlap between PTSD, GAD, and MDD following a serious motor vehicle accident. They tested a number of structural models to better explore their interrelations, and found that each of the three disorders were distinguishable from each other, though a higher-order 'Dysphoria' factor also appeared to account for some of the variance across each of the three (Grant, Beck, Marques, Palyo, & Clapp, 2008). Ayazi et al. (2014) examined the prevalence of anxiety disorders in a post-conflict setting to identify relationships between anxiety diagnoses and exposure to traumatic events. The researchers found that, among individuals with trauma exposure, those who were socio-economically disadvantaged were more likely to meet

criteria for a GAD-only diagnosis, as opposed to PTSD (Ayazi, Lien, Eide, Swartz, & Hauff, 2014). Previous research has also found that both PTSD and GAD serve as unique predictors of suicidal ideation among respondents to the National Comorbidity Survey in the US (Coughe, Keough, Riccardi, & Sachs-Ericsson, 2009; Sareen, Houlahan, Cox, & Asmundson, 2005).

#### ***2.3.4 PTSD and Substance Use***

Research has consistently found a link between PTSD diagnoses and substance use disorders (Atwoli, Stein, Koenen, & McLaughlin, 2015; Breslau, Davis, & Schultz, 2003; Fetzner, McMillan, Sareen, & Asmundson, 2011; Grant, et al., 2015; Jacobsen, Southwick, & Kosten, 2001; Khoury, Tang, Bradley, Cubells, & Ressler, 2010; Mills, Teesson, Ross, & Peters, 2006; Reynolds, et al., 2005). As well, individuals with a history of exposure to traumatic events, regardless of whether they meet the diagnostic criteria for PTSD, are also more likely to meet criteria for alcohol use disorders or other substance use disorders (Fergusson, McLeod, & Horwood, 2013; Fetzner, McMillan, Sareen, & Asmundson, 2011; Khoury, Tang, Bradley, Cubells, & Ressler, 2010). A common hypothesized explanation for this association is the use of alcohol or other substances as a form of self-medication to manage PTSD symptoms (Fetzner, McMillan, Sareen, & Asmundson, 2011; Jacobsen, Southwick, & Kosten, 2001). Given that avoidance is a required criterion for PTSD, the use of substances can be seen as a type of avoidance behaviour by helping to distance oneself from the reminders of the traumatic event (Ishikawa, et al., 2022). However, other studies have examined the potential for those with alcohol use disorders to engage in other high-risk behaviours, which would increase the risk of further traumatization (Fetzner, McMillan, Sareen, & Asmundson, 2011; O'Hare, Shen, & Sherrer, 2010).

**PTSD and Alcohol Use.** Individuals presenting with PTSD often demonstrate problematic alcohol use behaviours, with estimates ranging as high as 50% in some studies (Hawn, Cusack, & Amstadter, 2020; Mills, Teesson, Ross, & Peters, 2006). Blanco et al. (2013) examined the prevalence of PTSD and Alcohol Use Disorder (AUD), as well as their relationships with sociodemographic variables, potential risk factors, and treatment seeking in a representative sample of US citizens through the National Epidemiologic Survey on Alcohol and Related Conditions. The researchers found that those with comorbid AUD and PTSD were more likely to be male, have experienced childhood adversities (such as neglect and verbal, physical, or sexual abuse), higher rates of suicide attempts, and meet more PTSD criteria than those with PTSD alone. In contrast, compared with those with AUD alone, those with comorbid AUD and PTSD were more likely to be women and meet more AUD criteria (Blanco, et al., 2013). One common difficulty in estimating the prevalence of alcohol use disorders is that the true number of individuals who meet criteria are harder to estimate, as they may be less likely to seek treatment (Norman, et al., 2018). Norman et al. (2018) conducted a study examining US military veterans in a community sample, as opposed to the treatment-seeking samples most often used with studies involving military veterans. The authors used data from the National Health and Resilience in Veterans Study, a nationally representative sample of US veterans living in the community. They found that individuals with comorbid PTSD and alcohol use disorders were more than three times more likely to have attempted suicide than those with PTSD who did not meet criteria for alcohol use disorder, and those with comorbid PTSD and alcohol use disorder were also more likely to have attempted suicide, more likely to also meet criteria for MDD or GAD, and scored lower on measures of quality of life than those with alcohol use disorder alone (Norman, et al., 2018). Husky, Mazure, and Kovess-Masfety (2018) examined data from the

WMH population survey conducted in France to determine gender specific differences in PTSD comorbidities. They found that men were more likely to have comorbid alcohol abuse than women in both the PTSD and non-PTSD samples (Husky, Mazure, & Kovess-Masfety, 2018).

**PTSD and Cannabis Use.** Cannabis is another substance that has been identified in the literature whose use by individuals with PTSD is common (Cogle, Bonn-Miller, Vujanovic, Zvolensky, & Hawkins, 2011; Lake, et al., 2020). Cannabis use in individuals with PTSD has been linked to heavier and more problematic usage, with greater usage being linked to higher symptom scores (Bonn-Miller, Babson, & Vandrey, 2014; Gentes, et al., 2016). In a large-scale review of cannabis usage, Gentes et al. (2016) examined 719 veterans accessing PTSD treatment and found that cannabis usage within the previous six months was associated with increased PTSD symptom severity, depressive symptom severity, and increased suicidality. As the study was cross-sectional, the authors were not able to determine any causal relationships between cannabis use and symptom severity (Gentes, et al., 2016). Some evidence exists as to the potential utility of cannabis use. A study by Bonn-Miller et al. (2021) examined the potential utility of cannabis and its principal psychoactive components, THC and CBD, on the reduction of PTSD symptoms. The authors assigned 80 participants to treatment for three weeks in one of 4 experimental groups (primarily THC, primarily CBD, combination THC and CBD, or placebo), and then after a two-week washout period randomly assigned them to one of the remaining three groups. They found an overall reduction in PTSD symptoms for all participants, but that no particular experimental group outperformed placebo (Bonn-Miller, et al., 2021). The authors suggested that the findings may suggest that cannabis use in this case was not deleterious, and that further research may be useful to identify if particular preparations are more beneficial, or at least less harmful, considering the increased use among individuals with PTSD

(Bonn-Miller, et al., 2021). In contrast, Boden et al. (2013) conducted a study examining characteristics of the cannabis use of 94 veterans with cannabis dependency issues prior to their attempts to cease usage. They found that participants with PTSD endorsed using cannabis to cope with their symptoms, and were more likely to experience cravings and more severe cannabis withdrawal upon cessation (Boden, Babson, Vujanovic, Short, & Bonn-Miller, 2013).

**PTSD and Other Illicit Substance Use.** PTSD has long been associated with problematic substance use (Najavits, Krinsley, Waring, Gallagher, & Skidmore, 2018). While a great deal of research has been conducted regarding problematic alcohol and cannabis use, studies have found that individuals with PTSD also use other substances at higher rates than those without PTSD (Mills, 2013; Mills, Teesson, Ross, & Peters, 2006). A longitudinal study conducted by Breslau, Davis, and Schultz (2003) followed a cohort of young adults over a 10-year period to examine the relationship between traumatic exposure, PTSD, and subsequent substance use. They found that while those who developed PTSD as a result of trauma exposure were more likely to go on to experience other substance use disorders, neither PTSD diagnosis nor trauma exposure served as a predictor for alcohol use or dependence (Breslau, Davis, & Schultz, 2003). However, their study did not find that exposure to trauma alone was a predictor for substance use or dependence, suggesting that the manifestation of PTSD symptoms as a response to the traumatic event is the key factor related to comorbidity. The authors also postulated that another shared risk factor could underlie the association between both substance use and exposure to traumatic events, such as familial influence, personality traits, family history of antisocial behaviour, or early conduct problems (Breslau, Davis, & Schultz, 2003).

Interestingly, Breslau, Peterson, and Schultz (2008), using longitudinal data, did not demonstrate



an association between having a substance use disorder (as a pretraumatic risk factor) and subsequent exposure to traumatic events.

## **2.4 Current study**

Numerous studies have found that comorbidity is quite common with diagnoses of PTSD (Breslau, Davis, Andreski, & Peterson, 1991; Breslau, Davis, Peterson, & Schultz, 2000; Brunello, et al., 2001; O'Donnell, Creamer, & Pattison, 2004; Sareen, 2014; Tortella-Fellu, et al., 2019). However, many of these studies focus on individuals with combat experience or operational stress injuries, and their findings are thus based on clinical samples (Tortella-Fellu, et al., 2019). According to the American Psychiatric Association, individuals with PTSD diagnoses are 80% more likely than those without PTSD to have symptoms that meet diagnostic criteria for at least one other mental disorder (2013). As well, individuals with comorbid conditions are more likely to present to treatment facilities, and as such studies that use samples from these populations may overestimate the level of comorbidity in a community-based sample (Grant, Beck, Marques, Palyo, & Clapp, 2008). The current study aims to estimate the prevalence of PTSD in a nationally representative community sample of Canadian adults that does not include individuals in the military or those who are incarcerated, with the intent of identifying the complexity and magnitude of issues facing individuals with PTSD diagnoses. The study will also compare the rates of other psychiatric diagnoses in individuals with PTSD to those observed in an age- and gender-matched sample who did not report having a PTSD diagnosis. The study will also examine gender differences in demographics and comorbid disorders within the PTSD sample. It is expected that the PTSD group will show higher levels of comorbid psychopathology, lower income levels, poorer relationship outcomes, and higher levels of substance use and suicidal ideation than those who did not report the diagnosis. It is also

anticipated that women in the PTSD group will show higher rates of comorbid psychopathology for most disorders, in line with previous research, with men being more likely to present with comorbid substance use disorders.

## Chapter 3: Methods

### 3.1 Participants

Data for the current study were obtained from the Statistics Canada Canadian Community Health Survey of Mental Health (CCHS-MH) (Statistics Canada, 2013). The CCHS-MH is a national survey that samples individuals living in private dwellings throughout 115 health regions across all ten Canadian provinces.

Respondents for the survey were selected in three stages. First, geographical areas were randomly selected. Secondly, individual households were randomly selected from each region. Lastly, one respondent from each household was randomly selected. The overall national response rate was 68.9%, with the CCHS-MH providing cross-sectional data from a total of 25,113 Canadians aged 15 to 80 years. Individuals living in the three territories, living on Indigenous reserves or settlements, full-time members of the Canadian forces, or institutional residents were not included in the survey. The total number of individuals in these excluded groups represents less than 3% of the target population (Statistics Canada, 2013).

Inclusion in the current study was based on responses to the variables of interest. Age is a categorical variable in the CCHS-MH database and recorded in five-year increments from age 15 to age 80 plus years. As the current study focused on adults, individuals in the 15-19 age category were not included in the analyses. Furthermore, data from individuals who did not provide a response when asked whether they had been diagnosed by a health professional with PTSD were also excluded from the analysis.

Finally, an age-matched sample of randomly selected adult men and women who did not report being diagnosed by a health professional with PTSD was created as the control group. The study's final sample size was 850 participants aged 20 years and older.

### 3.2 Data Collection Method

Data collection occurred from January to December 2012. During the sampling period, 25,113 valid interviews were conducted. First, clusters were selected using a sampling method with a probability proportional to size. Next, for each cluster, lists of dwellings were prepared, and a sample of households was selected from these lists. Finally, a single member was randomly selected from each household with the assistance of selection probabilities based on household composition and age.

Before the start of data collection, introductory letters and brochures that explained the purpose of the CCHS-MH survey were sent to the 43,030 selected households. These letters explained the purpose of the study, emphasized the importance of participation, and provided examples of how the data collected in the survey would be used. Potential participants were informed that completion of the survey was voluntary.

**Minimizing non-responding.** Interviewers were instructed to make initial contact with the randomly selected survey respondent from each dwelling. Respondents were initially contacted by phone to schedule an in-person interview. Respondents were also offered the opportunity to complete the interview by phone. Proxy interviews were not permitted.

To further minimize the incidence of non-responding, a letter underscoring the importance of the household's participation in the survey was sent to those respondents who initially refused to complete the survey. This was followed by a second contact with a Statistics Canada representative (either in person or by phone) to further stress the importance of participation in the survey.

**Use of computer-assisted personal interview (CAPI).** Data were collected directly from survey respondents by trained individuals from Statistics Canada's Collections Planning

and Management division. The majority of interviews (87%) for the CCHS-MH were conducted in person, with the remaining completed via telephone. All interviews were completed using CAPI. The CAPI system allows for custom interviews based on individual respondents' characteristics and survey results. This ensures that interviewers do not ask questions that do not apply to the respondent.

**Weighting.** Each respondent in the CCHS-MH database was assigned a survey weight value that corresponds to the number of people in the entire population that the respondent represents. Weighting ensures that estimates derived from the CCHS-MH are representative of the Canadian population.

### **3.3 Instrument Description**

Statistics Canada designed the CCHS-MH in consultation with representatives from various governmental agencies, the Mental Health Commission of Canada, and academic experts in mental health. Topics covered in the survey include health, health care services, lifestyle and social conditions, mental health and wellbeing, and prevention and detection of disease. The survey is composed of 30 modules. The decision to include an in-depth module assessing for symptoms of a given diagnostic psychiatric disorder was guided by recommendations from the CCHS-MH expert committee. Modules to be incorporated into the CCHS-MH were selected based upon numerous factors, including currently available estimates of prevalence, relevance to current programs/policy, perceived impact on health care costs, and comparability with previous CCHS-MH cycles (Statistics Canada, 2013).

### **3.4 Measures**

**Prevalence of PTSD.** The PTSD variable was assessed within the Chronic Conditions module of the survey. Respondents were instructed prior to the start of the module that they

would be asked about the presence of various health conditions that are expected to last (or have already lasted) six months that had already been diagnosed by a health professional. Respondents were asked ‘Do you have Post-Traumatic Stress Disorder,’ and interviewers coded responses as either ‘Yes’ or ‘No.’ A positive response (‘Yes’) was coded as the respondent having a diagnosis of PTSD.

**Screening Section.** To reduce response burden, survey modules exploring symptoms of several psychiatric disorders (with the exception of the substance use disorder modules) are preceded with screener questions for each disorder. Screener questions were based upon those used in the World Mental Health version of the Composite International Diagnostic Interview (WMH-CIDI) (Statistics Canada, 2014). To reduce false negatives and the possibility of participants purposely answering ‘no’ to avoid completing a given module, all screener questions were grouped in a separate module (Screening Section) near the beginning of the survey. Participants who responded ‘no’ to screener questions were not asked questions associated with that disorder and were considered as failing to meet criteria for the given disorder. Respondents who answered ‘yes’ were flagged for follow-up questioning within disorder-specific modules, which included more in-depth examination regarding specific symptoms of a given psychiatric illness. All respondents are asked a minimum set of questions from the substance use disorders modules.

**Assessment of Psychiatric Disorders; Lifetime and 12-month Prevalence.** The questions used for the CCHS-MH modules on substance and alcohol, depression, Generalized Anxiety Disorder, Bipolar Disorder I and II are based on the World Mental Health version of the Composite International Diagnostic Interview (WMH-CIDI). The WMH-CIDI is a comprehensive and fully standardized instrument for the assessment of mental disorders and

conditions according to definitions and criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and the International Classification of Diseases and Related Health Problems (ICD-10) (Kessler & Üstün, 2004). The WMH-CIDI was created by the World Health Organization (WHO) in 1998 to be used by trained lay-interviewers for epidemiological, clinical and research purposes. The WMH-CIDI was created as an expansion of its predecessor, the WHO-CIDI (Kessler & Üstün, 2004), which was developed in 1990 (World Health Organization, 2018). The WMH-CIDI is similar to the WHO-CIDI, which contains symptom-related questions, probes for psychosocial impairments, evaluates symptom severity, and measures other relevant episode-related questions (Wittchen, 1994). Previous research, including a review of multiple reliability studies by Wittchen (1994), suggests that the WHO-CIDI is a reliable and valid measure (Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998; Wittchen, 1994; World Health Organization, 1990), as is its expanded and updated version, the WMH-CIDI (Haro, et al., 2006; Kessler & Üstün, 2004), upon which the CCHS-MH modules for Major Depressive Episode, Generalized Anxiety Disorder, Bipolar Disorder I and II, and substance and alcohol use are based.

Within any given module, respondents who declined to offer a response for a given question were coded as ‘RF’ and were not included in the analysis. Those who responded that they were unsure or did not know were coded as ‘DK’ and also excluded. Computer-based algorithms were used to calculate lifetime criteria for each disorder based on respondents’ answers to the questions within each disorder module. For each disorder, 12-month criteria included meeting the criteria for a lifetime diagnosis of the disorder, experiencing an episode of the disorder within the previous 12 months, and experiencing a marked impairment in

occupational and social functioning. The assessment of each variable is briefly summarized with examples below.

**Substance abuse and dependence.** The substance abuse and dependence (SUD) variable was assessed by measuring symptoms of Substance Use Disorder as outlined in the World Mental Health version of the Composite International Diagnostic Interview (WMH-CIDI). As part of the SUD module, respondents were asked about their use of cannabis and a variety of both illicit and prescribed substances being used non-medicinally. The interviewer provided examples of the substance in question for each substance, then asked ‘Have you ever used or tried [substance in question] non-medicinally?’. Responses were coded as either ‘Yes, just once,’ ‘Yes, more than once,’ or ‘No.’ Only those who indicated that they had used a given substance more than once were asked further questions regarding their use of the given substance. Respondents were asked about their use of sedatives (e.g., valium, Rohypnol, diazepam), stimulants (e.g., methamphetamine, Adderall, Ritalin), analgesics (e.g., codeine, morphine, Percodan), marijuana or hashish, cocaine (e.g., in any form, including powder, crack, freebase, coca leaves, paste), ‘club drugs’ (ecstasy, ketamine, MDMA), hallucinogens (e.g., LSD, mescaline, PCP, angel dust, mushrooms, peyote), heroin or opium, inhalants or solvents (e.g., nitrous oxide, paint, gasoline, glue), and any other substances not covered by these categories.

Questions assessing substance dependence were also administered for each substance. For example, respondents were asked ‘Was your use ever so regular that you felt that you could not stop using [substance in question]?’, with responses being coded as ‘Yes’ or ‘No.’ Respondents were also asked to indicate for each substance whether their use within the past 12 months has interfered with their life and activities, including home management activities, ability to attend school or work a job, ability to form and maintain relationships, and social relations.



**Alcohol abuse and dependence.** The alcohol abuse and dependence were assessed by measuring symptoms of alcohol use disorder as outlined in the World Mental Health Composite International Diagnostic Interview (WHO-CIDI). The term ‘drink’ was used throughout the module to indicate one standard serving of alcohol. Respondents were asked about their use of alcohol, followed by questions related to alcohol abuse and dependence as appropriate. The module included questions that covered cognitive, behavioural, and physiological symptoms associated with Alcohol Use Disorder. Alcohol dependence and abuse were explored through questions about patterns of alcohol use, tolerance and withdrawal. Respondents were also asked to report the extent to which the symptoms they reported have interfered with their ability to engage in a range of activities (e.g., responsibilities at home, school/work attendance, maintenance of relationships, social engagement).

**Generalized anxiety disorder (GAD).** GAD was assessed by measuring symptoms of GAD as outlined in the World Mental Health Composite International Diagnostic Interview (WMH-CIDI). The GAD module was introduced only to those respondents who answered ‘Yes’ to screener questions designed to identify the existence of possible GAD. Respondents were shown a list of common areas that are often a source of worry for those with GAD (e.g., finances, relationships, own health, etc.) and asked to identify which (if any) of these are a source of worry for them. This module included questions designed to assess the presence of symptoms (both physiological and cognitive) associated with GAD, including the frequency and duration of these symptoms. Respondents were also asked to report the extent to which the symptoms they reported have interfered with their ability to engage in a range of activities (e.g., responsibilities at home, school/work attendance, maintenance of relationships, social engagement).

**Major depressive episode.** The depression module was introduced only to those respondents who answered ‘Yes’ to one of three screener questions designed to identify the symptoms consistent with a major depressive episode. This module included questions designed to assess the presence of symptoms associated with a major depressive episode, including the frequency, duration, and severity of these symptoms. Questions assessed the physiological symptoms associated with depression (e.g., changes in appetite, weight, and sleeping patterns), as well as cognitive symptoms (e.g., difficulty concentrating, indecisiveness), emotional/mood-related symptoms (e.g., feelings of sadness, hopelessness, worthlessness) and behavioural symptoms (e.g., isolating oneself, ceasing to engage in previously enjoyed activities). Questions also asked participants to indicate the severity of their symptoms as well as their impact on various aspects of their life (e.g., relationships, occupational functioning).

**Suicidal ideation.** Questions regarding the presence of 12-month and lifetime suicidal ideation were posed to all respondents. All questions within the suicidality module required a forced choice; respondents were required to answer ‘Yes,’ ‘No.’

**Bipolar Disorder I and II.** Bipolar Disorder I and II were assessed within the mania module of the survey. This module included questions designed to assess the presence of symptoms associated with a manic or hypomanic episode, including the frequency, duration, and severity of these symptoms. Questions asked about periods of time in which the respondent experienced issues such as exaggerated feelings of elevated or irritable mood plus a certain number and combination of other manic symptoms such as racing thoughts, talking more than usual, excessive spending, decreased need for sleep, increased pleasure-seeking activity, or exaggerated self-confidence. Respondents were also asked to indicate the duration and severity

of their symptoms as well as their impact on various aspects of their life (e.g., relationships, occupational functioning).

### ***Socio-demographic Variables***

Socio-demographic variables incorporated into the analysis were categorical in nature and included age, marital status, level of education, and personal income.

**Age.** Age was recorded categorically in the database in five-year increments; 20 to 24, 25 to 29, 30 to 34, 35 to 39, 40 to 44, 45 to 49, 50 to 54, 55 to 59, 60 to 64, 65-69, 70-74, 74-79, and 80+ years (Statistics Canada, 2013).

**Marital status.** Respondents were asked to select a response that best reflected their current marital status from the following options: ‘Married,’ ‘Common-Law,’ ‘Widowed,’ ‘Divorced or Separated,’ or ‘Single’ (Statistics Canada, 2013).

**Level of education.** Respondents were asked to select a response that best reflected their current level of education from the following options: ‘Less Than Secondary School Graduation,’ ‘Secondary School Graduation,’ ‘Some Post-Secondary,’ ‘Post-Secondary Graduation’ (Statistics Canada, 2013).

**Personal income.** Respondents were asked to estimate their total personal income from all sources from the following categories: ‘Less than 10,000’, ‘\$10,000-\$19,999’, ‘\$20,000-\$29,000’, ‘\$30,000-\$39,999’, ‘\$40,000-\$49,999’, ‘\$50,000 or more’ (Statistics Canada, 2013).

### **3.5 Data Analyses**

SPSS (Statistical Package for the Social Sciences) (version 27) software was used to perform data analyses. To test the hypotheses, a series of chi-square tests were performed to assess whether the prevalence of various psychiatric illnesses (alcohol abuse and dependence, substance (not including cannabis) abuse and dependence, cannabis abuse and dependence,

Generalized Anxiety Disorder, Major Depressive Episode, Bipolar I and II), suicidal ideation and socio-demographic variables (education, personal income, marital status) were significantly dependent on whether an individual reported having been diagnosed with PTSD. Specifically, all analyses compared the adult Canadian sample of individuals reporting a diagnosis of PTSD with an age- and gender-matched group of randomly selected individuals from the overall sample who did not report a diagnosis of PTSD. Effect sizes for all significant comparisons were calculated.

## Chapter 4: Results

### 4.1 Prevalence of PTSD

A total of 425 individuals in the CHHS-MH database between the ages of 20 and 80 years and older reported having been diagnosed by a health professional with PTSD. This represents a prevalence rate of 1.8%. Of these 425 individuals, 144 (33.9%) were male and 281 (66.1%) were female.

### 4.2 Comparison of the Prevalence (lifetime and 12-month) of Psychiatric Disorders and Suicidal Thoughts in the PTSD and Control Groups

A summary of chi-square test results including frequencies, chi-square values, effect sizes, and p-values for both groups (PTSD and control group) are shown in Tables 1, 2, and 3.

Effect sizes were measured by *Phi* with the magnitude of the effect size being considered either small, medium or large based on Cohen (1988).

**Drug Abuse and Dependence (excluding cannabis).** To determine whether a significant relationship exists between a diagnosis of PTSD and the prevalence of drug abuse or dependence (excluding cannabis), chi-square tests of independence were conducted. The results indicate that individuals who reported being diagnosed with PTSD were significantly more likely to meet criteria for a diagnosis of drug (excluding cannabis) abuse within the past 12 months ( $\chi^2 (1) = 5.0, p < 0.05$ ), and within their lifetime ( $\chi^2 (1) = 19.7, p < 0.001$ ) compared to individuals who did not report being diagnosed with PTSD. Effect sizes were small for both 12-month (.08) and lifetime (0.15) prevalence. Individuals with PTSD were also significantly more likely to meet criteria for a diagnosis of drug (excluding cannabis) dependence within the past 12 months ( $\chi^2 (1) = 10.0, p < 0.01$ ) and within their lifetime ( $\chi^2 (1) = 42.1, p < 0.001$ ) compared to individuals

who did not report being diagnosed with PTSD. Effect sizes were small for both the 12-month (0.11) and lifetime (0.22) prevalence.

**Cannabis Abuse and Dependence.** To determine whether a significant relationship exists between a diagnosis of PTSD and cannabis abuse and dependence, chi-square tests of independence were conducted. The results indicate that individuals who reported being diagnosed with PTSD were significantly more likely to meet criteria for cannabis abuse ( $\chi^2 (1) = 4.8, p < 0.05$ ) and dependence ( $\chi^2 (1) = 17.0, p < 0.001$ ) within their lifetime. Effect sizes were small for both abuse (0.08) and dependence (0.14). There were no differences between the groups in terms of the prevalence of meeting criteria for cannabis abuse ( $\chi^2 (1) = 1.4, p > 0.05$ ) or dependence ( $\chi^2 (1) = 1.6, p > 0.05$ ) within the last 12 months.

**Alcohol Abuse and Dependence.** To determine whether a significant relationship exists between having a diagnosis of PTSD and the prevalence of alcohol abuse and dependence, chi-square tests of independence were conducted. The results indicate that individuals who reported being diagnosed with PTSD were significantly more likely to meet criteria for alcohol dependence within the past 12 months ( $\chi^2 (1) = 13.0, p < 0.001$ ) and within their lifetime ( $\chi^2 (1) = 43.8, p < 0.001$ ) compared to individuals who did not report being diagnosed with PTSD. Effect sizes were small for both 12-month (0.12) and lifetime (0.23) prevalence. There were no differences between the groups in terms of the prevalence of meeting criteria for 12-month ( $\chi^2 (1) = 3.9, p > 0.05$ ) or lifetime ( $\chi^2 (1) = 2.7, p > 0.05$ ) alcohol abuse.

**Generalized Anxiety Disorder (GAD).** To determine whether a significant relationship exists having a diagnosis of PTSD and the prevalence of GAD, chi-square tests of independence were conducted. The results indicate that individuals who reported being diagnosed with PTSD were significantly more likely to meet criteria for GAD within the past 12 months ( $\chi^2 (1) = 85.1,$

$p < 0.001$ ) and within their lifetime ( $\chi^2 (1) = 148.2, p < 0.001$ ) compared to individuals did not report being diagnosed with PTSD. Effect sizes were medium for both 12-month (0.32) and lifetime (0.42) prevalence.

**Major Depressive Episode.** To determine whether a significant relationship exists between having a diagnosis of PTSD and the prevalence of experiencing a major depressive episode, chi-square tests of independence were conducted. The results indicate that individuals who reported being diagnosed with PTSD were significantly more likely to meet criteria for a major depressive episode within the past 12 months ( $\chi^2 (1) = 120.5, p < 0.001$ ) and within their lifetime ( $\chi^2 (1) = 181.9, p < 0.001$ ) compared to individuals who did not report being diagnosed with PTSD. Effect sizes were medium for both 12-month (0.38) and lifetime (0.46) prevalence.

**Suicidal Thoughts.** To determine whether a significant relationship exists between a diagnosis of PTSD and the prevalence of suicidal thoughts, chi-square tests of independence were conducted. The results indicate that individuals who reported being diagnosed with PTSD were significantly more likely to endorse having suicidal thoughts both within the past 12 months ( $\chi^2 (1) = 89.2, p < 0.001$ ) and within their lifetime ( $\chi^2 (1) = 179.3, p < 0.001$ ) compared to individuals who did not report being diagnosed with PTSD. Effect sizes were medium for 12-month (0.33) and lifetime (0.46) prevalence.

**Bipolar Disorder I (BD I).** To determine whether a significant relationship exists between having a diagnosis of PTSD and the prevalence of BD I, chi-square tests of independence were conducted. The results indicate that individuals who reported being diagnosed with PTSD were significantly more likely to meet criteria for a diagnosis of BD I within the last 12 months ( $\chi^2 (1) = 16.1, p < 0.001$ ) and within their lifetime ( $\chi^2 (1) = 21.0, p <$

0.001) compared to individuals who did not report being diagnosed with PTSD. Effect sizes were small for 12-month (0.17) and lifetime (0.16) prevalence.

**Bipolar Disorder II (BD II).** To determine whether a significant relationship exists between having a diagnosis of PTSD and prevalence of BD II, chi-square tests of independence were conducted. The results indicate that individuals who reported being diagnosed with PTSD were significantly more likely to meet criteria for a diagnosis of BD II within the last 12 months ( $\chi^2 (1) = 25.0, p < 0.001$ ) and within their lifetime ( $\chi^2 (1) = 24.2, p < 0.001$ ) compared to individuals who did not report being diagnosed with PTSD. Effect sizes were small for 12-month (0.17) and lifetime (0.17) prevalence.

### 4.3 Assessment of Sociodemographic Variables

To determine whether a significant relationship exists between a diagnosis of PTSD and sociodemographic variables (marital status, level of education, personal income), chi-square tests of independence were conducted. Effect sizes were calculated using Cramer's V with effect sizes being interpreted as small, medium, or large based on Cohen (1988). Table 4 contains a summary of chi-square test results including frequencies, chi-square values, effect sizes, and *p*-values for both groups (PTSD and control group).

**Marital Status.** The results indicate a significant relationship between having a diagnosis of PTSD and marital status ( $\chi^2 (4) = 47.8, p < 0.001$ ). Specifically, individuals who reported being diagnosed with PTSD were more likely to be divorced/separated, and less likely to be married, than individuals who did not report being diagnosed with PTSD. The effect size was small (0.24).

**Level of Education.** The results indicate there is no significant relationship between having a diagnosis of PTSD and level of education ( $\chi^2 (3) = 4.59, p > 0.05$ ).



**Personal Income.** The results indicate a significant relationship between having a diagnosis of PTSD and current personal income ( $\chi^2 (5) = 40.94, p < 0.000$ ). Specifically, individuals who reported being diagnosed with PTSD were more likely to report incomes between 10,000 and 19,999 dollars per year and less likely to report incomes above 50,000 dollars a year compared to individuals not reporting being diagnosed with PTSD. The effect size was small (0.23).

#### **4.4 Comparison of the Prevalence (lifetime and 12-month) of Psychiatric Disorders and Suicidal Thoughts in the Males and Females with PTSD**

A summary of chi-square test results including frequencies, chi-square values, effect sizes, and p-values for both groups (males and females with PTSD) are shown in Tables 5, 6, and 7.

Effect sizes were measured by *Phi* with the magnitude of the effect size being considered either small, medium or large based on Cohen (1988).

**Drug Abuse and Dependence (excluding cannabis).** To determine whether a significant relationship exists between gender and the prevalence of drug abuse and dependence (excluding cannabis) within the PTSD group, chi-square tests of independence were conducted. The results indicate that there were no significant differences in the prevalence with which males and females met criteria for drug abuse (excluding cannabis) within the last 12 months ( $\chi^2 (1) = 0.1, p > 0.05$ ) or within their lifetime ( $\chi^2 (1) = 5.0, p < 0.05$ ). There were also no significant gender differences noted in prevalence rates for drug dependence (excluding cannabis) within the last 12 months ( $\chi^2 (1) = 2.8 p > 0.05$ ) or lifetime ( $\chi^2 (1) = 0.4, p > 0.05$ ).

**Cannabis Abuse and Dependence.** To determine whether a significant relationship exists between gender and the prevalence of cannabis abuse and dependence within the PTSD

group, chi-square tests of independence were conducted. The results indicate that males in the PTSD group were significantly more likely to meet criteria for cannabis abuse ( $\chi^2 (1) = 8.4, p < 0.01$ ) and dependence ( $\chi^2 (1) = 9.9, p < 0.001$ ) within their lifetime than females in the PTSD group. Effect sizes were small for both abuse (0.14) and dependence (0.15). There were no differences between the genders in terms of the prevalence of cannabis abuse ( $\chi^2 (1) = 2.0, p > 0.05$ ) or dependence ( $\chi^2 (1) = 1.7, p > 0.05$ ) within the last 12 months.

**Alcohol Abuse and Dependence.** To determine whether a significant relationship exists between gender and the prevalence of alcohol abuse and dependence in the PTSD group, chi-square tests of independence were conducted. The results indicate that males in the PTSD group were significantly more likely to meet criteria for alcohol dependence within the past 12 months ( $\chi^2 (1) = 4.5, p < 0.05$ ) and within their lifetime ( $\chi^2 (1) = 4.2, p < 0.05$ ) compared to females in the PTSD group. Effect sizes were small for both 12-month (0.10) and lifetime (0.10) prevalence. There were no differences between the groups in terms of the prevalence of 12-month ( $\chi^2 (1) = 1.2, p > 0.05$ ) or lifetime ( $\chi^2 (1) = 2.0, p > 0.05$ ) alcohol abuse.

**Generalized Anxiety Disorder (GAD).** To determine whether a significant relationship exists between gender and the prevalence of GAD in the PTSD group, chi-square tests of independence were conducted. The results indicate that females in the PTSD group were significantly more likely to meet criteria for GAD over their lifetime than males in the PTSD group ( $\chi^2 (1) = 7.6, p < 0.01$ ). The effect size was small (0.14). There were no differences between males and females in the PTSD group in terms of the prevalence of meeting criteria for GAD in the last 12 months ( $\chi^2 (1) = 1.1, p > 0.05$ ).

**Major Depressive Episode.** To determine whether a significant relationship exists between gender and the prevalence of experiencing a major depressive episode in the PTSD

group, chi-square tests of independence were conducted. The results indicate that females in the PTSD group were significantly more likely to meet criteria for a major depressive episode within their lifetime ( $\chi^2 (1) = 9.8, p < 0.01$ ) compared to males in the PTSD group. The effect size was small (0.15). There were no differences between males and females in the PTSD group in terms of the prevalence of meeting criteria for a major depressive episode in the last 12 months ( $\chi^2 (1) = 2.8, p > 0.05$ ).

**Suicidal Thoughts.** To determine whether a significant relationship exists between gender and the prevalence of suicidal thoughts in the PTSD group, chi-square tests of independence were conducted. The results indicate that women in the PTSD group were significantly more likely to endorse having suicidal thoughts both within the past 12 months ( $\chi^2 (1) = 4.2, p < 0.05$ ) and within their lifetime ( $\chi^2 (1) = 4.8, p < 0.05$ ) compared to males in the PTSD group. Effect sizes were small for both 12-month (0.10) and lifetime (0.11) prevalence.

**Bipolar Disorder I (BD I).** To determine whether a significant relationship exists between gender and prevalence of meeting criteria for BD I in the PTSD group, chi-square tests of independence were conducted. The results indicate that there were no significant differences between males and females with PTSD in the prevalence with which they meet criteria for BD I in the last 12 months ( $\chi^2 (1) = 0.7, p > 0.05$ ) and within their lifetime ( $\chi^2 (1) = 0.01, p > 0.05$ ).

**Bipolar Disorder II (BD II).** To determine whether a significant relationship exists between gender and prevalence of meeting criteria for a diagnosis of BD II in the PTSD group, chi-square tests of independence were conducted. The results indicate that there were no significant differences between males and females with PTSD in the prevalence with which they meet criteria for BD II in the last 12 months ( $\chi^2 (1) = 0.60, p > 0.05$ ) and within their lifetime ( $\chi^2 (1) = 0.60, p > 0.05$ ).

#### 4.5 Comparison of Sociodemographic Variables in Males and Females with PTSD

To determine whether a significant relationship exists between gender and socio-demographic variables (marital status, level of education, personal income) in the PTSD group, chi-square tests of independence were conducted. Effect sizes were calculated using Cramer's  $V$  with effect sizes being interpreted as small, medium, or large based on Cohen (1988). Table 8 contains a summary of chi-square test results including frequencies, chi-square values, effect sizes, and  $p$ -values for both groups (Males and Females with PTSD).

**Marital Status.** The results indicate that there is no relationship between being male or female with a diagnosis of PTSD and marital status ( $\chi^2 (4) = 8.3, p > 0.05$ ).

**Level of Education.** The results indicate there is no relationship between being male or female with a diagnosis of PTSD and level of education ( $\chi^2 (3) = 2.4, p > 0.05$ ).

**Personal Income.** The results indicate a significant relationship between gender in the PTSD group and current personal income ( $\chi^2 (5) = 16.1, p < 0.01$ ). Specifically, males with PTSD were more likely to report annual incomes over 50,000 dollars than females with PTSD and less likely to report annual incomes below 20,000 dollars than females with PTSD. The effect size was small (0.20).

## Chapter 5: Discussion

### 5.1 Summary of Findings

#### *Prevalence*

Many estimates of the prevalence of PTSD diagnoses rely on extrapolations from studies that either include military personnel or are extensions of studies conducted in the US (Van Ameringen, Mancini, Patterson, & Boyle, 2008). One of the main goals of this study was to determine the prevalence rate of PTSD, diagnosed by a health professional, in a nationally representative sample of Canadians outside of those incarcerated or in active duty. The current study found the prevalence rate of PTSD diagnosis to be 1.8%, which is a much lower number than what is commonly reported in the literature. One of the more likely reasons for this lower number was the criteria used; instead of conducting a symptom checklist and assigning probable diagnosis on the basis of responses to the diagnostic interview or questionnaire (as has been used in other studies), using the potentially more stringent criteria of an official diagnosis reduces the possibility for increased variance in severity of diagnosis. However, as the database used for this study does not include individuals that are either full-time military personnel or those who were incarcerated, this could simply be a more accurate estimate of the civilian prevalence rate. Studies have commonly shown heightened rates of PTSD in those who have served in the military, and in Canada the lifetime prevalence rate has been reported as 7.2% (Richardson, Elhai, & Sarreen, 2011). The use of a questionnaire for identifying traumatic events involves the significance of potential recall bias on the over reporting of early traumatic events on the subsequent development of PTSD in response to a more recent stressor, as individuals with PTSD are more likely to over report negative or past traumatic events (Breslau, Peterson, & Schultz, 2008). However, the approach used in the current study may also limit the applicability

of the findings, as previous research has indicated that meeting some, but not full, criteria for PTSD can still carry a level of disability similar to that of full PTSD (Stein, Walker, Hazen, & Forde, 1997). A more in-depth discussion of each of the notable findings is presented below.

### ***Gender differences***

In the current study, over 66% of those who reported having a PTSD diagnosis were women, a finding generally consistent with the literature that women with diagnoses tend to outnumber men. Indeed, studies by Breslau et al. (2004) and de Vries (2009) also found that women outnumbered men in their study with a twofold increase in odds of diagnosis. While the research shows that there are often differences in the types of trauma experienced by men versus women, these sex differences in types of traumatic event exposure only partially explain the differences in the risk of development of PTSD (Tolin & Foa, 2006). Men are more likely to experience traumatic events in general, and even when controlling for the specific categories of traumatic events where women outnumber men, women still show higher rates of PTSD diagnoses (Breslau, 2009; de Vries & Olf, 2009; Lilly, Pole, Best, Metzler, & Marmar, 2009; Olf, Langeland, Draijer, & Gersons, 2007). Clinicians providing support for individuals with exposure to potentially traumatic events should be mindful not only of the differences in the rates of PTSD diagnosis, but also in the potential differences in symptom expression (Tolin & Foa, 2006). Previous research has shown that women may be more likely to present with symptoms consistent with more internalizing behaviours, such as anxiety, avoidance, or depression, whereas men may be more likely to show externalizing responses such as irritability, acting out, or aggression (Tolin & Foa, 2006). Given that some studies have shown women as being more likely to present with symptoms of avoidance behaviours (for example, Kilpatrick et al., 2013), it is important to return to the changes in the diagnostic criteria between DSM-IV-TR and DSM-5.

As discussed earlier, one of the changes that was made in the DSM-5 was the inclusion of “Persistent avoidance of stimuli associated with the traumatic event” as its own criteria in the diagnosis in the new DSM, as opposed to avoidance symptoms being included in a more general criterion in the previous version (Kilpatrick, et al., 2013). By separating and including avoidance-related symptoms – which are more prevalent in women – as a separate criterion, the use of DSM-5 diagnostic criteria may lead to reduced diagnosis of men who do not present with avoidance symptoms, further expanding the potential gender divide in diagnosis (Kilpatrick, et al., 2013).

Given the potential differences in symptom expression, it is important for clinicians to include screening for trauma as part of their intake assessment, as they may misdiagnose or fail to recognize PTSD symptoms (Breslau, 2009; Tolin & Foa, 2006). As well, Breslau noted that individuals with PTSD diagnoses may form a subset group that is also at higher risk of concurrent disorders over and above others who did not meet criteria for PTSD after exposure to a potentially traumatic event (2009).

### ***Suicidal Ideation***

This study found that individuals with PTSD were significantly more likely to have experienced suicidal ideation than their age- and gender-matched peers without a PTSD diagnosis. This greater reported suicidality was seen in both the 12-month and lifetime prevalence, with medium effect sizes of 0.33 and 0.46, respectively. This finding is consistent with Cogle, Resnick, and Kilpatrick (2009) and Kessler (2000), who also found PTSD diagnosis to be predictive of suicidal ideation. This observed association has clear implications for clinicians, as a diagnosis of PTSD can indicate individuals are at significant increased risk of suicidality (Sareen, Houlihan, Cox, & Asmundson, 2005). When screening for suicidal ideation,

the existence of a PTSD diagnosis necessitates further attention over and above the risk associated with the existence of other comorbid disorders like depression (Franklin, et al., 2017; Sareen, 2014). This study also found that women in the PTSD group were more likely to endorse suicidal ideation than men for both 12-month and lifetime prevalence, with small effect sizes of 0.10 and 0.11, respectively, which are consistent with previous studies looking at these gender differences (Horesh, Lowe, Galea, Uddin, & Koenen, 2015).

### ***Major Depressive Episode***

Previous research has shown that individuals with PTSD are more likely than those without a diagnosis to meet criteria for comorbid MDD (Campbell, et al., 2007). Consistent with previous research, this study found that individuals diagnosed with PTSD were significantly more likely to meet criteria for a Major Depressive Episode within the previous 12 months and within their lifetime than those who did not report a diagnosis. Both effect sizes were medium (0.38 and 0.46, respectively). While no gender differences were observed within the PTSD group in 12-month prevalence, a small effect size (0.15) was seen in the lifetime prevalence, with women more likely to meet lifetime Major Depressive Episode criteria than men.

The observed comorbidity rate of PTSD and experiencing a Major Depressive Episode is important to note, as research has shown that those with comorbid PTSD and MDD tend to show increased severity of symptoms of both disorders, leading to poorer outcomes (Campbell, et al., 2007; Cougle, Resnick, & Kilpatrick, 2009). Dewar, Paradis, and Fortin (2020) also highlighted, in their systemic review, that among individuals with PTSD, having comorbid MDD was a significant predictor of nonresponse to therapy for PTSD. Such findings suggest that symptoms of PTSD and MDD must be recognized and assessed separately, as the overlap between the two diagnoses may lead to inadequate assessment and diagnosis, which has direct impact on the



treatment trajectory of the client. Specifically targeted treatments for both disorders, when applicable, continues to be important to reduce the impact of functional impairments and the likelihood of relapse of either PTSD or MDD symptoms in treatment settings.

### ***Bipolar Disorder***

In the current study, respondents who indicated a PTSD diagnosis were significantly more likely to also meet criteria for BD I for both 12-month and lifetime prevalence than those without a PTSD diagnosis. The effect sizes for both were small (0.17 and 0.16, respectively). Those with a reported PTSD diagnosis were also significantly more likely to meet criteria for a BD II diagnosis, both in the last 12 months and over their lifetime (effect sizes for both were 0.17). No significant gender differences in either timeframe were observed for either BD I or II. Given the disproportionate health-care-related costs and symptom severity for those diagnosed with comorbid PTSD and BD I (Fan, et al., 2020), the identification of a comorbid BD I diagnosis is important for clinicians to be aware of (Carter, et al., 2017). While it is difficult to identify any potential causal relationship between the two, the increased risk associated with both symptom severity and suicide risk is significant (Carter, et al., 2017; Fan, et al., 2020; Quarantini, et al., 2010). In their exploration of BD and PTSD comorbidity, Quarantini et al. (2010) highlighted that individuals with comorbid BD and PTSD were up to 50% more likely to have a history of suicide attempts than those with BD alone, and Carter et al. (2017) found that the comorbidity was associated with significantly higher suicidal ideation than those with PTSD alone.

### ***Generalized Anxiety Disorder (GAD)***

While both PTSD and GAD were classified as anxiety disorders in the DSM-IV-TR, and show some symptom overlap (American Psychiatric Association, 2013), the independence of the

diagnoses has been validated in previous studies and can show unique etiologies (Grant, Beck, Marques, Palyo, & Clapp, 2008). The current study found that individuals who reported having a diagnosis of PTSD were significantly more likely to meet criteria for GAD than those without a diagnosis, both in the past 12 months and over their lifetime. The observed effect sizes were medium for both timeframes (0.32 and 0.42, respectively). While no gender differences were observed in the PTSD group for the 12-month prevalence, women in the PTSD group were more likely than men to meet GAD criteria over their lifetime, with a small effect size (0.14) observed. These findings are consistent with Grant et al. (2008), who also identified significant comorbidity despite each diagnosis accounting for unique variance in the data using structural modelling. The researchers highlighted that GAD represented a unique pattern of symptoms over and above the potential symptom overlap with PTSD; as such, it is important for clinicians to recognize symptoms of GAD that may present concurrently with PTSD, as GAD may be a distinct response to trauma (Grant, Beck, Marques, Palyo, & Clapp, 2008).

### ***Substance Use***

As was expected from the findings of previous studies (Breslau, Davis, & Schultz, 2003; Khoury, Tang, Bradley, Cubells, & Ressler, 2010), individuals in the present study who reported PTSD diagnoses were more likely to meet criteria for alcohol or substance abuse (excluding cannabis) both in the previous 12 months and within their lifetime. The PTSD group was also more likely to meet criteria for a diagnosis of alcohol or drug dependence (excluding cannabis) for both timeframes. Interestingly, while those with reported PTSD diagnoses were more likely to meet criteria for lifetime cannabis abuse and dependence, there were no differences between the two groups for meeting Cannabis abuse or dependence criteria within the previous 12 months. Consistent with Breslau, Davis, and Schultz (2003), these data also found no significant

gender effects with respect to alcohol abuse, non-cannabis drug abuse, or non-cannabis drug dependence. However, males in the PTSD group were significantly more likely to meet criteria for alcohol dependence both in the past 12 months and lifetime prevalence. Men with PTSD were also more likely to meet criteria for lifetime cannabis abuse and cannabis dependence than women. This finding is consistent with past research that men are more likely to report externalizing disorders than women (Street & Dardis, 2018).

### ***Demographic Variables***

Individuals who reported PTSD diagnoses were more likely to report being divorced/separated, and less likely to be married, than those who did not report a diagnosis. This finding is consistent with previous studies that have demonstrated significant difficulties in interpersonal relationships and social functioning (Atwoli, Stein, Koenen, & McLaughlin, 2015; Mills, Teesson, Ross, & Peters, 2006; Taft, et al., 2011). Those in the PTSD group were also more likely to report incomes under 20,000 dollars per year, and less likely to report incomes above 50,000 dollars per year, than those who did not report a PTSD diagnosis. These findings are important to note, as it underscores the further lack of supports that may be available to individuals who meet criteria for PTSD, which can impact individuals' willingness or ability to access treatments (Mills, Teesson, Ross, & Peters, 2006). This study also found a significant effect of gender on personal income, in that males in the PTSD group were more likely to report incomes over 50,000 dollars, and less likely to report incomes below 20,000 dollars, than women in the PTSD group.

### **5.2 Clinical Implications**

The results of the current study were able to highlight some important factors related to diagnostics, risk assessment, and treatment considerations. By identifying the frequency of

comorbid conditions in individuals in a non-clinical community sample who identified as having been diagnosed with PTSD, this research helps to draw attention to the need for careful assessment of comorbid disorders across any community setting. Individuals with PTSD and a comorbid condition are more likely to experience increased symptom severity and more negative outcomes than those with a singular diagnosis (Galatzer-Levy, Nickerson, Litz, & Marmar, 2013), and the results of this study also underscore the importance of continuing to endorse trauma-informed practices in a variety of primary care settings. This study also helped to identify the frequency of comorbid disorders that can negatively affect treatment outcomes. While individuals may present to treatment clinics with symptoms of anxiety or depression, the high rate of comorbidities suggest that practitioners assess for symptoms of PTSD, or trauma exposure, when possible to ensure that the most appropriate treatment is pursued (Cogle, Resnick, & Kilpatrick, 2009; Hesson & Fowler, 2018). Clinicians should consider the potential for the impact of trauma, or the existence of a PTSD diagnosis, in situations where individuals demonstrate reduced responsiveness to standard treatments for their initially-presenting diagnoses (Hesson & Fowler, 2018). This study also reinforces the findings of Grant et al. (2008) that, following the experience of a traumatic event, clinicians should be mindful to consider additional potential diagnoses other than PTSD, as there are several conditions with both overlapping and co-occurring symptom presentations that can arise from exposure to traumatic events. A diagnosis of PTSD may also identify a subset of trauma-exposed individuals to clinicians that are at increased risk of developing other associated disorders (Breslau, 2009). This study's findings also aligned with previous research indicating the increased risk of substance use in individuals with PTSD (Mills, 2013; Ullman, Townsend, Starzynski, & Long, 2006). Research has shown that individuals with comorbid PTSD and polysubstance use tend to fall in

lower socioeconomic brackets, have poorer functioning, and have increased exposures to potentially traumatic events than those with PTSD alone (Ullman, Townsend, Starzynski, & Long, 2006). Such findings are especially important to consider in light of the gender discrepancy in reported substance abuse. Given the data showing that men with PTSD diagnoses are more likely to report having substance use issues, clinicians should be mindful of the additional risks and conduct relevant assessments when working with men with either diagnoses.

The sociodemographic variables associated with PTSD diagnosis are also an important finding. Socioeconomic status has often been cited as a risk factor for exposure to traumatic events (Hatch & Dohrenwend, 2007), and the current study found that those in the PTSD group were more likely to report household income in the lowest income bracket than those without a reported diagnosis. The relationships between traumatic event exposure (as well as any subsequent PTSD diagnosis), lower income, and employment status are complex, and studies have explored the concept of lost life course opportunities in the past (Brunello, et al., 2001; Kessler, 2000). In Brunello et al.'s review (2001), the researchers found that individuals with PTSD diagnoses were particularly at risk for adverse life course consequences, such as educational failures, marital instability, and unemployment. The impacts of lower income and employment status could also serve to compound difficulties with respect to treatment, as these populations are both more vulnerable to further complications and less likely to have easy access to treatment options, as suggested by Kessler's exploration of reported reasons for not seeking treatment. (Kessler, 2000). Their research indicated that the most common reported reason for not seeking treatment was the lack of awareness of a problem or perceived need for treatment, followed by situational barriers (including lack of knowledge/availability of services or inconvenience) and financial barriers (including direct cost and lack of health insurance

coverage) (Kessler, 2000). More recent studies have explored the impact of socioeconomic disadvantage on the trajectories of individuals exposed to traumatic events, as those who live in lower socioeconomic brackets may be more likely to be exposed to higher rates of crime or more inconsistent housing opportunities compared to those in higher socioeconomic brackets (Lowe, Galea, Uddin, & Koenen, 2014). Lowe and colleagues suggested that treatments aimed to reduce the impact of traumatic event exposure are more likely to be effective if they are combined with community-level interventions designed to address those socioeconomic disadvantages (2014). Increased awareness of the association between, if not direct impact of, socioeconomic stressors and PTSD diagnosis may help to further advocacy efforts for government policies and/or programs designed to increase resource availability among those in the lowest income brackets.

### **5.3 Strengths of the Current Study**

One of the strengths of this study was the clear definition used to establish PTSD diagnosis. Research in this area often relies on establishing a probable PTSD diagnosis based on the respondent's responses to a specific set of diagnostic questions. Such an approach allows for a wider array of respondents to be potentially identified within the criteria for meeting PTSD diagnostic criteria but carries the downside of a potentially heterogeneous respondent pool. As well, studies that rely on categorization based on symptom severity may be more likely to include individuals with non-specific distress that may not be directly related to the traumatic event (Taft, et al., 2011). The use of a community sample may also provide a more general estimate of comorbidities in the general population, as comorbid conditions are more likely to be observed in treatment-seeking populations (Grant, Beck, Marques, Palyo, & Clapp, 2008). The use of a nationally representative sample is also a notable strength of the study, and of the data set as a whole. As mentioned above, the database used for this study excluded full-time military

personnel and those who were incarcerated, both population subsets that may contribute to higher observed prevalence rates of PTSD using other methods, and as such these findings may be a more accurate estimate of the civilian PTSD prevalence rate. The large number of individuals sampled and the geographic distribution used allowed for a more comprehensive picture of the scope of the distribution of individuals with diagnoses across the country, as opposed to being limited to individuals being treated in specific cities or accessing specific clinics. As such, this study provides insight into the prevalence of individuals with PTSD diagnoses in a Canadian, non-military, community sample, which may help to inform community-based clinics. The distribution of participants across various socioeconomic variables may also provide a different clinical picture of the target respondents; a study by Madnick and Spokas (2022) conducted a review of clinical literature related to interventions for PTSD in the United States and found significant underrepresentation of individuals in the lowest socioeconomic brackets. Studies that use a more targeted representative sample, such as the CCHS, may be more likely to capture a clinical picture beyond what would be seen specifically at treatment clinics or hospitals providing services to veterans.

#### **5.4 Limitations**

As discussed above, while the specificity of the diagnostic questionnaire item used to establish PTSD diagnosis was a strength, it can also be viewed as a potential limitation of the current study. The inclusion of respondents into the PTSD group relied on respondents' self-report that they had received a diagnosis by a health professional; the self-report nature of the survey methods render it impossible to confirm individuals' diagnoses (Hesson & Fowler, 2018). Similarly, the determination of lifetime versus 12-month designations of clinical diagnoses were made by the survey interviewers as opposed to clinical professionals that (in theory) would have

made the PTSD diagnosis (Hesson & Fowler, 2018). Another limitation of the current study is the cross-sectional design, as data collected are unable to provide a temporal relationship that could help to establish any potential cause and effect relationships. As well, by focusing on the presence or absence of a diagnosis made by a medical practitioner, these results do not take into account the current level of symptom severity or any evidence of ongoing treatment (i.e. psychotherapy, medication) for any of the identified disorders and the resultant impact on any of the variables measured.

The current study may also underrepresent the number of individuals for whom a PTSD diagnosis could readily be applied, as not all individuals who meet criteria for psychological disorders actively seek help or receive diagnoses (Stein, Walker, Hazen, & Forde, 1997). The differences in methodology may account for the difference in prevalence rate seen between this study and previous community estimates of PTSD diagnoses, as other studies primarily used diagnostic interviews to identify individuals who meet the criteria and therefore can be classified with a probable PTSD diagnosis (Van Ameringen, Mancini, Patterson, & Boyle, 2008).

An additional limitation of the present study involves the sampling methods themselves; participation in the survey was limited to individuals who were selected based on sampling of households within particular geographic areas, and excluded individuals living in the three Territories, active military personnel, individuals living on reserves, or those who are either institutionalized or homeless. Some studies have shown that individuals who are homeless have increased rates of PTSD (Mills, Teesson, Ross, & Peters, 2006), and the fact that these individuals would have been excluded from the study may also contribute to the observed prevalence rate. While the results presented herein did highlight particular socioeconomic disadvantages related to PTSD diagnosis, the size of this effect in the community may actually



be underestimated. The meta-analysis conducted by Tortella-Feliu and colleagues (2019) identified that simply being an Indigenous person in the Americas was a strong risk factor for PTSD diagnosis as a sociodemographic pre-trauma variable. As well, the aforementioned study by Madnick and Spokas (2022) also highlighted that ethno-racial minorities have often been underrepresented in the clinical literature; the sampling methods of the current data set are similarly less likely to reflect the Indigenous communities across the country. Indigenous individuals living on reservations are a population that has endured significant historical trauma (Bombay, Matheson, & Anisman, 2014). Indigenous people as a whole in Canada have lower income and education than non-indigenous people, and also experience higher rates of pretraumatic risk factors (Bellamy & Hardy, 2015). While the unique experiences of this heterogeneous population are worthy of extensive study in their own right, the selection methods of the current data set are likely to underrepresent these communities.

This study was also limited by the fact that the data used was collected prior to the release of the most recent version of the DSM (American Psychiatric Association, 2013), and as such any future research will include the most updated diagnostic criteria. It should be noted that the differences between the versions (as described earlier in the study), for the diagnoses described herein, are similar enough to still be compared. However, notable changes in the diagnostic criteria, such as the DSM-5 requirement for the existence of persistent avoidance behaviour, may lead to reduced diagnosis of PTSD despite the expansion of the definition of qualifying potentially traumatic events.

This research also highlighted a limitation in PTSD research overall, in that discussions about sex and gender differences are often discussed with the two terms used interchangeably. These issues may be related to the limited recognition or reduced awareness in the population at

the time of many of the existing studies, or even restrictions based on the development of the questionnaires used (Valentine, Smith, Miller, Hadden, & Shipherd, 2023). As such, individuals identifying as transgender or gender nonconforming likely had to choose from a binary that did not necessarily reflect their gender identity, and that lack of specific instructions as to whether to choose biological sex or gender identity from the resulting binary likely confounds any results specifically related to this population (Canadian Professional Association of Transgender Health, 2019). As greater awareness continues to affect public policy, the research underpinning these policies should also be adjusted to better reflect the specific variables at play. Questionnaires should include questions of both sex and gender identity to more accurately quantify the data (Canadian Professional Association of Transgender Health, 2019).

### **5.5 Future Research**

The benefits of providing trauma-informed care in clinical settings have been acknowledged for some time (Sweeney, Filson, Kennedy, Collinson, & Gillard, 2018), and continue to be important for improving client outcomes. As identified by Sweeney et al. (2018), the importance of recognizing, acknowledging, and screening for significant trauma history can lead to better clinical outcomes. In addition, individuals with comorbid disorders are likely to be better served if more specific interventions can be developed for individuals with PTSD and specific comorbid conditions, especially for those that tend to have more significantly poorer outcomes. Carter et al. (2017) highlighted the importance of further research into the risk factors associated with the increased suicidal ideation and attempts of those with comorbid PTSD and Bipolar Disorder. As well, though trauma-informed practice continues to be promoted and increasingly adopted in health care settings across Canada, it may also be important to study the frequency of undiagnosed PTSD among individuals presenting with symptoms of Bipolar

Disorder in acute care settings (Goldberg & Fagin-Jones, 2004). Given the association seen between low income, employment status, and PTSD diagnosis, further research may also look to better explore the complex relationship between these variables (Brunello, et al., 2001; Lowe, Galea, Uddin, & Koenen, 2014; Madnick & Spokas, 2022). It may be that low income status serves as a risk factor for trauma exposure, and subsequent PTSD diagnosis is related to subsequent loss of economic or educational opportunities (Brunello, et al., 2001; Hatch & Dohrenwend, 2007; Kessler, 2000; Lowe, Galea, Uddin, & Koenen, 2014).

Stein and colleagues (Stein, Walker, Hazen, & Forde, 1997) conducted a study that expanded on the National Comorbidity Survey by administering the complete PTSD section of the survey questionnaire to all of their respondents, thereby allowing them to collect data from individuals that only met partial diagnostic criteria for PTSD. The researchers found that individuals who met partial criteria still experienced more functional impairment related to their symptoms than those who did not show symptoms, and that they reported comparable impairment in their home and social functioning to those who met full criteria for PTSD diagnosis (Stein, Walker, Hazen, & Forde, 1997). As such, Stein et al. (1997) indicated that individuals with partial PTSD still carry a significant burden even without the diagnosis. Similar results were also found in Müller et al. (2009), whose findings suggested that comorbidity patterns found in individuals with full PTSD symptoms also applied to individuals who only partially met criteria for a PTSD diagnosis. Given that our current study focused specifically on those that reported that they had received a diagnosis from a health professional, further research could also focus on the functional impairment and comorbidities of those that only meet partial criteria.

The aforementioned limitations of this study also identified the gaps in the research related to individuals identifying as transgender and gender diverse. Given the well-documented gender discrepancies in PTSD diagnosis, increased recognition of gender fluidity, and the unique experiences of discrimination and trauma among the transgender and gender diverse community, further research should continue to be conducted with this population in mind (Valentine, Smith, Miller, Hadden, & Shipherd, 2023). All relevant research materials and questionnaires should also be adjusted to include separate questions for biological sex and gender, and to include more diverse options from which participants can choose, in order to ensure more accurate reflection of the discrepancies in sex- and gender-based differences in PTSD symptom presentation and diagnosis (Canadian Professional Association of Transgender Health, 2019).

Lastly, as was identified above, the lack of engagement and data sampling with indigenous communities across the country limits this study's applicability to a population that is known to have been exposed to significant and often ongoing trauma. Further study of these communities in particular will continue to be important for better understanding some of the complexities with diagnosis and treatment provision. The use of Western-based diagnostic measures for the assessment of trauma may not appropriately capture the needs or experiences of the indigenous population, as trauma reactions in differing cultures may present differently than the reactions measured with the DSM (Patel & Hall, 2021). Future research should be conducted with this population in mind in order to identify, create, and/or refine more culturally sensitive instruments in order to properly evaluate the experience of trauma in a population that is often experiencing significant ongoing stress and adversity (Patel & Hall, 2021).

## 5.6 Conclusion

PTSD is a complex disorder that has seen significant increase in research attention in recent years, though the primary source of data continues to be from research conducted in the United States or with military veterans. The current study aimed to examine the prevalence of PTSD diagnoses and comorbid conditions in a community-based, nationally representative Canadian sample of adults. Results showed that 1.8% of respondents reported having received a diagnosis of PTSD from a health professional. Those with a reported PTSD diagnosis were more likely to also meet criteria for 12-month and lifetime diagnoses of a number of psychiatric diagnoses and to were more likely to report having suicidal thoughts. In addition, individuals with PTSD were found to differ from individuals with PTSD on a number of sociodemographic variables, suggesting significant functional impairment in the former group. They were also more likely to report having suicidal thoughts. Among those with a diagnosis of PTSD, women were more likely than men to meet criteria for GAD and MDD over their lifetime, as well as being more likely to have experienced suicidal thoughts both within the previous 12 months and over their lifetime. Conversely, men with PTSD were more likely than women with PTSD to meet criteria for 12-month and lifetime alcohol dependence and lifetime cannabis use disorders.

As it is impossible to completely avoid exposure to potentially traumatic events, clinicians and primary care personnel continue to have the important task of mindful, careful assessment of individuals presenting with a wide array of comorbid conditions for the potential existence of PTSD, as the existence of the disorder introduces complexity and poorer outcomes on treatment and long-term outcome, especially if undiagnosed. These results contribute to the body of evidence that individuals with diagnoses of PTSD are likely to experience comorbid difficulties that may not be immediately recognized. As such, it continues to be important for

clinicians to be aware of the potential impacts of PTSD diagnoses and comorbidities and that proper assessments are conducted in all health-related settings in order to ensure the most appropriate treatment is made available, especially in the presence of specific risk factors.

## References

- American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*. Washington, DC: American Psychiatric Association.
- American Psychiatric Association. (2013). *Diagnostic And Statistical Manual of Mental Disorders, Fifth Edition*. Arlington, VA: American Psychiatric Association.
- American Psychiatric Association. Committee on Nomenclature and Statistics. (1952). *Diagnostic and Statistical Manual: Mental Disorders*. Washington, DC: American Psychiatric Association, Mental Hospital Service.
- American Psychiatric Association. Committee on Nomenclature and Statistics. (1968). *Diagnostic and Statistical Manual of Mental Disorders, Second Edition*. Washington, DC: American Psychiatric Association.
- American Psychiatric Committee on Nomenclature and Statistics. (1980). *Diagnostic and Statistical Manual of Mental Disorders, Third Edition*. Washington, DC: American Psychiatric Association.
- Atwoli, L., Stein, D. J., Koenen, K. C., & McLaughlin, K. A. (2015). Epidemiology of Posttraumatic Stress Disorder: Prevalence, correlates and consequences. *Current Opinion in Psychiatry*, 28(4), 307-311. doi:10.1097/YCO.0000000000000167
- Ayazi, T., Lien, L., Eide, A., Swartz, L., & Hauff, E. (2014). Association between exposure to traumatic events and anxiety disorders in a post-conflict setting: A cross-sectional community study in South Sudan. *BMC Psychiatry*, 14(1), 6-6. doi:10.1186/1471-244X-14-6
- Beck, J. G., Coffey, S. F., Palyo, S. A., Gudmundsdottir, B., Miller, L. M., Colder, C. R., & Strauss, M. E. (2004). Psychometric properties of the Posttraumatic Cognitions Inventory (PTCI): A replication

with motor vehicle accident survivors. *Psychological Assessment*, 16(3), 289-298.

doi:10.1037/1040-3590.16.3.289

Bellamy, S., & Hardy, C. (2015). *Post-Traumatic Stress Disorder in Aboriginal people in Canada: Review of risk factors, the current state of knowledge and directions for further research*. Prince George, BC: National Collaborating Centre for Aboriginal Health.

Benjet, C., Bromet, E., Karam, E., Kessler, R., KA, M., AM, R., . . . al., e. (2016). The epidemiology of traumatic event exposure worldwide: Results from the World Mental Health Survey Consortium. *Psychological Medicine*, 46, 327-343. doi:10.1017/S0033291715001981

Black, L. L., & Flynn, S. V. (2021). *Crisis, trauma, and disaster: A clinician's guide*. Los Angeles, CA: SAGE Publications, Inc.

Blanco, C., Xu, Y., Brady, K., Pérez-Fuentes, G., Okuda, M., & Wang, S. (2013). Comorbidity of Posttraumatic Stress Disorder with alcohol dependence among US adults: Results from National Epidemiological Survey on Alcohol and Related Conditions. *Drug And Alcohol Dependence*, 132(3), 630-638. doi:10.1016/j.drugalcdep.2013.04.016

Boden, M. T., Babson, K. A., Vujanovic, A. A., Short, N. A., & Bonn-Miller, M. O. (2013). Posttraumatic Stress Disorder and cannabis use characteristics among military veterans with cannabis dependence. *The American Journal on Addictions*, 22(3), 277-284. doi:10.1111/j.1521-0391.2012.12018.x

Bombay, A., Matheson, K., & Anisman, H. (2014). The intergenerational effects of Indian Residential Schools: Implications for the concept of historical trauma. *Transcultural Psychiatry*, 51(3), 320-338. doi:10.1177/1363461513503380



- Bonn-Miller, M. O., Babson, K. A., & Vandrey, R. (2014). Using cannabis to help you sleep: Heightened frequency of medical cannabis use among those with PTSD. *Drug And Alcohol Dependence*, 136(1), 162-165. doi:10.1016/j.drugalcdep.2013.12.008
- Bonn-Miller, M. O., Sisley, S., Riggs, P., Yazar-Klosinski, B., Wang, J. B., Loflin, M. J., . . . Le Foll, B. (2021). The short-term impact of 3 smoked cannabis preparations versus placebo on PTSD symptoms: A randomized cross-over clinical trial. *PloS One*, 16(3), e0246990. doi:10.1371/journal.pone.0246990
- Bremner, J. D. (2006). Traumatic stress: Effects on the brain. *Dialogues in Clinical Neuroscience*, 8(4), 445-461. doi:10.31887/DCNS.2006.8.4/jbremner
- Bremner, J. D., Narayan, M., Staib, L. H., Southwick, S. M., McGlashan, T., & Charney, D. S. (1999). Neural correlates of memories of childhood sexual abuse in women with and without Posttraumatic Stress Disorder. *The American Journal of Psychiatry*, 156(11), 1787-1795. doi:10.1176/ajp.156.11.1787
- Breslau, N. (2009). The epidemiology of trauma, PTSD, and other posttrauma disorders. *Trauma, Violence & Abuse*, 10(3), 198-210. doi:10.1177/1524838009334448
- Breslau, N., Davis, G. C., & Andreski, P. (1995). Risk factors for PTSD-related traumatic events: A prospective analysis. *American Journal of Psychiatry*, 152(4), 529-535. doi:10.1176/ajp.152.4.529
- Breslau, N., Davis, G. C., & Schultz, L. R. (2003). Posttraumatic Stress Disorder and the incidence of nicotine, alcohol, and other drug disorders in persons who have experienced trauma. *Archives Of General Psychiatry*, 60(3), 289-294. doi:10.1001/archpsyc.60.3.289

- Breslau, N., Davis, G. C., Andreski, P., & Peterson, E. (1991). Traumatic events and Posttraumatic Stress Disorder in an urban population of young adults. *Archives of General Psychiatry*, *48*(3), 216-222. doi:10.1001/archpsyc.1991.01810270028003
- Breslau, N., Davis, G. C., Peterson, E. L., & Schultz, L. R. (2000). A second look at comorbidity in victims of trauma: The Posttraumatic Stress Disorder- Major Depression connection. *Biological Psychiatry*, *48*(9), 902-909. doi:10.1016/S0006-3223(00)00933-1
- Breslau, N., Kessler, R. C., Chilcoat, H. D., Schultz, L. R., Davis, G. C., & Andreski, P. (1998). Trauma and Posttraumatic Stress Disorder in the community: The 1996 Detroit area survey of trauma. *Archives Of General Psychiatry*, *55*(7), 626-632. doi:10.1001/archpsyc.55.7.626
- Breslau, N., Peterson, E. L., & Schultz, L. R. (2008). A second look at prior trauma and the Posttraumatic Stress Disorder effects of subsequent trauma. *Archives of General Psychiatry*, *65*(4), 431-437. doi:10.1001/archpsyc.65.4.431
- Breslau, N., Peterson, E. L., Poisson, L. M., Schultz, L. R., & Lucia, V. C. (2004). Estimating Post-Traumatic Stress Disorder in the community: Lifetime perspective and the impact of typical traumatic events. *Psychological Medicine*, *34*, 889–898. doi:10.1017/S0033291703001612
- 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*(5), 748-766. doi:10.1037//0022-006X.68.5
- Brunello, N., Davidson, J. R., Deahl, M., Kessler, R. C., Mendlewicz, J., Racagni, G., . . . Zohar, J. (2001). Posttraumatic Stress Disorder: Diagnosis and epidemiology, comorbidity and social consequences, biology and treatment. *Neuropsychobiology*, *43*(3), 150-162. doi:10.1159/000054884

- Bryant, R. A. (2019). Post-traumatic Stress Disorder: A state-of-the-art review of evidence and challenges. *World Psychiatry, 18*(3), 259-269. doi:10.1002/wps.20656
- Campbell, D. G., Felker, B. L., Liu, C.-F., Yano, E. M., Kirchner, J. E., Chan, D., . . . Chaney, E. F. (2007). Prevalence of Depression–PTSD comorbidity: Implications for clinical practice guidelines and primary care-based interventions. *Journal of General Internal Medicine, 22*(6), 711-718. doi:10.1007/s11606-006-0101-4
- Canadian Professional Association of Transgender Health. (2019). *CPATH ethical guidelines for research involving transgender people & communities*. Retrieved from <https://cpath.ca/en/resources/cpath-ethical-guidelines/>
- Carter, J. M., Arentsen, T. J., Cordova, M. J., Ruzek, J., Reiser, R., Suppes, T., & Ostacher, M. J. (2017). Increased suicidal ideation in patients with co-occurring Bipolar Disorder and Post-Traumatic Stress Disorder. *Archives of Suicide Research, 21*(4), 621-632. doi:10.1080/13811118.2016.1199986
- Cerimele, J. M., LePoire, E., Fortney, J. C., Hawrilenko, M., Unützer, J., & Bauer, A. M. (2020). Bipolar Disorder and PTSD screening and telepsychiatry diagnoses in primary care. *General Hospital Psychiatry, 65*, 28-32. doi:10.1016/j.genhosppsy.2020.05.006
- Chan, D., Cheadle, A. D., Reiber, G., Unützer, J., & Chaney, E. F. (2009). Health care utilization and its costs for depressed veterans with and without comorbid PTSD symptoms. *Psychiatric Services, 60*(12), 1612-1617. doi:10.1176/ps.2009.60.12.1612
- Christiansen, D. M., & Hansen, M. (2015). Accounting for sex differences in PTSD: A multi-variable mediation model. *European Journal of Psychotraumatology, 6*(1), 1-10. doi:10.3402/ejpt.v6.26068

- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd Ed. ed.). Hillsdale, NJ: L. Erlbaum Associates.
- Contractor, A. A., Elhai, J. D., Fine, T. H., Tamburrino, M. B., Cohen, G., Shirley, E., . . . Calabrese, J. R. (2015). Latent profile analyses of posttraumatic stress disorder, depression and generalized anxiety disorder symptoms in trauma-exposed soldiers. *Journal of Psychiatric Research, 68*, 19-26. doi:10.1016/j.jpsychires.2015.05.014
- Coplan, J., Chanatry, S. T., & Rosenblum, L. A. (2017). Persistence of early-life stress on the epigenome: Nonhuman primate observations. In J. Stein, *Reference Module in Neuroscience and Biobehavioral Psychology* (pp. 981–987). Elsevier Inc. doi:https://doi.org/10.1016/B978-0-12-809324-5.02862-5
- Cogle, J. R., Bonn-Miller, M. O., Vujanovic, A. A., Zvolensky, M. J., & Hawkins, K. A. (2011). Posttraumatic Stress Disorder and cannabis use in a nationally representative sample. *Psychology of Addictive Behaviors, 25*(3), 554-558. doi:10.1037/a0023076
- Cogle, J. R., Keough, M. E., Riccardi, C. J., & Sachs-Ericsson, N. (2009). Anxiety disorders and suicidality in the National Comorbidity Survey-Replication. *Journal of Psychiatric Research, 43*(9), 825-829. doi:10.1016/j.jpsychires.2008.12.004
- Cogle, J. R., Resnick, H., & Kilpatrick, D. G. (2009). PTSD, depression, and their comorbidity in relation to suicidality: Cross-sectional and prospective analyses of a national probability sample of women. *Depression and Anxiety, 26*(12), 1151-1157. doi:10.1002/da.20621
- Creamer, M., Burgess, P., & McFarlane, A. C. (2001). Post-traumatic Stress Disorder: Findings from the Australian National Survey of Mental Health and Well-being. *Psychological Medicine, 31*(7), 1237-1247. doi:10.1017/S0033291701004287

- Dalgleish, T. (2004). Cognitive approaches to Posttraumatic Stress Disorder: The evolution of  
multirepresentational theorizing. *Psychological Bulletin*, *130*(2), 228-260. doi:10.1037/0033-  
2909.130.2.228
- de Vries, G.-J., & Olf, M. (2009). The lifetime prevalence of traumatic events and Posttraumatic Stress  
Disorder in the Netherlands. *Journal of Traumatic Stress*, *22*(4), 259–267. doi: 10.1002/jts.20429
- Dewar, M., Paradis, A., & Fortin, C. A. (2020). Identifying trajectories and predictors of response to  
psychotherapy for Post-Traumatic Stress Disorder in adults: A systematic review of literature.  
*Canadian Journal of Psychiatry*, *65*(2), 71-86. doi: 10.1177/0706743719875602
- Dilsaver, S. C., Benazzi, F., Akiskal, H. S., & Akiskal, K. K. (2007). Post-Traumatic Stress Disorder among  
adolescents with Bipolar Disorder and its relationship to suicidality. *Bipolar Disorders*, *9*(6), 649-  
655. doi:10.1111/j.1399-5618.2007.00396.x
- Duckers, M. L., Alisic, E., & Brewin, C. R. (2016). A vulnerability paradox in the cross-national prevalence  
of Post-Traumatic Stress Disorder. *The British Journal of Psychiatry*, *209*, 300–305.  
doi:10.1192/bjp.bp.115.176628
- Fan, P., Guo, X., Qi, X., Matharu, M., Patel, R., Sakolsky, D., . . . Wang, L. (2020). Prediction of suicide-  
related events by analyzing electronic medical records from PTSD patients with Bipolar Disorder.  
*Brain Sciences*, *10*(11), 1-30. doi:10.3390/brainsci10110784
- Farr, O., Ko, B., Joung, K., Zaichenko, L., Usher, N., Tsoukas, M., . . . Mantzoros, C. (2015). Posttraumatic  
Stress Disorder, alone or additively with early life adversity, is associated with obesity and  
cardiometabolic risk. *Nutrition, Metabolism, and Cardiovascular Diseases*, *25*(5), 479-488.  
doi:10.1016/j.numecd.2015.01.007

- Farrelly, K. N., Romero-Sanchiz, P., Mahu, T., Barrett, S. P., Collins, P., Rasic, D., & Stewart, S. H. (2022). Posttraumatic Stress Disorder symptoms and coping motives are independently associated with cannabis craving elicited by trauma cues. *Journal Of Traumatic Stress, 35*(1), 178-185.  
doi:10.1002/jts.22715
- Fergusson, D. M., McLeod, G. F., & Horwood, L. J. (2013). Childhood sexual abuse and adult developmental outcomes: Findings from a 30-year longitudinal study in New Zealand. *Child Abuse & Neglect, 37*(9), 664-674. doi:10.1016/j.chiabu.2013.03.013
- Fetzner, M. G., McMillan, K. A., Sareen, J., & Asmundson, G. J. (2011). What is the association between traumatic life events and alcohol abuse/dependence in people with and without PTSD? Findings from a nationally representative sample. *Depression and Anxiety, 4*(8), 632-638.  
doi:10.1002/da.20852
- Firmin, M. W., Pugh, K. C., Turkelson, L., Annecharico, K. N., & Sohn, V. A. (2015). Implications for patients regarding PTSD diagnostic criteria differences when using the DSM and ICD classification systems. *International Journal of Psychology Research, 10*(3), 247-261.
- Foa, E. B. (2011). Prolonged exposure therapy: Past, present, and future. *Depression and Anxiety, 28*(12), 1043-1047. doi:10.1002/da.20907
- Foa, E. B., Stein, D. J., & McFarlane, A. C. (2006). Symptomatology and psychopathology of mental health problems after disaster. *The Journal of Clinical Psychiatry, 67*(2), 15-25.
- Foran, H. M., & O'Leary, K. D. (2008). Alcohol and intimate partner violence: A meta-analytic review. *Clinical Psychology Review, 28*(7), 1222-1234. doi:10.1016/j.cpr.2008.05.001

- Fortuna, L., Ramos, Z., Falgas-Bague, I., Cellerino, L., & Alegria, M. (2016). Gender differences in medical and psychiatric comorbidities in patients with Posttraumatic Stress Disorder. *European Psychiatry, 33*(S1), S213-S214. doi:10.1016/j.eurpsy.2016.01.516
- Franklin, J. C., Ribeiro, J. D., Fox, K. R., Bentley, K. H., Kleiman, E. M., Huang, X., . . . Albarracín, D. (2017). Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. *Psychological Bulletin, 143*(2), 187-232. doi:10.1037/bul0000084
- Freud, S. (1933). *New introductory lectures on psycho-analysis* (Fourth impression ed.). (W. J. Sprott, Trans.) Toronto: Clarke, Irwin & Co. Ltd.
- Friedman, M. J., Resick, P. A., Bryant, R. A., & Brewin, C. R. (2011). Considering PTSD for DSM-5. *Depression and Anxiety, 28*, 750-769. doi:10.1002/da.20767
- Galatzer-Levy, I. R., Nickerson, A., Litz, B. T., & Marmar, C. R. (2013). Patterns of lifetime PTSD comorbidity: A latent class analysis. *Depression and Anxiety, 30*(5), 489-496. doi:10.1002/da.22048
- Gentes, E. L., Schry, A. R., Hicks, T. A., Clancy, C. P., Collie, C. F., Kirby, A. C., . . . Petry, N. M. (2016). Prevalence and correlates of cannabis use in an outpatient VA Posttraumatic Stress Disorder clinic. *Psychology Of Addictive Behaviors, 30*(3), 415-421. doi:10.1037/adb0000154
- Goldberg, J. F., & Fagin-Jones, S. (2004). Diagnosing and treating anxiety comorbidity in Bipolar Disorders. *Psychiatric Annals, 31*(11), 874-884. doi:10.3928/0048-5713-20041101-16
- Gootzeit, J., & Markon, K. (2011). Factors of PTSD: Differential specificity and external correlates. *Clinical Psychology Review, 31*(6), 993-1003. doi:10.1016/j.cpr.2011.06.005
- Grant, B. F., Saha, T. D., Ruan, W. J., Goldstein, R. B., Chou, S. P., Jung, J., . . . Hasin, D. S. (2015). Epidemiology of DSM-5 Drug Use Disorder: Results from the national epidemiologic survey on

alcohol and related conditions—iii. *JAMA psychiatry*, 73(1), 1-9.

doi:10.1001/jamapsychiatry.2015.2132

Grant, D. M., Beck, J. G., Marques, L., Palyo, S. A., & Clapp, J. D. (2008). The structure of distress following trauma: Posttraumatic Stress Disorder, Major Depressive Disorder, and Generalized Anxiety Disorder. *Journal Of Abnormal Psychology*, 117(3), 662-672. doi:10.1037/a0012591

Grauerholz, L. (2000). An ecological approach to understanding sexual revictimization: Linking personal, interpersonal, and sociocultural factors and processes. *Child Maltreatment*, 5(1), 5-17.  
doi:10.1177/1077559500005001002

Green, B. L., Krupnick, J. L., Chung, J., Siddique, J., Krause, E. D., Revicki, D., . . . Miranda, J. (2006). Impact of PTSD comorbidity on one-year outcomes in a depression trial. *Journal of Clinical Psychology*, 4(4), 815-835. doi:10.1002/jclp.20279

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 standardized clinical assessments in the WHO World Mental Health Surveys. *International Journal of Methods in Psychiatric Research*, 15(4), 167-180. doi:10.1002/mpr.196

Hartley, C. A., McKenna, M. C., Salman, R., Holmes, A., Casey, B. J., Phelps, E. A., & Glatt, C. E. (2012). Serotonin transporter polyadenylation polymorphism modulates the retention of fear extinction memory. *Proceedings of the National Academy of Sciences - PNAS*, 109(14), 5493-5498.  
doi:10.1073/pnas.1202044109

Harvard Medical School Department of Health Care Policy. (2005). *The World Mental Health Survey Initiative*. Retrieved from <https://www.hcp.med.harvard.edu/wmh/>



- Hatch, S. L., & Dohrenwend, B. P. (2007). Distribution of traumatic and other stressful life events by race/ethnicity, gender, SES, and age: A review of the research. *American Journal Of Community Psychology, 40*(3-4), 313-332. doi:10.1007/s10464-007-9134-z
- Hawn, S. E., Cusack, S. E., & Amstadter, A. B. (2020). A systematic review of the self-medication hypothesis in the context of Posttraumatic Stress Disorder and comorbid problematic alcohol use. *Journal Of Traumatic Stress, 33*(5), 699-708. doi:10.1002/jts.22521
- Hesson, J., & Fowler, K. (2018). Prevalence and correlates of self-reported ADD/ADHD in a large national sample of Canadian adults. *Journal of Attention Disorders, 22*(2), 191-200. doi:10.1177/1087054715573992
- Hinton, D. E., & Lewis-Fernández, R. (2011). The cross-cultural validity of Posttraumatic Stress Disorder: Implications for DSM-5. *Depression and Anxiety, 28*(9), 783-801. doi:10.1002/da.20753
- 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. doi:10.1016/S0005-7894(01)80044-7
- Horesh, D., Lowe, S. R., Galea, S., Aiello, A. E., Koenen, K. C., & Uddin, M. (2017). An in-depth look into PTSD-depression comorbidity: A longitudinal study of chronically-exposed Detroit residents. *Journal Of Affective Disorders, 208*, 653-661. doi:10.1016/j.jad.2016.08.053
- Horesh, D., Lowe, S. R., Galea, S., Uddin, M., & Koenen, K. C. (2015). Gender differences in the long-term associations between Posttraumatic Stress Disorder and Depression symptoms: Findings from the Detroit neighborhood health study. *Depression and Anxiety, 21*(1), 38-48. doi:10.1002/da.22267
- Horwitz, A. V. (2018). *PTSD: A short history*. Baltimore: Johns Hopkins University Press.

- Husky, M. M., Mazure, C. M., & Kovess-Masfety, V. (2018). Gender differences in psychiatric and medical comorbidity with Post-Traumatic Stress Disorder. *Comprehensive Psychiatry*, *84*, 75-81.  
doi:10.1016/j.comppsy.2018.04.007
- Inslicht, S. S., Metzler, T. J., Garcia, N. M., Pineles, S. L., Milad, M. R., Orr, S. P., . . . Neylan, T. C. (2012). Sex differences in fear conditioning in Posttraumatic Stress Disorder. *Journal Of Psychiatric Research*, *47*(1), 64-71. doi:10.1016/j.jpsychires.2012.08.027
- Ishikawa, R. Z., Steere, R., Conteh, N., Cramer, M. A., Rao, V., Sprich, S., & Cohen, J. N. (2022). Treating PTSD and Alcohol Use Disorder: Concurrent Cognitive Processing Therapy and psychopharmacology. *The Journal of Clinical Psychiatry*, *84*(1), 1-8. doi:10.4088/JCP.22ct14636
- Jacobsen, L. K., Southwick, S. M., & Kosten, T. R. (2001). Substance use disorders in patients with Posttraumatic Stress Disorder: A review of the literature. *The American Journal of Psychiatry*, *158*(8), 1184-1190. doi:10.1176/appi.ajp.158.8.1184
- Jellestad, L., Vital, N. A., Malamud, J., Taeymans, J., & Mueller-Pfeiffer, C. (2021). Functional impairment in Posttraumatic Stress Disorder: A systematic review and meta-analysis. *Journal Of Psychiatric Research*, *136*, 14-22. doi:10.1016/j.jpsychires.2021.01.039
- Kessler, R. C. (2000). Posttraumatic Stress Disorder: The Burden to the Individual and to Society. *Journal of Clinical Psychiatry*, *61*(5), 4-12.
- Kessler, R. C., & Üstün, T. B. (2004). The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *International Journal of Methods in Psychiatric Research*, *13*(2), 93-121. doi:10.1002/mpr.168

- Kessler, R. C., Andrews, G., Mroczek, D., Ustun, B., & Wittchen, H.-U. (1998). The World Health Organization Composite International Diagnostic Interview short-form (CIDI-SF). *International Journal of Methods in Psychiatric Research*, 7(4), 171-185. doi:10.1002/mpr.47
- Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey replication. *Archives of General Psychiatry*, 62(6), 617-627. doi:0.1001/archpsyc.62.6.617
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic Stress Disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 52(12), 1048-1060. doi:10.1001/archpsyc.1995.03950240066012
- Khoury, L., Tang, Y. L., Bradley, B., Cubells, J. F., & Ressler, K. J. (2010). Substance use, childhood traumatic experience, and Posttraumatic Stress Disorder in an urban civilian population. *Depression and Anxiety*, 4(12), 1077-1086. doi:10.1002/da.20751
- Kilpatrick, D. G., Resnick, H. S., Milanak, M. E., Miller, M. W., Keyes, K. M., & Friedman, M. J. (2013). National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV and DSM-5 criteria. *Journal of Traumatic Stress*, 26, 537-547. doi:10.1002/jts.21848
- Kim, K., Tsai, A. C., Sumner, J. A., & Jung, S. J. (2022). Posttraumatic Stress Disorder, cardiovascular disease outcomes and the modifying role of socioeconomic status. *Journal of Affective Disorders*, 319, 555-561. doi:10.1016/j.jad.2022.09.117
- Koenen, K., Ratanatharathorn, A., Ng, L., McLaughlin, K., Bromet, E., Stein, D., . . . al., e. (2017). Posttraumatic Stress Disorder in the World Mental Health Surveys. *Psychological Medicine*, 47, 2260-2274. doi:10.1017/S0033291717000708

- Krysinska, K., & Lester, D. (2010). Post-Traumatic Stress Disorder and suicide risk: A systematic review. *Archives Of Suicide Research, 14*(1), 1-23. doi:10.1080/13811110903478997
- Lake, S., Kerr, T., Buxton, J., Walsh, Z., Marshall, B. D., Wood, E., & Milloy, M.-J. (2020). Does cannabis use modify the effect of post-traumatic stress disorder on severe depression and suicidal ideation? Evidence from a population-based cross-sectional study of Canadians. *Journal of Psychopharmacology, 34*(2), 181-188. doi:10.1177/0269881119882806
- Lilly, M. M., Pole, N., Best, S. R., Metzler, T., & Marmar, C. R. (2009). Gender and PTSD: What can we learn from female police officers? *Journal Of Anxiety Disorders, 23*(6), 767-774. doi:10.1016/j.janxdis.2009.02.015
- Lissek, S., & van Meurs, B. (2015). Learning models of PTSD: Theoretical accounts and psychobiological evidence. *International Journal of Psychophysiology, 98*(3 Pt 2), 594–605. doi:10.1016/j.ijpsycho.2014.11.006
- Litz, B. T., Gray, M. J., Bryant, R. A., & Adler, A. B. (2002). Early intervention for trauma: Current status and future directions. *Clinical Psychology, 9*(2), 112-134. doi:10.1093/clipsy/9.2.112
- Liu, H., Petukhova, M. V., Sampson, N. A., Aguilar-Gaxiola, S., Alonso, J., Andrade, L. H., . . . Kessler, R. C. (2017). Association of DSM-IV Posttraumatic Stress Disorder with traumatic experience type and history in the World Health Organization World Mental Health Surveys. *JAMA Psychiatry, 74*(3), 270-281. doi:10.1001/jamapsychiatry.2016.3783
- Logue, M. W., van Rooij, S. J., Dennis, E. L., Davis, S. L., Hayes, J. P., Stevens, J. S., . . . Morey, R. A. (2018). Smaller hippocampal volume in Posttraumatic Stress Disorder: A multisite ENIGMA-PGC study: Subcortical volumetry results from Posttraumatic Stress Disorder Consortia. *Biological Psychiatry, 83*(3), 244-253. doi:10.1016/j.biopsych.2017.09.006

- Lowe, S. R., Galea, S., Uddin, M., & Koenen, K. C. (2014). Trajectories of posttraumatic stress among urban residents. *American Journal of Community Psychology, 53*, 159-172. doi:10.1007/s10464-014-9634-6
- Madnick, D., & Spokas, M. (2022). Reporting and inclusion of specific sociodemographic groups in the adult PTSD treatment outcome literature within the United States: A systematic review. *Clinical Psychology, 29*(3), 311-321. doi:10.1037/cps0000067
- McFarlane, A. C. (2010). The long-term costs of traumatic stress: Intertwined physical and psychological consequences. *World Psychiatry, 9*(1), 3-10. doi:10.1002/j.2051-5545.2010.tb00254.x
- McGinty, G., Fox, R., Ben-Ezra, M., Cloitre, M., Karatzias, T., Shevlin, M., & Hyland, P. (2021). Sex and age differences in ICD-11 PTSD and complex PTSD: An analysis of four general population samples. *European Psychiatry, 64*(1), e66-e66. doi:10.1192/j.eurpsy.2021.2239
- Merikangas, K. R., Akiskal, H. S., Angst, J., Greenberg, P. E., Hirschfeld, R. M., Petukhova, M., & Kessler, R. C. (2007). Lifetime and 12-month prevalence of Bipolar Spectrum Disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 64*(5), .543-552. doi:10.1001/archpsyc.64.5.543
- Mills, K. (2013). Treatment of comorbid substance dependence and posttraumatic stress disorder. *JAMA: The Journal of the American Medical Association, 310*(5), 482-483. doi:10.1001/jama.2013.8269
- Mills, K., Teesson, M., Ross, J., & Peters, L. (2006). Trauma, PTSD, and substance use disorders: Findings from the Australian national survey of mental health and well-being. *The American Journal Of Psychiatry, 163*(4), 652-658. doi:10.1176/ajp.2006.163.4.652

- Morina, N., Wicherts, J. M., Lobbrecht, J., & Priebe, S. (2014). Remission from Post-Traumatic Stress Disorder in adults: A systematic review and meta-analysis of long term outcome studies. *Clinical Psychology Review, 34*(3), 249-255. doi:10.1016/j.cpr.2014.03.002
- Mueser, K. T., Essock, S. M., Haines, M., Wolfe, R., & Xie, H. (2004). Posttraumatic Stress Disorder, supported employment, and outcomes in people with severe mental illness. *CNS Spectrums, 9*(12), 913-925. doi:10.1017/S1092852900009779
- Müller, M., Vandeleur, C., Rodgers, S., Rössler, W., Castelao, E., Preisig, M., & Ajdacic-Gross, V. (2014). Factors associated with comorbidity patterns in full and partial PTSD: Findings from the PsyCoLaus study. *Comprehensive Psychiatry, 55*(4), 837-848. doi:10.1016/j.comppsy.2014.01.009
- Najavits, L. M., Krinsley, K., Waring, M. E., Gallagher, M. W., & Skidmore, C. (2018). A randomized controlled trial for veterans with PTSD and Substance Use Disorder: Creating change versus seeking safety. *Substance Use & Misuse, 53*(11), 1788-1800. doi:10.1080/10826084.2018.1432653
- Neria, Y., Besser, A., Kiper, D., & Westphal, M. (2010). A longitudinal study of Posttraumatic Stress Disorder, Depression, and Generalized Anxiety Disorder in Israeli civilians exposed to war trauma: Longitudinal Study of PTSD, MDD, and GAD. *Journal Of Traumatic Stress, 23*(3), 322-330. doi:10.1002/jts.20522
- Norman, S. B., Haller, M., Hamblen, J. L., Southwick, S. M., Pietrzak, R. H., & Petry, N. M. (2018). The burden of co-occurring Alcohol Use Disorder and PTSD in U.S. military veterans: Comorbidities, functioning, and suicidality. *Psychology Of Addictive Behaviors, 32*(2), 224-229. doi:10.1037/adb0000348

- North, C. S., Suris, A. M., Smith, R. P., & King, R. V. (2016). The evolution of PTSD criteria across editions of DSM. *Annals of Clinical Psychiatry, 28*(3), 197-208.
- O'Donnell, M. L., Creamer, M., & Pattison, P. (2004). Posttraumatic Stress Disorder and Depression following trauma: Understanding comorbidity. *American Journal of Psychiatry, 161*(8), 1390–1396. doi:10.1176/appi.ajp.161.8.1390
- O'Hare, T., Shen, C., & Sherrer, M. (2010). High-risk behaviors and drinking-to-cope as mediators of lifetime abuse and PTSD symptoms in clients with severe mental illness. *Journal Of Traumatic Stress, 23*(2), 255-263. doi:10.1002/jts.20515
- Olf, M. (2017). Sex and gender differences in Post-Traumatic Stress Disorder: An update. *European Journal Of Psychotraumatology, 8*(sup4), 1-2. doi:doi.org/10.1080/20008198.2017.1351204
- Olf, M., Langeland, W., Draijer, N., & Gersons, B. P. (2007). Gender Differences in Posttraumatic Stress Disorder. *Psychological Bulletin, 133*(2), 183-204. doi:10.1037/0033-2909.133.2.183
- Otto, M. W., Perlman, C. A., Wernicke, R., Reese, H. E., Bauer, M. S., & Pollack, M. H. (2004). Posttraumatic Stress Disorder in patients with Bipolar Disorder: A review of prevalence, correlates, and treatment strategies. *Bipolar disorders, 6*(6), 470-479. doi: 10.1111/j.1399-5618.2004.00151.x
- 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*(1), 52-73. doi:10.1037/0033-2909.129.1.52
- Patel, A. R., & Hall, B. J. (2021). Beyond the DSM-5 diagnoses: A cross-cultural approach to assessing trauma. *Focus (American Psychiatric Publishing), 19*(2), 197-203. doi:10.1176/appi.focus.20200049

- Perrin, M., Vandeleur, C. L., Castelao, E., Rothen, S., Glaus, J., Vollenweider, P., & Preisig, M. (2014). Determinants of the development of Post-Traumatic Stress Disorder in the general population. *Social Psychiatry and Psychiatric Epidemiology*, *49*, 447-457. doi:10.1007/s00127-013-0762-3
- Perry, B. D., Pollard, R. A., Blakley, T. L., Baker, W. L., & Vigilante, D. (1995). Childhood trauma, the neurobiology of adaptation, and "use-dependent" development of the brain: How "states" become "traits". *Infant Mental Health Journal*, *16*(4), 271-291. doi:10.1002/1097-0355(199524)16:4<271::AID-IMHJ2280160404>3.0.CO;2-B
- Pitman, R. K., Rasmusson, A. M., Koenen, K. C., Shin, L. M., Orr, S. P., Gilbertson, M. W., . . . Liberzon, I. (2012). Biological Studies of Post-Traumatic Stress Disorder. *Nature Reviews. Neuroscience*, *13*(11), 769-787. doi:10.1038/nrn3339
- Pole, N., Best, S. R., Weiss, D. S., Metzler, T., Liberman, A. M., Fagan, J., & Marmar, C. R. (2001). Effects of gender and ethnicity on duty-related posttraumatic stress symptoms among urban police officers. *The Journal of Nervous and Mental Disease*, *189*(7), 442-448. doi:10.1097/00005053-200107000-00005
- Post, L. M., Zoellner, L. A., Youngstrom, E., & Feeny, N. C. (2011). Understanding the relationship between co-occurring PTSD and MDD: Symptom severity and affect. *Journal Of Anxiety Disorders*, *25*(8), 1123-1130. doi:10.1016/j.janxdis.2011.08.003
- Price, M., & van Stolk-Cooke, K. (2015). Examination of the interrelations between the factors of PTSD, Major Depression, and Generalized Anxiety Disorder in a heterogeneous trauma-exposed sample using DSM 5 criteria. *Journal of Affective Disorders*, *186*, 149-155. doi:10.1016/j.jad.2015.06.012



- Qassem, T., Aly-ElGabry, D., Alzarouni, A., Abdel-Aziz, K., & Arnone, D. (2021). Psychiatric co-morbidities in Post-Traumatic Stress Disorder: Detailed findings from the adult psychiatric morbidity survey in the English population. *Psychiatric Quarterly*, *92*(1), 321-330. doi:10.1007/s11126-020-09797-4
- Quarantini, L. C., Miranda-Scippa, Â., Nery-Fernandes, F., Andrade-Nascimento, M., Galvão-de-Almeida, A., Guimarães, J. L., . . . Post, R. M. (2010). The impact of comorbid Posttraumatic Stress Disorder on Bipolar Disorder patients. *Journal Of Affective Disorders*, *123*(1), 71-76. doi:10.1016/j.jad.2009.08.005
- Quirk, G. J., Milad, M. R., & Santini, E. (2007). Learning not to fear: A neural systems approach. In L. J. Kirmayer, R. Lemelson, & M. Barad, *Understanding trauma: Integrating biological, clinical, and cultural perspectives* (pp. 60-77). Cambridge: Cambridge University Press.
- Ramel, W., Goldin, P. R., Eyler, L. T., Brown, G. G., Gotlib, I. H., & McQuaid, J. R. (2007). Amygdala reactivity and mood-congruent memory in individuals at risk for depressive relapse. *Biological Psychiatry*, *61*(2), 231-239. doi:10.1016/j.biopsych.2006.05.004
- Rau, V., & Fanselow, M. S. (2007). Neurobiological and neuroethological perspectives on fear and anxiety. In L. J. Kirmayer, R. Lemelson, & M. Barad, *Understanding Trauma: Integrating Biological, Clinical, and Cultural Perspectives* (pp. 27-40). Cambridge: Cambridge University Press.
- Rehder, K., & Bowen, S. (2019). PTSD symptom severity, cannabis, and gender: A zero-inflated negative binomial regression model. *Substance Use & Misuse*, *54*(8), 1309-1318. doi:10.1080/10826084.2019.1575421

- Reynolds, M., Mezey, G., Chapman, M., Wheeler, M., Drummond, C., & Baldacchino, A. (2005). Co-morbid Post-Traumatic Stress Disorder in a substance misusing clinical population. *Drug And Alcohol Dependence*, 77(3), 251-258. doi:10.1016/j.drugalcdep.2004.08.017
- Richardson, J. D., Elhai, J. D., & Sarreen, J. (2011). Predictors of treatment response in canadian combat and peacekeeping veterans with military-related Posttraumatic Stress Disorder. *The Journal Of Nervous And Mental Disease*, 199(9), 639-645. doi:10.1097/NMD.0b013e318229ce7b
- Rubin, D. C., & Feeling, N. (2013). Measuring the severity of negative and traumatic events. *Clinical Psychological Science*, 1(4), 375-389. doi:10.1177/2167702613483112
- Rubin, D. C., Berntsen, D., Bohni, M. K., & Rayner, K. (2008). A memory-based model of Posttraumatic Stress Disorder: Evaluating basic assumptions underlying the PTSD diagnosis. *Psychological Review*, 115(4), 985-1011. doi:10.1037/a0013397
- Sareen, J. (2014). Posttraumatic Stress Disorder in adults: Impact, comorbidity, risk factors, and treatment. *Canadian Journal of Psychiatry*, 59(9), 460–467. doi:10.1177/070674371405900902
- Sareen, J., Cox, B. J., Afifi, T. O., de Graaf, R., Asmundson, G. J., ten Have, M., & Stein, M. B. (2005). Anxiety disorders and risk for suicidal ideation and suicide attempts: A population-based longitudinal study of adults. *Archives Of General Psychiatry*, 62(11), 1249-1257. doi:10.1001/archpsyc.62.11.1249
- Sareen, J., Cox, B. J., Stein, M. B., Afifi, T. O., Fleet, C., & Asmundson, G. J. (2007). Physical and mental comorbidity, disability, and suicidal behavior associated with Posttraumatic Stress Disorder in a large community sample. *Psychosomatic Medicine*, 69(3), 242-248. doi:10.1097/PSY.0b013e31803146d8

- Sareen, J., Houlihan, T., Cox, B. J., & Asmundson, G. J. (2005). Anxiety disorders associated with suicidal ideation and suicide attempts in the National Comorbidity Survey. *The Journal Of Nervous And Mental Disease, 193*(7), 450-454. doi:10.1097/01.nmd.0000168263.89652.6b
- Scott, K. M., Koenen, K. C., Aguilar-Gaxiola, S., Alonso, J., Angermeyer, M. C., Benjet, C., . . . Bayer, A. (2013). Associations between lifetime traumatic events and subsequent chronic physical conditions: A cross-national, cross-sectional study. *United States: Public Library of Science, 8*(11), e80573-e80573. doi:10.1371/journal.pone.0080573
- Shevlin, M., Hyland, P., Vallières, F., Bisson, J., Makhshvili, N., Javakhishvili, J., . . . Roberts, B. (2018). A comparison of DSM-5 and ICD-11 PTSD prevalence, comorbidity and disability: an analysis of the Ukrainian Internally Displaced Person's Mental Health Survey. *Acta Psychiatrica Scandinavica, 137*(2), 138-147. doi:10.1111/acps.12840
- Simon, J., Pari, A. A., Wolstenholme, J., Berger, M., Goodwin, G. M., & Geddes, J. R. (2021). The costs of Bipolar Disorder in the United Kingdom. *Brain and Behavior, 11*(10), e2351-n/a. doi:10.1002/brb3.2351
- Smith, M. W., Schnurr, P. P., & Rosenheck, R. A. (2005). Employment outcomes and PTSD Symptom severity. *Mental Health Services Research, 7*(2), 89-101. doi:10.1007/s11020-005-3780-2
- Spitzer, R. L., First, M. B., & Wakefield, J. C. (2006). Saving PTSD from itself in DSM-V. *Journal Of Anxiety Disorders, 21*(2), 233-241. doi:10.1016/j.janxdis.2006.09.006
- Sprague, S., & Olff, M. (2014). Intimate partner violence and mental health. *European Journal Of Psychotraumatology, 1*-2.

- Sripada, R. K., Henry, J., Yosef, M., Levine, D. S., Bohnert, K. M., Miller, E., . . . Kendall-Tackett, K. (2018). Occupational functioning and employment services use among va primary care patients with Posttraumatic Stress Disorder. *Psychological Trauma, 10*(2), 140-143. doi:10.1037/tra0000241
- Statistics Canada. (2013). *Canadian Community Health Survey: Mental Health*. Retrieved from [http://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item\\_Id=119788](http://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item_Id=119788)
- Statistics Canada. (2014). *Mental Health - Public Use Microdata File Derived Variable (DV) Specifications*. Retrieved from Canadian Community Health Survey (CCHS) : [https://gsg.uottawa.ca/data/teaching/escc-cchs/fmgd\\_pumf/2012/cchs\\_mh\\_derived\\_variables.pdf](https://gsg.uottawa.ca/data/teaching/escc-cchs/fmgd_pumf/2012/cchs_mh_derived_variables.pdf)
- Statistics Canada. (2022, May 20). *Survey on Mental Health and Stressful Events, August to December 2021*. Retrieved from Statistics Canada: <https://www150.statcan.gc.ca/n1/daily-quotidien/220520/dq220520b-eng.htm>
- Stein, M. B., Walker, J. R., Hazen, A., & Forde, D. (1997). Full and partial Posttraumatic Stress Disorder: Findings from a community survey. *American Journal of Psychiatry, 154*(8), 1114-1119. doi:10.1176/ajp.154.8.1114
- Stergiopoulos, E., Cimo, A., Cheng, C., Bonato, S., & Dewa, C. S. (2011). Interventions to improve work outcomes in work-related PTSD: A systematic review. *BMC Public Health, 11*(1), 838-838. doi:10.1186/1471-2458-11-838
- Street, A. E., & Dardis, C. M. (2018). Using a social construction of gender lens to understand gender differences in Posttraumatic Stress Disorder. *Clinical Psychology Review, 66*, 97-105. doi:10.1016/j.cpr.2018.03.001

- Street, A. E., Gradus, J. L., Giasson, H. L., Vogt, D., & Resick, P. A. (2013). Gender differences among veterans deployed in support of the wars in Afghanistan and Iraq. *Journal Of General Internal Medicine, 28*(2), 556-562. doi:10.1007/s11606-013-2333-4
- Sweeney, A., Filson, B., Kennedy, A., Collinson, L., & Gillard, S. (2018). A paradigm shift: Relationships in trauma-informed mental health services. *British Journal of Psychiatry Advances, 24*(5), 319-333. doi:10.1192/bja.2018.29
- Taft, C. T., Watkins, L. E., Stafford, J., Street, A. E., Monson, C. M., & Nezu, A. M. (2011). Posttraumatic Stress Disorder and intimate relationship problems: A meta-analysis. *Journal of Consulting and Clinical Psychology, 79*(1), 22-33. doi:10.1037/a0022196
- Tolin, D. F., & Foa, E. B. (2006). Sex differences in trauma and Posttraumatic Stress Disorder: A quantitative review of 25 years of research. *Psychological Bulletin, 132*(6), 959-992. doi:10.1037/0033-2909.132.6.959
- Tortella-Fellu, M., Fullana, M. A., Pérez-Vigil, A., Torres, X., Chamorro, J., Littarelli, S. A., . . . Fernández de la Cruz, L. (2019). Risk factors for Posttraumatic Stress Disorder: An umbrella review of systematic reviews and meta-analyses. *Neuroscience and Biobehavioral Reviews, 107*, 154-165. doi:10.1016/j.neubiorev.2019.09.013
- Trafton, J. A., Minkel, J., & Humphreys, K. (2006). Opioid substitution treatment reduces substance use equivalently in patients with and without Posttraumatic Stress Disorder. *Journal of Studies on Alcohol and Drugs, 67*(2), 228-235. doi:https://doi.org/10.15288/jsa.2006.67.228
- Ullman, S. E., Townsend, S. M., Starzynski, L. L., & Long, L. M. (2006). Correlates of comorbid PTSD and polysubstance use in sexual assault victims. *Violence and Victims, 21*(6), 725-743. doi:10.1891/0886-6708.21.6.725

- Valentine, S. E., Smith, A. M., Miller, K., Hadden, L., & Shipherd, J. C. (2023). Considerations and complexities of accurate PTSD assessment among transgender and gender diverse adults. *Psychological Assessment, 35*(5), 383-395. doi:10.1037/pas0001215
- Van Ameringen, M., Mancini, C., Patterson, B., & Boyle, M. H. (2008). Post-Traumatic Stress Disorder in Canada. *CNS Neuroscience & Therapeutics, 14*, 171–181. doi:10.1111/j.1755-5949.2008.00049.x
- van der Kolk, B. (2014). *The body keeps the score: Brain, mind, and body in the healing of trauma*. New York: Penguin Books.
- van der Kolk, B., & Yehuda, R. (2006). Clinical implications of neuroscience research In PTSD. *Annals of the New York Academy of Sciences, 1071*(1), 277-293. doi:10.1196/annals.1364.022
- Vogt, D., Smith, B. N., Fox, A. B., Amoroso, T., Taverna, E., & Schnurr, P. P. (2017). Consequences of PTSD for the work and family quality of life of female and male U.S. Afghanistan and Iraq War veterans. *Social Psychiatry and Psychiatric Epidemiology, 52*(3), 341–352. doi:10.1007/s00127-016-1321-5
- Wittchen, H.-U. (1994). Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): A critical review. *Journal Of Psychiatric Research, 28*(1), 57-84. doi:10.1016/0022-3956(94)90036-1
- World Health Organization. (1990). *Composite International Diagnostic Interview (CIDI)*. Geneva: World Health Organization.
- World Health Organization. (2015). *International Classification of Diseases, Tenth Revision (Fifth ed.)*. Geneva: World Health Organization.
- World Health Organization. (2018). *World Mental Health Composite International Diagnostic Interview*. Retrieved from <https://www.hcp.med.harvard.edu/wmhcdi/>

World Health Organization. (2022). *International Classification of Diseases, Eleventh Revision*. Geneva:  
World Health Organization.

Zannas, A. S., Provençal, N., & Binder, E. B. (2015). Epigenetics of Posttraumatic Stress Disorder: Current evidence, challenges, and future directions. *Biological Psychiatry*, 78(5), 327–335.  
doi:10.1016/j.biopsych.2015.04.003

## **Appendix A: DSM-5 diagnostic criteria for Posttraumatic Stress Disorder (PTSD)**

A. Exposure to actual or threatened death, serious injury, or sexual violence in one (or more) of the following ways:

1. Directly experiencing the traumatic event(s).
2. Witnessing, in person, the event(s) as it occurred to others.
3. Learning that the traumatic event(s) occurred to a close family member or close friend. In cases of actual or threatened a death of a family member or friend, the event(s) must have been violent or accidental.
4. Experiencing repeated or extreme exposure to a verse of details of the traumatic event(s) (e.g. first responders collecting human remains; police officers repeatedly exposed the details of child abuse).

Note: Criterion A4 does not apply to exposure through electronic media, television, movies, or pictures, unless this exposure is work-related.

B. Presence of one (or more) of the following intrusion symptoms associated with a traumatic event(s), beginning after the traumatic event(s) occurred:

1. Recurrent, involuntary, and intrusive distressing memories of a traumatic event(s).

Note: in children older than six years, repetitive play may occur in which themes or aspect of the traumatic event(s) are expressed.

2. Recurrent distressing dreams in which the content and/or affect of the dream are related to the traumatic event(s).

Note: in children, there may be frightening dreams without recognisable content.

3. Dissociative reactions (e.g. flashbacks) in which the individual feels or acts as if the traumatic event(s) were recurring. (Such reactions may occur on a continuum,



with the most extreme expression being a complete loss of awareness of present surroundings.)

Note: in children, trauma-specific re-enactment may occur in play.

4. Intense or prolonged psychological distress at exposure to internal or external cues that symbolise or resemble an aspect of the traumatic event(s).
  5. Marked physiological reactions to internal or external cues that symbolise or resemble an aspect of the traumatic event(s).
- C. Persistent avoidance of stimuli associated with the traumatic event(s), beginning after the traumatic event(s) occurred, as evidenced by one or both of the following:
1. Avoidance of your efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).
  2. Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).
- D. Negative alterations and cognitions and mood associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two or more of the following:
1. Inability to remember an important aspect of the traumatic event(s) (typically due to dissociate or amnesia and not to other factors such as head injury, alcohol, or drugs).
  2. Persistent and exaggerated negative beliefs or expectations about oneself, others, or the world (E.g. “I am bad,” “No one can be trusted,” “The world is completely dangerous,” “My whole nervous system is permanently ruined”).

3. Persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others.
  4. Persistent negative emotional state (e.g. fear, horror, anger, guilt, or shame).
  5. Markedly diminished interest or participation in significant activities.
  6. Feelings of detachment or estrangement from others.
  7. Persistent inability to experience positive emotions (e.g. inability to experience happiness, satisfaction, or loving feelings).
- E. Were good alterations in arousal and reactivity associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:
1. Irritable behaviour and angry outbursts (with little or no provocation) typically expressed as verbal or physical aggression towards people or objects.
  2. Reckless or self-destructive behaviour.
  3. Hypervigilance.
  4. Exaggerated startle response.
  5. Problems with concentration.
  6. Sleep disturbance (e.g. difficulty falling or staying asleep or restless sleep).
- F. Duration of the disturbance (Criteria B, C, D, and E) is more than one month.
- G. The disturbance causes clinically significant distress or impairment and social, occupational trauma or other important areas of functioning.
- H. The disturbance is not attributable to the physiological effects of a substance (e.g. medication, alcohol) or another medical condition.

Specify whether:

**With dissociative symptoms:** the individual symptoms and meet the criteria for post-traumatic stress disorder, and in addition, in response to the stressor, the individual experiences persistent or recurrent symptoms of either of the following:

1. **Depersonalisation:** persistent or recurrent experiences are feeling detached from, and as if one were an outside observer of, one's mental processes or body (e.g. feeling as though one were in a dream; feeling a sense of unreality of self or body or of time moving slowly).
2. **Derealization:** persistent or recurrent experiences of unreality of surroundings (e.g. the world around the individual is experienced as unreal, dreamlike, distant, or distorted).

Note: to use this subtype the dissociative symptoms must not be attributable to the physiological effects of a substance (e.g. blackouts, behaviour during alcohol intoxication) or another medical condition (e.g. complex partial seizures).

Specify if:

**With delayed expression:** if the full diagnostic criteria are not met until at least six months after the event (although the onset and expression of some symptoms may be immediate).

## **Appendix B: DSM-IV-TR diagnostic criteria for Posttraumatic Stress Disorder (PTSD)**

A. The person has been exposed to a traumatic event in which both of the following were present:

1. The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others.
2. The person's response involved intense fear, helplessness, or horror. **Note:** In children, this may be expressed instead by disorganized or agitated behaviour.

B. The traumatic event is persistently reexperienced in one (or more) of the following ways:

1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. **Note:** In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
2. Recurrent distressing dreams of the event. **Note:** In children, there may be frightening dreams without recognizable content.
3. Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience; illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). **Note:** In young children, trauma-specific reenactment may occur.
4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.
5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

- C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:
1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma
  2. Efforts to avoid activities, places, or people that arouse recollections of the trauma
  3. Inability to recall an important aspect of the trauma
  4. Markedly diminished interest or participation in significant activities
  5. Feeling of detachment or estrangement from others
  6. Restricted range of affect (e.g., unable to have loving feelings)
  7. Sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal lifespan)
- D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:
1. Difficulty falling or staying asleep
  2. Irritability or outbursts of anger
  3. Difficulty concentrating
  4. Hypervigilance
  5. Exaggerated startle response
- E. Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.
- F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Specify if:

**Acute:** if duration of symptoms is less than 3 months

**Chronic:** if duration of symptoms is 3 months or more

Specify if:

**With Delayed Onset:** if onset of symptoms is at least 6 months after the stressor

## Appendix C: DSM-IV-TR diagnostic criteria for Major Depressive Episode

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.

**Note:** Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). **Note:** In children and adolescents, can be irritable mood.
2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)
3. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. **Note:** In children, consider failure to make expected weight gains.
4. Insomnia or hypersomnia nearly every day
5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
6. Fatigue or loss of energy nearly every day
7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)

9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide
- B. The symptoms do not meet criteria for a Mixed Episode.
- C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g. hypothyroidism).
- E. The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.



## Appendix D: DSM-IV-TR diagnostic criteria for Major Depressive Disorder

- A. Presence of a single Major Depressive Episode (See Appendix C).
- B. The Major Depressive Episode is not better accounted for by Schizoaffective disorder and is not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.
- C. There has never been a Manic Episode (See Appendix E), A Mixed Episode, or a Hypomanic Episode (See Appendix F). Note: This exclusion does not apply if all of the manic-like, mixed-like, or hypomanic-like episodes are substance or treatment induced or are due to the direct physiological effects of a general medical condition.

If the full criteria are currently met for a Major Depressive Episode, *specify* its current clinical status and/or features:

Mild, Moderate, Severe Without Psychotic Features/Severe With Psychotic Features

Chronic

With Catatonic Features

With Melancholic Features

With Atypical Features

With Postpartum Onset

If the full criteria are not currently met for a Major Depressive Episode, *specify* the current clinical status of the Major Depressive Disorder or features of the most recent episode:

In Partial Remission, In Full Remission

Chronic

With Catatonic Features

With Melancholic Features

With Atypical Features

With Postpartum Onset

## **Appendix E: DSM-IV-TR diagnostic criteria for Manic Episode**

- A. A distinct period of abnormally and persistently elevated, expansive, or irritable mood, lasting at least 1 week (or any duration if hospitalization is necessary).
- B. During the period of mood disturbance, three (or more) of the following symptoms have persisted (four if the mood is only irritable) and have been present to a significant degree:
  - 1. Inflated self-esteem or grandiosity
  - 2. Decreased need for sleep (e.g., feels rested after only 3 hours of sleep)
  - 3. More talkative than usual or pressure to keep talking
  - 4. Flight of ideas or subjective experience that thoughts are racing
  - 5. Distractibility (i.e., attention too easily drawn to unimportant or irrelevant external stimuli)
  - 6. Increase in goal-directed activity (either socially, at work or school, or sexually) or psychomotor agitation
  - 7. Excessive involvement in pleasurable activities that have a high potential for painful consequences (e.g., engaging in unrestrained buying sprees, sexual indiscretions, or foolish business investments)
- C. The symptoms do not meet criteria for a Mixed Episode.
- D. The mood disturbance is sufficiently severe to cause marked impairment in occupational functioning or in usual social activities or relationships with others, or to necessitate hospitalization to prevent harm to self or others, or there are psychotic features.
- E. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication, or other treatment) or a general medical condition (e.g., hyperthyroidism).

**Note:** Manic-like episodes that are clearly caused by somatic antidepressant treatment (e.g., medication, electroconvulsive therapy, light therapy) should not count toward a diagnosis of Bipolar I Disorder.

**DSM-IV-TR diagnostic criteria for Hypomanic Episode**

- A. A distinct period of persistently elevated, expansive, or irritable mood, lasting throughout at least 4 days that is clearly different from the usual nondepressed mood.
- B. During the period of mood disturbance, three (or more) of the following symptoms have persisted (four if the mood is only irritable) and have been present to a significant degree:
  - 1. Inflated self-esteem or grandiosity
  - 2. Decreased need for sleep (e.g., feels rested after only 3 hours of sleep)
  - 3. More talkative than usual or pressure to keep talking
  - 4. Flight of ideas or subjective experience that thoughts are racing
  - 5. Distractibility (i.e., attention too easily drawn to unimportant or irrelevant external stimuli)
  - 6. Increase in goal-directed activity (either socially, at work or school, or sexually) or psychomotor agitation
  - 7. Excessive involvement in pleasurable activities that have a high potential for painful consequences (e.g., engaging in unrestrained buying sprees, sexual indiscretions, or foolish business investments)
- C. The episode is associated with an unequivocal change in functioning that is uncharacteristic of the person when not symptomatic.
- D. The disturbance in mood and the change in functioning are observable by others.

- E. The episode is not severe enough to cause marked impairment in social or occupational functioning, or to necessitate hospitalization, and there are no psychotic features.
- F. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication, or other treatment) or a general medical condition (e.g., hyperthyroidism).

**Note:** Hypomanic-like episodes that are clearly caused by somatic antidepressant treatment (e.g., medication, electroconvulsive therapy, light therapy) should not count toward a diagnosis of Bipolar II Disorder.

**DSM-IV-TR diagnostic criteria for Mixed Episode**

- A. The criteria are met both for a Manic Episode and for a Major Depressive Episode (except for duration) nearly every day during at least a 1-week period.
- B. The mood disturbance is sufficiently severe to cause marked impairment in occupational functioning or in usual social activities or relationships with others, or to necessitate hospitalization to prevent harm to self or others, or there are psychotic features.
- C. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication, or other treatment) or a general medical condition (e.g., hyperthyroidism).

**Note:** Mixed-like episodes that are that are clearly caused by somatic antidepressant treatment (e.g., medication, electroconvulsive therapy, light therapy) should not count toward a diagnosis of Bipolar I Disorder.

## Appendix F: DSM-IV-TR diagnostic criteria for Bipolar I Disorder, Most Recent Episode

### Manic

- A. Currently (or most recently) in a Manic Episode.
- B. There has previously been at least one Major Depressive Episode, Manic Episode, or Mixed Episode.
- C. The mood episodes in Criteria A and B are not better accounted for by Schizoaffective Disorder and are not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.

If the full criteria are currently met for a Manic Episode, *specify* its current clinical status and/or features:

Mild, Moderate, Severe Without Psychotic Features/Severe With Psychotic Features  
With Catatonic Features  
With Postpartum Onset

If the full criteria are not currently met for a Manic Episode, *specify* the current clinical status of the Bipolar I Disorder and/or features of the most recent Manic Episode:

In Partial Remission, In Full Remission  
With Catatonic Features  
With Postpartum Onset

*Specify:*

Longitudinal Course Specifiers (With and Without Interepisode Recovery)  
With Seasonal Pattern  
With Rapid Cycling

## DSM-IV-TR diagnostic criteria for Bipolar II Disorder

- A. Presence (or history) of at least one Major Depressive Episode
- B. Presence (or history) of at least one Hypomanic Episode.
- C. There has never been a Manic Episode or a Mixed Episode.
- D. The mood symptoms in Criteria A and B are not better accounted for by Schizoaffective Disorder and are not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.
- E. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

*Specify* current or most recent episode:

Hypomanic: if currently (or most recently) in a Hypomanic Episode

Depressed: if currently (or most recently) in a Major Depressive Episode

If the full criteria are not currently met for a Major Depressive Episode, *specify* its current clinical status and/or features:

Mild, Moderate, Severe Without Psychotic Features/Severe With Psychotic

Features

Chronic

With Catatonic Features

With Melancholic Features

With Atypical Features

With Postpartum Onset

*Specify*:

Longitudinal Course Specifiers (With and Without Interepisode Recovery)

With Seasonal Pattern

With Rapid Cycling



## **Appendix G: DSM-IV-TR diagnostic criteria for Generalized Anxiety Disorder**

- A. Excessive anxiety and worry (apprehensive expectation), occurring more days than not for at least 6 months, about a number of events or activities (such as work or school performance).
- B. The person finds it difficult to control the worry.
- C. The anxiety and worry are associated with three (or more) of the following six symptoms (with at least some symptoms present for more days than not for the previous 6 months).

**Note:** Only one item is required in children).

1. Restlessness or feeling keyed up or on edge
  2. Being easily fatigued
  3. Difficulty concentrating or mind going blank
  4. Irritability
  5. Muscle tension
  6. Sleep disturbance (difficulty falling or staying asleep, or restless unsatisfying sleep)
- D. The focus of the anxiety and worry is not confined to features of an Axis I disorder, e.g., the anxiety or worry is not about having a Panic Attack (as in Panic Disorder), being embarrassed in public (as in Social Phobia), being contaminated (as in Obsessive-Compulsive Disorder), being away from home or close relatives (as in Separation Anxiety Disorder), gaining weight (as in Anorexia Nervosa), having multiple physical complaints (as in Somatization Disorder), or having a serious illness (as in Hypochondriasis), and the anxiety and worry do not occur exclusively during Posttraumatic Stress Disorder.

- E. The anxiety, worry, or physical symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- F. The disturbance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e/g/, hyperthyroidism) and does not occur exclusively during a Mood Disorder, a Psychotic Disorder, or a Pervasive Developmental Disorder.

**Table 1***Age Distribution Frequencies for Individuals With and Without PTSD*

Age (Years)	PTSD				Total	
	Yes		No		n	%
	n	%	n	%	n	%
20 to 24	25	5.9	25	5.9	50	5.9
25 to 29	22	5.2	22	5.2	44	5.2
30 to 34	32	7.5	32	7.5	64	7.5
35 to 39	34	8.0	34	8.0	68	8.0
40 to 44	48	11.3	48	11.3	96	11.3
45 to 49	47	11.1	47	11.1	94	11.1
50 to 54	58	13.6	58	13.6	116	13.6
55 to 59	61	14.4	61	14.4	122	14.4
60 to 64	37	8.7	37	8.7	74	8.7
65 to 69	34	8.0	34	8.0	68	8.0
70 to 74	7	1.6	7	1.6	14	1.6
75 to 79	11	2.6	11	2.6	22	2.6
80+	9	2.1	9	2.1	18	2.1
Total	425	100	425	100	850	100

**Table 2**

*Frequencies and Chi-Square Results for Lifetime Prevalence of Psychiatric Disorders in Individuals with PTSD and Controls*

Psychiatric Illness/Outcome	PTSD				Chi Square	<i>p</i>	Phi
	Yes		No				
	n	%	n	%			
Cannabis Abuse	38	9.0	22	5.2	4.799	.03	0.075
Cannabis Dependence	32	7.6	7	1.7	16.990	.00	0.142
Non-Cannabis Drug Abuse	35	8.3	7	1.7	19.649	.00	0.084
Non-Cannabis Drug Dependence	61	14.5	9	2.1	42.140	.00	0.224
Generalized Anxiety Disorder	216	51.7	52	12.4	148.204	.00	0.421
Major Depressive Episode	249	59.0	61	14.4	181.939	.00	0.463
Suicidal Thoughts	249	58.7	61	14.4	179.131	.00	0.460
Alcohol Abuse	76	18.1	59	13.9	2.695	.10	0.057
Alcohol Dependence	70	16.7	13	3.1	43.751	.00	0.228
Bipolar Disorder I	30	7.2	4	0.9	21.041	.00	0.158
Bipolar Disorder II	26	6.2	1	0.2	24.222	.00	0.170

**Table 3***Frequencies and Chi-Square Results for 12-Month Prevalence of Psychiatric Disorders in Individuals with PTSD and Controls*

Psychiatric Illness/Outcome	PTSD				Chi Square	<i>p</i>	Phi
	Yes		No				
	n	%	n	%			
Cannabis Abuse	8	1.9	4	0.9	1.372	.24	0.040
Cannabis Dependence	7	1.7	3	0.4	1.619	.20	0.044
Non-Cannabis Drug Abuse	5	1.2	0	0.0	5.030	.03	0.077
Non-Cannabis Drug Dependence	17	4.0	3	0.7	10.039	.00	0.109
Generalized Anxiety Disorder	108	25.8	14	3.3	85.048	.00	0.319
Major Depressive Episode	160	38.1	28	6.6	120.496	.00	0.378
Suicidal Thoughts	108	25.5	12	2.8	89.213	.00	0.325
Alcohol Abuse	10	2.4	3	0.7	3.845	.05	0.067
Alcohol Dependence	22	5.3	4	1.0	12.949	.00	0.124
Bipolar Disorder I	23	5.5	3	0.7	16.121	.00	0.138
Bipolar Disorder II	24	5.7	0	0.0	24.998	.00	0.172

**Table 4***Frequencies and Chi-Square Results for Sociodemographic Variables of Individuals with PTSD and Controls*

Socio-Demographic Variable	PTSD				Chi Square	<i>p</i>	Phi
	Yes		No				
	n	%	n	%			
<b>Marital Status</b>					47.826	.00	0.238
Married	115	27.4	200	47.3			
Common-Law	33	7.9	39	9.2			
Widowed	28	6.7	33	7.8			
Divorced or Separated	114	27.1	59	13.9			
Single	130	31	92	21.7			
<b>Level of Education</b>					4.587	0.07	0.205
Less Than Secondary School Graduation	64	15.1	65	15.4			
Secondary School Graduation	65	15.3	65	15.4			
Some Post-Secondary	33	7.8	18	4.3			
Post-Secondary Graduation	263	61.9	273	64.8			
<b>Personal Income</b>					40.940	.00	0.226
Less Than \$10,000	24	5.9	19	4.8			
\$10,000-\$19,999	120	29.4	50	12.8			
\$20,000-\$29,000	103	25.2	97	24.7			
\$30,000-\$39,000	47	11.5	58	14.8			
\$40,000-\$49,000	30	7.4	48	12.2			
\$50,000 or more	84	20.6	120	30.6			

**Table 5***Age Distribution Frequencies for Males and Females with PTSD*

Age (Years)	PTSD				Total	
	Male		Female		n	%
	n	%	n	%		
20 to 24	8	5.6	17	6.0	25	5.9
25 to 29	6	4.2	16	5.7	22	5.2
30 to 34	8	5.6	24	8.5	32	7.5
35 to 39	13	9.0	21	7.5	34	8.0
40 to 44	18	12.5	30	10.7	48	11.3
45 to 49	11	7.6	36	12.8	47	11.1
50 to 54	18	12.5	40	14.2	58	13.6
55 to 59	21	14.6	40	14.2	61	14.4
60 to 64	14	9.7	23	8.2	37	8.7
65 to 69	14	9.7	20	7.1	34	8.0
70 to 74	2	1.4	5	1.8	7	1.6
75 to 79	4	2.8	7	2.5	11	2.6
80+	7	4.9	2	0.7	9	2.1
Total	144	100	281	100	425	100

**Table 6**

*Frequencies and Chi-Square Results for Lifetime Prevalence of Psychiatric Disorders in Males and Females with PTSD (N=425)*

Psychiatric Illness/Outcome	PTSD				Chi Square	<i>p</i>	Phi
	Male		Female				
	n	%	n	%			
Cannabis Abuse	21	14.7	17	6.1	8.375	.00	0.141
Cannabis Dependence	19	13.3	13	4.7	9.895	.00	0.153
Non-Cannabis Drug Abuse	14	9.8	21	7.6	0.602	.44	0.038
Non-Cannabis Drug Dependence	23	16.1	38	13.7	0.425	.51	0.032
Generalized Anxiety Disorder	60	42.3	156	56.5	7.644	.01	-0.135
Major Depressive Episode	70	48.6	179	64.4	9.762	.00	-0.152
Suicidal Thoughts	74	51.4	175	62.5	4.844	.03	-0.107
Alcohol Abuse	31	21.8	45	16.2	2.020	.16	0.069
Alcohol Dependence	31	22	39	14.1	4.189	.04	0.100
Bipolar Disorder I	10	7	20	7.2	0.009	.92	-0.005
Bipolar Disorder II	10	6.9	16	5.8	0.206	.65	0.022



**Table 7**

*Frequencies and Chi-Square Results for 12-Month Prevalence of Psychiatric Disorders in Males and Females with PTSD (N=425)*

Psychiatric Illness/Outcome	PTSD				Chi Square	<i>p</i>	Phi
	Male		Female				
	n	%	n	%			
Cannabis Abuse	5	3.5	3	1.1	2.941	.09	0.083
Cannabis Dependence	4	2.8	3	1.1	1.692	.19	0.063
Non-Cannabis Drug Abuse	2	1.4	3	1.1	0.080	.78	0.014
Non-Cannabis Drug Dependence	9	6.3	8	2.9	2.816	.09	0.082
Generalized Anxiety Disorder	32	22.7	76	27.4	1.096	.30	-0.051
Major Depressive Episode	47	32.6	113	40.9	2.766	.10	-0.081
Suicidal Thoughts	28	19.4	80	28.6	4.173	.04	-0.099
Alcohol Abuse	5	3.5	5	1.8	1.187	.28	0.053
Alcohol Dependence	12	8.5	10	3.6	4.500	.03	0.104
Bipolar Disorder I	6	4.2	17	6.2	0.700	.40	-0.403
Bipolar Disorder II	10	6.9	14	5.1	0.601	.44	0.038

**Table 8***Frequencies and Chi-Square Results for Sociodemographic Variables of Males and Females with PTSD (N=425)*

Socio-Demographic Variable	PTSD				Chi Square	<i>p</i>	Phi
	Male		Female				
	n	%	n	%			
<b>Marital Status</b>					8.256	0.08	0.14
Married	48	33.8	67	24.1			
Common-Law	9	6.3	24	8.6			
Widowed	7	4.9	21	7.6			
Divorced or Separated	30	21.1	84	30.2			
Single	48	33.8	82	29.5			
<b>Level of Education</b>					2.4	0.49	0.075
Less Than Secondary School Graduation							
Secondary School Graduation	20	13.9	44	15.7			
Some Post-Secondary	23	16	42	14.9			
Post-Secondary Graduation	15	10.4	18	6.4			
	86	59.7	177	67.3			
<b>Personal Income</b>					16.116	0.00	0.199
Less Than \$10,000	2	1.4	22	8.2			
\$10,000-\$19,999	32	22.9	88	32.8			
\$20,000-\$29,000	39	27.9	64	23.9			
\$30,000-\$39,000	16	13.6	28	10.4			
\$40,000-\$49,000	10	7.1	20	7.5			
\$50,000 or more	38	27.1	46	17.2			