Treatment Variations in Post-Traumatic Stress Disorder (PTSD) in a Privately Insured Patient Cohort

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Treatment Variations in Post-Traumatic Stress Disorder (PTSD) in a Privately Insured Patient Cohort

BY

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Medical University of South Carolina

A doctoral project submitted to the faculty of the Medical University of South Carolina in partial fulfillment of the requirements for the degree Doctor of Health Administration in the College of Health Professions

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The National Institute of Health (NIH) has used the term “epidemic” to describe PTSD, with some 7.1 million Americans affected as of 2009. Presently, PTSD is generally treated through a combination of psychotherapy and psychopharmacological approaches; however, alternate approaches such as acupuncture, hypnotherapy, and hyperbaric oxygen therapy (HBOT) have also been inappreciably investigated. Each type of PTSD treatment has varying effectiveness, side effects, and cost. While many individual studies of specific treatments for PTSD are published, there is scarce information on the prevalence of use of treatment modalities for PTSD in current practice. Measuring the distribution of the multiple PTSD treatment options would inform researchers, clinician, and most importantly patients on the frequency, benefits, and cost burden of current modalities currently in use in the United States.
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Chapter 1

Introduction

A. Background and Need

Post Traumatic Stress Disorder (PTSD) is a confounding mental health disorder because of its differences in symptom presentation and symptoms associated with other anxiety related conditions that have similar comorbid characteristics. PTSD is a negative result of a severe adverse associative relationship between the receiver and a significant traumatic event. According to the National Center for PTSD, 7 or 8 out of every 100 people (or 7-8% of the US population) will have PTSD at some point in their lives. Additionally, about 8 million adults have PTSD during a given year (2016, May 22). Retrieved from http://www ptsd va gov/public/PTSD overview/basics/how-common-is ptsd asp). Its core symptoms comprise re-experiencing traumatic content, persistent avoidance of traumatic content, negative alterations in cognitions, and arousal and reactivity (American Psychiatric Association, 2013). Re-experiencing the traumatic content can occur through multiple ideations to include flashbacks, audiovisual cues, and olfactory sensory perceptions to induce latent PTSD symptoms. Conceptually, PTSD can
be considered as a maladaptation to a traumatic stressor, with altered fear-related learning (fear conditioning) and extinction, behavioral sensitization/kindling, and alterations in brain areas and neurotransmitters systems closely linked to these processes (Steckler & Risbrough, 2012). Additionally, behavior associated with PTSD almost always involves the retreat from or avoidance of objects or events that incites hyperarousal due to the recollection of the traumatic event.

PTSD generally continues for long periods, with a median time of recovery in the range of 3 to 5 years (Polak, Witteveen, Visser, Opmeer, Vulink, Figee, Denys, & Olff, 2012). Everyone will experience some type of traumatic event during the course of his or her life; however, the ability to cope with this event, return to normal functioning capacity, and the undiminished awareness of comprehending the events relationship to the nature of the human experience should be the aim of reducing the significant impact of trauma related experiences over time. Under the revised fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), PTSD was the third most common anxiety disorder in the United States for adults aged 18-64 years, with lifetime prevalence estimates below only those of specific phobia and social phobia (Bentkover, Aldern, Lerner, Richardson, Chadha, Jacques, & Bautista-Saeyan, 2015). Traumatic events that could potentially trigger PTSD episodes include sexual assault, rape, national disasters, major traffic accidents, sudden death of close family members, combat action, terrorism, and other significant emotional events where the threat of death or serious bodily injury is present.
Unsurprisingly, PTSD is a significant public health burden in the United States due to its prevalence. This causal effect has resulted in varied and substantially different treatment options for patients clinically diagnosed with PTSD. These variations are not only conspicuous in effective and favorable outcomes, but also in the cost burden associated with administering treatment. A recent study determined substantial PTSD per-case direct costs of $19,407 for Medicaid patients and $11,287 for privately insured patients (Ivanova, Birnbaum, Chen, Duhig, Dayoub, Kantor, Schiller, & Phillips, 2011). While the cost effectiveness of PTSD treatment is not the primary focus of this study, it will inform researchers on the transparency of treatment costs analogous to treatment options and if the underlying center of gravity for treatment decisions in private practice are linked to reimbursable private insurance cost and the ability of the patient to pay for mental health services.

PTSD is a highly heterogeneous disorder with a total of 79,794 unique symptom constellations described that meet the clinical threshold for PTSD diagnosis based on DSM-IV criteria (Smith, Summers, Dillon, & Cougle, 2016). When examining PTSD in society, multiple studies have shown that women are at greater risk for developing PTSD than men in both civilian and military populations. This dynamic is significant in that the nature of the traumatic event and its gender association with the increased risk of developing PTSD requires further examination. Although gender differences exists in the type of traumatic events experienced (e.g. women are more likely to be victims of sexual assault) and the number of traumatic events experienced, neither of these provide an adequate explanation for the elevated risk for PTSD seen among women (Norr, Albanese,
Boffa, Short, & Schmidt, 2016). This relationship further amplifies the need for mitigation strategies to combat and treat PTSD with a keen eye on those factors that have the greatest impact on improved gender specific outcomes.

Men and women with PTSD experience a greater number of medical comorbidities than individuals without PTSD; it is possible that among patients with PTSD, those with medical comorbidities feel too overwhelmed by multiple health issues and or medical treatments to be interested in and/or seek psychological care for PTSD (Breland, Greenbaum, Zulman, & Rosen, 2015). The bifurcation between the comorbidity paradigm and its relationship to PTSD is a key component to understanding this complex phenomenon. Comorbidity is the norm rather than the exception, with approximately 80-85% of chronic PTSD cases meeting the criteria for at least one other axis I condition. The most common co-morbid conditions are major depression, substance use disorders and other anxiety disorders (Creamer & O’Donnell, 2002).

Current research on PTSD has focused significantly on the effects of PTSD on the US military and veteran populations in light of the enormous amount media attention and scrutiny surrounding perceived mistreatment and adverse outcomes (increased suicides, domestic violence, and maladaptive transition to civilian life) as well as the social and economic impacts of military healthcare. In 2012, the Department of Defense (DOD) spent $52 billion on health care for service members, retirees, and their families. As a result, even as overall funding for defense increased sharply, health care funding as a share of those resources rose to almost 10 percent in 2012 (Congressional Budget Office, 2014). Federal agencies such as the DOD and the Veterans Health Administration
(VHA) have invested significantly in the awareness, prevention, and treatment of mental health disorders such as depression, traumatic brain injury (TBI) and other illnesses, which are significant contributors to the ballooning defense budget of the federal government.

In terms of direct cost, the VHA spends $8,300 per case for the first year of PTSD specific treatment and $660 million in direct costs for four years of treatment (Ivanova et al, 2011). Those who serve in the military are at an even greater risk for PTSD regardless of gender due to the inherent nature and dangers of military service, particularly if their service involved deployment in combat zones where the threat and possibility of death are ever present. It is well documented that after the September 2001 attacks on the United States and its subsequent military operations in the Middle East over the last 15 years, the Department of Defense and the Department of Veterans Affairs have both struggled with providing effective diagnosis and treatment for PTSD and other pervasive mental health disorders among its active duty and veteran populations. Anecdotal evidence suggests that this problem indirectly exacerbated the coincidental overlap of the suicide epidemic that has plagued the US military and veteran populations over the past 10-12 years.

Presently, PTSD is generally treated through a combination of psychotherapy and psychopharmacological approaches; however, alternate approaches such as acupuncture and hyperbaric oxygen therapy (HBOT) have also been inappreciably investigated. There continues to be considerable debate as to whether the latter treatments modalities provide statistically significant improvements in PTSD outcomes. While HBOT therapy
has revealed modest improvements in the treatment of TBI and other neurobiological conditions, recent studies by the US military have found no appreciative correlation with using HBOT for PTSD therapy. Both psychotherapy and psychopharmacological approaches have different categories of treatment that will be further analyzed in this study. The following first-choice interventions are recommended by most or all-clinical practice guidelines: eye movement desensitization and reprocessing (EMDR), exposure therapy (ET), cognitive therapy (CT), cognitive restructuring therapy (CR), cognitive processing therapy (CPT), and trauma-focused cognitive behavioral therapy (TF-CBT) (Haagen, Smid, Knipscheer, & Kleber, 2015).

Medication treatments can be effective in PTSD, acting to reduce its core symptoms, and should be considered as part of the treatment of this disorder. Although there is also no clear evidence to show that any particular class of medication is more effective or better tolerated than any other, the greatest number of trials showing efficacy to date, as well as the largest, have been with the selective serotonin re-uptake inhibitors (SSRIs) (Stein, Ipser, Seedat, Sager, & Amos, 2006). It is imperative that clinicians understand that their preference of treatment modalities have significant impacts on their patient populations. Clinicians may make treatment selections based on their clinical training, research knowledge, clinical judgment, clinic restrictions, logistics (e.g., time, resources), and personal preferences (Raza & Holohan, 2015).
Problem Statement

Each type of PTSD treatment has varying effectiveness, side effects, and cost. However, while many individual studies of specific treatments for PTSD are published, there is scarce information on the prevalence of use of treatment modalities for PTSD in current practice. Measuring the distribution of the multiple PTSD treatment options would inform researchers, clinician, and most importantly patients on the frequency, benefits, and cost burden of current modalities currently in use in the United States. There are published guidelines for diagnosing and treating PTSD disorders, but greater transparency and awareness is needed on the preferred methods clinicians use to treat this problem.

While evidence-based PTSD treatments guidelines are recommended, there is research that suggests that PTSD medications are routinely prescribed outside of current guidelines. Clinicians currently have an incomplete set of guidelines for when CPT or prolonged exposure (PE) is more likely to be beneficial for a given patient (Raza & Holohan, 2015). The decision on the optimal approach between psychotherapy, psychopharmalogical methods or a combination of both should be a mutual decision between the patient and the health provider. It is acknowledged that patient participation could potentially be withdrawn if a severe episode of PTSD or another associated comorbid disorder is presented; however, patient participation decisions in treatment options are generally known to improve patient compliance and patient outcomes. This discrepancy is also observed among veteran populations receiving treatment at VHA health centers. There is evidence that non-guideline supported pharmacotherapy for
veterans with PTSD is frequently practiced and mental health clinicians provided a larger proportion of these prescriptions than other types of practitioners (Abrams, Lund, Bernardy, & Friedman, 2013). These discrepancies indicate that there is further need for additional evaluation of the efficacy of combining both psychotherapy and medications as first line treatment options.

What follows this introduction (Chapter 1) is a comprehensive evaluation of previously published literature in the field of PTSD regarding symptoms, diagnosis, treatment methods, prevention, and opinions regarding future research in this field. In Chapter 3, the methods utilized to investigate the prevalence and mix of PTSD treatment options will be discussed. In Chapter 4, we will present the results of the statistical analysis, and finally Chapter 5 will provide our conclusion, limitations of our study, and recommendations for future study in the field.
Study Objective

The objective of this study is to begin to investigate and identify the current prevalence and mix of PTSD treatments in the United States. We will describe current practice patterns for privately insured patients age 18 to 65 with a diagnosis of PTSD. This is the first known study to analyze and report on this data.

Study Approach

We will use the 2013 and 2014 Market Scan® data set to examine treatment mix observed in a cohort of US patients with at least one diagnosis of PTSD recorded in 2013. The time horizon for the study is one year after the index PTSD diagnosis (or until death if sooner than 12 months).

Study Aims

We will describe: 1) Treatment patterns, including frequency and type of therapy, drug treatment and other modalities; 2) Use of hospital, emergency department and outpatient visits; 3) Cost of treatment received and influence of cost on treatment decisions.
Chapter 2
Review of the Literature

A comprehensive review of the literature indicates that PTSD is a heavily researched and studied mental health disorder. The electronic databases Ovid/MEDLINE, PubMed, ScienceDirect, and CINAHL were searched using multiple key words: PTSD, PTSD prevalence, PTSD causes, PTSD symptoms, PTSD treatment, PTSD outcomes, PTSD epidemiology, PTSD military, and PTSD trauma. The National Institute of Health (NIH) has used the term “epidemic” to describe PTSD, with some 7.1 million Americans affected as of 2009 (Church, Feinstein, Palmer-Hoffman, Stein, & Tranguch, 2014). While there remains significant interest in PTSD and its effects on society, the current research trends continue to expand and focus on the significant burden PTSD has had on US military and veteran populations. Most recent PTSD research continues to amplify the significant problems associated with properly identifying and diagnosing PTSD and its associated symptoms. The issue of the standardization of PTSD guidelines and protocols for diagnosis and treatment remain elusive. Current assessment tools ranging from guidelines from the World Health Organization (WHO) to the American Psychiatric Association’s (APA), Diagnostic and
Statistical Manual of Mental Disorders (DSM) have increased awareness and has helped to identify and characterize common symptoms and characteristics of PTSD. In spite of this, there remains considerable variance in how PTSD is treated among physicians and other medical professionals in both inpatient and outpatient settings.

Epidemiological studies indicate that approximately 15-25% of individuals experiencing a significant trauma will go on to develop PTSD, although approximately half will recover without formal intervention (Creamer & O’Donnell, 2002). The APA’s DSM remains the current gold standard diagnostic tool for PTSD and other psychiatric disorders internationally and in United States. However, it is not without critics who believe that it is too conforming to social norms and lacks validity due to a perceived lack of transparency of board and panel members who develop the diagnostic criteria and have personal connections to various pharmaceutical companies that manufacture medications for various psychological disorders.

Other key areas of PTSD research centers on prevention, PTSD comorbidity, treatment modalities, and their resulting efficacy and overall clinical outcomes. Understanding the prevalence and pervasive qualities of this disorder is crucial in identifying persons at greater risk for developing PTSD. Extant research has outlined several factors that complicate the documentation of accurate prevalence estimates and comparison of prevalence estimates of PTSD across studies. These factors include employment of different diagnostic criteria assessment of lifetime versus past year PTSD, and the use of specific samples (Reynolds, Pietrzak, Mackenzie, Chou, & Sareen, 2016).
Estimates on the prevalence of PTSD vary depending on the population, the traumatic event, the diagnostic criteria used, and other methodological factors. Prevalence rates are also likely affected by issues related to PTSD course, chronicity, and comorbidity; symptom overlap with other psychiatric disorders; and sociopolitical and cultural factors that may vary over time and by nation (Richardson, Frueh, & Acienro, 2010). Reports of lifetime prevalence in community samples are usually around 5-10%, representing approximately 15-25% of those exposed to traumatic events, whereas the 12-month prevalence rates vary between 1.3% and 3.9% (Creamer & O’Donnell, 2002). Among military personnel, researchers approximate that the prevalence of PTSD among returning U.S. military service members is between 5% and 20%, although some assert that the most reliable estimates fall between 10% and 14% (Fisher, 2014). Persons who are treated in hospital emergency rooms and intensive units (ICUs) were shown to have greater risk for developing PTSD. Jackson et al. (2007) reported that PTSD prevalence rates varied from 5% to 63% for medical ICU patients (Jackson, et al., 2007).

Several studies suggest that psychological characteristics, such as personality, are related to how individuals react against the occurrence of stressful situations, promoting PTSD in some cases. Specifically, many personality disorders have been associated with PTSD diagnosis, such as avoidant, schizotypal, borderline, and narcissistic personality disorder (Reis, Carvalho, & Elhai, 2016). While identifying the underlying cause remains elusive, there is general agreement that trauma is the common denominator and the catalyst that precipitates the posttraumatic episode. With regard to trauma, severity of the trauma is also a key component of developing PTSD. There is also an increased risk
of PTSD in people with occupations such as firefighting, law enforcement, and emergency medical services, and those experiencing a critical medical event, such as cancer survivors, cardiac arrest survivors, and mothers who have experienced perinatal death (Murphy, 2015).

Traumatic events generally associated with PTSD include experiencing man made or natural disasters, combat experience, terrorism, car accidents, severe trauma, sexual assault (including rape), and other events where death or serious injury is possible. PTSD is the most commonly studied and probably the most frequent and debilitating psychological disorder that occurs after traumatic events and disasters (Galea, Nandi, & Vlahov, 2005). In the civilian population, PTSD following motor vehicle accidents, the most common cause of PTSD, is less likely to be recognized by the general population and medical community than PTSD caused by exposure to military combat (Eovaldi & Zanetti, 2010). Among military personnel and veterans, acceptance and acknowledgement of a PTSD diagnosis is often perceived as an indicator of weakness and goes unreported despite the significant burden it presents to the service member, their families, and their military organizations. Fisher (2014) reported service members and veterans who display or admit symptoms of PTSD, or who receive a PTSD diagnosis, were perceived by interviewees to be discredited or devalued by their peers. In the military community, the emotional toll and stigma associated with mental health conditions is one that is frequently discussed, but rarely studied in the context of its impact on military personnel and veterans and their reluctant to receive treatment for PTSD.
PTSD has been a recognized disorder in the APA’s Diagnostic and Statistical Manual for more than 30 years (Fisher, 2014). PTSD was initially classified as an anxiety disorder with associated diagnostic criteria provided with guidance on specific symptoms. These criteria included a gateway criterion (criterion A) which suggested that certain traumas were “eligible” traumas and that only these events were capable of producing PTSD. The fifth revision (DSM-5) was released in May 2013. This revision includes changes to the diagnostic criteria for PTSD and Acute Stress Disorder. PTSD (as well as Acute Stress Disorder) moved from the class of anxiety disorders into a new class of "trauma and stressor-related disorders.” The rationale for the creation of this new class is based upon clinical recognition of variable expressions of distress as a result of traumatic experience (2016, June 19). Retrieved from http://www.ptsd.va.gov/professional/PTSD-overview/diagnostic_criteria_dsm-5.asp.

DSM-5 criteria are a significant departure from the criteria recommend for PTSD guidelines issued in the DSM-IV version. To minimize the impact on this conversion, Rosellini et al. (2015) showed that DSM –IV criteria can be used to closely approximate DSM-5 criteria to provide a principled basis for recoding DSM-IV diagnosis in previously collected research samples to generate estimates of DSM-5 PTSD.

The diagnosis of PTSD may appear to be a comprehensive and straightforward process due to established DSM guidelines, but due to the divergent opinions of clinicians, their individual experiences, and evidence-based research, there remains great variance in the diagnosis and treatment preferences for PTSD. While this is significant, there is less divergence on the defining presence of a traumatic event preceding a
posttraumatic episode. The event must involve an experience of threat to one’s physical well-being or witnessing (seeing, hearing about) the death, injury, or threat to physical well-being of another person. In addition, the individual’s subjective reaction must include but is not limited to the experience of fear, horror, and helplessness. If the event and the individual’s reaction fulfill such criteria, the diagnosis of PTSD can be considered (Charuvastra & Cloitre, 2008).

The multivariate dimensions of PTSD coupled with the likely presence of symptoms for other co-occurring psychiatric conditions inhibits the accuracy of diagnosing PTSD as a singular psychiatric condition. PTSD is highly comorbid (83–90%) with other psychiatric disorders, including mood, substance use, personality, and panic disorder (Bradley, Greene, Russ, Dutra, & Westen, 2005). For this reason, healthcare providers and researchers must consider a holistic approach when accurately diagnosing PTSD with a critical eye on understanding that other serious conditions may potentially affect the desired outcome for effective treatment of PTSD symptom while inversely affecting recovery from other comorbid conditions. The co-occurrence of depression with PTSD is an area of significant interest to researchers due to its presentation and similarity of symptoms. In a study conducted by Ronconi, et al., (2015), researchers found that existing PTSD treatments were as effective for comorbid depressive symptoms as they were for PTSD symptoms. Therefore, the presence of associated depressive symptoms should not necessarily influence treatment choice.

In another study, Papini et al., (2015) suggests that specific linguistic characteristics of non-trauma-related speech are linked to PTSD diagnosis and symptom
severity. Specifically, a PTSD diagnosis among individuals with a trauma history was associated with greater use of third-person singular pronouns and death-related words, but decreased use of third-person plural pronouns. To receive a diagnosis of PTSD, the symptoms must last more than one month in duration and must cause clinically significant distress or impairment (Brady, Tuerk, Back, Saladin, Waldrop, & Myrick, 2009). Since PTSD often presents similar comorbid symptoms as other behavior health conditions, this makes initial diagnosis challenging. The overlap of symptoms requires detailed feedback from the patient, which necessitates a thorough examination of the patient’s history and recognition of past events, which may have induced PTSD based on the patient experience.

Further complicating diagnosis, categorizing and associating the traumatic event is also a reoccurring problem. Defining trauma has been controversial since DSM-III. Regardless of whether new subtypes or disorders are created, clinicians must recognize the various manifestations of trauma, so that simply managing symptoms does not distract from treating underlying causes (Guina, Welton, Broderick, Correll, & Peirson, 2016). Thus, accurately diagnosing PTSD is crucial for the application of appropriate treatment options for PTSD patients. Patients are likely to experience anxiety, depression, and hopelessness when PTSD symptoms are unremitting and interfere with their cognitions, emotions, sleep, interpersonal relationships, and daily life demands (Haviland, Banta, Sonne, & Przekop, 2016).

The core symptoms of PTSD include reexperiencing symptoms and intrusive thoughts, avoidance of traumatic stimuli, negative alterations in thoughts and moods, and
increased physiological arousal (including sleep and concentration difficulties) (Boyd, Rodgers, Aupperle, & Jak, 2016). In most cases, PTSD symptoms remit over the first months after trauma, but for a minority of individuals, symptoms become persistent, often causing significant impairment in daily functioning (Morina, Wicherts, Lobbrecht, & Priebe, 2014). The subtle variations in PTSD symptoms are such that they are easily misinterpreted or misdiagnosed with other anxiety disorders such as depression. It was previously mentioned that PTSD is highly comorbid and as a result, untreated PTSD may have wider consequences for developing other serious medical conditions. Current findings contribute to a broader literature demonstrating that PTSD is associated with an array of negative physical health outcomes, including cardiovascular diseases (e.g., hypertension and heart disease), respiratory diseases, gastrointestinal illness, and non-headache-related chronic pain conditions, such as fibromyalgia, back pain, and arthritis (Pacella, Hruska, & Delahanty, 2016).

PTSD symptoms present in many different ways. There is an association between both physical and emotional symptoms, which are characteristic of the common PTSD profile. Considerable debate remains concerning how PTSD is acquired. A traumatic event is the catalyst, but the corresponding response and reaction are areas where researchers have differing opinions on whether PTSD is acquired or the result other environmental influences. There may also be distinct personality traits that predict a higher risk for developing PTSD. The research of Contractor et al., (2016) indicates that personality traits influence four aspects of PTSD symptoms: (1) vulnerability, (2) resilience, (3) posttraumatic growth (PTG), and (4) behavioral expressions.
It must be stated that presentation of PTSD is as varied as each individual who suffers from this disorder. Symptoms are also not always present immediately preceding the traumatic event. Oftentimes symptoms are displayed inconsistently over a period of time, which could be weeks or months after the traumatic episode. Research and evidence related to the pathogenesis of PTSD suggests that the dysfunction is not merely present in the mind, but that organic changes in the hippocampus and limbic system are also involved (Eovaldi & Zanetti, 2010). This biological response contributes to the difficulty in properly diagnosing PTSD due to its impact on other areas of the body, not just the brain and other sensory organs.

It is crucially important that clinicians and other providers who treat PTSD are cognizant of the different cultural profiles of patients suffering from PTSD symptoms. A current study suggests that different racial, gender, and other sociodemographic variables influence symptom patterns among different groups. Nevertheless, racial/ethnic and gender differences in PTSD symptom cluster presentation at treatment initiation indicate that the healthcare provider’s cultural competence may require a nuanced understanding of how symptoms of mental health disorders are experienced by individuals from diverse backgrounds, particularly for women, in order to better detect PTSD as early as possible (Koo, Hebenstreit, Madden, & Maguen, 2016). The various views on mental health treatment are a possible key indicator of future treatment compliance and acceptance after diagnosis.

PTSD has proven itself notoriously difficult to treat effectively (Bradley, et al., 2005). This is due to numerous reasons, which include variations in the acceptance of
established clinical practice guidelines, patient compliance with prescribed treatment, disagreement on the effectiveness of specific psychotherapy techniques, and several other concerns generally related to physician experience and preference, which ultimately affect patient outcomes upon diagnosis. The choice of treatment in common clinical practice is rather arbitrary and seems to partly depend on indirect and direct assumptions of the clinician, style of health service delivery, and patient factors (Polak, Witteveen, Visser, Opmeer, Vulink, Figee, Denys, & Olff, 2012). A recent study revealed that physician experience is a major indicator of prescribing practice among health care professionals who treat PTSD symptoms. Personal experience has a greater impact on psychological therapy prescription than professional characteristics whose findings suggest that educational efforts are required for decision-making skills regarding prescribing based upon evidence-based medicine rather than subjective factors (Verdoux, Cortaredona, Dumesnil, Sebbah, & Verger, 2014).

Once a positive diagnosis of PTSD has been made, collaboration between clinician and patient on a successful treatment program is often a major factor in ameliorating PTSD. The vast majority (97.3%) of people who screened positive for PTSD wanted to be involved in treatment decisions. Participants most commonly wanted information on treatment effectiveness, long-term benefits and side effects (Harick, Hundt, Bernardy, Norman, & Hamblen, 2016). The introduction of pharmacological treatment for PTSD should be approached with special considerations by clinicians on the psyche of the patient. If patients are not intimately involved in treatment decisions, the possibility of mistrust or denial of the severity of PTSD could surface. During this
assessment phase of viable treatment options clinicians must be sensitive to patient perceptions of their diagnosis. Labeling a patient as “complicated or “complex” has a potential iatrogenic effect of giving the patient the impression that “traditional treatments” will not be effective or that special or longer treatments are necessary (DeJongh et al., 2016).

A common question arises from patients when treating PTSD and other mental health disorders. How long will the treatment last, and will it reoccur? Researchers Schnurr and Lunney (2016) suggests that treating PTSD patients until the patient no longer meets diagnostic criteria results in optimal gains and good quality of life endpoints. It is important to note that treatment gains for cognitive processing therapy (CPT) and prolonged exposure (PE) have been shown to maintain for five or more years post treatment (Resick, Williams, Suvak, Monson, & Gradus, 2012). While there are multiple available options available to clinicians and patients, treatment for PTSD generally includes psychotherapy, medication, or a combination of both (Foa, 2006). Despite the aforementioned guidelines established by the APA, there continues to be much debate on the efficacy of the different treatment options.

Psychotherapy treatment retains high usage rates due to studies that show it has high response and acceptance rates by patients. Patients diagnosed with PTSD were associated with both the greatest likelihood of receiving psychotherapy and with the largest dose of psychotherapy as measured by number of visits; this may be a result of ongoing reports of mixed results in randomized clinical trials on the effectiveness of pharmacological agents in the treatment of PTSD (Harpaz-Rotem, Libby, & Rosenheck,
Of patients who complete psychotherapy treatment, 67% no longer meet criteria for PTSD, and of those who enter treatment (whether or not they complete), the recovery rate is 56% (Bradley, Greene, Russ, Dutra, & Westen, 2005).

Within the psychotherapy treatment family, CBT, exposure therapy, cognitive restructuring, and eye movement desensitization and reprocessing (EMDR) have been shown to be clinically effective in treating PTSD. Response rates for CBT’s are relatively high, with 50% to 80% of completers reporting significant symptom reduction (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008). In their study, (Tuerk et al., 2013), prolonged exposure (PE) was well tolerated by patients with PTSD, 73% of those who began treatment met criteria as treatment completers. Treatment was also associated with large statistically significant and meaningful declines in the need for mental health services, with approximately a 30% reduction in annual mental health service utilization and associated costs of care and a 45% reduction for treatment completers. Eye Movement Desensitization and Reprocessing (EMDR) was proposed as a psychological trauma treatment approach in 1987. A study conducted by Chen et al., suggests that EMDR is slightly superior to CBT for treating adult PTSD (Chen, Zhang, Hu, & Liang, 2015). Treatment with EMDR was followed by significant reductions in PTSD, depression, and anxiety symptoms. EMDR desensitization was also followed by significant decreases in the distress and vividness associated with traumatic memories (Schubert et al., 2016).

Based on high evidence-based response rates for psychotherapy, it is reasonable to conclude that these treatments will continue to be used to treat PTSD in the near
future; nevertheless, there are aspects of psychotherapy that may prevent preferred treatment outcomes due the extensive time require to complete treatment. CBT is generally a time-limited treatment, with new skills practiced after treatment ends; one is not expected to continue in therapy for several years (Weisberg, Beard, Moitra, Dyck, & Keller, 2014).

Similar to psychotherapy, there remains considerable debate as to when medications should be introduced when treating PTSD. Therefore, a provider must make medication choices only after eliciting the patient’s feelings about being on medications and what meaning the patient places on taking psychiatric medications (Watson, Ghani, & Correll, 2016). A recent study suggests that medications should be considered for initial PTSD treatment. Boehnlein and Kinzie (2007) cite the Consensus Statement on Posttraumatic Stress Disorder for the International Consensus Group on Depression and Anxiety, which recommended SSRIs as first line treatment for PTSD. While studies of PTSD patients have become increasingly sophisticated, clinical studies remain limited in their ability to probe the underlying neurobiology of PTSD. Effective pharmacotherapies for PTSD are quite limited. They include mainly selective serotonin reuptake inhibitors (SSRIs), with the only two FDA approved agents being paroxetine and sertraline (Perrine et al., 2016). Benzodiazepines are used to treat some anxiety disorders and are indicated in some studies as successfully reducing comorbid PTSD symptoms; however, their effectiveness against approved SSRIs is not a focus of this study.

Since PTSD is a chronic illness, and the treatment selected is likely to be continued over an extended period, factors such as short- and long-term side-effect
profiles and the risks for drug/drug interactions are weighed strongly in deciding whether
and at what point in treatment to include a medication (Bajor, Ticlea, & Osser, 2011). As
PTSD treatment has evolved, other novel and alternative treatment approaches have been
researched which are gaining greater attention among researchers and clinicians. Eovaldi
& Zanetti (2010) suggests that hyperbaric oxygen therapy was effective in improving
their patient’s acute psychiatric disturbance by effectively counteracting the pathological
processes of oxidative stress, acute inflammation, vasogenic edema and hippocampal
neuronal apoptosis. Acupuncture has also shown appreciable efficacy. A randomized
controlled pilot trial conducted by Hollifield et al., (2007) indicates that acupuncture may
be efficacious for reducing symptoms of PTSD, depression, anxiety, and impairment in
people diagnosed with PTSD. Acupuncture provided treatment effects similar to a group
CBT intervention, and both interventions were superior to a wait-list control condition for
all outcome measures (Hollifield, Sinclair-Lian, Warner, & Hammerschlag, 2007). In
their research, Church et al., (2014) also support acupuncture but state that nothing in the
training or background of most physicians or researchers prepares them to understand
how acupressure can play a role in overcoming severe psychological disorders or account
for the speed and power of positive clinical results. Another recent study champions the
use of hypnotherapeutic techniques to treat PTSD. In their study, O’Toole et al., (2016)
reports significantly reduced PTSD symptoms, regardless of the time since the trauma
occurred and whether it was witnessed, directly experienced, or both when
hypnotherapeutic techniques were applied. These studies further show that while
psychotherapy and medications are the most frequently used treatment modalities for
PTSD, other approaches with less invasive side effects are being considered.
It is impossible to discuss PTSD without mentioning its comorbid relationship with other psychiatric, biological, and physiological conditions. In a study among veterans with PTSD in primary care, 87% have one or more comorbid psychiatric disorder, the most common being depression (Hollifield, 2011). The phenomenon exacerbates the difficult nature of diagnosing and treating PTSD across treatment populations. Zatzick et al. (2016) cites studies which show that multiple chronic conditions appear to endemic among physical trauma survivors treated in US trauma care systems (Mackenzie et al., 2006; Zatzick et al., 2007; Zatzick et al., 2015). Patients being treated for multiple medical conditions are often incapacitated by the burden of dealing with multiple medical conditions simultaneously. It is possible that among patients with PTSD, those with medical co morbidities feel too overwhelmed by multiple health issues and/or medical treatments to be interested in and/or seek psychological care for PTSD-

patients with numerous co morbidities often describe feeling burdened by managing multiple conditions (Breland, Greenbaum, Zulman, & Rosen, 2015).

Patients with comorbid medical conditions that have adequate social support are more likely to have positive outcomes, whereas those who do not have adequate support are more prone to not adhere to directives, which may support improved and measurable treatment benefits. Patients with strong support bases are more resilient and the success of family and couple-based treatment for PTSD in improving these cognitions is encouraging and provides support for the use of cognitive interventions in the dyadic treatment of PTSD (MacDonald, Pukay-Martin, Wagner, Fredman, & Monson, 2016). Based on research published thus far, it is clear that PTSD treatment in outpatient settings
and associated decision-making processes surrounding preferred treatment patterns practice remain inconsistent and may contribute to underutilization of prescribed treatment guidelines.

In summary, the findings from the current literature indicate that there remains significant variance among health care professional regarding the diagnosis and treatment of PTSD despite available and prescribed guidelines promulgated on evidence-based studies. PTSD is a difficult and elusive disorder that continues to affect millions of Americans. The estimated number of Americans receiving outpatient mental health treatment increased from approximately 16.1 million in 1998 to 23.3 million in 2007 (Olfson & Marcus, 2010). Despite the prevalence and impact of PTSD on society, controversy persists about the efficacy of combining psychotherapeutic and pharmacotherapy treatments (Sorsdahl et al., 2013). Recent studies have indicated a marked departure from psychotherapy to psychopharmacological treatments. Mojtabai & Olfson (2008) suggests this may be attributed to reimbursement policies, which favor brief medication management visits rather than psychotherapy and the introduction of newer psychotropic medications with fewer adverse effects. If there is a direct correlation between reimbursement and treatment options based on private insurers, then PTSD patients who are privately insured must be informed so that responsible decisions are made in concert with their physician. The level of ambition exerted to ensure timely reimbursement should also be commensurate to the most effective treatment for PTSD patients.
Evaluating prescribing patterns in different patient settings will enhance and increase greater visibility on current trends in a privately insured patient population. The current study will investigate and identify the current variations of PTSD treatment in the United States. We will describe: 1) Treatment patterns, including frequency and type of therapy, drug treatment and other modalities; 2) Use of hospital, emergency department and outpatient visits; 3) Cost of treatment received. We will also describe current practice patterns for privately insured patients age 18 to 65 with a diagnosis of PTSD. The primary aim of this study is to inform researcher and clinicians involved in PTSD research about current treatment variations of PTSD in a privately insured patient population.
Chapter 3

Methods

PTSD is a significant public health burden in the United States due to its prevalence. This causal effect has resulted in varied and substantially different treatment options for patients clinically diagnosed with PTSD. These variations are well described for Medicaid patients (Ivanova, Birnbaum, Chen, Duhig, Dayoub, Kantor, Schiller, & Phillips, 2011), but treatment patterns for privately insured patients who face economic barriers to care, such as co-insurance and deductible payments have not been described.

The objective of this study is to describe the current prevalence and mix of treatments in the United States for privately insured patients. This is the first known study to analyze and report on these data.

Population

Privately insured patients age 18 to 65 with a diagnosis of PTSD and insurance coverage for at least 12 months during 2013-2014, or until death (if death occurs before 365 days) will be included in the study. Inclusion criteria for the study are the presence of one or more inpatient or outpatient records with a diagnosis code for PTSD defined by
ICD-9 code. Both male and female patients will be included. All races will be included by default but subgroup analysis by race cannot be ascertained because commercial insurers in the US do not record patients’ race on their demographic records.

**Study Design and Data Source**

The design of the study is a retrospective analysis of archival billing data extracted from the 2013 and 2014 Market Scan® data set licensed to The Medical University of South Carolina (MUSC) by Truven. The cohort chosen represent a cross sectional selection of privately insured patients with PTSD.

**Dataset Construction**

We will extract all records of patient with any PTSD code on inpatient or outpatient contacts during 2013. The first occurrence will be designated as the Index Date of the study. All records for the patient for 360 days post the Index Date or until death will be extracted from inpatient outpatient and prescription bills. Records will be classified as 1) Therapy visits based on the Current Procedural Terminology (CPT) code or as 2) drug therapies based on their recorded National Drug Codes (NDC). Within the two treatment groups, we will identify subtypes based on code details. The detailed subgroup treatment classification scheme is provided in Table 1 below. Therapy visits and drug therapy coverage days will be aggregated at the patient level. Total cost for all medical care received will be calculated by summing all payments for the patient over the 365 days in the study or until death if sooner than 12 months.
Data Analysis

We will describe: 1) Treatment patterns, including frequency and type of therapy, drug treatment and other modalities using frequencies means and modes; 2) medical care utilization will be captured as the number of hospital, emergency department and outpatient visits and total days in the hospital; 3) Cost of treatment received will be summed within treatment group; and 4) Total annual cost of care will be calculated as the sum of all paid bills over the time of the study.

Descriptive statistics will be used to compare hospital and other medical care utilization across the major treatment modalities. Multivariable regression will be used to examine the contribution of the treatment modalities used to total cost over the study year. Transformation of the data will be performed if needed to fit the assumptions underlying the statistical approaches used. However, the purpose of the study is descriptive and we will use tables and graphic displays as much as possible to display variations in the data.

Study Limitations

The design of the study is cross sectional. This approach has the advantage that it includes patients at all stages of PTSD. However, it also has the disadvantage that it does not allow us to identify effect of time post injury on treatments. In addition, we use archival billing data with ICD-9 to select patients with PTSD. This approach is open to coding errors. Further, we rely on CPT codes to identify therapy type, which may be subject to “up-coding” to increase reimbursement. In addition, the drug therapy is
measured by dispensed prescriptions. We do not know if the patient took the medication as prescribed.

Table 1: Definition of PTSD and CPT and NDC Codes Used to Define Treatments.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Code Numbers</th>
<th>Code Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSD</td>
<td>309.81</td>
<td>ICD-9</td>
</tr>
<tr>
<td>Therapy Treatments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive-behavioral therapy (CBT) — involves working with cognitions to change emotions, thoughts, and behaviors. Types of CBT include exposure therapy, breathing retraining, biofeedback, cognitive restructuring, and stress inoculation.</td>
<td>90791, 90832, 90834, 90837, 90839, 90840, 90853, 90785</td>
<td>CPT</td>
</tr>
<tr>
<td>Psychotherapy — focuses on the emotional conflicts caused by the traumatic event.</td>
<td>90791, 90832, 90834, 90837, 90839, 90840, 90853, 90785</td>
<td>CPT</td>
</tr>
<tr>
<td>Hyperbaric oxygen therapy</td>
<td>99183, G0880</td>
<td>CPT</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>97810, 97811, 97813, 97814</td>
<td>HCPCS</td>
</tr>
<tr>
<td>Hypnotherapy</td>
<td>90880</td>
<td></td>
</tr>
<tr>
<td>Drug therapy: antidepressants to reduce depression and antianxiety medications to decrease sleep problems.</td>
<td>Generic Drug Class Code</td>
<td></td>
</tr>
<tr>
<td>Paroxetine</td>
<td></td>
<td>NDC</td>
</tr>
<tr>
<td>Sertraline</td>
<td></td>
<td>NDC</td>
</tr>
<tr>
<td>Benzodiazepine</td>
<td></td>
<td>NDC</td>
</tr>
</tbody>
</table>
Chapter 4

Results

The objective of this study was to describe the current prevalence and mix of treatments in the United States for privately insured patients using data extracted from the MarketScan® data based licensed by Truven Analytics to the Medical University of South Carolina.

Population

A total of 6,819 privately insured patients age 18 to 65 with a diagnosis of PTSD and insurance coverage for at least 12 months during 2013-2014, or until death (if death occurs before 365 days) were included in the study. Mean patient age was 42.6 years, distributed fairly evenly across four age categories. There were slightly more patients in the youngest age group (18-34 years), and slightly fewer patients in the oldest group (55-64 years) (p<.0001). Three quarters of patients were female and one third were living in the Northeastern US, 18% each were living in the North Central and Southern US, and 28% were living in Western states. A total of 64 (0.9%) patients died during the 365-day
study period. Racial distribution could not be examined because race is not available on these data. Patient demographic characteristics are provided in Table 2 below.

Table 2: Distribution of Age, Sex and Other Characteristics Among Study Patients

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Mean (SD) or Number (%)</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>42.6 (12.4)</td>
<td></td>
</tr>
<tr>
<td>Age Group 18-34</td>
<td>1868 (27.4)</td>
<td>P&lt;.0001</td>
</tr>
<tr>
<td>Age Group 35-44</td>
<td>1670 (24.5)</td>
<td></td>
</tr>
<tr>
<td>Age Group 45-54</td>
<td>1931 (28.3)</td>
<td></td>
</tr>
<tr>
<td>Age Group 55-64</td>
<td>1351 (19.8)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1588 (23.3)</td>
<td>P&lt;.0001</td>
</tr>
<tr>
<td>Female</td>
<td>5231 (76.7)</td>
<td></td>
</tr>
<tr>
<td>Died During Study</td>
<td>64 (0.9)</td>
<td></td>
</tr>
<tr>
<td>Mean Days in Study</td>
<td>360.3 (20.6)</td>
<td></td>
</tr>
<tr>
<td>Region: North East</td>
<td>2235 (32.8)</td>
<td>P&lt;.0001</td>
</tr>
<tr>
<td>North Central</td>
<td>1205 (17.7)</td>
<td></td>
</tr>
<tr>
<td>South</td>
<td>1254 (18.4)</td>
<td></td>
</tr>
<tr>
<td>West</td>
<td>1954 (28.7)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>171 (2.5)</td>
<td></td>
</tr>
</tbody>
</table>

**Treatments Received**

The main objective of this study was to describe the current prevalence and mix of treatments in the United States for privately insured patients. Ninety percent of the patients with PTSD received psychotherapy with 15 percent of these patients also receiving either sertraline or paroxetine therapy. An additional 119 (11.6%) of patient received sertraline or paroxetine but no psychotherapy, while 544 (8.0%) received no psychotherapy, sertraline or paroxetine. The detailed findings are provided in Table 3 below. It is important to note that 90.3% of patients who received psychotherapy, on
average, had 28.5 treatment visits. Sertraline was prescribed nearly 10 times as much as paroxetine, but had slightly lower mean daily drug doses at 204.5 days versus 232.4 days respectively. Benzodiazepine (29.6%) and other anti-anxiety medications (48.7%) were most often prescribed than the SSRIs sertraline (12%) and paroxetine (2.8%). This finding supports previous research, which indicates that PTSD is highly comorbid with depression and other anxiety disorders and diagnosing and treating PTSD in the presence of other co-occurring disorders with similar symptoms is extremely difficult and time consuming for both provider and patient. Comparatively, of the alternative PTSD treatment options (acupuncture, hypnosis, and rTMS) acupuncture was the most frequently used PTSD treatment with 3.1% of patients receiving the treatment with an average of 24.4 visits over a year. Hypnosis was the least utilized treatment option in this study with only 4 patients receiving this treatment over the course on 1 visit on average.

Table 3: Treatments Received by PTSD Patients Over the Study Year

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Number and Percent with Treatment</th>
<th>Mean (SD) of Daily Drug Doses or Visits for Treatment for Patients Receiving Any</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychotherapy</td>
<td>6156 (90.3)</td>
<td>28.5 (27)</td>
</tr>
<tr>
<td>Paroxetine</td>
<td>194 (2.8)</td>
<td>232.4 (139)</td>
</tr>
<tr>
<td>Sertraline</td>
<td>839 (12.3)</td>
<td>204.5 (134)</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>208 (3.1)</td>
<td>24.4 (33)</td>
</tr>
<tr>
<td>Hypnosis</td>
<td>4 (0.06)</td>
<td>1 (0)</td>
</tr>
<tr>
<td>Benzodiazepine</td>
<td>2016 (29.6)</td>
<td>148.9 (149)</td>
</tr>
<tr>
<td>Other Antidepressants</td>
<td>3332 (48.7)</td>
<td>336.1 (243)</td>
</tr>
<tr>
<td>rTMS</td>
<td>5 (0.07)</td>
<td>25.4 (7)</td>
</tr>
</tbody>
</table>
We examined the medical care utilization and total medical care cost for our patient group. We enumerated the number of hospital and emergency department visits used by patients over the study year and calculated total cost for all medical care received by summing all payments for the patient over the 365 days in the study or until death if sooner than 12 months. The average annual cost burden for each PTSD patient in the study was $18,862. Of the 886 patient who had a hospital admission, they averaged 1.6 admissions over the course of a year. It is important to note that PTSD patients required an average of 38 office visits during the study time period. Our medical care resource use findings and costs are provided in Table 4 below.

Table 4: Annual Frequency of Emergency Department Visits, Hospital Admissions and Office Visits and Total Cost of Care for Patients with PTSD

<table>
<thead>
<tr>
<th>Medical Care Utilization</th>
<th>Number and Percent of Patients Using the Type of Care</th>
<th>Mean Use for Patients With Any Use of Type of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Admissions</td>
<td>886 (13.0)</td>
<td>1.6 (1.3)</td>
</tr>
<tr>
<td>ED Visits</td>
<td>1913 (28.1)</td>
<td>2.2 (3.7)</td>
</tr>
<tr>
<td>Office Visits</td>
<td>6819 (100.0)</td>
<td>38.0 (29.0)</td>
</tr>
<tr>
<td>Total Cost of Care</td>
<td>$1,105,555 (100.0)</td>
<td>$18,862 (37,451)</td>
</tr>
</tbody>
</table>

We also examined the total cost of medical care for PTSD patient subgroups. The highest total cost of treatment were for those patients who died during the study at a cost of $36,297 per patient. Patients treated with SSRI medications had higher treatment costs at $25,197 per patient than those patients who received therapy only at $18,270 per patient. Patients receiving therapy and SSRIs had slightly higher per patient costs at
Patients’ not receiving therapy or SSRI for alternative PTSD treatment had total treatment costs of $21,436 during the study period.

Table 5: Total Cost of Medical Care for PTSD Patient Subgroups

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>Number (%)</th>
<th>Total Annual Cost</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Patients</td>
<td>6819 (100)</td>
<td>$18,862</td>
<td>$37,451</td>
</tr>
<tr>
<td>Surviving patients</td>
<td>6755 (99)</td>
<td>$18,697</td>
<td>$36,427</td>
</tr>
<tr>
<td>Patients who died</td>
<td>64 (1)</td>
<td>$36,297</td>
<td>$96,033</td>
</tr>
<tr>
<td>Patient receiving therapy only</td>
<td>5251 (77)</td>
<td>$18,270</td>
<td>$36,333</td>
</tr>
<tr>
<td>Patients receiving therapy and SSRIs</td>
<td>905 (13)</td>
<td>$19,918</td>
<td>$34,010</td>
</tr>
<tr>
<td>Patients receiving SSRIs only</td>
<td>119 (2)</td>
<td>$25,197</td>
<td>$50,021</td>
</tr>
<tr>
<td>Patients not receiving therapy or SSRI</td>
<td>544 (8)</td>
<td>$21,436</td>
<td>$48,555</td>
</tr>
</tbody>
</table>

Primary diagnosis and cause of death of the 64 PTSD patient who died during the study yielded important observations. Of the PTSD patients, 30% of died from septicemia, pneumonia, HIV or other infections. 14% died from acute respiratory distress, renal failure, overdose or other poisoning. Cancer was the next highest cause of death at 13% followed by other medical conditions which were significantly less prevalent in the study population.
Table 6: Primary Diagnosis for Hospital Admission for 64 PTSD Patients Who Died During the Study Period

<table>
<thead>
<tr>
<th>Diagnostic Groupings</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Septicemia, pneumonia, HIV or other infection</td>
<td>19 (30)</td>
</tr>
<tr>
<td>Cancer</td>
<td>8 (13)</td>
</tr>
<tr>
<td>Acute respiratory or renal failure</td>
<td>9 (14)</td>
</tr>
<tr>
<td>Complications of transplant or medical procedure</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Stroke or heart failure</td>
<td>4 (6)</td>
</tr>
<tr>
<td>GI or metabolic problem</td>
<td>5 (8)</td>
</tr>
<tr>
<td>Bipolar or Mood Disorder</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Head fracture or other injury</td>
<td>4 (6)</td>
</tr>
<tr>
<td>Overdose or other poisoning</td>
<td>9 (14)</td>
</tr>
</tbody>
</table>
Chapter 5

Discussion

Our primary objective was to identify which PTSD treatment methods were preferred based on current treatments options available to health care providers who treat PTSD patients. This study provides valuable insight and has a number of important findings. First, privately insured PTSD patients are treated using a variety of available PTSD treatment options. Second, psychotherapy is the preferred method of treatment among clinicians who are reimbursed by private insurers. Third, of the PTSD patients who are prescribed medications, anti-anxiety medications are most predominately prescribed rather than SSRIs and lastly, nearly 3 out of 4 PTSD patients in this study were women and most were treated for other co-occurring anxiety conditions.

To begin with, PTSD patients in the present study, were treated with numerous PTSD treatment options which include psychotherapy, psychopharmacological and alternative treatment approaches. In our study 90% of the sample (n=6819) received some form of psychotherapy. Although it is unclear what method of psychotherapy was used (ET, CBT, EMDR, etc.), it does suggest acceptance of and adherence to current
APA DSM guidelines, which recommend psychotherapy as the first line treatment for PTSD. The minimal use of alternative approaches such as hypnotherapy (.06%), acupuncture (3.05%) and repetitive transcranial magnetic stimulation (.07%) to treat PTSD patients may indicate several important observations. It informs clinicians that additional research and random controlled trial studies are necessary to prove that these methods as efficacious treatment options for PTSD, or it may suggest that there are not enough clinicians properly trained in these treatment approaches. It could also be that patients are not comfortable with these methods, which are not mainstream treatments, which may be viewed as socially non-acceptable. Risk adverse clinicians may also shun alternative approaches due to concerns about treatments that could affect patient safety with potential negative outcomes.

Within respect to service utilization, 13% of PTSD patients in this study were admitted to a hospital and 28% patients were treated in an ER. These small percentages may be indicative of acute and unpredictable PTSD episodes before or after the initial PTSD diagnosis. While this was not a key objective of the study, there could be variations across the primary and specialty care utilization rates with respect to prescribing frequency for those patients who were prescribed medications to treat PTSD symptoms. Despite several studies promoting the efficacy of both psychotherapy and psychopharmacological approaches, there remains considerably debate over their acceptability, efficacy, and affordability for PTSD patients. Considering the severity of their PTSD symptoms, appropriate and relevant decisions must be made and a variety of factors such as patient treatment preference, patient social support structure, duration of
PTSD treatment, and the experience and expertise of the clinician are all important things to consider.

An important observation was the disproportionate number of women versus men amongst the study population. In this study, women comprised 76.7% of the population. While women are at higher risk for developing PTSD and they experience different types of trauma than men, this number may indicate that women are more likely to seek treatment for PTSD than men or are predisposed to other mental health conditions with comorbid PTSD present. This would also explain the high number of anti-anxiety medications that were prescribed for those patients who were on medications such as benzodiazepine and other antidepressants.

**Limitations**

The study has several limitations that must be considered when interpreting these findings. First, the study is a concise review of PTSD diagnosis and treatment patterns in a privately insured cohort over the course of 1 year. This is a very short period in which to evaluate the multiple factors that affect PTSD treatment. Patients who are predisposed to certain treatments may not be receptive to the addition or subtraction of other possible efficacious treatment options. Second, this study did not evaluate treatment outcomes to assess which PTSD treatment methods were most beneficial for patients based on cost, time burden, and possible side effects. While psychotherapy was the preferred method of treatment in this study, the method of available psychotherapeutic treatment techniques was not observed. This is significant in that some approaches such as CBT require a significant amount of time to produce tangible results. Psychotherapy treatments can last
from a few 60-minute sessions to several weeks depending on the severity of PTSD. This requires a significant time commitment in order to gain benefits from the treatment. This study was not able to identify if this time burden had an impact on patient treatment outcomes.

Third, the high comorbidity rate of PTSD is another area in which this study did not purposely focus on, but has major implications in future research on PTSD diagnosis and treatment. This area is contentious in that it must be decided which disorder is the primary focus of treatment or will there be a multidisciplinary approach to treating multiple psychiatric disorders simultaneously. This is important, and has second and third order implications, which could ultimately determine whether there will be a successful PTSD outcome. In addition, if medications are prescribed, clinicians must ensure that side effects do not have an adverse impact on PTSD treatments and on co-occurring disorders such as depression, substance abuse, and other anxiety disorders. These findings also highlight the need for additional research on the efficacy of combining both psychotherapy and psychopharmaceutical approaches in the treatment of PTSD.

Fourth, in addition, we use archival billing data with ICD-9 to select patients with PTSD. This approach is open to human coding errors. Further, we rely on CPT codes to identify therapy type, which may be subject to “up-coding” to increase reimbursement. Lastly, the drug therapy is measured by dispensed prescriptions. We do not know if the patient took the medication as prescribed and as previously discussed, we do not know
the treatment outcomes for any of the patients regardless of treatment plan directed by their clinician.

Areas for Further Study

In conclusion, we assess that further research regarding treatment outcomes, cost and time burden on PTSD patients, and the efficacy of combining available PTSD treatment options in order to capitalize on this significant public health burden to both US civilian and military personnel who suffer from this debilitating disorder. We hope that this study encourages further investigation into informing PTSD patients and clinicians on the most effective treatment options for PTSD to improve patient outcomes.
Table 7: Alphabetic List of Variables and Attributes

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td>Age of Patient</td>
</tr>
<tr>
<td>AGEGRP</td>
<td>Age Group</td>
</tr>
<tr>
<td>Accu</td>
<td>Acupuncture</td>
</tr>
<tr>
<td>AnyAccu</td>
<td>Any Acupuncture</td>
</tr>
<tr>
<td>AnyER</td>
<td>Any ER Visit</td>
</tr>
<tr>
<td>AnyHypno</td>
<td>Any Hypnotherapy</td>
</tr>
<tr>
<td>AnyIP</td>
<td>Any Inpatient</td>
</tr>
<tr>
<td>AnyPsyc</td>
<td>Any Psychotherapy</td>
</tr>
<tr>
<td>AnyTMS</td>
<td>Any Transcranial Magnetic Stimulation</td>
</tr>
<tr>
<td>Benzo</td>
<td>Benzodiazepine</td>
</tr>
<tr>
<td>BenzoDys</td>
<td>Benzodiazepine Days Supply</td>
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<td>Days Post Diagnosis</td>
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<td>Died</td>
<td>Number of Patients Who Died</td>
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<td>Enrollee ID</td>
</tr>
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<td>ER_Tot</td>
<td>Payment Total ER Visit</td>
</tr>
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<td>ER_Vis</td>
<td>Number of Emergency Room Visits</td>
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<td>HypTx</td>
<td>Number of Hypnotherapy Treatments</td>
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<tr>
<td>IP_Dys</td>
<td>Number of Inpatient Days Length of Stay</td>
</tr>
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<td>IndexDT</td>
<td>Index PTSD Diagnosis</td>
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<td>Ip_Pay</td>
<td>Number of Inpatient Payments</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
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<td>--------------------------------------------------</td>
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<tr>
<td>OP_Pay</td>
<td>Number of Outpatient Payments</td>
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<td>Other Antidepressants</td>
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<td>OthADDys</td>
<td>Other Antidepressants Days Supply</td>
</tr>
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<td>PTSD</td>
<td>Number PTSD</td>
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<td>Par</td>
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</tr>
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<td>ParDys</td>
<td>Paroxetine Number of Days Supply</td>
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<td>Region</td>
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<td>RxNum</td>
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<td>SEX</td>
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<tr>
<td>Sert</td>
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References


Cognitive Therapy on Psychological, Neuropsychological, and Speech 
Symptoms in Comorbid PTSD and TBI. Cognitive and Behavioral Practice, 
Volume 23, 173-183.

Meta-Analysis of Psychotherapy for PTSD. American Journal of Psychiatry, 
Volume 162, 14–227.

Posttraumatic Stress Disorder, Substance Use Disorders, and Traumatic Brain 
Injury. 
Journal Addictive Medicine, Volume 3, Number 4, 179-188

Comorbidities on Male and Female Veterans’ Use of Psychotherapy for 
PTSD. 
Medical Care, Volume 53, Number 4, Supplement 1.

Annual Review of Psychology, Volume 59, 301-328.


Clinical, and Biological Data Support Further Research. *CNS Neuroscience & Therapeutics, Volume 17, 769–779.*


with PTSD Returning from Iraq and Afghanistan. *Journal of Affective Disorders, Volume 189, 10-16.*


www.NursingMadeIncrediblyEasy.com

Personality and Individual Differences 90, 210-213.


Journal of Anxiety Disorders, Volume 27, 33-46.


55

Weisberg, R. B., Beard, C., Moitra, E., Dyck, I., & Keller, M. B. (2014). Adequacy of Treatment Received by Primary Care Patients with Anxiety Disorders. *Depression Anxiety, Volume 31, Number 5*, 443-450.


