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# Improving Utilization of and Adherence to Treatment for Post-Traumatic Stress Disorder Among U.S. Servicemembers and Veterans

Jeremy R. Kurz



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Jeremy R. Kurz

This document was submitted as a dissertation in July 2015 in partial fulfillment of the requirements of the doctoral degree in public policy analysis at the Pardee RAND Graduate School. The faculty committee that supervised and approved the dissertation consisted of Lisa S. Meredith (Chair), Terry L. Schell, and Albert "Skip" Rizzo.



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## Abstract

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Post-traumatic stress disorder (PTSD) is a mental health condition which afflicts thousands of current and former U.S. servicemembers. Despite significant advances in treatment options, many servicemembers and veterans suffering from PTSD either do not seek mental healthcare or discontinue treatment before they can receive an adequate dose to reduce their symptoms. This dissertation seeks to find ways in which PTSD treatment utilization and adherence can be improved among servicemembers and veterans. I used a multi-method approach and three data sources to answer five specific research questions. Responses to two separate surveys of servicemembers and veterans were used to examine differences in treatment utilization and adherence between sub-groups of these populations. I interviewed behavioral health specialists to gain insights into administrative practices, use of evidence-based treatments, differences between population sub-groups, and recommendations for improvement. Combined, these two methods provided a picture of what factors contribute to low treatment utilization and adherence and how policies and practices can be changed to better provide for servicemembers and veterans suffering from PTSD.

The results of my analyses indicate that several groups are less likely to utilize and adhere to treatment for PTSD, including men and those with lower levels of combat exposure and/or symptom severity. I also found that attending longer appointments with behavioral health specialists and receiving psychotherapy and/or medications were important predictors of treatment adherence. Several barriers were identified for both utilization and adherence among veterans and servicemembers. However, it was found that servicemembers often experience more barriers to initial treatment entry, whereas veterans have more barriers to continuation. I recommend many policy changes and efforts to improve treatment utilization and adherence, but the most important are establishing standardized practices for provider referrals and appointment scheduling, providing greater support for prolonged exposure therapy, removing negative career consequences for servicemembers seeking care, and providing greater availability of behavioral health specialists.



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## List of Acronyms

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<u>Term</u>	<u>Definition</u>
AFSOC	Air Force Special Operations Command
ASD	Acute Stress Disorder
ATSC	Attitudes Toward Seeking Care
AUD	Alcohol Use Disorder
AUDIT	Alcohol Use Disorders Identification Test
BH	Behavioral Health
BTBIS	Brief Traumatic Brain Injury Screen
CAM	Complementary and Alternative Medicine
CAPS	Clinician-Administered PTSD Scale
CBT	Cognitive Behavioral Therapy
CPT	Cognitive Processing Therapy
DoD	Department of Defense
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition - Text Revision
EMDR	Eye Movement Desensitization and Reprocessing
EMR	Electronic Medical Record
GAD	Generalized Anxiety Disorder
GAD-7	Generalized Anxiety Disorder 7-item scale
IED	Improvised Explosive Device
IRR	Incidence Rate Ratio
IW	Invisible Wounds (Survey)
MAC	Minimally Adequate Care
MEB	Medical Evaluation Board
MHS	Military Health System
MOS	Military Occupational Specialty

<u>Term</u>	<u>Definition</u>
MTF	Military Treatment Facility
OCD	Obsessive-Compulsive Disorder
OEF/OIF	Operations Enduring Freedom and Iraqi Freedom
OR	Odds Ratio
PCL-M	PTSD Checklist - Military Version
PCP	Primary Care Provider
PC-PTSD	Primary Care PTSD (Short Screener)
PDHA	Post-Deployment Health Assessment
PDHRA	Post-Deployment Health Re-Assessment
PE	Prolonged Exposure (Therapy)
PEB	Physical Evaluation Board
PHQ-2	Patient Health Questionnaire-2 item
PHQ-8	Patient Health Questionnaire-8 item
PTSD	Post-Traumatic Stress Disorder
SAD	Substance Abuse Disorder
SES	Socio-Economic Status
SOF	Special Operations Forces
SSRI	Selective Serotonin Reuptake Inhibitor
TBI	Traumatic Brain Injury
VA	(Department of) Veterans Affairs
VAOS	Veterans Attitudes Online Survey
VHA	Veterans Health Administration
VRET	Virtual Reality Exposure Therapy

# 1. Introduction

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## General Aims and Objectives

Post-traumatic stress disorder (PTSD) is a mental health condition which afflicts thousands of current and former U.S. servicemembers. The recent wars in Iraq and Afghanistan have resulted in extensive battlefield trauma which is at the core of PTSD development for many in this population (Tanielian et al., 2008). Treating PTSD among servicemembers and veterans has been a considerable challenge due in part to the large demand for services and the relatively recent development of PTSD diagnostic and treatment methods. This large demand in mental healthcare has prompted significant advances in treatment options in since the wars began in the early 2000's. Unfortunately, many servicemembers and veterans suffering from PTSD do not receive adequate treatment to significantly reduce their symptoms and improve their quality of life. In fact, many individuals living with PTSD never seek treatment (Hoge, Auchterlonie, & Milliken, 2006). For those who do seek mental healthcare, many discontinue treatment before they have received an adequate dose (Burnam, Meredith, Tanielian, & Jaycox, 2009). Now that some effective treatments have been developed and disseminated, an important challenge currently presented is how to improve utilization of and adherence to treatment for PTSD.

The overarching goal of this dissertation is to produce knowledge and recommendations that will lead to improvements in treatment utilization and adherence among U.S. servicemembers and veterans suffering from PTSD. Following this introductory chapter, this dissertation provides background information and a description of the existing literature on this topic. In addition, this dissertation contains two sections of analysis, each addressing a different aspect of utilization and adherence. The objective of the first section (Chapter 3) is to identify specific individual-level variables – such as demographics, treatment experiences and military service – which are associated with high or low utilization/adherence. Previous research has identified sub-groups within the military and veteran populations which demonstrate particularly low levels of treatment utilization and/or adherence. However, much of the literature on this subject presents these results as incomplete and secondary, rather than the primary focus of research. This dissertation quantifies specific statistical relationships between individual-level variables and measures of treatment utilization/adherence to identify groups which exhibit particularly high or low rates of treatment seeking and continuation. The objective of the second section (Chapter 4) is to explore reasons for why some servicemembers and veterans experience high or low rates of treatment utilization and adherence. Simply knowing which groups suffer from low utilization or adherence does little to inform policymakers. The reasons for low treatment seeking and continuation must be revealed in order to construct policies which can counteract them. To conclude, this dissertation offers recommendations for incorporating the results of this research

into actionable policy and treatment practice changes that will improve utilization of and adherence to treatment of PTSD among servicemembers and veterans.

## Research Questions

In order to meet the objectives stated above, this dissertation answers several research questions, as stated below:

1. How are demographic variables, military factors, treatment experiences, clinical characteristics, attitudes regarding mental healthcare, barriers, and economic factors related to measures of mental healthcare utilization and adherence?
2. What healthcare administrative practices may affect PTSD treatment utilization and adherence among servicemembers and veterans?
3. How do behavioral health specialists view and utilize evidence-based treatments for PTSD, such as prolonged exposure therapy?
4. How do behavioral health specialists view differences in PTSD treatment utilization and adherence among sub-groups of servicemembers and veterans?
5. What changes do behavioral health specialists recommend for improving utilization of and adherence to PTSD treatment among servicemembers and veterans?

## Policy Relevance

This research is relevant to public policy because PTSD is a significant health problem, particularly in the military and veteran populations. Recent research efforts have helped identify effective diagnostic tools and screening options, but getting these populations to participate in treatment remains a major challenge. There have been several efforts in the last few years to increase the number of first-time visits between PTSD patients and providers. Unfortunately, many patients do not continue their prescribed or recommended treatment plans. The research on why this unfortunate phenomenon occurs and how to prevent it is relatively thin. This dissertation aims to fill that gap in knowledge.

The results of Chapter 3 of this dissertation offer insights which are valuable to crafting policies which target the groups most in need of assistance. Identifying specific groups that struggle with treatment utilization and adherence can guide policies which target the particular barriers experienced within those groups. In conjunction with these findings, the Chapter 4 is important because it identifies a number of reasons for treatment avoidance or discontinuation, as well as ways in which mental healthcare providers can keep more patients in treatment. Combined, the results of this dissertation offer to policymakers a multi-dimensional approach for improving PTSD treatment utilization and adherence. Policymakers within the Departments of Defense and Veterans Affairs, as well as healthcare providers and other healthcare administrators, should benefit from the research contained in this dissertation.

## Conceptualization of Utilization and Adherence

Treatment utilization and adherence are similar concepts which may overlap in some cases, depending on how they are defined. For my purposes, I draw a line between utilization and adherence based on behaviors in seeking and receiving care for PTSD. Specifically, I define treatment utilization as behaviors demonstrating that a person intends to receive care for their disorder, such as attending an initial appointment with a healthcare provider to voice their concerns and begin a treatment plan. Treatment adherence, on the other hand, is defined as behaviors demonstrating that a person follows through with their intention to receive care, such as attending follow-up appointments, engaging in psychotherapy, or taking prescribed medications. Utilization precedes and is necessary for adherence, but can occur without adherence. Utilization is the simpler concept and is represented as attendance of an initial behavioral health appointment in my analyses of survey data. Adherence, however, is more difficult to measure, as described in Chapters 2 and 3. The obstacles facing servicemembers and veterans suffering from PTSD are often similar for treatment utilization and adherence, which is why I address both concepts in this dissertation.

## Organization of the Monograph

This dissertation is submitted in the form of a monograph with multiple chapters. The next chapter provides background information on the topics of PTSD, military mental healthcare and treatment adherence, and also describes the existing literature which is relevant to this research.

The third chapter describes my analyses of individual-level factors of servicemembers and veterans associated with treatment utilization and adherence, which are the primary analyses of this dissertation. This chapter describes the methods I used and the results I obtained from examining two separate sets of survey data.

The fourth chapter is a description of the information I collected from semi-structured interviews with behavioral health specialists who treat servicemembers and veterans. The results from this qualitative analysis complement and expand upon the findings from my quantitative analyses of survey data.

The fifth and final chapter synthesizes the findings from all of my analyses into broader take-away points. I use these conclusions to support recommendations to policymakers within the Departments of Defense and Veterans Affairs. I also describe the limitations of my analyses and areas which are in need of further research.

## 2. Background and Literature Review

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Before explaining the methods and results of my research, it is important that I provide some background information on PTSD, as well as identify and explain the existing literature on PTSD treatments and treatment adherence. In doing so, I will construct a framework upon which I justify my methods and identify gaps in knowledge I strive to fill with my results. This chapter begins by explaining the significance of military-related PTSD in our society and the medical conceptualization of the disorder. Next, I describe the major PTSD treatment options currently available and the common barriers to accessing and continuing treatment. Finally, I describe how treatment adherence is defined and measured, factors associated with adherence, and challenges facing providers who treat servicemembers and veterans suffering from PTSD.

### Significance of the Problem

Post-traumatic stress disorder is a mental health condition which may develop after experiencing a traumatic event. PTSD is commonly linked to relationship and employment problems and a lower quality of life (Jordan et al., 1992; Zatzick et al., 1997; Sullivan et al., 2000). The symptoms of hypervigilance and anxiety can lead individuals suffering from PTSD to behave abrasively and even violently. Additionally, re-experiencing trauma and avoidance of triggers in the environment can make it difficult to complete daily tasks effectively. As a result, domestic violence and divorce rates are higher among servicemembers and veterans with PTSD, as are unemployment and homelessness (Carroll et al., 1985; Kessler, Walters, & Forthofer, 1998; Rosenheck et al., 1996). PTSD is also associated with poor health behaviors such as drug and alcohol abuse, sedentary lifestyle, and poor diet. Individuals suffering from PTSD may turn to drugs and alcohol to relieve anxiety and other symptoms. Their symptoms may also prevent them from exercising or preparing healthy meals. These behaviors contribute to higher lifetime prevalence of respiratory, circulatory, digestive, musculoskeletal and infectious diseases among individuals with PTSD (Zen, Whooley, Zhao, & Cohen, 2012).

As the fifth most common psychiatric condition in the U.S. today, the lifetime prevalence of PTSD is estimated to be about 7%. Additionally, rates for women with PTSD in the general population are higher than those for men (Keane, Marshall, & Taft, 2006). In the United States, incidence and prevalence of PTSD are consistently higher among servicemembers and veterans than the general population. A recent study estimated that about 1 in 5 veterans of Operations Enduring Freedom and Iraqi Freedom (OEF/OIF) suffer from PTSD and/or depression (Tanielian et al., 2008). Differences in prevalence rates have been observed between cultures, genders, and racial and ethnic groups, although different sources offer conflicting trends. Like many mental health conditions, development of PTSD can be influenced by many environmental

and biological factors, and many individuals who experience significant trauma never develop PTSD (Keane, Marshall, & Taft, 2006).

Many challenges exist for servicemembers and veterans seeking care for PTSD. Mental healthcare services available to them vary considerably both between the Military Health System (MHS) and the Veterans Health Administration (VHA) and within the facilities operated by these two systems. For example, complementary and alternative medicine (CAM) methods are not covered by TRICARE, the military's health insurance system, but are offered at some larger military treatment facilities (MTF) and VHA facilities. There are significant barriers which prevent servicemembers from seeking care for mental health conditions, including perceived stigma and negative consequences to career opportunities and security clearances (Erbes, Curry, & Leskela, 2009; Hoge et al., 2004). A lack of trained mental healthcare professionals within both the MHS and the VHA to treat the rising number of patients with PTSD has been cited as a serious problem. Of those servicemembers and veterans with PTSD who do find care initially, many of them eventually drop out of treatment without receiving an adequate dose to significantly reduce their symptoms and improve their quality of life (Burnam, Meredith, Tanielian, & Jaycox, 2009).

## Medical Conceptualization and Diagnosis

The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition – Text Revision (DSM-IV-TR) categorizes PTSD as an anxiety disorder. This diagnostic category also includes panic disorders, phobias, obsessive-compulsive disorder (OCD), generalized anxiety disorder (GAD) and acute stress disorder (ASD). PTSD and ASD are unique in that, unlike other panic disorders, they may only develop after experiencing a traumatic event. The DSM-IV-TR groups the symptoms of PTSD into three clusters: re-experiencing, arousal, and avoidance/numbing (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000). In 2013, the American Psychiatric Association published a fifth edition of the DSM, which groups symptoms of PTSD into four clusters: intrusions, persistent negative alterations in cognitions and mood, avoidance, and alterations in arousal and reactivity. This new version also groups PTSD and ASD into a newly-created “Trauma- and Stressor-Related Disorders” section (5<sup>th</sup> ed.; *DSM-V*; American Psychiatric Association, 2013). Since the vast majority of research cited in this dissertation is based on the DSM-IV-TR concept of PTSD, I will follow these earlier guidelines.

The development of PTSD can be conceptualized through both cognitive and physiological models. Cognitive models are often based on classical conditioning and focus on associations between environmental stimuli and fear or danger (Ehlers & Clark, 2000; Foa, Steketee, & Rothbaum, 1989). On the other hand, physiological models focus on responses to trauma in the central nervous system. The “fight or flight” response is a necessary physiological process, but excessive trauma can change an individual's physiology to be hypersensitive to stimuli associated with the traumatic event (Strawn & Geraciotti, 2008).

Traumatic events which may lead to the development of PTSD may be experienced directly or witnessed, and they include military combat, sexual assault, physical attack, kidnapping, terrorist attacks, torture, natural disasters and automobile accidents, among others. It is important to note that many individuals are exposed to traumatic events, but only some develop PTSD as a result. The intensity, frequency and proximity to traumatic events increase the likelihood of developing PTSD (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000; Keane, Marshall, & Taft, 2006). For members of the military and veterans who develop PTSD, traumatic events related to combat duty are commonly the cause. The nature of the wars in Iraq and Afghanistan (OEF/OIF), with many casualties from improvised explosive devices (IEDs) and relatively few deaths, may be partially to blame for high rates of PTSD among veterans of those wars (Tanielian et al., 2008). IED attacks resulted in thousands of injuries to U.S. servicemembers during OEF/OIF. However, the relatively small blasts from most IEDs, coupled with the relatively good battlefield trauma care and evacuation capabilities of the U.S. military, meant that many victims of IED blasts survived with amputated limbs and/or traumatic brain injuries (TBI). This phenomenon may help explain the higher rates of PTSD among veterans of OEF/OIF than those of other conflicts, during which survival rates from wounds were lower (Tanielian et al., 2008). Additionally, the many suicide attacks and indiscriminate IED placements resulted in many civilian casualties during OEF/OIF. Servicemembers who witnessed these attacks are at risk of developing PTSD as well. Finally, the long duration and repetition of OEF/OIF deployments made these servicemembers especially susceptible to developing PTSD (Tanielian et al., 2008).

An individual's risk of developing PTSD is not only influenced by the trauma they experience or witness, but also by many environmental and biological factors. Genetic predisposition, or a family history of psychopathology, has been shown in some studies to influence development of PTSD (Ozer, Best, Lipsey, & Weiss, 2008). However, these effects are small compared to those of environmental contributors (McLeod et al., 2001). Multiple traumas, life adversity and psychopathology prior to trauma are all associated with greater susceptibility to PTSD development. Additionally, factors after trauma such as a lack of social and family support can contribute to the likelihood of developing PTSD (Keane, Marshall, & Taft, 2006).

Diagnosing PTSD, like other disorders, can be difficult in some cases. Patients may display symptoms in all three symptom clusters or just one or two. The DSM lists guidelines for the number and duration of symptoms required for a PTSD diagnosis, but patients below the threshold may also benefit from treatment. Specifically, a diagnosis requires the presence of one or more symptoms from the re-experiencing cluster, three or more from the avoidance cluster and two or more from the hyperarousal cluster lasting more than one month and causing significant distress or impairment (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000)

## *Assessment*

There are several medical assessments currently in use to diagnose PTSD. The Clinician-Administered PTSD Scale (CAPS) – often considered the “gold standard” in PTSD diagnostic tools – shows high reliability and specificity (Weathers, Keane, & Davidson, 2001). Clinicians administering the CAPS collect frequency and intensity data from their patients related to past traumatic events and all PTSD symptoms listed in the DSM-IV using both multiple-choice and open-ended questions. These data are summarized with a scoring system to help assign symptom severity scores for each patient. The CAPS is a full-length structured diagnostic interview, but there are shorter screeners available which save time for providers by quickly ruling out many patients who do not meet PTSD diagnostic criteria. The PTSD Checklist – Military version (PCL-M) is an 18-item screener commonly used in the MHS and the VHA (Gore et al., 2013). Additionally, the 4-item Primary Care PTSD (PC-PTSD) is a short screener developed by the VA. These short screeners, however, do not provide the same sensitivity and specificity as the more comprehensive CAPS.

The Post-Deployment Health Assessment (PDHA) is administered to all U.S. servicemembers upon return from deployment, and contains the PC-PTSD to screen for symptoms of PTSD (Aralis, Macera, Rauh, & MacGregor, 2014). Three to six months after returning from deployment, servicemembers are also required to take the Post-Deployment Health Re-Assessment (PDHRA), which contains the more comprehensive 18-item PCL-M (McCarthy, Thompson, & Knox, 2012). Like many short screeners, the validity and reliability of these PTSD screeners vary between tests and by patient population (Spoont et al., 2013). The PDHA, in particular, has faced scrutiny for its low reliability. Servicemembers who endorse symptoms on the PDHA are subject to additional medical examinations which may delay their return home after deployment. Therefore, the timing of and consequences associated with the PDHA create negative incentives for honest reporting. A study by Hourani, Bender, Weimer and Larson (2012) demonstrated that servicemembers do, in fact, tend to underreport symptoms on these surveys. The PDHA and PDHRA aim to identify servicemembers with PTSD and other disorders, but it is unclear how effective they are at getting them the care they need.

## **Treatment Options**

There are several different treatment options available to patients with PTSD. Unfortunately, not all of them are offered to servicemembers and veterans through the MHS and the VHA. However, some of the most effective treatments are available at many of the larger facilities within these two systems, including prolonged exposure therapy.

### *Psychotherapy*

Often considered the most efficacious and effective treatment for PTSD, prolonged exposure therapy (PE) involves gradual exposure of a patient to traumatic stimuli and guiding them

through the process of re-associating the stimuli with non-negative outcomes (Shalev, Bonne, & Eth, 1996). Both imaginal and in-vivo exposure therapy have been shown to be effective, and are often used together in the course of treatment (Foa, Zoellner, Feeny, Hembree, & Alvarez-Conrad, 2002; Bradley, Greene, Russ, Dutra, & Westen, 2005). Interoceptive exposure therapy can also be used to induce arousal-related bodily sensations (Wald & Taylor, 2005). Despite high efficacy in clinical trials, exposure therapies can be challenging for patients as they force them to confront the stimuli that they want to avoid. Therefore, high treatment dropout rates are often associated with exposure therapies (Foa, Zoellner, Feeny, Hembree, & Alvarez-Conrad, 2002).

Exposure therapies are categorized as a type of cognitive behavioral therapy (CBT), which is commonly used to treat many types of mental disorders. Another form of CBT used to treat PTSD is cognitive processing therapy (CPT), which focuses on identifying and changing the patient's maladaptive thoughts and beliefs. Like exposure therapies and many other forms of CBT, the main drawback of CPT is that it can be time- and resource-intensive (Monson et al., 2006). This can be a significant obstacle to keeping patients in treatment long enough to receive adequate dosage. Another common psychotherapy is eye movement desensitization and reprocessing (EMDR), which involves the patient focusing on a disturbing memory while they visually track an object. The theoretical justification for this treatment is unclear, but it seems to be effective in practice in some cases (Davidson & Parker, 2001).

### *Pharmacotherapy*

There are several types of medications which healthcare providers commonly prescribe to patients suffering from PTSD for symptom reduction. Unfortunately, these medications do not treat the underlying cause of PTSD, and therefore cannot rid the patient of symptoms long-term once treatment is discontinued. Antidepressants, especially selective serotonin reuptake inhibitors (SSRIs), are commonly prescribed and often show the greatest efficacy among medications in managing PTSD symptoms. Although not recommended as a stand-alone treatment option, pharmacotherapy can be very useful in conjunction with psychotherapies (Cukor, Spitalnick, Difede, Rizzo, & Rothbaum, 2009).

### *Other treatment techniques to improve adherence*

Techniques in complementary and alternative medicine (CAM) have gained popularity in recent years, and certain types have been shown to be effective in treating PTSD. Yoga and meditation, in particular, seem to be effective at reducing anxiety associated with PTSD (Rosenthal, Grosswald, Ross, & Rosenthal, 2011; Lang et al., 2012; Staples, Hamilton, & Uddo, 2013). However, the empirical evidence for CAM treatments is weak, as randomized controlled trials including patients with PTSD are scant (Cukor, Spitalnick, Difede, Rizzo, & Rothbaum, 2009). Additionally, TRICARE does not cover referrals for CAM treatments, so access for servicemembers and veterans is limited to in-house MHS and VHA services.

There are several new treatment approaches being developed which may improve treatment adherence for servicemembers and veterans suffering from PTSD. New methods may help overcome the difficulties associated with exposure therapy. In conducting imaginal exposure therapy, it may be difficult for therapists to get patients to overcome their avoidance symptoms and imagine traumatic stimuli. In vivo exposure therapy, on the other hand, can also be difficult because recreating traumatic scenarios is often impossible or very expensive and time-consuming.

Exposure therapy may be enhanced by adding a virtual reality component which allows patients to bridge the gap between imaginal and in vivo exposure and reap the benefits of both methods while decreasing their limitations. Early development of Virtual Reality Exposure Therapy (VRET) systems, such as *Virtual Iraq*, has shown promising results for improving the effectiveness of exposure therapy (Rizzo et al., 2010; McLay et al., 2011). These systems project images, sounds, and sometimes vibrations and smells to provide stimuli related to the patient's traumatic experiences. Much like a video game, the patient can control their movements through the virtual world while the therapist controls the type, timing and intensity of stimuli. This delivery method may be more acceptable to younger servicemembers and veterans, many of whom play video games. In addition to this, VRET may also improve treatment adherence because it makes it easier for patients to be exposed to stimuli that they can sense repetitively.

Providing psychotherapy alone to patients suffering from PTSD may create frustration for the patients because they often do not see immediate relief of their symptoms. Therefore, using other treatment methods to provide short-term symptom relief may be preferable. Psychotherapies can often be enhanced with conjunctive pharmacotherapy, and some medications, such as D-cycloserine, propranolol, and prazosin have shown promise in preventing and reducing symptoms of PTSD (Cukor, Spitalnick, Difede, Rizzo, & Rothbaum, 2009). Additionally, CAM treatments such as yoga, meditation, and acupuncture are gaining more attention in research and practice for their potential in relieving anxiety for patients with PTSD. Similar to pharmacotherapy, CAM treatments can provide quick relief of PTSD symptoms and prevent patients from becoming frustrated with their treatment, therefore making it more likely that they will continue with psychotherapy and see long-term improvement.

For some patients suffering from PTSD, especially servicemembers and veterans, there can be logistical barriers to accessing treatment, such as limited time available for psychotherapy and long distances between the patient and the therapist. Fortunately, internet- and computer-based CBT interventions are becoming more feasible due to the wide availability of advanced technology, and these delivery methods can help patients and providers overcome logistical barriers to improve treatment adherence (Cukor, Spitalnick, Difede, Rizzo, & Rothbaum, 2009). Performing psychotherapy over videoconference has been shown to be a feasible alternative to in-person meetings (Luxton, Mishkind, Crumpton, Ayers, & Mysliwiec, 2012). It is currently unclear if this treatment delivery method is as effective as in-person therapy, but there is little reason to expect a large decline in effectiveness. However, there are serious concerns with

privacy and security regarding the exchange of sensitive health information over videoconferencing platforms.

## Barriers to Accessing and Continuing Treatment

Many factors can prevent servicemembers and veterans from continuing treatment for PTSD once they enter care. Several barriers to care are consistent across both populations, but there are some important differences between the two groups, as I discuss for specific barriers below. Barriers can include physical barriers, such as long distances to care facilities, lack of transportation or time off from work, and poor appointment availability. Barriers can also be non-physical, such as perceived stigma, career consequences, and beliefs about mental illness and healthcare.

### *Beliefs about mental healthcare*

A common barrier to accessing treatment for PTSD among servicemembers which has been the subject of much study and conversation is stigma. Several research papers have identified perceived stigma among servicemembers as a major reason for why they do not seek or continue treatment for mental health issues (Vogt, 2011; Hoge et al., 2004; Stecker, Shiner, Watts, Jones, & Conner, 2013). While general stigma is the disapproval of an individual or group based on particular characteristics, there is an important distinction between public and self-stigma. Public stigma refers to society's negative views of individuals with a certain characteristic (such as the mentally ill), whereas self-stigma is the internalization of those negative beliefs (Vogt, 2011). A servicemember with PTSD may perceive public stigma by believing that society views those in need of mental healthcare negatively. They may also perceive self-stigma by holding negative beliefs about those individuals (and therefore himself or herself). In both cases, disapproval of individuals who need mental healthcare can prevent servicemembers and veterans from seeking and continuing treatment for PTSD.

A comprehensive study of mental health stigma in the military was recently conducted by RAND researchers (Acosta et al., 2014). This study identified several stigma-reduction efforts within the DoD which may be contributing to a decline in stigma associated with seeking mental healthcare. However, most of these efforts target the broad public context of the military, rather than specifically the individuals who may benefit from mental healthcare. Additionally, there are policies which prevent individuals who have received mental healthcare from competing for certain career opportunities. There continues to be a debate between the need for keeping commanders informed about the health of their troops and the need for privacy in ensuring that servicemembers are comfortable seeking treatment without fear of negative career consequences. The authors of this report recommended that the DoD adjust their stigma-reduction policies to specifically target the improvement of treatment-seeking behaviors, validate the need for policies which exclude servicemembers from certain opportunities based on mental health treatment

history, and carefully weigh the importance of commander knowledge of medical history at the expense of servicemember privacy and treatment-seeking.

Besides stigma, other personal beliefs about mental illness and treatment may prevent servicemembers and veterans from seeking mental healthcare. The belief that individuals with mental health disorders are responsible for their problems has been shown to be associated with a low probability of seeking treatment (Vogt, 2011). Similarly, young, male servicemembers tend to place high value on self-reliance and emotional strength and may view mental healthcare as detrimental to these values (Hoge et al., 2004). Other beliefs have been shown to be associated with low treatment seeking, such as perceived lack of treatment effectiveness, mistrust in mental health professionals, deservingness of healthcare services, and fear of career consequences (Vogt, 2011; Hoge et al., 2004; Stecker, Shiner, Watts, Jones, & Conner, 2013). Many servicemembers express that they would not seek mental health treatment through the MHS because they believe records of their treatment would prevent them from receiving promotions, job assignments, and security clearances. Unfortunately, this belief may be true in some cases, but it is very difficult to measure its validity in practice (Walters, 2014).

Fear of negative consequences to their careers from seeking mental healthcare has been expressed by many active duty servicemembers (Hoge et al., 2004). Military doctors have the authority to remove servicemembers from specific duties for medical reasons, including the existence of PTSD. Therefore, servicemembers may not seek treatment for fear that they will be forced to stop doing their jobs or removed from service altogether with a medical discharge. They may also lose security clearances or future deployments as a result of mental disorder diagnoses (Stecker, Shiner, Watts, Jones, & Conner, 2013). Less severe consequences may include commanders gaining access to their subordinates' medical records and not recommending promotions or special duties because of past treatment for mental health conditions such as PTSD (Vogt, 2011). Similarly, veterans may avoid seeking treatment in the VHA for fear that their mental health history will be accessed by federal or state employers and damage their potential for future employment opportunities (Vogt, 2011). All of these possibilities may prevent servicemembers suffering from PTSD from seeking treatment.

### *Logistical barriers*

Logistical barriers constitute another important category identified by servicemembers and veterans. A common barrier perceived by active duty servicemembers is that it would be difficult to schedule an appointment and get time off from work to receive treatment. Some also reported a lack of adequate transportation and costs of mental healthcare as barriers to accessing care (Hoge et al., 2004). Many medical facilities at smaller military installations do not offer mental health services, so some servicemembers must travel to larger installations to receive treatment for PTSD. Veterans often cite long wait times, extensive paperwork and difficulty navigating the healthcare system in the VHA as significant barriers (Vogt, 2011). The recent problems within

the VA highlighted in the public media demonstrate that VHA facilities are often undermanned to treat the high numbers of veterans with both physical and mental health issues.

### *Symptoms as barriers*

The symptoms of PTSD may also create barriers to seeking and continuing treatment. Several psychotherapies, especially exposure therapies, require patients to recall traumatic events in their past and the stimuli related to those events. For many patients, avoidance of these memories and stimuli is a strong enough symptom of their disorder that it prevents them from participating in such treatments. They express that they do not want to be “emotionally triggered” or “relive the trauma” as a result of psychotherapy (Stecker, Shiner, Watts, Jones, & Conner, 2013). Experiencing anger during exposure therapy is a defense mechanism and is a common response among patients. Anger can prevent the patient from experiencing fear in relation to the trauma and therefore impede the recovery process (Jaycox & Foa, 1996). Similarly, emotional numbing and overwhelming anxiety can prevent patients from participating in exposure therapy by not allowing them to feel and control necessary emotions (Jaycox & Foa, 1996). Finally, patients often associate symptoms with need for healthcare. Therefore, individuals with few or less severe symptoms of PTSD are less likely to seek and continue treatment than those who have many or more severe symptoms. Unfortunately, this can mean that patients who see improvements in their PTSD symptoms may feel they no longer need treatment and therefore discontinue it before lasting effects can be achieved (Vogt, 2011; Stecker, Shiner, Watts, Jones, & Conner, 2013; Kutter, Wolf, & McKeever, 2004).

### *Other barriers*

Social support has been identified consistently as an important factor in seeking and continuing mental healthcare. Issues within an individual’s family, for example, may prevent treatment-seeking (Vogt, 2011, Stecker, Shiner, Watts, Jones, & Conner, 2013). Specifically, servicemembers and veterans with low family support, problems at home and/or time-consuming family responsibilities are less likely to seek treatment. Relationships with friends can have similar effects on treatment-seeking and adherence. Individuals with supportive friends and family members are generally more likely to follow through with their treatments.

Some servicemembers and veterans have also reported concerns about their readiness for treatment, which may prevent them from seeking or continuing treatment. Some have expressed difficulty in talking about their symptoms and concern that medical providers will not understand their problems. Additionally, many servicemembers and veterans report that they do not seek treatment because they do not want to take medications (Stecker, Shiner, Watts, Jones, & Conner, 2013). Many patients suffering from PTSD worry about the side effects of medications and their effects on physical and mental functioning (Tanielian et al., 2008).

## Conceptualizing and Measuring Treatment Adherence

Even if patients with PTSD are successful at entering treatment, there is a high probability for some that they will not continue treatment as prescribed by their healthcare provider (Burnam, Meredith, Tanielian, & Jaycox, 2009). Dropping out of treatment before receiving an adequate dose prevents the patient from achieving lasting gains in terms of symptom reduction and improved quality of life. Therefore, improving treatment adherence is vital to improving care for patients with PTSD.

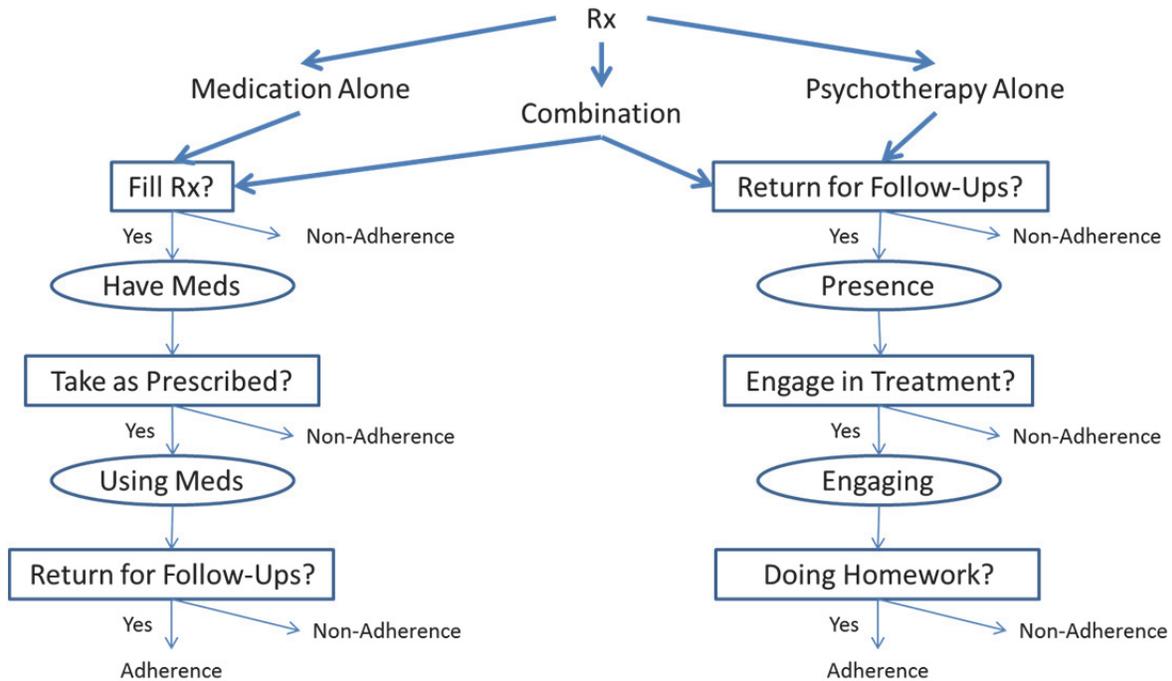
Treatment adherence can be a difficult concept to define, and it may vary significantly between cases. A perfectly adherent patient would be one that follows all of their provider's orders. They would attend all scheduled appointments, fill and consume all prescribed medications as directed, and be fully engaged in psychotherapy. Unfortunately, identifying adherence to a provider's instructions cannot always be done dichotomously (i.e. they adhere or they do not). For example, a patient might attend some therapy sessions but not others, or may show up late. Therefore, it is difficult to describe the level at which the patient is adhering to their prescribed treatment. Fortunately, researchers have identified several ways in which treatment adherence can be measured quantitatively, such as medication prescription consumption, psychotherapy sessions attended, and seeing specialists referred by other providers (Dobscha, Gerrity, Corson, Bahr, & Cuilwik, 2003).

Ways of measuring treatment adherence may be conceptualized by Figure 1 below. A provider or group of providers may prescribe medications, psychotherapies, or both to a patient suffering from PTSD. If a patient receives a prescription for medication, the first step in their treatment adherence is going to a pharmacy and filling the prescription, which serves as the most basic measure of adherence. Once the patient has their medications, their consumption behaviors can serve as another measure of adherence. They are perfectly adherent if they take their medications in the right dosages and combinations and at the correct frequencies.

Whether a patient receives a prescription for medications, psychotherapies, or both, they typically are directed by their provider to return for follow-up appointments. Primary care physicians or psychiatrists may alternatively refer patients to other mental health specialists. Attendance at these follow-up appointments may serve as another important measure of a patient's treatment adherence. A patient who is late for appointments or misses some would be considered less adherent than a patient who attends all appointments on time. This is perhaps one of the most important measures as many servicemembers and veterans diagnosed with PTSD only attend a single appointment (Hoge et al., 2014). Therefore, attendance of multiple sessions could be an indicator of treatment adherence and success. When receiving psychotherapy, it is also important for a patient to engage with the provider in order to gain benefits from the treatment (Jaycox & Foa, 1996). Therefore, psychotherapy engagement is an important, yet ambiguous, measure of adherence. Finally, some providers give homework to patients suffering from PTSD as part of psychotherapy, such as doing breathing exercises before bed or filling out

sleep diaries. A patient’s completion of these homework tasks may serve as an additional measure of treatment adherence.

**Figure 1. Concept map of treatment adherence.**



## Factors Associated with Treatment Adherence

Many factors have been shown to be associated with poor treatment adherence. These include patient beliefs about effectiveness of treatment, self and public stigma, family and social support, logistical barriers to receiving care, ease of appointment scheduling, comorbidities, drug or alcohol use, age, military rank, military occupation, social-economic status, race or ethnicity, treatment type and environment, and provider continuity of care (Erbes, Curry, & Leskela, 2009; Davis, Walter, Chard, Parkinson, & Houston, 2013; Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008; DiMatteo, Haskard, & Williams, 2007). Sub-groups of a population which are characterized by certain factors may suffer from lower treatment adherence than other sub-groups, as the following paragraphs describe. For example, veterans who belonged to a certain military occupation may experience worse treatment adherence than veterans of other occupations.

A meta-analysis of empirical research on treatment adherence in healthcare revealed that patient perception of disease severity is significantly related to treatment adherence. Those patients who see their conditions as more severe generally adhere more closely to their prescribed treatments, possibly because they feel a more urgent need to improve their health (DiMatteo, Haskard, & Williams, 2007). Patient beliefs about the competency of their providers and effectiveness of healthcare are also tied to treatment adherence. Specific to mental health,

servicemembers who are skeptical of their providers and about the efficacy of psychotherapy and psychotropic medications are less likely to adhere to treatment than those who believe mental healthcare can help relieve their symptoms (Vogt, 2011; Stecker, Shiner, Watts, Jones, & Conner, 2013; Hoge et al., 2004).

### *Treatment environment*

Many aspects of the treatment environment have been shown to be associated with treatment adherence. Servicemembers and veterans commonly cite logistical barriers to receiving treatment as reasons for discontinuation. These logistical barriers may include scheduling conflicts (e.g. not getting sufficient time off from work or lack of available appointment times) and difficulty with transportation to and from appointments (e.g. clinic is too far away from veteran's home) (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008; Mitchell & Selmes, 2007b). Time constraints may be especially prevalent for servicemembers in high tempo occupations or on shift work because they cannot attend appointments during regular working hours. Veterans living in rural areas face greater logistical challenges than those living in metropolitan areas because they often must travel greater distances to receive treatment. Indeed, several studies have shown that patients living in rural areas demonstrate lower rates of treatment adherence (Kruse & Rohland, 2002; Mitchell & Selmes, 2007b).

Interestingly, appointment scheduling practices may also have impacts on patient treatment adherence. One study has shown that scheduling psychiatric appointments further than two weeks in advance significantly reduces the probability that patients will attend those appointments (Kruse & Rohland, 2002). Another study demonstrated that psychiatric appointments scheduled on Fridays and in winter months were less likely to be attended than appointments scheduled on other days and in other seasons (Mitchell & Selmes, 2007a). A third study discovered that the use of appointment and treatment reminders given to patients by their providers is associated with higher treatment adherence (McIvor, Ek, & Carson, 2004). These results suggest that mental healthcare providers should attempt to schedule appointments which are convenient and timely for patients, as well as provide reminders in order to increase the probability that patients will continue their treatments as prescribed.

Treatment type and environment are important factors when examining differential treatment adherence rates. Treatments delivered in regular clinical settings (non-research) may experience worse adherence than treatments being evaluated in research settings due to the additional care and incentives provided to research participants (e.g. greater treatment structure, reminders, more staff members, free treatment and/or payments). Therefore, environmental factors which contribute to treatment adherence in "real-world" settings may not be captured by clinical trials. However, some initial research has shown that treatment environment factors such as specific treatment strategies, alliance building and the physical environment of facilities where treatment is conducted may contribute to treatment adherence (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008). Additionally, some studies suggest that manualized treatments may increase

dropout when compared to treatments which afford more therapist discretion because they may not allow the therapist to tailor treatment to the patient's comfort and concerns (Hembree et al., 2003; Bein et al., 2000).

### *Treatment type*

Different types of treatment for PTSD have also shown differential dropout rates in clinical trials. Cognitive behavioral therapies (CBT) and eye movement desensitization and reprocessing (EMDR) consistently show efficacy, but also high dropout rates (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008). Exposure therapies often show the greatest efficacy for treating PTSD in clinical trials, but are not commonly used in the clinical community. Despite the empirical evidence, many clinicians express concern that exposure therapy may “re-traumatize” patients and make their symptoms worse, leading them to drop out of a treatment they view as counterproductive (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008). However, there is little evidence of this greater dropout in non-research settings. Additionally, a study by Foa and colleagues (2002) demonstrated that patients whose PTSD symptoms were exacerbated during exposure therapy did not have significantly different post-treatment symptom severity scores compared to other patients, and that treatment dropout was not related to symptom exacerbation.

Several studies have shown that taking prescribed psychotropic medications is significantly associated with higher attendance of psychiatric appointments (Kruse, Rohland, & Wu, 2002; Mitchell & Selmes, 2007b). This suggests that patients in combined therapy may be more likely to attend psychotherapy sessions if they adhere to their prescribed medication regimen. However, it is unclear whether this phenomenon occurs because psychotropic medications relieve symptoms and encourage patients to continue treatment or because patients who do not take their prescribed medications are too embarrassed to attend appointments where they will have to explain their lack of adherence. Unlike use of prescribed medication, alcohol dependence or abuse has been shown to be negatively associated with PTSD treatment adherence (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008). Unfortunately, alcohol dependence and abuse is common among patients suffering from PTSD (Tanielian et al., 2008).

The type of treatment that a patient prefers is important in continuing treatment. Patients who receive the treatment they expect are less likely to drop out and more likely to develop an alliance with their provider (Elkin et al., 1999). Additionally, poor communication between patients and providers, disagreements on referrals and treatments, and non-collaborative decision-making have all been linked to greater treatment dropout (Mitchell & Selmes, 2007b). Therefore, it is important for providers to involve their patients in the treatment decision-making process, offer options in treatment and tailor their methods to their patients' needs and preferences.

### *Support for patients*

Referring a patient from one provider to another or simply switching providers adds another point at which dropout can occur. Primary care providers (PCP) will often refer patients to behavioral health specialists, who may then refer patients to other specialists. In the military, in particular, provider turnover is very quick, so a patient's PCP or specialist may change without advanced notice. When seeing a new provider, a patient has to retell their personal history and rebuild therapeutic rapport. This feeling of starting over can be frustrating for patients who are seeking progress through their treatment. A study by McIvor, Ek and Carson (2004) identified continuity of care as a main reason for differences in appointment attendance at a mental health clinic. Continuity of care is especially difficult in the MHS, which experiences relatively rapid turnover in healthcare providers, many of whom are servicemembers who receive new assignments every few years. Provider turnover may be a significant contributor to patient dropout among active duty servicemembers in treatment for PTSD, but research is scant on this topic.

Underlying many of the additional factors associated with PTSD treatment adherence is family and social support. In their review of outcome studies on PTSD, Schottenbauer and colleagues (2008) identified a lack of support from friends and family as a predictor of treatment dropout. Similarly, they showed that unemployment and homelessness are associated with poor treatment adherence. Additionally, other studies have shown that younger patients, those in lower socio-economic status (SES) categories and racial/ethnic minorities (particularly Hispanic) are more likely to drop out of treatment (Kruse, Rohland, & Wu, 2002; Mitchell & Selmes, 2007b). Unfortunately, racial/ethnic minorities commonly belong to lower SES categories in the United States, and lower income may reduce family and social support available. Similarly, younger, unemployed or homeless individuals are all less likely to have strong family and social support than older individuals in more stable environments. One can see how all of these factors are tied together under family and social support, which may be vital to enabling continuation of treatment for PTSD.

### **Challenges Facing Providers in Maintaining Patients**

Treatment adherence is not solely a function of patient participation, but healthcare providers play an important role as well. Providers often face challenges in motivating their patients to engage in and continue their prescribed treatments. Those who treat servicemembers and veterans with PTSD can experience unique challenges, such as dealing with traumatic memories from combat experiences and comorbidities such as traumatic brain injury (TBI), depression, and substance abuse disorder, which can exacerbate PTSD symptoms (Macready, 2008; Zen, Whooley, Zhao, & Cohen, 2012; Tanielian et al., 2008). Clinicians who do not have experience in the military may not be familiar with the nature and intensity of traumas from combat, and may therefore find it harder to relate to and build rapport with these patients than clinicians who

are in the military or veterans themselves (Sharpless & Barber, 2011). Veterans within the VHA commonly express mistrust in non-veterans – both providers and other patients in group treatments – who they feel cannot fully understand their experiences (Macready, 2008).

Even for clinicians with military experience, treating patients suffering for PTSD can be a challenge because of a lack of specialized training or time constraints. Many primary care providers within the MHS and the VHA are inexperienced with identifying PTSD symptoms and/or may not have the time to administer appropriate mental health screeners. In a survey of VHA healthcare providers on the treatment of veterans with PTSD, lack of skilled providers and case management, confusion about treatment options, and lack of knowledge about treatment best practices were all identified as significant barriers to effective treatment. Overbooked and insufficient staff was often identified as the underlying problem creating these barriers (Najavits, Norman, Kivlahan, & Kosten, 2010). Additionally, training given to mental health specialists is often not uniform, so it may vary from extensive hands-on training to shortened remote or online courses (Sharpless & Barber, 2011).

The accessibility and treatment offerings of behavioral health specialists and primary care providers are often different when treating servicemembers. A recent study conducted by RAND researchers using the same data I use in part of my analyses compared treatment experiences of servicemembers previously deployed to Iraq or Afghanistan (Wong et al., 2013). Of particular interest was the proportion of servicemembers who received treatment from behavioral health specialists versus primary care providers. Surprisingly, three times as many of the survey respondents had seen specialists as had seen primary care providers. When asked about the helpfulness of their providers, the vast majority of respondents who had seen specialists thought their treatment helped “a lot or some.” In contrast, 15% of those who had seen primary care providers thought their treatment did not help at all, and only 51% thought it helped “a lot or some.” The authors also found that respondents who saw specialists attended significantly more and longer appointments than those who saw primary care providers. These results suggest there may be important differences in the accessibility of and treatment options afforded by behavioral health specialists versus primary care providers in military settings. This study limited its scope to only active-duty survey respondents and the variables of appointment attendance, number of visits, length of visits, and provider helpfulness. My analyses expand on these findings with multiple samples and other important variables.

Additionally, although not officially documented in empirical research, military healthcare providers may feel a moral dilemma between treating servicemembers with PTSD and reporting to commanders that these servicemembers are unfit for duty, resulting in underdiagnosis. Servicemembers understand that the providers they see in the MHS have a responsibility to report significant health issues, and this understanding may prevent servicemembers from seeking and continuing treatment for PTSD or other issues. The challenges facing healthcare providers who treat servicemembers and veterans can significantly complicate the process of

providing effective treatment. When these barriers are not overcome, treatment discontinuation can be the result. (C. Engel, personal communication, May 2, 2014).

### *Research and practice discontinuity*

In addition to a lack of training on specific treatments for PTSD, many mental health specialists choose not to use some treatments which have high efficacy in clinical trials, especially exposure therapies. A common critique for these treatments among providers is that the samples included in research trials often do not represent the real-world patient population. The most challenging cases, they argue, such as patients with extreme trauma or several comorbidities are often excluded from participation in clinical trials (Cook, Schnurr, & Foa, 2004). Therefore, efficacy demonstrated in clinical trials may not translate to effectiveness in the real world. Without being convinced that treatments such as prolonged exposure therapy will be effective, many clinicians are hesitant to invest the time needed to learn these treatments and risk their clinical autonomy and the health of their patients. Unfortunately, the result is that treatments which have been empirically tested and proven are often not broadly adopted.

Since one of the main symptoms of PTSD is avoidance, behavioral health providers often have difficulties convincing patients with PTSD to participate in psychotherapy. This may be especially true when treating servicemembers and veterans with PTSD since the military culture often discourages talking about personal problems (Kutter, Wolf, & McKeever, 2004). Prolonged exposure therapy, in particular, directly confronts avoidance and may be difficult for some patients. Therapists delivering PE may feel sympathy for such patients and scale back the exposure or cut it short. Unfortunately, this can reinforce avoidance and make symptoms worse by impeding emotional processing (Cook, Schnurr, & Foa, 2004). Similarly, other symptoms of PTSD can themselves be barriers to effective PE delivery. Extreme anger or emotional numbing can prevent patients from engaging in treatment, while intense anxiety can lead to over-engagement. Experts recommend that the PE protocol be followed through to completion, with some minor modifications, to overcome these barriers (Cook, Schnurr, & Foa, 2004). Unfortunately, without proper training in PE, clinicians may be hesitant or unaware of how to do so.

When providers have limited time and knowledge of effective behavioral treatments for PTSD, prescribing medications to manage symptoms often becomes the first-line treatment. SSRI's such as Zoloft and Paxil have been approved by the Food and Drug Administration (FDA) to treat PTSD, despite no evidence for long-term symptom reduction (Sharpless & Barber, 2011). Many studies on medications are funded by the pharmaceutical companies which develop them, and it is unclear how marketing plays into providers' decisions to prescribe medications for PTSD treatment (Vedantam, 2007). Many servicemembers and veterans express concerns with taking medication, and refusal or inability to offer other treatments may result in loss of confidence in the MHS or the VHA and lead to treatment dropout (Sharpless & Barber, 2011).

## My Work Extends the Knowledge Base

The existing literature just described demonstrates that many factors may be related to treatment utilization and adherence among U.S. servicemembers and veterans suffering from PTSD. Much of the current information on PTSD treatment utilization and adherence was collected from studies which had the primary goal of measuring the efficacy of treatment options. Comparisons of utilization/adherence between different groups were done as secondary analyses and often only for a few groups. In contrast, the primary aim of my research is to identify differential utilization and adherence rates between a wide array of groups through exploratory analyses. My research seeks to confirm or refute previous findings and expand our knowledge of individual-level factors which may influence treatment utilization and adherence with samples which are larger than those collected from many of the studies previously described.

Most of the previous research identified here only examined treatment utilization and adherence for single samples of either active duty servicemembers or veterans. My research expands our understanding of utilization and adherence by comparing common variables across samples of both servicemembers and veterans. This approach allows me to identify specific characteristics and/or barriers which may be unique among servicemembers or veterans and particular issues within the MHS and the VHA. Comparing results between two sample sets – which were collected six years apart – also allows me to identify factors which may influence treatment utilization and adherence that appear to remain constant over time.

Few studies compare utilization and adherence rates between different treatments and provider types. The study by Wong et al. (2013) provided important insights into how servicemembers utilize specialists and primary care providers differently, but focused on a small set of variables and a sub-group of the survey respondents. My analysis uses the same data as this study, but utilizes a greater number of variables and the full sample to expand on these results and identify other important findings. An important addition to this study is my analysis of patients' perceived helpfulness of providers and medication in relation to treatment adherence.

Several studies have identified barriers to accessing care for PTSD among servicemembers and veterans, including the study by Schell and Marshall in Tanielian et al. (2008), which used the same data as Wong et al. (2013). The authors identified the frequencies of reported barriers among the respondents, but my analysis expands on these findings by identifying the demographic groups which are most likely to report these barriers and the relationships between these barriers and treatment utilization and adherence. Several other research efforts, including the recent study by RAND researchers (Acosta et al., 2014), point to stigma as a major barrier preventing servicemembers from seeking mental healthcare. The differences in PTSD treatment utilization and adherence observed in my analyses may be at least partially attributable to stigma. However, as explained by Acosta and her colleagues, it is very difficult to change attitudes and reduce the stigma associated with mental healthcare. Furthermore, it is not clear that reducing

stigma would have significant impacts on treatment utilization and adherence. Therefore, my research aims to identify the groups within the military and veteran communities which would directly benefit from policy changes aimed at improving treatment utilization and adherence in ways more tangible than stigma reduction.

Perhaps the largest contribution of my research to our knowledge of PTSD treatment utilization and adherence among servicemembers and veterans is my analysis of semi-structured interviews with behavioral health specialists. The majority of previous research describes differences in treatment utilization and adherence without providing significant evidence on the underlying causes of these differences. I rely on expert opinions to deduce logical explanations for the results of my survey data analyses to provide a complete picture of what differences exist between groups and why they have developed. This knowledge is vital to creating effective policies to target specific groups and get more servicemembers and veterans to utilize and adhere to treatment for PTSD.

### 3. Individual-Level Factors of Servicemembers and Veterans Associated with Treatment Utilization and Adherence

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#### Introduction

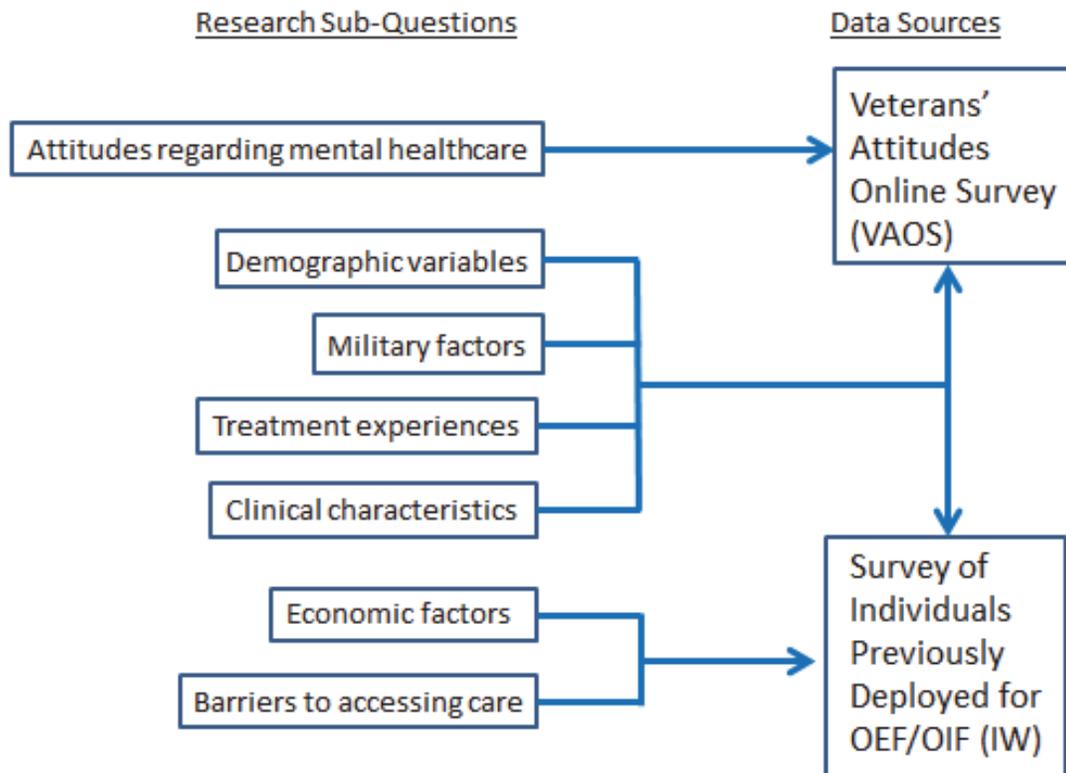
The goal of this chapter is to develop an understanding of the relationships between individual-level variables and treatment utilization and adherence. This chapter examines the statistical relationships between outcome variables measuring behavioral healthcare utilization and PTSD treatment adherence and input variables from the categories of demographics, military factors, treatment experience, clinical characteristics, attitudes regarding mental healthcare, economic factors, and barriers to accessing care. Various measures of treatment utilization and adherence were considered, ranging from attendance of a single behavioral health (BH) appointment to receipt of minimally adequate care for PTSD (as defined below). Specific measures of treatment adherence varied slightly between the two data surveys used, so some variables were recoded to maintain consistency.

I used two similar sources of survey data to compare and contrast results. The benefit of using data from two different surveys was that it allowed for comparison and validation of findings related to treatment utilization and adherence. Both surveys contained items to record demographic information of the respondents, measure their attitudes and behaviors regarding treatment, and quantify how much treatment they had received. They differ in some specific items, their respective time periods of data collection and their target populations for sampling.

In this chapter, I describe my approach to addressing Research Question 1 through the predictor variable sub-groups listed in Figure 2 below. As this figure illustrates, the two data sources each provided information which addressed sub-sets of my research question. When combined, these two data sources allowed me to address this question more fully. Four of these predictor variable sub-groups were contained in both datasets, enabling comparisons across survey samples.

**Figure 2. Chapter 3 sub-questions and data sources.**

Research Question 1: How are demographic variables, military factors, treatment experiences, clinical characteristics, attitudes regarding mental healthcare, barriers, and economic factors related to measures of mental healthcare utilization and adherence?



### *Hypotheses*

From past research and interaction with military healthcare providers and commanders, I hypothesized that younger, less educated, and lower-ranking individuals with PTSD would have lower treatment adherence rates (Kruse, Rohland, & Wu, 2002; Mitchell & Selmes, 2007b). Previous literature led me to expect that married individuals would be more likely to adhere than single or divorced individuals (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008). Additionally, past research on this topic led me to believe that ground combat forces (i.e. Army and Marine infantry) would be less likely to adhere than individuals from other specialties (i.e. Air Force and Navy, support personnel) (Hoge et al., 2004). Similarly, I hypothesized that African-Americans and Hispanics would among the least likely to adhere to treatment (Kruse & Rohland, 2002). Although I was uncertain of effect directions from my reading of past literature, I suspected that there would be differential adherence rates between genders and patients who do or do not have symptoms of other mental health disorders.

Furthermore, previous research led me to believe that individuals with certain past experiences with mental healthcare would be less likely to adhere to treatment. For instance, those prescribed medications alone for PTSD symptom reduction would be less likely to adhere than those given psychotherapy alone or in conjunction with medication (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008; Mitchell & Selmes, 2007b). Due to previously-identified issues with appointment availability and logistical barriers, I suspected that veterans who received care from the VHA would be less likely to adhere than servicemembers and veterans who received care from the MHS or civilian providers. Specifically, I expected those who experienced fewer barriers to accessing care and received longer appointments would be more likely to adhere than others (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008; McIvor, Ek, & Carson, 2004).

My past research led me to believe that attitudes regarding mental health treatment would have significant impacts on treatment utilization and adherence, with more positive attitudes being correlated with greater adherence. Although I had seen little evidence in previous literature, I predicted that some other economic factors would also influence treatment seeking. Specifically, those with more physical injuries or who worked full time would seek less mental health treatment than those with fewer physical injuries or without full-time employment.

## Methods

The RAND Human Subjects Protection Committee approved my use of existing survey data collected and owned by the RAND Corporation. Specifically, I used data from the *Veterans' Attitudes Online Survey* (VAOS) and a survey conducted as part of the Invisible Wounds of War Project (IW) to identify relationships between individual-level variables and outcomes related to PTSD treatment utilization and adherence. The two surveys shared many similarities in their content, but a few key differences limited their direct comparability. Perhaps most apparent is the fact that these surveys were conducted six years apart. Additionally, the VAOS included only separated veterans under the age of 35, whereas the IW survey included anyone who had served in OEF/OIF (many of whom were still active duty servicemembers). Therefore, these surveys may have captured samples of populations which may differ in terms of healthcare needs, culture and barriers related to mental health treatment. Nevertheless, the common items included in these surveys and the similar military backgrounds of their respondents provided important opportunities for comparison.

### *Samples and participants*

As part of the RAND Invisible Wounds of War Project, the *Survey of Individuals Previously Deployed for OEF/OIF* collected data from 1,965 eligible phone respondents from across the United States by random digit dialing prior to 2008 (Schell & Marshall, 2008). Eligible respondents had to have been deployed as part of OEF/OIF and reachable by a landline telephone. Therefore, individuals who were deployed during the study period or did not have

landline telephones could not participate. The researchers targeted 24 geographic areas of the United States, which encompassed some of the largest military installations, to recruit participants. Screening questions were used to identify respondents who were eligible for interviews.

In total, 203,679 phone numbers were dialed and 70,149 were found to be in service and residential. Of these, 46,732 calls were answered and 32,552 households were screened. A total of 3,771 households contained eligible individuals, of which 1,965 were interviewed between August 2007 and January 2008. Of these respondents, 13.8% had probable PTSD. Among those with a need for mental health services (N=326), 52.7% attended any mental health visit to a doctor or mental health specialist in the 12 months preceding the survey. Of that same number, 36.5% received a prescription for a mental health condition in the previous 12 months. Only 30.1% of respondents with a need for services had received some form of minimally adequate treatment. Minimally adequate talk treatment had been received by 18.4% and minimally adequate drug treatment had been received by 22.3%. The authors of the chapter which used these data also reported percentages of respondents with a possible need for services (N=752) who identified specific barriers to care (Schell & Marshall, 2008). These barriers are further examined by individual-level characteristics in this dissertation.

The VAOS examined beliefs and behaviors of 1,023 American veterans through an online survey advertised on Facebook during the summer of 2014. The final sample included 812 veterans aged 19-34 who had previously served in the U.S. Air Force, Army, Marines or Navy (Pedersen et al., 2015). This sample excluded those who were still serving in the National Guard or Reserves. A total of 2,275 individuals accessed the online survey page. Of these, 779 did not provide any data, 200 provided insufficient data to meet inclusion criteria, 216 were ineligible for inclusion, and 57 declined to give consent and were screened out. Of the 1,023 eligible participants, 812 provided sufficient data to be used in analyses, although specific sample sizes for different outcomes varied. Among those who skipped certain survey items, there were no meaningful differences in demographics or outcomes.

Over 87% of the VAOS respondents included in the analyses reported having been deployed at least once during their time in service. Of the 801 respondents screened for PTSD and depression, 46.6% screened positive for at least one of these disorders. Additionally, of 812 respondents, 57% endorsed attending an appointment for mental healthcare in the 12 months prior to the survey. This survey also contained measures of the number of mental health appointments attended, types of providers seen, duration of appointments, medications prescribed, and perceived helpfulness of treatment. I used these data to compile a measure of minimally adequate care and other outcome variables.

## Measures

This section describes the outcome and predictor variables that were included in the analyses of the VAOS and IW survey data. Variables were recoded to be consistent across the two datasets when necessary and feasible.

### Outcome variables

The outcome variables I used were chosen to represent measures of behavioral health treatment utilization and adherence related to PTSD. These outcome variables included: 1) attendance of any behavioral health (BH) appointment within a certain timeframe; 2) time since last BH appointment attended (at the time of survey); 3) number of BH appointments attended in the previous 12 months; 4) adherence to medication prescribed for a mental health diagnosis; and 5) receipt of minimally adequate care for PTSD. Table 1 provides more details of these outcome variables. Specific measures of treatment utilization and adherence varied slightly between the two surveys, as described below.

**Table 1. Outcome variables examined in statistical analyses.**

Variable Description	Possible Values	Variable Type
Indicator of any BH appointment attended since discharge/in last year	Yes, No	Dichotomous
Time since last BH appointment attended <sup>1</sup>	<3 months, >3 months	Dichotomous
Number of BH appointments attended in last year	(Integers)	Scalar
Adherence to medication prescribed for MH diagnosis	No adherence, Perfect adherence	Dichotomous
Receipt of minimally adequate care (MAC) <sup>2</sup> for PTSD in last year	Yes, No	Dichotomous

NOTE: <sup>1</sup>Variable only present in VAOS dataset

<sup>2</sup>As defined by Wang et al., 2005

### *Attendance of any BH appointment*

The VAOS asked respondents if they had attended a BH appointment since being discharged from the military, whereas the IW survey asked if they had attended a BH appointment in the last year. Since the VAOS sample was limited to veterans under the age of 35, the majority of respondents had left the military fairly recently, so this difference between the surveys was not very significant.

### *Time since last BH appointment attended*

The biggest difference between the two samples was that the IW survey did not include a measure of most recent BH appointment attended. Time since last BH appointment was collected in the VAOS as an ordinal variable, with possible responses being ascending categories of time periods (e.g. within the last month, over a year ago). In order to maintain consistency across the

outcome variables and ease the comparison of results, I transformed time since last BH appointment into a dichotomous variable with a cut point of 3 months since last appointment. Therefore, those who had attended an appointment in the last 3 months were assigned a “1” and those who had not were assigned a “0.” I chose this cut point because it was the closest even division of respondents (202 were “1” and 259 were “0”).

#### *Number of BH appointments attended in last year*

Both surveys asked their respective respondents for the number of BH appointments they had attended in the year prior to taking the survey. These data were suitable for analyses in their raw forms.

#### *Adherence to medication prescribed for BH diagnosis*

The last difference in the outcome variables related to how medication adherence was measured. The IW survey simply asked respondents who had been prescribed medication for BH issues if they had taken it for as long as their doctors instructed. The VAOS, however, asked respondents if they had taken their medications as prescribed up to three times for each of three possible healthcare settings: VA, Vet Center, or Not VA/Vet Center. Therefore, it was possible for VAOS respondents to demonstrate partial medication adherence by adhering to medication prescribed in one setting and not in others. Since this number of partially-adherent respondents was less than 2% of the sample, they were treated as adherent, making medication adherence a dichotomous variable in both datasets.

#### *Receipt of MAC for PTSD in last year*

The indicator of minimally-adequate care (MAC) was based on the guidelines provided by Wang and colleagues (2005), who operationalized MAC as the receipt of either pharmacotherapy for at least two months with at least four visits to any type of physician; or psychotherapy consisting of at least eight visits with a mental healthcare or human services professional lasting an average of 30 minutes or more. In my analyses, I created a dichotomous variable indicating whether each individual had received MAC based on other items of self-reported treatment history. I tested predictor variables against this outcome using only individuals who had indicated that they had been diagnosed with PTSD. I assumed that treatment given to these individuals was at least in part aimed at treating symptoms of PTSD, among other possible comorbid disorders.

#### **Predictor variables**

Predictor variables were chosen based on the items available in the surveys, past research on individual-level variables related to treatment adherence, and my hypotheses stated above. I grouped predictor variables into the categories of demographics, military factors, treatment experience, clinical characteristics, attitudes regarding mental healthcare, barriers to accessing

care, and economic factors to match my specific research sub-questions. Full lists of the predictor variables used in my analyses are available in Appendices A and B.

The VAOS and IW survey contained many variables which were respectively unique. For this dissertation I grouped some of these variables into categories which are relevant to PTSD treatment adherence. The VAOS included items measuring the attitudes of respondents regarding mental healthcare. The IW survey asked respondents about their perceived barriers to accessing care. Additionally, the IW survey contained several items related to physical injuries, insurance coverage, and work status which were not present in the VAOS. I tested all of these variables against the same outcomes, but comparison of the results between the two samples was obviously impossible.

### *Demographics*

In addition to understanding the representativeness of the samples and creating weights to adjust my analyses accordingly, I used demographic factors as predictor variables in my analyses. Both surveys included measures of age, gender, race, marital status, number of children, and income. Regarding race, I recoded survey responses into one of four categories: white, black, Hispanic, or other. The VAOS asked for relationship status with six possible responses, but I recoded these into “married” or “unmarried” to match the IW survey data. The two surveys used different response categories for annual income, so I recoded responses into two categories of over or under \$50,000 since about half of the respondents belonged to each category. The IW survey did not ask about education, but the VAOS included several education categories, which I recoded into an indicator of having attended college.

### *Military factors*

Both surveys included comparable items for total time deployed, number of deployments, total time in service, branch of service, and rank. Some recoding was needed to reformat these items into variables that could be easily analyzed. For example, the VAOS collected date of entry into the military and date of separation, so I had to use these data to develop a variable for total time in service. Similarly, rank was recorded in different ways for each survey, so I recoded rank using a common integer number system.

Military occupational specialty (MOS) was collected in both surveys. In the IW survey, however, MOS responses were only recorded for Army personnel. For the purposes of this dissertation, specialties were coded into combat or non-combat specialties. This is an important factor for analysis because individuals who serve in combat roles are more likely to experience traumatic events during deployments and may also be exposed to different cultures and barriers to care than those in non-combat roles. Combat specialties included armor, artillery, combat medic/corpsman, infantry, motor transport, and special operations forces. Non-combat specialties included air defense artillery, maintenance, engineering, intelligence, police, signal corps,

medicine, and logistics, among others. The VAOS sample contained a higher proportion of respondents from combat specialties (51%) than the IW sample (28%).

As will be shown in the results below, combat exposure severity was an important predictor of mental healthcare utilization and adherence in both samples. The IW survey included a section which asked the respondents if they had experienced each of 25 potentially traumatic combat events while they were deployed as part of OEF/OIF. Further, for each event they endorsed, respondents provided frequencies of their occurrences (e.g. just once, 2-3 times, 4 or more times). With this information, I created a variable which measured combat exposure severity by summing the frequencies of the combat events reported by each respondent (possible scores ranged from 0 to 75).

The VAOS was written several years after the IW and borrowed 11 of the 25 potentially traumatic combat events from the IW survey. As a shorter survey, the VAOS did not include frequencies of combat experiences; only whether they had ever occurred. Therefore, I created another measure of combat exposure severity by summing the number of these events reported (possible scores ranging from 0 to 11). To maintain consistency, I used this shorter measure in the analyses of both datasets because it was composed of items common to the two surveys. Fortunately, statistical tests using each of the combat exposure severity measures produced similar results with the IW survey data, demonstrating that the more parsimonious measure was sufficiently reliable.

#### *Treatment experience*

Respondents of both surveys were asked several questions about their experiences with BH treatment which may be related to treatment utilization and adherence. Both surveys contained measures of average appointment length, which I recoded into a variable indicating above or below thirty minutes. The type of BH provider was also recorded, allowing me to code an indicator of whether a respondent had seen a specialist or not. Both surveys asked if respondents had been prescribed medication for a BH problem. The IW survey also asked respondents if they had experienced several forms of CBT, which I used to code a single indicator of any CBT use.

In addition to objective treatment experience measures, both surveys also contained items related to the respondents' perceptions of helpfulness of providers and medications. These items contained several possible responses, which I recoded into indicators of helpful or unhelpful. Additionally, the IW survey contained a measure of treatment satisfaction, which I also recoded into "satisfied" or "unsatisfied."

#### *Clinical characteristics*

Respondents to the VAOS were asked if they had ever been told by a health professional that they have PTSD, depression, a traumatic brain injury (TBI), alcohol use disorder (AUD), or substance abuse disorder (SAD). Similarly, the IW survey asked respondents if they had ever been diagnosed with PTSD, depression, TBI, generalized anxiety disorder (GAD), SAD, panic

disorder, or personality disorder. Indicators were created for each of these disorders in their respective datasets.

Both surveys also included screening tools to determine the severity of symptoms for various mental health conditions. The VAOS included the Primary Care PTSD Screen (PC-PTSD) to measure PTSD symptoms, the Patient Health Questionnaire, 2-Item (PHQ-2) for depression, the Generalized Anxiety Disorder 7-Item Scale (GAD-7) for GAD, and the Alcohol Use Disorders Identification Test (AUDIT) for AUD. The IW survey included the PTSD Checklist, Military Version (PCL-M) for PTSD, the PHQ-8 for depression, and the Brief Traumatic Brain Injury Screen (BTBIS) for TBI. The individual items for these screeners were recorded in the data and used to compile overall scores, which I used in my analyses. Additionally, I used an item of binge drinking days per month from the IW survey to measure alcohol abuse.

#### *Attitudes regarding mental healthcare*

Respondents to the VAOS were asked about their current attitudes toward mental health treatment and seeking care for mental illness. This survey contained six items related to stigma associated with mental healthcare from a study by Britt and colleagues (2008) to measure perceived attitudes of others toward self. Additionally, these six items were reworded to measure the respondents' attitudes toward others in relation to stigma of mental healthcare. Each item was rated on a 1-5 Likert scale and I coded a composite score variable for each type of attitude (toward self or toward others). Higher scores indicated more negative attitudes toward seeking mental healthcare.

The VAOS also included the Attitudes Toward Seeking Professional Psychological Help Scale-Short Form, developed by Elhai, Schweinle, and Anderson (2008). This scale contained ten items which measured the respondents' attitudes about seeking care if they were to develop mental health problems. I followed the guidelines from the scale's developers (Elhai, Schweinle, & Anderson, 2008) to create a composite score variable based on these ten items. Scores ranged from 0-30, with higher scores indicating more positive attitudes.

#### *Economic factors*

The IW survey contained a number of items which were not included in the VAOS and do not fit into the categories previously defined. However, I believed some of these variables to be important predictors of mental healthcare utilization and adherence, so they were grouped into their own category, referred to as "economic factors."

To measure severity of physical injuries, the IW survey included items related to physical injuries sustained while deployed, injuries to the head, and receipt of disability rating. Using these data, I coded a variable for the total number of physical injuries and indicators for having experienced a head injury or being given a disability rating.

Since the IW survey contained respondents who were active duty servicemembers and separated veterans, it asked for the type of insurance held by the respondents, which I included in

my analyses. This survey also contained items related to current occupation, which I recoded into a work status variable that had possible values of “working,” “student,” or “not working.”

*Barriers to accessing care*

Previous research has shown that many barriers can prevent servicemembers and veterans from beginning and/or continuing treatment for mental health disorders such as PTSD. The IW survey contained a total of 23 items related to specific barriers that respondents would expect to encounter in relation to seeking mental healthcare. The authors of the survey grouped these 23 items into three barrier categories: logistical, institutional and cultural, and beliefs and preferences for treatment (Schell & Marshall, 2008). For the purposes of my analyses, I reorganized these items into four categories: logistical barriers, fear of losses from treatment, concerns of effectiveness, and negative opinions toward treatment. These barrier items and their groupings are displayed in Table 2 below. Each item begins with the phrase “I might not get professional help for a problem because...”

**Table 2. Barrier items from the IW survey.**

<b>Logistical Barriers</b>
I would not know where to get help or who to see
It would be difficult to arrange transportation to treatment
It would be difficult to get childcare or time off of work
It would be difficult to schedule an appointment
<b>Fear of Losses from Treatment</b>
Mental health care would cost too much money
I do not think my treatment would be kept confidential
I could lose contact or custody of my children
I could lose my medical or disability benefits
I could be denied a security clearance in the future
It could harm my career
<b>Concerns of Effectiveness</b>
Even good mental health care is not very effective
The mental health treatments available to me are not very good
The medications that might help have too many side-effects
It would take too much time to be in treatment
My family or friends would be more helpful than a mental health professional
Religious counseling would be more helpful than mental health treatment
I have received treatment before and it did not work
<b>Negative Opinions Toward Treatment</b>
I would think less of myself if I could not handle it on my own
My friends and family would respect me less
My spouse or partner would not want me to get treatment
My coworkers would have less confidence in me if they found out
My commander or supervisor has asked us not to get treatment
My commander or supervisor might respect me less

I created a dichotomous variable for each category to indicate whether a respondent had experienced any of the barriers in the category. In addition to the dichotomous indicators of reported barrier types, I also created a variable for the total number of barriers reported by the respondents. Finally, I included in my analyses an item from the IW survey which asked if the respondents had ever wanted to get help for a mental health issue but did not in the last year.

## *Analyses*

Several different statistical tests were used to identify significant relationships between predictor and outcome variables in the two datasets. All statistical analyses were conducted using Stata version 12.1 software. For all statistical tests, findings with p-values of less than 0.05 were considered statistically significant.

For ease of results comparison, I present either odds ratios (OR) or incidence rate ratios (IRR) for all predictor-outcome variable pairs. For tests involving dichotomous outcome variables, I used logistic regressions, and odds ratios were calculated for each of the predictor variables in relation to the outcome variables. Similarly, for tests involving the scalar outcome variable (number of appointments attended), I used Poisson regressions because this variable follows a continuous, non-normal distribution. Incidence rate ratios were calculated for predictor variables in relation to number of appointments so that comparisons could be easily made with the other outcomes (which used odds ratios).

Logistic and Poisson regressions both require that input variables be either scalar or dichotomous. Therefore, I transformed ordinal and categorical variables into multiple dummy variables representing the various possible values. For example, the race variable I used contained four possible categories. Dummy variables were created for white, black, Hispanic, and other and were filled with either “1” or “0” for each case, accordingly. These four dummy variables replaced the race variable in the logistic and Poisson regressions to provide odds ratios and incidence rate ratios for each of the race categories in relation to the outcomes variables. The same process was followed for the other categorical variables, such as branch of service and work status. For ordinal variables, such as income level, a meaningful cut point was chosen and dummy variables were created for either being above or below that cut point. For example, respondents were categorized as either earning above or below \$50,000 per year since about half belonged to each group.

Two statistical tests were conducted for each predictor-outcome variable pair. The first series of tests were bivariate and included only the predictor and outcome variables of interest. The second series of tests included several control variables in the regressions. These controls included age, gender, race, branch of service, combat exposure severity, and PTSD and depression symptom severities. These variables were chosen as controls because they were available for nearly all respondents and have been shown to be related to PTSD treatment utilization and adherence in past research and/or my analyses. As will be shown, some predictor variables had significant relationships with outcome variables when tested in either bivariate or

multivariate regressions, but not both. Those that produced significant results in both types of tests are of particular interest because these relationships appear to be enduring, regardless of controls used.

### Causal directions

My analyses could not infer causality, but assuming sequential relationships was necessary for assigning dependent and independent variables. The outcome variables previously defined were assumed to succeed the predictor variables. However, in some cases it may be possible that the true sequential relationship was flipped, either for unique individuals or for entire groups of survey respondents. For example, diagnosis typically precedes a full course of specialized treatment. However, some providers may not diagnose certain patients until they see them several times (as explained in Chapter 4). Therefore, it was unclear whether some of the respondents continued to attend appointments because their providers gave them diagnoses, or these patients received diagnoses because they attended a certain number of appointments. Ambiguous causal directions such as this made it difficult to interpret some of the results from my analyses. However, assigning measures of treatment utilization and adherence as the outcome variables in my analyses was the most intuitive and consistent practice for my research purposes. Other predictor-outcome relationships which may be flipped in my analyses are described here.

The number of appointments that respondents attended may have influenced their opinions of mental healthcare, rather than the other way around. Individuals who indicated that their providers and medications were more helpful may have reported these positive opinions because they spent more time in treatment and did not want to admit to spending a lot of time on something that was not actually helpful. Similarly, individuals who were in treatment more recently and for longer might have reported greater satisfaction and more positive attitudes toward seeking care simply because of the recentness of their treatment experiences.

Similar to the example of not getting a diagnosis until a certain number of visits, it is possible that some respondents in the samples did not receive medication prescriptions or CBT until attending multiple appointments with their providers. If this was the case, number of appointments attended would have been a predictor of medication and/or CBT receipt, rather than the other way around.

Being disabled is a logical predictor of seeking healthcare in general. Not all veterans who are disabled receive a disability rating from the VHA, but it was assumed that everyone in the IW sample with a disability rating was indeed disabled. However, the VHA often requires veterans to continue attending appointments to maintain their disability status and the benefits which come with it. Therefore, it may be the case that the indicator of most recent appointment and the number of appointments in the last year were predicting the possession of a disability rating for some respondents, rather than the other way around.

## Comparing between samples

Although there are clear benefits to analyzing data from two separate surveys, there are challenges to integrating their results and forming clear conclusions. As will be shown in the next section, test results were not always consistent between the two datasets. For example, a significant effect that was observed in one sample may not have been observed in the other, making it difficult to draw a strong conclusion about the relationship between that particular predictor-outcome pair.

Observing statistical significance can often depend on having a large enough sample size, and therefore some of the real relationships between variables may not have been illuminated as significant in the tests I ran. However, using two samples again provided a benefit related to this problem. If an effect was observed as significant in one sample but not the other, and the effect sizes were similar, this could still be interpreted as consistency of effects between the samples. Obviously, it was desirable to observe both similar effect sizes and statistical significance in both samples, but this former phenomenon still provided valuable insight. Specific examples of this occurrence are detailed in the results section below.

## Results

The results are presented here in sub-sections based on each research sub-question addressed by the analyses. Predictor variables were grouped into categories which matched the sub-questions: demographics, military factors, treatment experience, clinical characteristics, attitudes regarding mental healthcare, economic factors, and barriers to accessing care. In the interest of brevity, the text of each sub-section highlights the most important findings from its respective group of statistical tests. The tables included here display all of the test results and should be the primary reference for comparisons between variables.

The results of all bivariate and multivariate statistical tests conducted are summarized in Tables 7 through 18. Outcome variables related to mental healthcare utilization and adherence are displayed along the top of the columns, and predictor variables are displayed along the left side of the rows. Each outcome variable column is split in two, with bivariate test results on the left and multivariate (with controls) test results on the right. Each table cell contains the resulting odds ratio or incidence-rate ratio for the test it represents. Asterisks indicate significant test results ( $p < 0.05$  or  $p < 0.01$ ). Some tests yielded very high odds ratios or incidence rate ratios ( $> 10$ ). These high ratios were likely due to small sample sizes used in the tests. Although the relationships may truly be significant, the lack of variance may have exacerbated the test results.

Due to sub-sampling and incomplete responses, the sample sizes for each test varied. The sample sizes for each outcome variable are indicated in the column headings. Sample sizes for time since last BH appointment and number of BH appointments attended were smaller than the full sample size because not everyone who was surveyed had attended a BH appointment in the last year/since discharge. Similarly, the number of individuals who were asked about their

medication adherence could only be as high as the number who were prescribed medications. Finally, the respondents with values for receipt of MAC for PTSD were all diagnosed with PTSD by healthcare professionals and provided information about the treatment they received.

### *Demographic analysis*

Table 3 summarizes the demographic makeup of the samples collected through the IW survey and the VAOS, as well as those of larger national samples for comparison. The VAOS sample was not significantly different from the U.S. Census and DoD samples in most demographic measures. However, there were inconsistencies in the distributions of race and branch of service. The Air Force and Navy were underrepresented in the VAOS sample, while the Army and Marine Corps were overrepresented. Additionally, Black individuals were underrepresented and Hispanic individuals were overrepresented in the VAOS sample. In the IW sample, Navy and Air Force personnel were underrepresented, as well as younger individuals, unmarried individuals, and males. Additionally, due to the geographic regions selected, active duty personnel were overrepresented in this sample.

To correct for these discrepancies, weights were created in the VAOS dataset based on comparisons of the VAOS sample with the Census and DoD samples. The IW weights were created by the original authors (Schell & Marshall, 2008) based on the population parameters at the time of the survey. I used these same weights in my analyses of the IW survey data and created similar weights for the VAOS data to produce the closest possible estimates of the populations of interest. Table 3 lists weighted percentages of demographic groups for both samples.

Weights for both datasets were created using the same method of: identifying skewed variables (race, branch, etc.); populating new “weight variables” with the quotients of variable category percentages from the population versus the samples; and multiplying the “weight variables” to create a variable containing an overall weight for each observation. This overall weight variable was identified in each of the statistical tests using Stata weighting options.

**Table 3. Demographics of VAOS, IW and National Samples.**

<b>Variable</b>	<b>VAOS (weighted)</b>	<b>Invisible Wounds (weighted)</b>	<b>Census (veterans age 18-34 only)</b>	<b>DoD (Active Duty and Reserves)</b>
<i>Age (Mean years)</i>	(N = 812) 28.4 (SD = 3.5)	(N = 2,102) 33.0 (SD = 9.2)	(N = 43,602) 28.4 (SD = 3.9)	(N = 1,388,028) 28.7; 80.4% age ≤ 35
<i>Age (Categories)</i>	(N = 812)	(N = 2,102)	(N = 43,602)	
<20	0.4%	0.0%	1.5%	--
20-24	13.6%	14.6%	16.9%	--
25-29	46.2%	36.4%	37.8%	--
30-34	39.9%	11.4%	43.9%	--
35-39	--	10.1%	--	--
40-44	--	12.3%	--	--
>44	--	15.2%	--	--
<i>Gender</i>	(N = 812)	(N = 2,120)	(N = 43,602)	(N = 1,388,028)
Male	85.3%	88.4%	80.6%	85.4%
Female	14.7%	11.6%	19.4%	14.6%
<i>Branch</i>	(N = 812)	(N = 2,120)		(N = 776,313)
Air Force	14.8%	19.8%	--	15.3%
Army	41.9%	48.9%	--	43.1%
Marines	18.8%	12.7%	--	19.8%
Navy	24.5%	18.6%	--	21.8%
<i>Marital Status</i>	(N=808)	(N = 2,120)	(N = 43,602)	(N = 1,388,028)
Married	51.6%	69.0%	47.3%	56.1%
Divorced	15.8%	--	11.2%	4.5%
Widowed	0.1%	--	0.2%	N/A
Separated	4.6%	--	3.3%	N/A
Never Married	26.3%	--	37.9%	39.3%
Other	1.6%	31.0%	N/A	0.1%
<i>Education</i>	(N = 812)		(N = 43,602)	(N = 1,388,028)
<Grade 12 or GED	1.9%	--	1.3%	0.3%
Grade 12 or GED	20.3%	--	27.7%	(Combined w/ below)
Some College or Tech. School	56.2%	--	53.8%	78.6%
College 4 yrs or more	21.6%	--	17.3%	19%
<i>Income (Annual Dollars)</i>	(N = 810)	(N = 1,010)	(N = 43,602)	
<\$10,000	--	1.9%	--	--
<\$15,000	17.9%	--	29.9%	--
\$10,000-\$19,999	--	2.4%	--	--
\$15,000-\$24,999	19.4%	--	16.5%	--
\$20,000-\$29,999	--	15.1%	--	--
\$25,000-\$49,999	32.0%	--	32.2%	--
\$30,000-\$39,999	--	15.0%	--	--
\$40,000-\$49,999	--	9.4%	--	--
\$50,000-\$99,999	25.0%	--	21.4%	--
\$50,000-\$74,999	--	19.8%	--	--
\$75,000-\$99,999	--	16.2%	--	--
>\$100,000	5.7%	18.1%	--	--
<i>Race</i>	(N = 812)	(N = 2,057)	(N = 43,602)	
White or Caucasian	68.6%	64.9%	68.5%	--
Black or African American	13.8%	22.4%	12.3%	--
Hispanic/Latino	7.0%	8.6%	12.3%	--
Other	10.5%	4.1%	6.9%	--

As can be seen in Table 4 below, reporting of combat experiences during deployment varied significantly between the two survey samples, with the VAOS respondents showing higher rates. It is important to again note that the VAOS respondents were all veterans who had separated from the military, while many of the IW survey respondents were still serving. On average, VAOS respondents had served 2.0 deployments, while the IW survey respondents had only served 1.0 deployment. More deployments naturally create more opportunities for combat exposure, which may explain why the VAOS respondents reported more combat experiences. Additionally, active duty servicemembers may be less willing to report experiences such as witnessing brutality toward detainees/prisoners and being responsible for civilian deaths because they may fear punishment for potential war crimes.

**Table 4. Combat exposure among VAOS and IW survey respondents (weighted percentages).**

Combat experience	VAOS Respondents	IW Respondents			
	Total	Total	Once	2-3 times	4 or more times
Having a friend who was seriously wounded or killed	58.8%	49.6%	18.3%	17.2%	14.1%
Seeing dead or seriously injured noncombatants	61.4%	43.1%	7.1%	11.6%	24.4%
Witnessing an accident resulting in serious injury or death	57.0%	44.1%	12.0%	18.5%	13.6%
Smelling decomposing bodies	47.7%	36.1%	5.1%	10.6%	20.4%
Being physically moved or knocked over by an explosion	37.7%	22.2%	7.9%	7.5%	6.9%
Being injured, but not requiring hospitalization	57.1%	23.0%	12.1%	7.3%	3.6%
Having a blow to the head from any accident or injury	32.9%	17.3%	8.3%	5.4%	3.6%
Being injured and requiring hospitalization	17.0%	10.0%	6.7%	2.7%	0.7%
Engaging in hand-to-hand combat	12.5%	9.2%	2.7%	2.4%	4.1%
Witnessing brutality toward detainees/prisoners	17.5%	5.3%	1.6%	1.4%	2.3%
Being responsible for the death of a civilian	13.0%	7.4%	1.5%	4.0%	2.0%

### *Mental disorder prevalence*

Prevalence rates of mental disorder diagnoses and probable disorder existence varied considerably between the two samples, as illustrated in Table 5. Both surveys asked respondents in similar ways if they had ever been diagnosed with various mental disorders. Proportions of individuals previously diagnosed with mental disorders or who screened positive for likely having a disorder were higher among the VAOS sample than the IW sample.

Probable disorder existence was determined from scores on the symptom screeners included in the respective surveys and accepted cutoff scores identified in previous literature. Unfortunately, the surveys did not use the same screeners, so inter-survey reliability is less than optimal. To screen for PTSD, the VAOS used the PC-PTSD, while the IW survey used the PCL.

I adopted cutoff scores of 3 and 30, respectively, to identify rates of probable PTSD in each sample (Prins et al., 2003). The VAOS and IW survey used the PHQ-2 and PHQ-8, respectively, to screen for depression. For these screeners, I adopted cutoff scores of 3 and 10, respectively (Kroenke, Spitzer, & Williams, 2003; Kroenke et al., 2009). Additionally, the IW survey included the BTBIS to screen for probable TBI. This tool has specific positive test guidelines which involve more than a simple score, and I followed these guidelines to identify probable TBI in the sample (Schwab et al., 2006). Finally, the VAOS contained the GAD-7 and AUDIT to screen for probable GAD and alcohol use disorder (AUD), respectively. For these screeners I adopted cutoff scores of 10 and 8, respectively, based on previous literature (Spitzer, Kroenke, Williams, & Lowe, 2006; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993).

**Table 5. Mental disorder prevalence in VAOS and IW samples (weighted percentages).**

Variable	VAOS Respondents	IW Respondents
<b>Previous Diagnoses</b>		
PTSD Diagnosis	42.1% (N = 797)	13.6% (N = 2,097)
Depression Diagnosis	44.4% (N = 796)	15.1% (N = 2,110)
TBI Diagnosis	19.5% (N = 797)	16.6% (N = 495)
GAD Diagnosis	--	8.9% (N = 2,104)
SAD Diagnosis	6.4% (N = 795)	4.0% (N = 2,115)
Panic Disorder Diagnosis	--	4.2% (N = 2,108)
Personality Disorder Diagnosis	--	3.2% (N = 2,109)
AUD Diagnosis	11.8% (N = 798)	--
<b>Current Symptoms</b>		
Probable PTSD	47.8% <sup>1</sup> (N = 812)	30.6% <sup>2</sup> (N = 2,120)
Probable Depression	37.1% <sup>3</sup> (N = 812)	12.5% <sup>4</sup> (N = 2,119)
Probable TBI	--	18.5% <sup>5</sup> (N = 2,120)
Probable GAD	44.1% <sup>6</sup> (N = 812)	--
Probable AUD	34.4% <sup>7</sup> (N = 777)	--

NOTE: <sup>1</sup>Using a PC-PTSD cutoff of 3; <sup>2</sup>Using a PCL-M cutoff of 30; <sup>3</sup>Using a PHQ-2 cutoff of 3; <sup>4</sup>Using a PHQ-8 cutoff of 10; <sup>5</sup>Using BTBIS positive screen guideline; <sup>6</sup>Using a GAD-7 cutoff score of 10; <sup>7</sup>Using an AUDIT cutoff score of 8; <sup>8</sup>Use in last 6 months; <sup>9</sup>Use in last 12 months

### *Probable PTSD sub-sample analysis*

From the perspective of a policymaker, understanding which groups have unmet healthcare needs is vital to crafting effective policies. An important sub-sample consists of those who exhibited probable PTSD, but did not report having ever been given a PTSD diagnosis or attended a BH appointment. Examining the demographic characteristics of this sub-sample yielded interesting differences from the sub-sample of those with probable PTSD, a PTSD

diagnosis, and BH appointment attendance. The characteristics of these sub-samples are outlined in Table 6 below.

**Table 6. Demographic characteristics of probable PTSD sub-samples (weighted percentages).**

Variable	VAOS Respondents		IW Respondents	
	Unmet Needs (N = 56)	Dx and Appt (N = 332)	Unmet Needs (N = 290)	Dx and Appt (N = 155)
<i>Age (mean years)</i>	27.9 (SD=4.1)	28.8 (SD=3.1)	32.0 (SD=8.4)	30.8 (SD=8.3)
<i>Gender</i>				
Male	78.8%	87.8%	90.0%	88.4%
Female	21.2%	12.2%	10.0%	11.6%
<i>Married (percentage)</i>	55.4%	49.3%	63.3%	60.8%
<i>Branch</i>				
Air Force	29.8%	12.7%	8.5%	0.9%
Army	39.3%	54.9%	70.4%	78.3%
Marines	18.2%	21.9%	14.7%	9.9%
Navy	12.8%	10.6%	6.5%	10.8%
<i>Race</i>				
White	69.7%	69.7%	54.3%	53.3%
Black	9.9%	12.7%	30.1%	15.5%
Hispanic	11.6%	5.3%	10.6%	23.5%
Other	8.8%	12.3%	5.0%	7.7%
<i>Combat MOS (percentage)<sup>†</sup></i>	47.5%	61.7%	26.9%	30.3%
<i>Combat exposure (0-11 average)</i>	4.1 (SD=2.6)	5.9 (SD=2.6)	3.9 (SD=2.5)	6.1 (SD=2.7)

<sup>†</sup>Combat occupations included armor, artillery, combat medic/corpsman, infantry, motor transport, and special operations forces

In both the VOAS and IW samples, age and marital status were not significantly different between the sub-samples. There is a noticeable difference by gender in the VAOS sample. The percentage of women was higher in the unmet needs group. Regarding branch of service, both samples revealed differences among members of the Air Force and Army. Airmen with probable PTSD were more likely to go undiagnosed and to not attend BH appointments, while their Army counterparts were more likely to attend appointments and receive PTSD diagnoses. Differences between the sub-samples were also found in terms of race. In the IW sample, black respondents with probable PTSD were more likely to go undiagnosed and not attend BH appointments. This trend was also true for Hispanic respondents in the VAOS sample. However, the IW sample revealed the opposite trend for Hispanics respondents. In both samples, individuals with probable PTSD from combat-related military specialties were more likely to have attended BH appointments and received diagnoses than those in non-combat specialties. Similarly, those who had received PTSD diagnoses and attended BH appointments had greater combat exposure, on average, than those with unmet healthcare needs, in both samples.

### *How are demographic variables related to measures of mental healthcare utilization and adherence?*

Tables 7 and 8 below summarize the results for the bivariate and multivariate regressions used to examine the relationships between demographic variables and the measures of mental healthcare utilization and adherence from the VAOS and IW survey, respectively.

When controlling for other factors, male respondents of the VAOS attended significantly fewer BH appointments (IRR = 0.41,  $p < 0.01$ ) and were significantly less likely to have attended an appointment in the last 3 months (OR = 0.28,  $p < 0.05$ ) than their female counterparts. However, test results from the IW sample were inconsistent and insignificant.

Within the IW sample, those with more children were more likely to adhere to prescribed BH medications, even while controlling for other factors (OR = 3.14,  $p < 0.05$ ). This trend was similar, but not significant in the VAOS sample, which produced smaller effect sizes. Marital status was significantly related to medication adherence in the VAOS sample, with married individuals being more likely to adhere to medication prescriptions (OR = 2.48,  $p < 0.05$ ). Again, a similar trend was seen in the IW sample, but the effect sizes were smaller and statistically insignificant.

Statistical tests with race as a predictor produced several significant results, but a clear trend was difficult to discern. Hispanic respondents to the VAOS attended significantly fewer appointments than their white counterparts, even when controlling for other factors (OR = 0.47,  $p < 0.01$ ). Similarly, black respondents in the IW sample were significantly less likely to have attended an initial BH appointment (OR = 0.32,  $p < 0.01$ ). These trends are consistent in the effect sizes across the samples, but statistical significance was only observed in one sample or the other. Overall, the effect sizes indicated that black and Hispanic respondents from both samples were less likely to have attended an initial appointment and attended fewer follow-up appointments than their white counterparts.

**Table 7. Associations between demographic characteristics and measures of treatment adherence (VAOS Sample).**

Predictor Variable	Attended Any BH Appt. Since Discharge (Y/N) (N=812) Odds Ratios		<3 Months Since Last BH Appt. (N=461) Odds Ratios		Number of BH Appts. Attended in Last Year (N=332) Incident-Rate Ratios		Adherence to Medication (Y/N) (N=278) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=377) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
Age (years)	1.04	1.06	1.02	1.03	1.03	1.07*	1.03	1.03	1.05	1.07
Male	1.14	1.60	0.34**	0.29*	0.41**	0.41**	0.45	0.47	0.37	0.20**
Race										
White <sup>†</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Black	0.75	0.85	0.79	0.67	0.93	0.68	1.61	1.61	0.64	0.67
Hispanic	0.80	0.38	0.63	0.78	0.53*	0.47**	0.80	0.40	0.94	1.35
Other	1.14	0.61	1.01	0.43	0.79	0.65	1.59	0.83	2.00*	0.40
Attended College	1.22	1.62	0.67	0.87	1.30	1.15	0.41	0.31*	0.80	0.74
Married	0.80	0.84	0.99	1.26	0.91	1.29	2.50*	2.48*	1.44	1.95*
Number of children	1.04	1.00	1.04	1.01	1.00	1.01	1.15	1.19	1.24*	1.18
Income >\$50,000	0.91	1.38	0.93	1.22	1.02	1.17	1.04	1.12	0.96	0.90

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PC-PTSD and PHQ-2).

\*Significant at the p<0.05 level.

\*\*Significant at the p<0.01 level.

<sup>†</sup>Reference category.

**Table 8. Associations between demographic characteristics and measures of treatment adherence (IW sample).**

Predictor Variable	Attended Any BH Appt. in Last Year (Y/N) (N=2116) Odds Ratios		Number of BH Appts. Attended in Last Year (N=348) Incidence-Rate Ratios		Adherence to Medication (Y/N) (N=226) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=262) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
Age (years)	0.98	1.00	0.99	1.00	1.03	1.05	0.99	0.98
Male	0.56*	0.61	1.07	0.87	1.01	2.92	0.76	0.95
Race								
White <sup>†</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Black	0.51**	0.32**	0.76	0.57**	0.43	0.27	0.94	0.99
Hispanic	1.64	0.45*	0.99	0.57*	0.96	1.47	4.04*	1.33
Other	1.70	1.26	0.88	0.85	0.47	1.04	3.94	6.35
Married	0.98	1.54	1.11	1.43	1.07	1.21	1.42	2.18
Number of children	0.97	1.11	0.90	1.08	2.21**	3.14*	1.00	1.23
Income >\$50,000	0.69	1.21	1.09	1.04	1.83	0.78	1.93	6.63*

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PCL and PHQ-8).

\*Significant at the  $p < 0.05$  level.

\*\*Significant at the  $p < 0.01$  level.

<sup>†</sup>Reference category.

### *How are military factors related to measures of mental healthcare utilization and adherence?*

As can be seen in Tables 9 and 10, only a few of the significant results in the military factors group were consistent between bivariate and multivariate tests. In the VAOS sample, total time deployed and number of deployments were both significantly related to receipt of MAC for PTSD, but the effect sizes are very small. There is also not a clear trend in the IW data related to these variables. Severity of combat exposure was strongly related to attendance of any BH appointment since discharge/in the last year in both samples. Those with more severe combat exposure were more likely to have attended initial appointments. However, these results were not significant in multivariate tests, although the odds ratios remained very similar. Combat exposure in the IW sample also produced significant results with number of BH appointments and receipt of MAC. Even when controlling for other factors, those with greater combat exposure were more likely to have received MAC for PTSD (OR = 1.32,  $p < 0.05$ ). Other effect sizes for combat exposure in the VAOS sample were small and insignificant.

Similarly, military specialty was significantly related to attendance of a BH appointment since discharge in the VAOS sample, but not the IW sample. Specifically, individuals in combat specialties such as armor, artillery, field medicine, infantry and motor transport were more likely to have attended a BH appointment than individuals in specialties such as maintenance, engineering, intelligence and police (OR = 2.05,  $p < 0.05$ ). Tests with rank and branch of service

produced some sporadic significant effects, but none that persisted between bivariate and multivariate models.

**Table 9. Associations between military factors and measures of treatment adherence (VAOS sample).**

Predictor Variable	Attended Any BH Appt. Since Discharge (Y/N) (N=812) Odds Ratios		<3 Months Since Last BH Appt. (N=461) Odds Ratios		Number of BH Appts. Attended in Last Year (N=332) Incidence-Rate Ratios		Adherence to Medication (Y/N) (N=278) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=377) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
Total time deployed (months)	1.00	0.99	0.99	1.01	1.00	1.00	1.00	1.01	0.96**	0.96*
Number of deployments	1.03	1.02	0.89	0.98	0.93*	0.97	1.08	1.23	0.86**	0.95
Combat exposure severity	1.36**	1.10	1.09	0.99	1.04	1.01	1.00	1.03	1.06	0.97
Total time in service (Years)	0.98	0.95	1.04	1.05	1.01	1.02	1.06	1.05	1.06	1.05
Combat Specialty	2.34**	2.05*	0.92	0.99	0.97	0.99	0.34*	0.57	0.66	0.81
Branch of service										
Air Force	0.55	1.40	0.64	0.71	0.53*	0.62	(empty)	(empty)	0.76	0.71
Army <sup>†</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Marines	0.66*	0.97	0.85	0.86	1.02	1.35	0.81	1.08	0.77	1.22
Navy	0.30**	0.47	0.44	1.16	1.46	0.49	0.44	1.00	0.44	(empty)
Rank E-5 or below	1.83	1.22	0.67	0.40	0.95	0.94	0.36	0.16	0.86	0.84

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PC-PTSD and PHQ-2).

\*Significant at the p<0.05 level.

\*\*Significant at the p<0.01 level.

<sup>†</sup>Reference category.

**Table 10. Associations between military factors and measures of treatment adherence (IW sample).**

Predictor Variable	Attended Any BH Appt. in Last Year (Y/N) (N=2116) Odds Ratios		Number of BH Appts. Attended in Last Year (N=348) Incidence-Rate Ratios		Adherence to Medication (Y/N) (N=226) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=262) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
Total time deployed (months)	1.03*	0.99	1.00	1.00	1.01	1.04	1.05	0.97
Number of deployments in Iraq or Afghanistan	1.26*	1.02	1.17	1.14	0.68*	0.77	1.59*	0.96
Combat exposure severity	1.34**	1.11	1.08**	1.00	0.91	0.84	1.50**	1.32*
Total time in service (years)	0.98	1.05	1.00	1.04	1.01	0.89	1.00	1.08
Combat Specialty	0.89	0.86	2.06**	1.59	1.28	0.95	1.59	2.54
Branch of service								
Air Force	0.56	1.37	0.60*	0.80	5.99	8.09	0.43	0.90
Army <sup>†</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Marines	0.65	0.68	0.95	1.13	0.89	0.79	0.18**	0.44
Navy	0.72	1.57	0.97	1.15	1.94	1.92	0.65	1.61
Rank E-5 or below	1.56*	1.07	0.94	0.97	0.73	0.78	0.74	0.40

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PCL and PHQ-8).

\*Significant at the  $p < 0.05$  level.

\*\*Significant at the  $p < 0.01$  level.

<sup>†</sup>Reference category.

### *How are treatment experiences related to measures of mental healthcare utilization and adherence?*

From tests using the VAOS data, every predictor variable in the treatment factors category was significantly related to at least one measure of mental healthcare utilization and adherence. It is important to point out that it was not appropriate to test some of these predictor variables against one or more of the outcome variables because the existence of one was contingent on the other. For example, an individual who denoted a provider type must have attended at least one appointment. Similarly, appointment length, provider type, and medication prescriptions were all used in defining minimally adequate care. Tables 11 and 12 summarize the results below, with “N/A” denoting tests that were inappropriate to conduct.

In the VAOS sample, provider type and receipt of medication were strongly related to time since last BH appt. Those who had seen a specialist rather than just a PCP were much more likely to have attended an appointment in the last 3 months (OR = 8.44,  $p < 0.01$ ), as were those who received prescriptions for medication (OR = 3.40,  $p < 0.01$ ). In both samples, those who had

attended appointments averaging greater than 30 minutes and/or saw specialists attended significantly more appointments, on average, than those who had shorter appointments and/or saw only PCPs. Additionally, within the IW sample, appointment attendance was more frequent among those who received medication prescriptions (OR = 1.72,  $p < 0.05$ ).

Large and strongly significant odds ratios were seen in both bivariate and multivariate tests of medication helpfulness and adherence to medication prescriptions within the VAOS sample. Although it is logical that those who believe their medications to be helpful are more likely to continue taking them, the huge odds ratios seen here are largely attributable to the lack of variance in the relatively small samples observed by these tests. It is also worth noting that these same tests did not produce significant results with the IW survey data, although the odds ratios were above 2.00.

**Table 11. Associations between treatment factors and measures of treatment adherence (VAOS sample).**

Predictor Variable	Attended Any BH Appt. Since Discharge (Y/N) (N=812) Odds Ratios		<3 Months Since Last BH Appt. (N=461) Odds Ratios		Number of BH Appts. Attended in Last Year (N=332) Incidence-Rate Ratios		Adherence to Medication (Y/N) (N=278) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=377) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
Avg. appt. >30 minutes	N/A		1.49	1.68	2.63**	2.47**	0.93	1.06		N/A
Seen by Specialist	N/A		7.64**	8.44**	2.65**	2.58**	1.27	1.20		N/A
Prescribed Medication for BH Treatment	N/A		4.73**	3.40**	1.62	0.90		N/A		N/A
Provider Described as Helpful	N/A		1.05	1.96*	0.95	1.35	2.21	3.37*	0.77	1.45
Medication Described as Helpful	N/A		1.19	2.13	1.17	1.78**	26.28**	39.69**	1.43	2.33

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PC-PTSD and PHQ-2).

\*Significant at the  $p < 0.05$  level.

\*\*Significant at the  $p < 0.01$  level.

**Table 12. Associations between treatment factors and measures of treatment adherence (IW sample).**

Predictor Variable	Attended Any BH Appt. in Last Year (Y/N) (N=2116) Odds Ratios		Number of BH Appts. Attended in Last Year (N=348) Incidence-Rate Ratios		Adherence to Medication (Y/N) (N=226) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=262) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
Avg. appt. >30 minutes	N/A		2.63**	2.43**	1.11	1.18		N/A
Seen by Specialist	N/A		3.17**	3.35**	0.23	0.21		N/A
Prescribed Medication for BH Treatment	N/A		2.21**	1.72*		N/A		N/A
Received any CBT	N/A		1.12	0.86	5.26	13.64*		N/A
Provider Described as Helpful	N/A		1.20	1.29	1.80	3.48	1.35	1.92
Medication Described as Helpful	N/A		1.05	1.29	2.41	3.10	0.35	0.63
Satisfied with treatment	N/A		0.98	1.22	1.28	2.11	2.04	5.67*

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PCL and PHQ-8).

\*Significant at the p<0.05 level.

\*\*Significant at the p<0.01 level.

### *How are clinical characteristics related to measures of mental healthcare utilization and adherence?*

In general, diagnoses and symptom severities were found to be strongly related to measures of mental healthcare utilization and adherence in both samples. Overall, individuals with previous diagnoses and/or more severe symptoms of mental illness at the time of the survey appeared to utilize more mental healthcare than those with no diagnoses or more moderate symptoms. It is important to note that respondents who reported having been diagnosed with various disorders were assumed to have attended at least one BH appointment to acquire such diagnoses. Therefore, statistical tests were not run with diagnoses as predictors and attendance of any BH appointment as the outcome variable. Tables 13 and 14 below summarize the results from the statistical tests using the VAOS and IW data, respectively.

Individuals with diagnoses of either PTSD and/or depression had attended more recent appointments and averaged more follow-up appointments in the previous year than those without these diagnoses. These patterns were also seen in the IW sample. Similarly, those who received a diagnosis of depression in either sample were much more likely to have received MAC for PTSD than those without a depression diagnosis. Several other diagnoses from the two samples

produced significant results with various outcome variables, and many of these results were consistent across bivariate and multivariate tests.

**Table 13. Associations between diagnostic factors and measures of treatment adherence (VAOS sample).**

Predictor Variable	Attended Any BH Appt. Since Discharge (Y/N) (N=812) Odds Ratios		<3 Months Since Last BH Appt. (N=461) Odds Ratios		Number of BH Appts. Attended in Last Year (N=332) Incidence-Rate Ratios		Adherence to Medication (Y/N) (N=278) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=377) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
PTSD diagnosis	N/A		2.48**	2.34*	2.01**	2.68**	0.70	0.82	N/A	
Depression diagnosis	N/A		2.47**	1.67	2.63**	1.29	1.59	1.88	8.05**	5.58**
TBI diagnosis	N/A		0.90	0.74	0.87	0.99	0.81	0.59	1.12	1.18
AUD diagnosis	N/A		0.65	0.42*	1.24	1.15	0.62	0.67	1.25	0.87
SAD diagnosis	N/A		0.93	0.85	0.76	0.87	2.03	2.96	2.67**	3.36*
PTSD symptom severity <sup>1</sup>	1.91**	1.86**	1.22*	1.33*	1.14	1.18	1.00	1.02	1.42**	1.37*
Depression symptom severity <sup>2</sup>	1.65**	1.59**	1.25**	1.32**	1.26**	1.30**	0.97	0.96	1.48**	1.56**
Anxiety symptom severity <sup>3</sup>	1.18**	1.09*	1.07**	1.02	1.08**	1.04	0.97	0.91	1.15**	1.08*
Distress severity	5.09**	3.62**	1.71**	1.46	1.59**	1.31*	0.93	0.95	1.97**	1.67*
AUD symptom severity <sup>4</sup>	1.06**	1.00	1.00	0.98	1.02	1.00	0.99	0.98	1.04**	1.02

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PC-PTSD and PHQ-2).

\*Significant at the p<0.05 level.

\*\*Significant at the p<0.01 level.

In both samples, PTSD symptom severity was significantly related to multiple measures of treatment utilization and adherence. Respondents of both surveys with higher PTSD symptom severity were more likely to have attended an initial BH appointment and receive MAC, even when controlling for other factors. Those with more severe PTSD symptoms also averaged more follow-up appointments in the IW sample and attended more recent appointments in the VAOS sample. These results were consistent across bivariate and multivariate tests. For both samples,

depression symptom severity was significantly related to all outcome measures, except for medication adherence, across both bivariate and multivariate tests. Those with worse depression symptoms demonstrated greater mental healthcare utilization and adherence across the board.

**Table 14. Associations between diagnostic factors and measures of treatment adherence (IW sample).**

Predictor Variable	Attended Any BH Appt. in Last Year (Y/N) (N=2116) Odds Ratios		Number of BH Appts. Attended in Last Year (N=348) Incidence-Rate Ratios		Adherence to Medication (Y/N) (N=226) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=262) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
PTSD diagnosis	N/A		2.13**	1.48	0.85	1.41	N/A	
Depression diagnosis	N/A		2.29**	1.92**	4.01**	5.56*	13.15**	8.77**
TBI diagnosis	N/A		2.14**	2.00**	2.67	3.30	3.57*	0.93
GAD diagnosis	N/A		2.40**	1.86**	2.31	2.91	4.90**	4.37*
SAD diagnosis	N/A		2.31**	1.96**	0.98	0.64	2.71	0.87
Panic disorder diagnosis	N/A		1.69*	1.01	5.09*	8.61*	7.15**	4.53*
Personality disorder diagnosis	N/A		1.57	1.36	5.90*	8.99*	1.77	1.43
PTSD symptom severity <sup>1</sup>	1.08**	1.09**	1.02**	1.03**	1.00	1.02	1.08**	1.08**
Depression symptom severity <sup>2</sup>	1.25**	1.24**	1.05**	1.05**	1.03	1.07	1.20**	1.16**
TBI symptom severity <sup>3</sup>	1.40**	1.05	1.09**	1.00	1.09	1.23	1.32**	1.03
Binge drinking (days per month)	1.04*	0.98	1.01	1.00	1.00	1.01	1.07*	1.05

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PCL and PHQ-8).

\*Significant at the  $p < 0.05$  level.

\*\*Significant at the  $p < 0.01$  level.

### *How are respondents' attitudes regarding mental healthcare related to measures of mental healthcare utilization and adherence?*

As previously shown, many of the respondents had received diagnoses and treatment for mental health conditions such as PTSD. Attitude toward seeking care was significantly related to several of the outcome measures. Those with more positive attitudes toward seeking care were more likely to have attended a BH appointment since discharge (OR = 1.15,  $p < 0.01$ ), attended more recent appointments (OR = 1.13,  $p < 0.01$ ), and received MAC for PTSD (OR = 1.08,  $p < 0.05$ ). These results are summarized in Table 15 below.

**Table 15. Associations between measures of attitudes and treatment utilization and adherence (VAOS sample).**

Predictor Variable	Attended Any BH Appt. Since Discharge (Y/N) (N=812) Odds Ratios		<3 Months Since Last BH Appt. (N=461) Odds Ratios		Number of BH Appts. Attended in Last Year (N=332) Incidence-Rate Ratios		Adherence to Medication (Y/N) (N=278) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=377) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
Treatment attitudes toward self	1.04**	0.99	0.99	0.98	0.98	0.97*	1.03	1.02	1.03	1.00
Treatment attitudes toward others	1.03	0.99	0.99	1.00	1.01	1.00	1.03	1.02	1.03	1.03
Attitudes toward seeking care	1.09**	1.15**	1.08**	1.13**	1.03	1.04*	1.02	1.05	1.05*	1.08*

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PCL and PHQ-8).

\*Significant at the  $p < 0.05$  level.

\*\*Significant at the  $p < 0.01$  level.

### *How are economic factors related to measures of mental healthcare utilization and adherence?*

Table 16 below summarizes the results of the bivariate and multivariate statistical tests conducted with the economic predictor variables and the outcome variables contained in the IW survey data. Individuals who had sustained multiple physical injuries or a head injury were more likely to have attended a BH appointment in the last year and to have received MAC for PTSD than those who had sustained fewer injuries. Unfortunately, these significant effects did not persist between both bivariate and multivariate tests. Respondents who had been given a disability rating were more likely to have attended a BH appointment in the last year than those who were not, even when controlling for other factors (OR = 2.18,  $p < 0.05$ ).

The IW survey also asked about the types of insurance respondents had. Respondents who belonged to the VA system or received Medicaid were significantly more likely to have attended a BH appointment in the last year than respondents in the MHS or with other insurance. However, respondents belonging to the MHS attended significantly more BH appointments, on average, than those in the VHA (IRR = 0.43,  $p < 0.01$ ). Several other significant test results were produced, but these were not consistent between bivariate and multivariate tests. Additionally, some very large odds ratios were produced and are likely the result of small sample sizes and low variance between the respondents.

The work status of respondents was also an important factor to examine in relation to mental healthcare utilization. In bivariate tests, work status was found to be significantly related to

attendance of a BH appointment and the number of BH appointments attended in the last year. Students and those not working were more likely to have attended an initial BH appointment than respondents who were working. However, the group of respondents who were not working attended the highest number of follow-up appointments, on average (bivariate IRR = 2.49,  $p < 0.01$ ). The link between unemployment and depression and/or PTSD is well-documented (Tanielian et al., 2008). In this sample, depression and PTSD symptom severity were both significantly correlated with work status ( $r = 0.22$  and  $r = 0.19$ , respectively). When controlling for either PCL or PHQ scores, statistical tests of work status and number of BH appointments yielded insignificant results. This suggests that work status may have served as a proxy of PTSD and depression severity, which may be better predictors of appointments attended.

**Table 16. Associations between economic factors and measures of treatment adherence (IW sample).**

Predictor Variable	Attended Any BH Appt. in Last Year (Y/N) (N=2116) Odds Ratios		Number of BH Appts. Attended in Last Year (N=348) Incidence-Rate Ratios		Adherence to Medication (Y/N) (N=226) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=262) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
Number of physical injuries from deployments	1.97**	1.19	1.11	0.94	0.98	0.97	1.60*	0.65
Head injury	3.39**	1.25	1.30	1.14	0.63	0.94	4.29**	1.44
Received Disability Rating	1.79*	2.18*	0.91	1.04	2.90	3.29	0.43	0.91
Primary health insurance type								
MHS <sup>†</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
VHA	2.24*	1.35	0.47*	0.43**	8.09	20.64*	0.21*	0.25
Medicaid	16.45*	6.82*	1.84	0.76	(empty)	(empty)	1.91	0.55
Other insurance	0.37**	0.48	0.61	0.73	4.32	9.58*	0.17	0.20
No insurance	1.01	0.36	0.57	0.42*	1.59	1.08	2.71	0.27
Work status								
Working <sup>†</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Student	4.27**	4.82*	0.80	1.10	0.11	0.01*	1.29	3.71
Not working	4.41**	0.64	2.49**	1.31	0.62	0.02	25.07**	14.48

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PCL and PHQ-8).

\*Significant at the  $p < 0.05$  level.

\*\*Significant at the  $p < 0.01$  level.

<sup>†</sup>Reference category.

*How are self-reported barriers to accessing mental healthcare related to demographics and measures of mental healthcare utilization and adherence?*

Before determining how barriers may influence treatment utilization and adherence, I examined the relationships between demographic variables and the types of expected barriers reported by respondents to the IW survey. A number of significant relationships emerged from these tests, as shown in Table 17. Reporting of logistical barriers was significantly related to age in both bivariate and multivariate tests. Specifically, respondents who were younger were more likely to report expecting logistical barriers than those who were older (OR = 0.97,  $p < 0.05$ ). Additionally, marital status was found to be significantly related to logistical barriers, fear of losses from treatment and concerns of treatment effectiveness. Unmarried individuals were more likely to report logistical barriers, fear losses and express concerns of effectiveness than married respondents.

**Table 17. Associations between demographics and self-reported barriers (IW sample).**

Demographic Variable	Logistical barrier(s) reported (Yes/No) Odds Ratios		Fear of loss(es) from treatment reported (Yes/No) Odds Ratios		Concerns of effectiveness reported (Yes/No) Odds Ratios		Negative opinions toward treatment reported (Yes/No) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
Age (years)	0.96**	0.97**	1.01	1.01	0.99	1.00	0.99	1.00
Male	0.71	0.83	0.92	1.07	0.74	0.63	0.68	0.73
Race								
White	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Black	1.05	0.89	1.19	1.07	1.38	1.34	0.89	0.76
Hispanic	1.36	0.59	1.14	0.74	1.08	0.72	0.73	0.36*
Other	1.09	0.85	1.58	1.48	2.26	2.14	1.68	1.44
Married	0.56*	0.68	0.45**	0.49**	0.63*	0.74	0.72	0.83
Number of children	0.94	1.11	0.95	0.96	0.99	1.04	0.92	0.93
Income >\$50,000	0.45**	0.63	1.11	1.64	0.66	0.91	0.89	1.51

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, combat specialty, military branch, and PTSD and depression severity scores (PCL and PHQ-8).

\*Significant at the  $p < 0.05$  level.

\*\*Significant at the  $p < 0.01$  level.

Table 18 summarizes the results of tests using barrier variables as predictors and utilization and adherence variables as outcomes. All of the predictor variables except concerns of effectiveness were significantly related to attendance of any BH appointment in the last year in bivariate tests. In fact, all of these tests yielded strongly significant results ( $p < 0.01$ ). Interestingly, for each barrier category, those who reported barriers were more likely to have attended appointments than those who did not report barriers. Similarly, respondents who attended at least one appointment reported expecting more barriers, on average, than those who

did not attend an appointment. Additionally, those who indicated that they had wanted help for a mental health concern but did not get it were more likely to have attended an appointment than those who did not indicate this.

**Table 18. Associations between self-reported barriers and measures of treatment adherence (IW sample).**

Predictor Variable	Attended Any BH Appt. in Last Year (Y/N) (N=2116) Odds Ratios		Number of BH Appts. Attended in Last Year (N=348) Incidence-Rate Ratios		Adherence to Medication (Y/N) (N=226) Odds Ratios		Receipt of Minimally Adequate Care for PTSD (Y/N) (N=262) Odds Ratios	
	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls	Bivariate	with Controls
Wanted Help, Did not Receive it	5.47**	1.55	1.27	0.90	0.83	0.38	2.52	0.48
Total Number of barriers reported	1.16**	1.03	1.00	0.95*	1.00	0.97	1.09	0.95
Logistical barrier(s) Reported	3.64**	1.46	0.88	0.63*	2.83*	2.00	1.40	0.60
Fear of Loss(es) from Treatment Reported	2.32**	1.24	0.81	0.71	1.98	1.76	1.35	0.35*
Concern(s) of Effectiveness Reported	1.39	0.83	1.23	1.02	0.04**	0.03**	1.07	0.53
Negative Opinion(s) Toward Treatment Reported	2.87**	1.33	1.04	0.79	1.49	1.07	2.56	1.10

NOTE: Control variables used in multivariate models were age, gender, race/ethnicity, combat exposure severity, military branch, and PTSD and depression severity scores (PCL and PHQ-8).

\*Significant at the  $p < 0.05$  level.

\*\*Significant at the  $p < 0.01$  level.

In this sample, PCL and PHQ scores were significantly correlated with the number of barriers reported ( $r = 0.40$  and  $r = 0.41$ , respectively). When testing for the relationship between number of barriers and attendance of a BH appointment, controlling for either PTSD or depression symptom severity yielded insignificant results (although the odds ratios remained over 1.00). This suggests that number of barriers reported may have served as a proxy for PTSD and/or depression severity in this sample. It could also be the case that individuals with greater symptoms sought care and then experienced barriers, whereas those with less severe or no symptoms did not experience barriers because they never sought care.

One of the barrier category variables showed a strong relationship with adherence to medication prescriptions, and this trend was consistent across bivariate and multivariate tests. Respondents who reported concerns of the effectiveness of BH treatments were much less likely to adhere to medication prescriptions than those who did not report these concerns (OR = 0.03,  $p$

< 0.01). This suggests that individuals who were skeptical of the benefits of medications were less likely to keep taking them than those who believed in their effects on symptoms.

## Discussion

Detailed discussion of my research conclusions and policy recommendations is provided in Chapter 5, which integrates findings from both the survey data analyses and the interviews with behavioral health providers. This section comments on trends identified in the analyses of the survey data and ties together findings from across the data sources and variable categories to present a higher-level concept of PTSD treatment utilization and adherence. The topics addressed here include: groups with unmet needs, key demographic variables, symptom severity, combat exposure severity, barriers to care, treatment experiences, receipt of MAC for PTSD, sample sizes of the outcome measures, limitations of the analyses, and knowledge gaps to fill with the interviews.

### *Groups with unmet mental healthcare needs*

Examination of the characteristics of the survey samples revealed some important findings regarding healthcare needs and treatment seeking behavior. Although the VAOS sample contained more individuals with probable PTSD (47.8% vs 30.6%), both samples showed similar compositions of those with probable PTSD who received diagnosis and an appointment versus those who did not. Individuals who have probable PTSD but have not attended a BH appointment or been diagnosed could be considered to have unmet healthcare needs. When constructing policies aimed at improving healthcare utilization and treatment adherence, these individuals are key targets.

The sample breakdown indicates that Air Force members are overrepresented in the “unmet needs” group, while members of the Army are underrepresented. This could be explained multiple ways. First, it is possible that the Army is ahead of the other services in their efforts to identify and treat servicemembers with PTSD, whereas the Air Force’s efforts may be lacking. Another explanation could involve differences in perceived stigma between the services. Many campaigns have been mounted since 2001 to decrease the stigma surrounding mental healthcare in the military (e.g. Real Warriors, PTSD Awareness Month, Take the Step). These campaigns may have been more effective in the Army, where PTSD is more prevalent than in the Air Force, and therefore it may be seen as more acceptable for soldiers to seek help. Airmen suffering from symptoms of PTSD may be more reluctant to seek help because there may be a perception that PTSD is something that only ground combat troops (i.e. Army and Marine infantry troops) are supposed to develop.

Differences between the groups of survey respondents who had probable PTSD and unmet needs versus those who had previous treatment and diagnoses were also significant in terms of combat exposure and military specialty. In both samples, it was clear that those with unmet

needs were more likely to come from non-combat military specialties and less likely to have been exposed to a lot of combat. Again, this phenomenon may be explained in different ways. Similar to the explanation given above for differences by branch, it is possible that those in non-combat military specialties are more reluctant to seek treatment for PTSD because they feel that they are not supposed to develop PTSD like their colleagues in combat specialties. Similarly, those who have seen less combat may feel that they do not need treatment as badly as those who have seen more combat. Another explanation could be related to symptom severity. It has already been shown that those with more severe PTSD and depression symptoms utilize more treatment than those with less severe symptoms. It has also been shown that combat exposure severity is correlated with PTSD and depression symptom severity in these samples. Therefore, those individuals in combat-related specialties (who are generally exposed to the most combat) may seek the most treatment because they have the greatest symptoms. This trend may account for the higher percentage of “non-combat” servicemembers in the “unmet needs” category.

Race categories accounted for some differences in “met” versus “unmet” mental healthcare needs, although these findings are inconsistent between the two samples. In both samples, white individuals with probable PTSD constituted similar percentages in the “met” and “unmet” needs groups. In the IW sample, black respondents were overrepresented in the “unmet needs” category, but the opposite was true in the VAOS sample (which had a low number of black respondents in general). There were also conflicting trends between the samples regarding Hispanic respondents. Therefore, it is difficult to draw any conclusions from these samples about differences between races in receiving care for probable PTSD. However, I suspect larger samples may provide clarity on differences in stigma or mental healthcare access between racial groups.

The discrepancies in diagnosis rates between the two samples is likely due in part to the fact that the VAOS sample was entirely separated veterans, while most of the IW survey respondents were active duty personnel. Veterans are generally more likely to seek diagnoses for mental disorders and endorse symptoms on screeners due to the different incentives within the two groups. Active duty personnel often fear negative consequences to their careers associated with having mental disorders such as PTSD and depression. Veterans, on the other hand, face fewer of these negative consequences and can receive benefits from the VA when diagnosed with a service-connected mental disorder.

### *Some demographic groups are less likely to utilize/adhere*

In general, the outcome measures had fewer significant relationships with demographic variables than other variable groups, such as military factors and treatment experience. Several demographic variables were significantly related to the outcome variables in each of the survey samples. Unfortunately, no significant relationships were shared by the two samples. However, it is important to point out that no relationships between demographic variables and outcomes were conflicting between the samples. In other words, gender was never a significant predictor of an

outcome in both samples, but it was also not found that women were more likely to receive MAC in one sample, for instance, and less likely in the other sample. Despite these inconsistent results, several demographic variables were found to be significantly related to multiple outcomes, and are therefore deserving of further exploration.

Gender was significantly related to two of the five outcomes in the VAOS sample and one outcome in the IW sample. In all of these cases, women were more likely than men to utilize and adhere to mental health treatment. Since access to care is likely the same in most cases for male and female servicemembers and veterans, this difference may be due to perceived stigma. Past research has indicated that men tend to feel more shame in seeking and receiving mental healthcare than women, and are therefore more reluctant to do so (Wang, 2005). This may be the result of a need to maintain a masculine image which equates emotional vulnerability to weakness. A two-sample t-test of the Attitudes Toward Seeking Care (ATSC) scores by gender from the VAOS revealed a significant difference between the genders, with women holding more positive attitudes than men. This finding supports the above explanation.

Tests of the outcomes and work status using the IW survey data produced some interesting results as well. Attendance of an initial BH appointment was higher among students and those who were not currently working than among employed respondents. This may be a reflection of free time available to patients to attend appointments. Employed respondents, who arguably have the least amount of free time, may find it more difficult to begin treatment than students or those who are not working. However, it was also found that students attended the lowest average number of appointments, while those not working attended the most. This phenomenon may be explained by fiscal constraints. Students often do not have health insurance or sufficient income to afford multiple mental healthcare appointments. The link between PTSD and depression severity and unemployment is also clearly noted in previous research (Tanielian et al., 2008). Therefore, unemployed veterans with diagnosable PTSD and/or depression (and therefore healthcare coverage through the VHA) have the need, the time and the insurance to attend multiple follow-up appointments. The facts that individuals with disability ratings and more physical injuries were also found to greater utilize and adhere to mental healthcare support this theory.

The lack of significant findings with certain variables is also worth discussing. It is surprising that rank and branch of service did not produce significant results in relation to the outcomes. I hypothesized that lower-ranking Soldiers and Marines would be among the least likely to adhere to treatment. My logic was that these groups were most likely to be influenced by stigma and hold negative beliefs about mental healthcare. In fact, I did not find any significant differences in treatment utilization and adherence between lower-ranking and higher-ranking or between branches of service. It may be that either: 1) differences in stigma between these groups are not very pronounced, 2) stigma does not influence treatment seeking behaviors as much as I believed, or 3) something else, like combat exposure or symptom severity, is underlying any

differences seen between branches or ranks. In any case, more research is needed to determine how rank and branch of service may influence treatment seeking.

### *Combat exposure and PTSD, depression severity*

Previous research is consistent on the point that individuals with greater need for healthcare will seek out and access more of it than people with less severe ailments (Kutter, Wolf, & McKeever, 2004). This relationship between symptom severity and treatment utilization was clear in both survey datasets which were used in my analyses. Overall, the clinical characteristics variable group produced the largest number of significant relationships with the outcome variables, compared to other groups. Across the board, those with previous diagnoses and/or more severe symptoms of PTSD, depression, and/or other disorders were more likely to attend a greater number of BH appointments and receive MAC for PTSD than those without diagnoses and/or with less severe symptoms. Additionally, PTSD and depression symptom severity were strongly correlated (VAOS:  $r=0.56$ ; IW:  $r=0.84$ ), with the majority of individuals having a PTSD diagnosis also having a depression diagnosis (VAOS: 75.3%; IW: 51.9%).

In simple terms, I believe it is safe to conclude that the servicemembers and veterans from these samples with greater symptoms of PTSD and depression were more likely to utilize and adhere to treatment. This may be because they were more likely to understand the seriousness of their disorder(s) and to seek help to improve their wellbeing. Unfortunately, these data cannot reveal anything about the effects of the treatment that these individuals have received on their symptoms. It may be the case that much of the treatment given by the MHS and the VHA is ineffective. If so, it stands to reason that the only patients who would continue treatment are those with more severe symptoms who feel significant impacts in their daily lives from PTSD and/or depression and seek relief. However, longitudinal data is needed to accurately draw such conclusions.

Of all of the non-diagnostic factors, combat exposure appeared to have the strongest relationships with PTSD and depression symptom severity. Combat exposure and PTSD symptom severity had correlation coefficients of 0.50 and 0.52 in the IW and VAOS datasets, respectively. It not only produced several of its own significant test results, but it was also the control in the multivariate regressions which was most often responsible for negating the effects of other predictor variables which produced significant bivariate results. The rational link between combat exposure and development of PTSD is clear, as combat is full of trauma and trauma is necessary for the development of PTSD. Although causal relationships cannot be shown in these data, it is likely that there is a causal chain between combat exposure, PTSD severity, and treatment utilization. This theory is supported by the significant relationships found between combat exposure and the outcomes defined in the data. In all significant results, higher combat exposure severity was associated with greater utilization and adherence.

I hypothesized that ground combat forces, Soldiers and Marines would be among the least likely to adhere to treatment for PTSD. My analyses revealed only a few isolated significant

relationships between military specialty and measures of adherence. Additionally, the effects of combat specialty varied by utilization and adherence measures and between samples. This lack of significant differences and consistency is actually an important finding when combined with those from combat exposure. Many people, including myself, may assume that servicemembers and veterans from combat-related specialties, the Army and the Marine Corps both have a greater need for PTSD treatment and are more reluctant to seek that treatment because of perceived stigma. However, these results indicate that although individuals from combat-related specialties are exposed to more combat, on average, military specialty or branch alone are not sufficient for predicting treatment need and adherence. Combat exposure is a better indicator, and may vary between branches and military occupational specialties. Additionally, as was shown earlier, individuals from combat-related specialties were actually more likely to seek treatment when experiencing symptoms of PTSD than their colleagues in other specialties. As a final tie-in, combat exposure was also found to be a stronger predictor of treatment adherence than time spent deployed and number of deployments.

### *Reported barriers and treatment utilization*

The analyses of self-reported barriers to accessing mental health care and their relationships with the outcome variables produced interesting, albeit inconclusive, results. Nearly all of the barrier types, as well as total number of barriers and unmet desires for help, were significantly related to attendance of any BH appointment in bivariate tests. However, only one test (concerns of effectiveness and adherence to medication) provided consistent significant results for the other outcomes. In all cases, it appears that those who attended initial appointments were more likely to report expected barriers to accessing care. It is possible that the cohorts of respondents who reported expecting barriers became aware of these barriers after attending an initial appointment. Conversely, those who did not attend appointments may not have had mental health concerns and were therefore never in a position to become aware of barriers to accessing care.

It is important to point out that the respondents were asked about challenges that they might experience if they were to seek mental healthcare in the future, not about barriers they had run into in the past. In general, individuals with little or no need for services would be unlikely to anticipate all of the barriers to accessing those services ahead of the time when they require them. As an analogy, it is unlikely that a person who lives in Wyoming and has never been to the beach would be able to identify all of the challenges of going to a crowded Los Angeles beach on a Saturday afternoon in July (e.g. traffic, parking, food access). This inability speaks nothing to the person's intelligence; it simply illustrates the fact that people often do not understand the difficulties of a seemingly simple experience until they attempt it for themselves. Similarly, accessing mental healthcare may sound simple to someone who has never attempted it, but many challenges may be presented to those who actually require such services. Therefore, individuals who have experienced challenges in the past are more likely to anticipate future obstacles.

In the sample of IW survey respondents, only 19% had attended a BH appointment in the last year. This demonstrates that even in a population with heightened needs for mental healthcare, only a minority seek care (whether they would benefit from it or not). As a relatively uncommon experience – much like a Wyomingite going to the beach – few servicemembers and veterans are likely to anticipate the challenges of accessing mental healthcare until they make an attempt. We know from past research that barriers can exist, especially for active duty servicemembers (Hoge et al., 2004; Stecker, Shiner, Watts, Jones, & Conner, 2013). It is therefore not surprising that the individuals from the survey who had sought mental healthcare in the past reported expecting more barriers than those who had not. Of course, these data are cross-sectional and it is impossible to prove a causal link between attending an appointment and then anticipating barriers. Further research using longitudinal methods to track patient attitudes and beliefs about mental healthcare throughout their treatment experiences is needed to better understand this phenomenon.

### *Treatment experiences may influence adherence*

A patient's treatment experience may be very influential to their attitudes regarding treatment and their behaviors in continuing to seek it. Tests using both datasets revealed that patients who saw specialists attended more BH appointments than those who saw only primary care providers, which was also shown in Wong et al. (2013) using the IW data. Unlike primary care providers, BH specialists are often trained to perform various forms of CBT – including prolonged exposure therapy – with patients suffering from PTSD. The efficacy of such psychotherapies, as described in Chapter 2, may explain why patients who saw specialists attended more appointments, on average, than those who saw primary care providers, who can often only offer pharmacotherapy to treat PTSD. As additional support to this claim, respondents to the IW survey who reported receiving a form of CBT attended significantly more BH appointments (over twice as many) than those who did not. Respondents to the VAOS survey also rated specialists as more helpful than primary care providers – a finding that was echoed by Wong et al. (2013) and replicated by my analysis of the IW data. In this sample, helpfulness of provider had significant positive relationships with adherence to medication. These results suggest that patients who see specialists are more likely to see their treatment as helpful and return for follow-up appointments than those who only see primary care providers.

The data did not disvalue pharmacotherapy, however. Patients who received medication prescriptions attended more appointments in the IW sample than those who did not. This finding is consistent with past literature (Kruse, Rohland, & Wu, 2002; Mitchell & Selmes, 2007b). Physicians typically require patients to attend follow-up appointments to continue receiving prescriptions, so this finding is not surprising. However, it does not necessarily indicate that medications were helpful to all of the patients in this population. Unsurprisingly, those who rated their medications as more helpful were more likely to continue taking them as prescribed. These results support the notion outlined in Chapter 2 that both pharmacotherapy and psychotherapy

can be beneficial to servicemembers and veterans suffering from PTSD, and that those who receive effective treatment (or are satisfied with it) are more likely to continue with it than those who do not see results.

Length of appointment is another variable which was shown to be significantly related to treatment adherence. Patients who were given longer appointments by their providers were more likely to attend more frequent appointments. This may be due to rapport built between providers and patients. Particularly during psychotherapy, it is important for patients to trust their healthcare providers in order for the treatment to continue and be effective (Elkin et al., 1999; Mitchell & Selmes, 2007b). This trust is often built over time spent between the patient and provider. Longer appointments can therefore allow for greater trust, better treatment outcomes, and better adherence by the patient.

Overarching all of these findings is the type of healthcare system that the respondents were enrolled in at the time of the survey. Only the IW survey asked about type of healthcare insurance (which corresponds to system). Among these respondents, those enrolled in the VHA were more likely to have attended an initial appointment than those in the MHS, but attended a lower average number of appointments (5.8 vs 10.3). These trends may reveal an important difference between servicemembers and veterans. It appears that servicemembers may be more reluctant than veterans to seek out an initial BH appointment, but follow-up appointments are more common in the MHS than the VHA. This may be the result of greater stigma felt among active-duty servicemembers, and greater obstacles to continuing treatment in the VHA (e.g. long wait times, poor scheduling, lack of providers). This phenomenon is explored more through the interviews with BH specialists.

The measure of attitudes toward seeking care (ATSC) provided by the VAOS survey illustrated the point that more positive attitudes are related to greater treatment adherence. This finding is likely a continuation of the idea that patients who have favorable and beneficial treatment experiences are more likely to continue treatment than those who experience barriers to care, unresponsive providers, and/or ineffective treatments. Again, it is impossible to draw conclusions about a causal relationship between ATSC and treatment adherence from these cross-sectional data. Although it is likely that treatment experiences influence patient attitudes and future behaviors regarding adherence, it is also possible that beliefs held before the first BH appointment carry on throughout the course of treatment. These results may simply illustrate a phenomenon that individuals who hold positive ATSC are more likely than those with negative attitudes to adhere to treatment, regardless of treatment experiences or barriers encountered along the way. More research is needed to quantify the effects of each of these factors in predicting the adherence of servicemembers and veterans who seek care for PTSD.

### *Symptom severity and receipt of MAC*

The analyses of mental disorder symptom severities and receipt of MAC for PTSD revealed that for all disorders measured, respondents with more severe symptoms were more likely to

have received MAC after being diagnosed with PTSD than those with less severe symptoms. This is consistent with the previously-presented idea that those with greater need for services are more likely to seek them, but it is also slightly disconcerting. Since these data are cross-sectional, receipt of MAC was determined based on past treatment received and symptom severity was determined at the time of the survey. Therefore, respondents with severe current symptoms were the most likely to have received treatment in the past which was deemed “minimally adequate” for treating PTSD. These findings could indicate one of two things.

First, it is possible that the MAC received by the patients in the samples was at least somewhat effective at reducing symptoms. In this case, if symptom severity data were available for the same patients before they began treatment, we would see that symptoms were worse in the past and are now better as a result of the treatment. The fact that individuals with more severe current symptoms are more likely to have received MAC would simply mean that the group of people that began and received a “full dose” of treatment contained more individuals with severe than mild symptoms, which follows my previous argument. The composition of this group would remain the same in terms of relative symptom severity. Everyone would improve, but those with the highest symptom severity at the start would still have the highest relative symptom severity at the end.

Second, it could also be the case that the MAC given to these respondents was not very effective at treating their symptoms. If we again imagine that longitudinal symptom severity data were available, we would see no significant changes from the start of treatment to the end. Patients with relatively severe symptoms would be more likely to begin treatment since they have the greatest need for it, which also follows my previous argument. If the treatment is indeed not very effective, individuals with less severe symptoms would likely not continue because their time investment is not worth the limited gains from treatment. Those with more severe symptoms, however, may continue with treatment because they feel significant distress from their symptoms and seek relief. Therefore, more patients with severe symptoms end up being classified as having received MAC for PTSD, even though their symptoms have not improved substantially as a result of the treatment.

Of course, the key to identifying the truth behind this phenomenon is longitudinal data which can compare symptom severities at the beginning and end of MAC for PTSD. Without such information, it is impossible to make clear conclusions. The question remains whether treatment fitting the definition of MAC is truly adequate for having significant positive impacts on PTSD symptoms. Further research using longitudinal symptom severity data may clarify this question.

### *Sample sizes of outcome measures*

As noted earlier, sample sizes varied by test due to nonresponses and sub-sampling in the outcome variables. The measure of attendance of any BH appointment contained values for almost every respondent represented in the datasets. The other outcomes, however, contained values for fewer cases because they measured only the individuals who had met certain treatment

criteria, such as receipt of a medication prescription or PTSD diagnosis. Since attendance of any BH appointment had the largest sample, statistical tests with this outcome had the greatest relative power. Therefore, it is unsurprising that this outcome had the largest number of significant test results. The other outcomes generally had sample sizes large enough to provide sufficient power to see general trends, but it is likely that larger sample sizes would provide greater clarity in the known relationships and also illuminate other relationships not seen in the given samples. Some tests, however, did not have sufficient sample sizes from which to draw accurate conclusions, which is a limitation of this research. All of the tests, but especially those using sub-samples of individuals diagnosed with PTSD, would benefit from larger sample sizes.

It became evident early in the analyses that some items likely suffered from inaccurate reporting. Specifically, the medication adherence rates in both samples, at around 79%, are likely inaccurate due to the human tendency to over-report positive behaviors (Farmer, 1999). This over-reporting may have contributed to the low number of significant test results between predictor variables and the outcome of medication adherence. Therefore, I would suggest that future studies of medication adherence and predictive factors among servicemembers and/or veterans with PTSD should not rely solely on self-reported measures of treatment adherence.

### *Limitations of these analyses*

Several limitations of these analyses have already been pointed out, but it is necessary to summarize them here. Like with many survey response datasets, sample size became an issue when running tests with certain variables. Testing with sub-samples naturally removes some of the statistical power as compared to the full sample, but low response rates of certain variables also reduced power. For unknown reasons, some items from the surveys were answered less frequently than others, making it more difficult to observe significant results from the tests run with variables derived from these items.

The cross-sectional nature of these data is another major limitation to inferring relationships between individual-level factors and treatment utilization and adherence. Since I cannot examine important factors such as PTSD symptom severity both before and after treatment events, it is impossible to infer causality. The relationships I have presented in this chapter are supported by the results, but cannot be proven with any degree of certainty.

Because I used survey data, the accuracy of the results of these analyses are highly dependent on the accuracy with which the respondents reported their behaviors, attitudes, and experiences. As I have alluded to earlier, some items in the data, such as medication adherence, are likely skewed away from reality because people tend to over-report positive behaviors (Farmer, 1999). A lack of variability in the data can be a result for such items, leading to the observation of fewer significant relationships than may actually exist.

The recruitment practices of the original survey authors also present limitations to the generalizability of the results presented in this chapter. Although both samples were nation-wide, the two surveys targeted slightly different populations from different time periods using different

methods. One recruited veterans under the age of 35 through Facebook, while the other recruited both active servicemembers and veterans of any age who served in OEF/OIF through random digit dialing. Because of these differences, these surveys may have captured samples of populations which may differ in terms of healthcare needs, culture and barriers related to mental healthcare.

Many of the variables used in these analyses were not available in both the VAOS and IW datasets. The benefit of using data from two different surveys is that I can compare and validate findings that are shared between them. This benefit does not exist for variables which are unique to one dataset or the other. My results would be stronger if I could compare all of the test results between two sources. However, the fact that I was able to acquire two similar datasets to compare at all is very beneficial. Since no two surveys are the same (assuming they have different authors and purposes), it would have been unrealistic of me to expect these two datasets to contain items which completely overlap for my purposes.

### *Gaps to fill with interviews*

The results of the analyses conducted in this chapter reveal some important groups of individuals who may be less likely to utilize and adhere to treatment for PTSD than their counterparts. Unfortunately, simply identifying these groups is not sufficient in order to form policies effective at improving mental healthcare utilization and adherence among servicemembers and veterans. Understanding the reasons why certain groups are less likely to receive treatment for PTSD is a similarly vital component in constructing policies. To this end, the next chapter describes my efforts to interview behavioral health specialists who treat servicemembers and/or veterans suffering from PTSD. Within these interviews, I sought to gain knowledge of practices within the MHS, the VHA and civilian practices which may contribute to differences in patient utilization and adherence between certain groups. I also presented to the interviewees some of the results from the survey data analyses which may be explained multiple ways and asked for their interpretations.

Specifically, I explained that greater symptoms and combat exposure were associated with greater treatment utilization and adherence in the survey data that I examined. I asked for their interpretations of these relationships and the factors which may be driving them. I also asked why they thought women were more likely to utilize and adhere to treatment than men in these samples. Although patients in the VHA were more likely than those in the MHS to attend initial BH appointments, they attended fewer follow-up appointments. This finding was particularly interesting to me, and interviewing providers from both systems gave valuable insights. As behavioral health specialists, these interviewees had unique perspectives on why these trends were occurring.

## 4. Behavioral Health Specialist Views on PTSD Treatment Utilization and Adherence by Servicemembers and Veterans

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### Introduction

This chapter describes how I used interviews with behavioral health specialists to help explain why some servicemembers and veterans experience difficulties in utilizing and adhering to treatment for PTSD. The goal of this chapter is to answer research questions 2 through 5 by synthesizing interview responses related to healthcare administrative practices, attitudes toward evidence-based treatments, attitudes toward treatment utilization and adherence, and recommended policy changes. Chapter 3 identified specific sub-groups of the servicemember and veteran populations which may struggle to utilize and adhere to treatment for PTSD more than others. This chapter aims to explain why these groups may experience these difficulties, and what can be done to overcome barriers to treatment access and continuation for all servicemembers and veterans.

The data I used in this chapter were collected through semi-structured interviews with various types of behavioral health specialists from the VHA, the MHS, and the civilian healthcare community. These data are qualitative in nature, and I used my interview notes to identify and develop themes which emerged to help answer my research questions. The methods section which follows provides greater details about my analytical approach, the interviewees and the measures I used. My results are divided into sub-sections addressing the characteristics of the interviewees, research questions 2 through 5, and a summary of the key themes. Finally, the discussion section highlights the important findings from the interviews and my analysis.

### *Hypotheses*

Before conducting the interviews, past literature on stigma led me to hypothesize that behavioral health specialists would identify stigma as a major determinant of treatment utilization and adherence differences between sub-groups of servicemembers and veterans. Specifically, I expected the interviewees to explain how perceived stigma toward mental healthcare – and healthcare more broadly – is more pronounced in certain sub-populations of American society and the military. For example, infantry Soldiers and Marines may be more likely to associate seeking and receiving mental healthcare with weakness and hold negative beliefs regarding the effectiveness of such services (Stecker, Shiner, Watts, Jones, & Conner, 2013).

Previous research also led me to believe that the interviewees would explain how certain groups experience greater barriers to receiving care than other groups. For example, veterans in remote rural areas may experience barriers in traveling to VHA facilities (Kruse & Rohland,

2002). On the other hand, veterans living in crowded metropolitan areas may also have trouble obtaining timely appointments at VHA facilities. Additionally, servicemembers in mission-essential career fields (e.g. infantry, aviation, special operations forces) may have less time available for attending mental health appointments than their colleagues in other occupations (Hoge et al., 2004).

Through past research experiences with the VHA and MHS, I expected that providers within the same health systems would have similar administrative practices, but that some practices would differ between systems. For example, I believed that the MHS and the VHA would each have their own unique, standardized procedures for scheduling patients and referring them between providers. Additionally, I hypothesized that different types of specialists would interact with new patients in different ways, such as using different screeners or interview techniques.

Finally, previous research efforts led me to hypothesize that attitudes regarding prolonged exposure (PE) therapy would differ between specialists who used it and those who did not. Specifically, I expected those who used PE to have more positive opinions of it and recommend greater use of PE and other evidence-based treatments. On the other hand, I expected the interviewees who did not use PE to criticize the theory behind it and doubt its effectiveness and feasibility.

## Methods

I recruited and interviewed behavioral health specialists with experience in treating servicemembers and/or veterans suffering from PTSD. My intent was to build explanations for my findings from Chapter 3 and identify ways of improving treatment utilization and adherence. The interviews were designed to directly address research questions 2 through 5, but I took a semi-structured approach to allow the interviewees to share their opinions and experiences as they desired. I analyzed the data I collected by identifying the common themes and comparing them between types of providers. My process for identifying themes was adapted from the work of Ryan and Bernard (2003) and their predecessors who helped develop the pile sorting method (Lincoln & Guba, 1985; Weller & Romney, 1988).

### *Sample and participants*

Behavioral health specialists were recruited to participate in semi-structured interviews through snowball sampling within my RAND extended social network. The RAND Human Subjects Protection Committee approved recruitment of behavioral health specialists with experience treating U.S. servicemembers and veterans for interviews. These providers worked within the MHS, the VHA and civilian practices. My goal was to stratify the sample by provider type and healthcare sector. I recruited 17 behavioral health specialists from the three sectors. I was unable to schedule interviews with two and did not receive a timely reply from another. In total, I interviewed 14 specialists and observed saturation in responses after about 12 interviews.

After the 14<sup>th</sup>, I decided that further interviews would not yield additional data that were sufficiently unique to justify recruitment continuation. I aimed to recruit similar numbers of providers from each of the health systems, but I was unable to identify more than a handful of private practice specialists, likely because most BH specialists who treat servicemembers or veterans work within the MHS or the VHA, respectively. I also attempted to recruit equal numbers from different BH specialties (e.g. psychiatry, clinical psychology, social work). The characteristics and experiences of the specialists interviewed varied, as shown in the results section.

### *Measures*

I used a semi-structured interview approach to collect information from the BH specialists with whom I spoke. I wrote a series of interview questions and tailored them as the interviews progressed. Interview question topics and examples are provided in Table 19 below, and the full list of questions is contained in Appendix C. The advantage of the semi-structured approach was that it allowed me to alter, add or remove questions in each interview so that I could gather sufficient information to address my research questions. I also allowed the interviewees to go off-question as long as the information they were providing was relevant to the topic and time permitted. Each interview lasted 50-60 minutes and I kept audio recordings of the interviews to augment my notes for analysis.

**Table 19. Interview question topics and examples.**

Question Topic	Example
Demographics and Background	In what kind of healthcare facility do you currently work?
Administrative Processes	How do you ensure your patients return for future appointments?
Treatment Modalities	How do you think patients suffering from PTSD view prolonged exposure therapy?
Sub-group Utilization and Adherence Rates	Are there any specific factors which you believe prevent patients from returning for PTSD treatment?
Recommendations for Improvement	What do you think can be done to get more patients to utilize and adhere to treatment for PTSD?

### *Analysis*

Due to the small sample size (N = 14) and structure of the data collected from the interviews, qualitative analysis was more appropriate than quantitative for complementing my survey analyses and addressing the research questions. The data I used were in the form of notes that I took while interviewing the behavioral health specialists. I augmented these notes with the audio recordings, which I listened to after each interview was completed. I chose to use notes rather than full transcripts for two reasons. First, transcripts would have required additional time to create and would have delayed my analysis. Second, transcripts would have created more text

data to analyze, much of which would have been conversational and not directly related to my research questions. I decided that full transcripts of the interviews were unnecessary for proper identification of themes and would have required more time and effort than they were worth. However, I analyzed my interview notes with the same systematic process I would have used with transcripts.

The interview notes were created in Microsoft Word documents. I created a separate document for each interview and wrote notes for the interviewees' answers under sections which corresponded to the questions asked. I then created documents organized by each question. For example, I created a document which contained all of my notes for policies which should be created or changed from all of the interviewees. This structure allowed me to better identify common themes among the interviewees' responses.

I used a modified pile sorting technique to code themes which emerged from the interview responses and stratify them by frequency. Rather than using a paper pile sorting technique with cards containing quotes, as described by Ryan and Bernard (2003), I utilized computer software tools. The first step was reading all of the responses for each interview item and listing broad themes I immediately recognized. Next, I highlighted the quotes which addressed my research questions and attached digital comments. Within each comment, I wrote a short description of the idea that the quote was conveying. As I attached more comments to quotes, I began to group similar quotes together by assigning them the same descriptions. Some of these descriptions turned into the broader themes identified previously. I also created some more specific themes to encompass quotes which did not fall neatly under the broader themes. I then recorded the frequencies in which each theme was observed under each interview item in a spreadsheet. With this spreadsheet, I was able to visualize which themes were most common and where they occurred in the interviews.

The interview questions were structured around the categories related to research questions 2-5. In the following results section, I describe in detail the most common themes which were identified from the interview responses. I paid particular attention to differences which appeared between different types of providers, such as clinical psychologists and psychiatrists or VHA and MHS providers.

## Results

The results for my analysis of the interview responses are presented here in five sub-sections. The first details the characteristics of the interview participants to show the diversity and the common traits of the behavioral health specialists with whom I spoke. The results addressing research questions 2 through 5 are presented in the sub-sections which follow. Finally, the key themes identified in the interviews are summarized in the last sub-section.

## Characteristics of the interview participants

Table 20 below summarizes the demographic characteristics of the 14 behavioral health specialists who were interviewed. The demographic items are reported for the overall sample and the sub-samples of MHS providers, VHA providers, and civilian providers.

**Table 20. Professional characteristics of behavioral health specialists interviewed (N=15).**

Variable	Overall Sample	Military Health System	Veterans Health Administration	Private Practice
Sample size	14	6	6	2
Gender				
Male	9	4	3	2
Female	5	2	3	0
Job specialty				
Psychiatrist	4	2	2	0
Clinical Psychologist	5	1	3	1
Other BH Specialist	5	3	1	1
Past military experience				
Yes	8	6	1	1
No	6	0	5	1
	<b>Overall Mean</b>	<b>MHS Mean</b>	<b>VHA Mean</b>	<b>Private Practice Mean</b>
Years in practice	17.5	18.8	17	15
Average number of PTSD patients per month	22.7	21.8	29.2	6

I interviewed an equal number of individuals from the MHS and the VHA, but I found it difficult to find private practice behavioral health specialists who had experience treating servicemembers or veterans. This is not surprising, however, as most servicemembers and veterans who require mental healthcare likely seek it from the MHS or the VHA. There were also about equal numbers of psychiatrists, clinical psychiatrists, and other types of specialists. It was interesting that only one of the specialists from the VHA had served in the military. Also of note was the fact that the VHA specialists had the highest average number of PTSD patients per month, as compared to MHS and private practice specialists.

### *What healthcare administrative practices may affect PTSD treatment utilization and adherence among servicemembers and veterans?*

#### Interactions with other providers

When asked about their interactions with primary care providers (PCPs), the majority of the interviewees explained that they generally have little interaction with PCPs. The few who did have regular contact with PCPs worked in teams of multi-disciplinary providers, including psychiatrists, clinical psychologists, and PCPs. Many did not feel a need to coordinate with PCPs about their patients, and would bring any questions or concerns they had about medications to psychiatrists. Additionally, some felt that PCPs did not have a good understanding of how to

treat PTSD, and would therefore refer patients to mental health specialty care as soon as they detected its symptoms.

*I rarely interact with medical providers. Usually if there's an issue the psychiatrist interacts with the PCP. The communication is usually physician to physician. (VHA Clinical Psychologist)*

*Generally, when I do communicate with a general practitioner, it's not very good. They make a lot of assumptions about our patient. I don't think they have a really good sense of what PTSD is and how to treat it other than throwing medication at it. (Civilian Clinical Psychologist)*

There appeared to be an equal distribution between the four types of referral sources identified by the interviewees: patient self-refer, by another BH specialist, directly by PCP, and by primary care intermediary. Examples of a primary care intermediary included a nurse care facilitator or a BH specialist embedded in a primary care clinic. The referral source depended heavily on the type of facility in which each interviewee worked. Those who worked in mental health specialty clinics received more self-referred patients and referrals from other BH specialists, whereas those who worked in integrated teams or primary care clinics received more referrals from PCPs and intermediaries.

For the few BH specialists who had regular interactions with PCPs, communication was usually face-to-face or over the phone because they worked in close proximity to each other. For others, communication with PCPs was often done electronically through email or electronic medical record (EMR) systems.

*If they're [PCPs] co-located it's usually through verbal communication – a quick phone call, email, staff meetings. If they're not co-located, it depends on the immediacy. If it's something that's pressing, we'll page them or call. If it's just like an FYI, we'll make a clinical note in the electronic medical record. (VHA Counseling Psychologist)*

When asked about shortfalls in their working relationships with PCPs which could prevent PTSD treatment utilization, the interviewees gave a wide range of responses. A few of the more common themes identified were that PCPs are often uncomfortable with PTSD or hold stigma against it, there is not enough integration between primary and specialty care, and there is rarely a “warm hand-off” when providers refer patients to other providers.

*Healthcare provider stigma is one of the biggest obstacles. If a PCP doesn't understand well enough how real, refractory and devastating psychological injuries like PTSD can be, then patients can be very sensitive to any kind of statement or attitude from the*

*provider that makes it seem like they're not taking it seriously. If the patient feels like they're not being taken seriously, they're not going to subject themselves to being invalidated. (MHS Psychiatrist)*

*Not doing a warm hand-off at the time of the referral. If a PCP just tells a patient they might benefit from coming to our clinic and they should give us a call, the probability of the patient actually doing that is slim to none. Instead, if the PCP calls the clinic right then with the patient to see what's available and they set up an appointment, that really makes a difference. (Civilian Social Worker, former MHS)*

### Initial contact with patients

When asked to describe a typical first meeting with a patient suffering from PTSD, the most common topics described by the interviewees were identification of the chief complaint, establishment of a personal connection with the patient, determination of a PTSD diagnosis, review of the medical record, discussion of the history of present illness, and education about PTSD and its treatment options. Although many of the interviewees described asking questions about symptoms to establish a PTSD diagnosis, only a few personally used evidence-based screeners or diagnostic interviews with their patients. In many of their facilities, screeners were conducted by technicians or nurses before patients saw the BH specialists. The most common PTSD screener used was the PCL.

When asked about how they wrap up an initial appointment with a new patient, about half of the interviewees described soliciting feedback about the meeting. Some used this as an opportunity to begin motivational interviewing or gauge the commitment of the patient. Others explained that they would summarize the session with the patient, provide further psychoeducation, or go over treatment instructions. A handful of interviewees described personally scheduling follow-up appointments with their patients, while some others either did not have access to their scheduling systems or relied on their patients to reach out to their clinics' administrative staff to schedule their future appointments.

Establishing a personal connection was the most commonly identified action taken by interviewees to ensure that their patients return for future appointments. Providing education about the development of PTSD and its treatment options was also a common practice. Several interviewees explained that making sure each patient has their next appointment scheduled before they leave the office is very important for ensuring follow-up. Several techniques to remind patients of future appointments were also identified, such as providing the clinic's contact information and next appointment time on a piece of paper, sending email reminders, and calling patients the day before their scheduled appointments.

## *How do behavioral health specialists view and utilize evidence-based treatments for PTSD, such as prolonged exposure therapy?*

### Common treatment practices

The treatment practices of the interviewees were highly related to job specialty. All of the psychiatrists used pharmacotherapy and general CBT, but were not trained in evidence-based psychotherapies, such as prolonged exposure (PE) and cognitive processing therapy (CPT). Conversely, all of the social workers and counseling or clinical psychologists were trained in and used at least one form of evidence-based psychotherapy. The BH nurse practitioner used several forms of evidence-based psychotherapy in addition to pharmacotherapy. The most common forms of psychotherapy used were PE and CPT, with about equal numbers of interviewees trained in each. However, PE was more commonly used in practice than CPT.

The treatment protocols used by the interviewees also varied by specialty and healthcare system. The psychiatrists tended to take a more personal approach and plan treatment around the needs of each individual patient, rather than follow a particular protocol. The psychologists within the VHA mostly adhered to the literature-directed treatment protocols for PE and CPT when using those modalities. In the MHS, however, psychologists expressed common difficulties in adhering to the protocols because of limitations on time allotted for each patient visit and expectations for patient encounters per day.

*Part of what's comical about military medicine is there's a lot of chit chat about doing empirically-based treatments. To actually get someone to administer PE the way it was designed, you need 90 minutes every week for 12 sessions. I've never seen that done where I work. (MHS Clinical Psychologist)*

When asked about how they decide which treatment modalities to use, many of the interviewees explained that it was a collaborative process with the patient. When it came to deciding between PE and CPT, personal preference or amount of training in each were common factors for the interviewees. Some who used PE more often liked that it involves direct exposure, while proponents of CPT prefer a less aggressive approach to treatment than PE.

*We look at the pros and cons of types of medication and therapy. I'm not in a hurry to push my own agenda. I try to see what the patient wants, and then we take it at the patient's rate from wherever they want to start. (VHA Psychiatrist)*

*It comes down to personal preference and discussion with the veteran. I will describe a little bit what each treatment involves – one tends to be more writing-based while the other involves audio taping and doing things in the community. In general, most of the*

*veterans I work with will defer to me, and I'm more comfortable with PE. (VHA Counseling Psychologist)*

### Opinions of prolonged exposure therapy

Opinions of PE varied between types of providers. Interviewees who were trained in and commonly use PE were huge proponents of it, often suggesting that it is the most effective treatment for PTSD available. Some of the proponents of CPT and psychiatrists, however, either expressed reserved support for PE or doubted the theory behind it. Most of the interviewees agreed that the PE protocol is feasible and effective when given the necessary resources. However, a few of the providers from the MHS explained how it is very difficult to follow the PE protocol in their facilities.

The majority of the interviewees either used PE as their primary PTSD treatment modality or not at all. A few described how they would use CPT instead of PE if a patient expressed a strong preference for writing or could not overcome their aversion to direct exposure. For those who used PE, the most common reasons for stopping PE were if the patient quit or had insurmountable avoidance which made exposure impossible. Overall, it was rare for the interviewees to decide to discontinue PE. Typically, their patients either finished the PE protocol or removed themselves from treatment. Comorbidities or outside life complications were also identified as occasional factors which may have prevented patients from finishing PE.

When asked about how they believed patients suffering from PTSD view PE, the majority of comments from interviewees were negative. Common opinions were that patients are uncomfortable with exposure, do not understand how it will help, and find it intimidating. Some interviewees suggested that patient opinions improve throughout the course of PE, and that further education and sharing success stories of former patients tend to improve opinions about PE among servicemembers and veterans.

A large number of potential barriers to completing PE were identified by the interviewees. Avoidance as a symptom of PTSD was the most common barrier identified. Other common barriers were logistical in nature, and often had to do with not having enough time to complete the lengthy PE protocol: work and family demands and transportation/distance to the clinic. Specific to the active duty environment, several interviewees explained that some commanders are not supportive of their troops receiving mental healthcare or that servicemembers feel stigma toward it. They also explained how some servicemembers also fear having a breach of confidentiality and experiencing negative career consequences from seeking mental healthcare.

*I think the barrier is the diagnosis itself. Making yourself vulnerable and making yourself relive the event that was traumatic is a barrier in and of itself. The problem we have with the disorder is avoidance. (Civilian Social Worker)*

## Comparing treatment modalities

There was very little agreement among the interviewees on which treatment modalities are easier for patients suffering from PTSD to continue. A few of them suggested that group therapies offer support and comfort to individuals suffering from PTSD, so many patients like going to groups. Besides group therapy, almost every major treatment modality was mentioned once or twice as easier than others in terms of adherence. Support for these claims was almost entirely anecdotal among the interviewees, rather than based in empirical evidence.

When asked to compare the effectiveness of treatment modalities, nearly all of the interviewees were aware of the empirical evidence supporting PE, CPT and antidepressant SSRIs in treating PTSD. However, most found it difficult to directly compare treatments because relatively few effectiveness trials have been done on these and other modalities. A common sentiment was that many treatment modalities can be effective if there is a strong patient-provider relationship and external barriers to continuing care are minimized or eliminated.

*The problem with the evidence is that much of it has been efficacy trials, and not as many effectiveness trials. In terms of population effectiveness, if you've got a super effective treatment that nobody will go to and a moderately effective treatment that's much more acceptable, that second treatment is going to have a lot more bang for its buck. (VHA Psychiatrist)*

## *How do behavioral health specialists view differences in PTSD treatment utilization and adherence among sub-groups of servicemembers and veterans?*

### Least common sub-groups seen in practice

The interviewees identified many different sub-groups of the servicemember and veteran populations which may experience greater difficulties adhering to treatment for PTSD, but there was very little agreement. One theme that did emerge several times was age, but in two different directions. Some of the interviewees explained that younger individuals often have greater work and family demands, and therefore struggle to make time for treatment. Others suggested that older veterans who have dealt with their PTSD for many years may find it hard to engage in treatment because their PTSD has become part of their identity. These interviewees explained that it can be difficult to see the effects of age in mental healthcare utilization data because of these phenomena.

Within the active duty population, a few interviewees explained that certain career fields experience lower mental healthcare utilization and adherence because of its associated negative consequences with fit-for-duty determinations. Specifically, individuals in the special operations forces (SOF) and aviation career fields can be disqualified from performing their duties if seen by mental health providers, and are therefore less likely to seek help when they need it.

## Interviewee reactions to my survey findings

When presented with the results of my survey analyses from Chapter 3, there was near consensus among the interviewees regarding my findings that individuals with greater combat exposure or greater symptoms of PTSD and depression were more likely to utilize and adhere to treatment. They agreed that servicemembers and veterans who had seen more combat are more likely to develop greater symptoms of PTSD, and those with greater symptoms seek more treatment because they experience greater declines in functioning.

My initial analyses of the survey data indicated an effect of rank on treatment utilization and adherence, which was eventually eliminated by my final analyses. However, I began the interviews before my survey analyses were complete, so I asked all of the interviewees about my initial results regarding rank. Several explanations were given for my initial finding that individuals of lower rank were more likely to utilize and adhere to treatment. The most common reasons were that servicemembers of lower rank often experience the most combat and that higher-ranking servicemembers feel the greatest stigma toward seeking mental healthcare. Other, less common explanations were that higher-ranking individuals have greater responsibilities and therefore less time to get treatment, and also have more to lose than lower-ranking individuals if they experience negative career consequences from seeking treatment.

The finding that women were more likely to utilize and adhere to treatment than men did not surprise any of the interviewees. However, many of them found it difficult to explain this phenomenon. Some suggested that men are taught to value self-reliance more than women in our society, while others explained that seeking treatment is in conflict with an image of male “machismo.” Still, other interviewees simply offered that men engage in treatment at lower rates than women in all types of healthcare, an idea which is consistent with previous literature (Pinkhasov et al., 2010).

When presented with the finding that veterans in the VHA were more likely than active duty servicemembers to attend initial BH appointments, but attended fewer follow-ups, on average, several of the interviewees could not offer an explanation. From those who did, a general theme emerged which seems to explain this phenomenon well. They explained that there appears to be less stigma surrounding mental healthcare in the VHA, as compared to the MHS. There are also incentives, in the form of disability benefits, available to veterans for seeking care. As opposed to the MHS, confidentiality within the VHA is very high, so there is little chance of negative career consequences for veterans seeking care. These factors all help explain why it is more likely for a veteran suffering from PTSD to enter treatment than for an active duty servicemember to do the same.

However, once a servicemember begins treatment for PTSD in the MHS, the interviewees explained that they often experience fewer barriers to continuing treatment than their veteran counterparts in the VHA. The most common barrier in the VHA identified by the interviewees was accessibility. They explained that appointments in VHA hospitals and clinics are often very limited and their locations are inconvenient for many veterans. On the other hand, availability of

appointments in MHS facilities is often better and they are always located on military installations where servicemembers work. Additionally, it is common for military supervisors to excuse their subordinates from work if they need to attend appointments. There is also greater accountability in the MHS. Servicemembers are punished if they miss appointments, whereas veterans in the VHA are not. All of these comparisons offered by the interviewees help explain why it is more common for veterans to initiate treatment in the VHA, but servicemembers in the MHS are more likely to continue treatment for PTSD.

*What changes do behavioral health specialists recommend for improving utilization of and adherence to PTSD treatment among servicemembers and veterans?*

Themes of suggestions for improving utilization of and adherence to PTSD treatment given by the interviewees fell into two main categories: policy changes to be made by the VHA and/or the MHS, and efforts to be made by the broader DoD and VA.

**Health system policy changes**

The single most common recommendation given by the interviewees was that the DoD and especially the VHA need to provide greater availability of BH appointments to servicemembers and veterans. They often remarked that these health systems adhere to standard business hours, which commonly force servicemembers and veterans to leave work to attend appointments. Many of the interviewees suggested opening some clinics in the evenings and on weekends to increase appointment availability. Additionally, several of the interviewees expressed feeling overworked, and that hiring more BH specialists would lighten their workload, increase availability, and allow them to provide higher quality care to their patients.

*First and foremost is the availability of therapists. Clinic hours need to be longer and there should be evening appointments. (MHS Clinical Psychologist)*

*We need to be more available when they're available. We need to have hours that accommodate what they need. (VHA Psychiatrist)*

The use of technology in treatment was another common theme that came up among the interviewees. Those who used PE in their clinical practices explained that they need a way to record their patients' exposure sessions, but for information security reasons, they are not allowed to give their patients digital recorders. Therefore, these clinicians must rely on their patients to bring and use their own devices to record (such as cell phones). They explained that creating a common procedure for recording PE sessions would remove a potential barrier to effective treatment. Additionally, several of the interviewees advocated for greater use of telehealth to deliver evidence-based treatments, such as PE, to geographically-distant patients in their homes or in clinics close to them.

*We also need more options for telehealth so we can be flexible and meet the patient where they are. (VHA Psychiatrist)*

Several of the interviewees called for more educational opportunities for providers within the VHA and the MHS. Specifically, they identified a need for more training in evidence-based treatments for PTSD so that more clinicians can deliver these treatments effectively. The interviewees from the VHA and civilian sector were consistent in recommending more education about military culture for healthcare providers. Additionally, among the interviewees who used evidence-based psychotherapies, several of them expressed the need for greater supervision and feedback to ensure that they continue to deliver these treatments effectively.

*Just more training of people to understand the nature of who we're working with – the OEF/OIF veterans. We need to be aware of our own biases as well. Primary care providers need to have a good understanding of PTSD in veterans. (Civilian Clinical Psychologist)*

Screening and treatment practices in the VHA and the MHS were also brought up by several of the interviewees. A few suggested requiring PTSD screening during each primary care visit, while the importance of conducting structured clinical assessments for PTSD in specialty care was also stressed. However, some other interviewees seemed reluctant to spend a lot of time on systematically measuring symptoms. Some of the interviewees seemed frustrated that the VHA and the MHS have not invested more in the known evidence-based treatments for PTSD. Additionally, at least one interviewee suggested that every BH specialty facility should offer at least some form of evidence-based treatment for PTSD in-house.

*Both in the DoD and the VA, I think we need to stay true to the evidence-based treatments that are shown to be effective. (VHA Counseling Psychologist)*

*There should be accountability for the requirement to offer evidence-based treatments in all facilities. (VHA Clinical Psychologist)*

#### DoD and VA efforts

Many of the comments from the interviewees were related to increasing the awareness of PTSD and its treatment options among servicemembers and veterans. Several of them called for greater education of servicemembers while they are on active duty, while others urged the VA and civilian organizations to make greater efforts in community outreach to veterans and their families. One interviewee suggested that the entire population would benefit from greater mental health literacy.

*There are so many clinicians in the VA and the DoD who are top-notch and offer sound therapy. I wish we had better PR [publicity] for that. I feel like we do veterans a disservice by not sending them the message that these are treatable conditions. (VHA Counseling Psychologist)*

*We need more education for servicemembers and veterans on how to recognize PTSD symptoms and how to seek treatment. We also need more education about substance abuse. A lot of veterans started drinking hard in the military to help cope with PTSD. (VHA Psychiatrist)*

*A big picture issue is that most Americans lack basic mental health literacy. They don't have words for how they feel or words for mental health problems and they don't know where to go for help... A nation that doesn't have basic mental health literacy is never going to fully succeed in having a military or veterans' mental health plan that works. (VHA Psychiatrist)*

Many of the interviewees identified several issues within the military which create barriers to accessing care for servicemembers. Several interviewees explained how the lack of confidentiality in mental healthcare in the MHS discourages servicemembers from seeking care because they do not want their peers or supervisors to know about their struggles. Lack of command support for treatment, a sense of stigma associated with mental health issues, and concerns of negative career consequences resulting from mental healthcare were also identified by several of the interviewees. They suggested that the DoD take steps to ensure that careers are not negatively affected simply because a servicemember seeks treatment, that greater confidentiality practices are established, and that commanders create climates within their units which are more supportive of seeking mental healthcare and discourage stigma.

*Improve confidentiality standards – that's one, two and three on my list. They should be comparable to those in the civilian sector... It's a huge barrier to seeking services. (MHS Psychiatrist)*

*For a lot of patients, there is a reluctance to engage in treatment because of how they think they will be perceived by their leadership and their comrades. There's been a lot of progress in that area, but I think there are still opportunities to improve communication and understanding among leadership about accessing treatment and making it more available for servicemembers. It remains a barrier. (MHS Social Worker)*

*Seeking behavioral healthcare cannot be an infringement on their security clearances or flight privileges... If a pilot is having an issue and is encouraged to stay out of the*

*cockpit, they should understand that it isn't a career stopper. The system has to support that. If it's a temporary issue that can be handled effectively with treatment, commanders and key personnel need to understand that.* (MHS Research Psychologist)

### Summary of key themes

Table 21 below summarizes the key themes identified by my analysis of interview responses. This table is divided into the four categories which fall under research questions 2 through 5. Short descriptions of each theme identified are provided in the right hand column.

**Table 21. Summary table of key themes.**

Theme	Description
<b>What healthcare administrative practices may affect PTSD treatment utilization and adherence among servicemembers and veterans?</b>	
Consistent referral practices	Ensure "warm hand-offs" between referring and gaining providers
Consistent scheduling practices	Ensure each patient has next appointment scheduled when they leave
Consistent screening practices	Use standard screening tools to identify and track patients with PTSD
Improving provider communication	Close communication gaps between primary and specialty care providers
<b>How do behavioral health specialists view and utilize evidence-based treatments for PTSD, such as prolonged exposure therapy?</b>	
Differing use by provider type	Clinical psychologists tended to use PE and CPT; psychiatrists did not
Barriers to PE delivery	Limited appointment availability and length prevent proper PE delivery
Barriers to PE use for patients	Avoidance as a symptom is a barrier to PE use; many PE barriers are the same as PTSD treatment in general
<b>How do behavioral health specialists view differences in PTSD treatment utilization and adherence among sub-groups of servicemembers and veterans?</b>	
Lack of consensus	There were no consistent explanations for differences between most sub-groups
Risk of negative consequences	Those who have more to lose from PTSD treatment are less likely to seek it
Combat-Symptoms-Treatment link	Greater combat exposure causes more symptoms, which cause more distress and treatment seeking
Differing barriers by system	The MHS has more barriers to treatment initiation, whereas the VHA has more barriers to treatment continuation
<b>What changes do behavioral health specialists recommend for improving utilization of and adherence to PTSD treatment among servicemembers and veterans?</b>	
Removing barriers to care	Provide greater patient-provider confidentiality; Eliminate career consequences from receiving mental healthcare; Address logistical issues for veterans
Greater availability of providers	Hire more behavioral health providers; Expand clinic hours (evenings/weekends)
More training in evidence-based treatments	Train more providers to deliver and supervise PE and CPT; Provide refresher training in these specialty treatments
Use of technology	Interviewees supported greater use of teleconferencing therapy, smartphone applications, virtual reality
Education for healthcare staff	Improve knowledge of military culture, challenges facing transitioning veterans, and the nuances of combat trauma
Education for SMs, vets, families	Improve public knowledge of the signs and symptoms of PTSD and how to receive effective treatment

## Discussion

This discussion section summarizes the key themes which emerged from my interviews with behavioral health specialists to address my last four research questions, which are divided accordingly in the sub-sections below. Themes of administrative practices included standardized practices for referrals, scheduling, and screening. Themes surrounding evidence-based practices were barriers to access and delivery and differing utilization between provider types. With the exceptions of combat exposure, symptom severity and treatment utilization, differences between population sub-groups were not clearly identified or explained by the interviewees. Finally, several important recommendations for improvement were made by the interviewees, as described in the last sub-section.

### *Administrative practices*

A few common themes emerged from my discussions with behavioral health specialists about their administrative practices which surprised me and raised concern. The first is that the MHS and the VHA do not appear to utilize consistent referral practices. When a PCP refers a patient to a specialist, one would hope that there is some system in place to ensure that a connection is actually made between the patient and the specialist. Indeed, several of the interviewees described methods which achieved this: a nurse who contacted the patient and served as an intermediary, or a “warm hand-off” between the two providers. However, these practices were not consistent between different facilities and providers, and there were even some providers who simply told their patients to see a specialist, wrote the referral in the record, and did not do anything else. Without ensuring that a patient contacts the specialist to whom they were referred, there is great potential for the patient to drop out of care.

A second theme of concern which emerged from the interviews is that there does not appear to be consistent appointment scheduling practices within either the MHS or the VHA. Several of the interviewees remarked that a patient who leaves the clinic with their next appointment already scheduled is more likely to return than another patient who does not. However, only six of the specialists interviewed described scheduling follow-up appointments with the patients themselves. The rest depended on the administrative assistants at their clinics and/or the patients to schedule future appointments. A few of them did not even have the ability to schedule their own appointments. The VHA and the MHS should make it as easy as possible for patients to schedule and attend follow-up appointments, and this means creating standardized practices which allow patients to always leave with future appointments already scheduled. Additionally, several of the interviewees emphasized the importance of timely appointments and sending reminders to the patients, which were suggestions supported by past literature (Kruse & Rohland, 2002; McIvor, Ek, & Carson, 2004).

Third, there also appears to be a lack of common practice for utilizing screeners and/or diagnostic interviews to assess symptoms of PTSD. The majority of the specialists with whom I

spoke did not use tools such as the PCL or CAPS, and those who did only used them occasionally. It is unclear whether their use in a specialty care environment would affect treatment utilization or adherence. However, a few of the interviewees recommended making regular screening in primary care settings a common practice, with the hope of identifying individuals with PTSD symptoms early.

The general lack of communication between PCPs and behavioral health specialists originally concerned me, but it then appeared that this communication may not be as vital to treatment utilization and adherence as other factors. The interviewees who worked with PCPs on a regular basis seemed content with these relationships, but there was an overall feeling that it was not necessary to coordinate with PCPs to deliver effective care. However, many of the specialists with whom I spoke said that they wished PCPs had greater awareness of PTSD, which may lead to earlier and more effective referrals to specialty mental healthcare. If the MHS and/or the VHA do wish to close the apparent gap between primary and specialty care clinics, they could embed more behavioral health specialists in primary care clinics or establish more multi-disciplinary teams, as described by the specialists I interviewed.

### *Evidence-based treatments*

The treatment practices of the interviewees were clearly divided between psychiatrists and psychologists. The medical training of psychiatrists was reflected in their common practices of symptom management through pharmacotherapy, whereas psychologists typically utilized the psychotherapies in which they were specifically trained, such as PE and CPT. Evidence-based therapies for PTSD were developed and validated using manualized treatment protocols, and the psychologists I interviewed were trained to follow these protocols. Although the majority of the psychiatrists with whom I spoke described incorporating exposure in their treatment for PTSD, they were trained to take more nuanced approaches to treatment and none of them used PE or CPT protocols, specifically. These practices reflect a foundational difference in treatment philosophy between psychiatrists and clinical psychologists/counselors/social workers. Educating servicemembers and veterans on the differences between provider types may help them decide which specialists they would like to see, and could enhance treatment utilization and adherence. As one VHA psychiatrist put it, most Americans “wouldn’t know a psychologist from a psychiatrist.”

The behavioral health specialists with whom I spoke who regularly used PE showed the greatest enthusiasm for it, but all of the interviewees expressed at least some support for using it to treat servicemembers and veterans suffering from PTSD. However, many of them believed that patients hold negative attitudes toward PE. A few of the psychologists explained that after learning about the theory behind PE and hearing success stories from other patients, their patients became more optimistic of their potential gains from PE. Providing this education and promoting PTSD treatment through testimonials from former patients could encourage more servicemembers and veterans to seek treatment.

Several of the interviewees raised concerns about the evidence base surrounding PE and their abilities to deliver it as designed in their clinical settings. A common complaint was that the RCTs used to evaluate PE often eliminate the challenges that clinicians encounter in the real world, such as multiple diagnoses and problems with engagement and follow-up. These critiques among clinicians have also been documented in past research (Cook, Schnurr, & Foa, 2004). Additionally, the PE protocol requires 90-minute weekly sessions for 8-12 weeks, but many MHS facilities only schedule in 1-hour intervals and cannot support weekly sessions for their patients with PTSD. The research community should therefore look for ways to evaluate PE with more representative samples and procedures and establish a treatment protocol that can be followed by clinicians and produce greater effectiveness. Additionally, the MHS (and possibly the VHA) should find ways to better support the use of PE as it was intended.

Many of the barriers to continuing PE identified by the specialists I interviewed were no different than barriers commonly experienced by servicemembers and veterans seeking PTSD treatment in general. These included time constraints, transportation, stigma, and fear of negative career consequences. However, one barrier was particularly prevalent for PE, in particular: avoidance. Several of the interviewees explained that since patients suffering from PTSD commonly avoid memories of their trauma, it can be difficult for them to engage in exposure-based therapies. Tools to enhance engagement, such as VRET, may be useful in helping such patients continue with PE and experience benefits. In fact, several of the interviewees suggested that virtual reality could help their patients who struggle with engagement.

### *Differences between population sub-groups*

When asked to identify sub-groups which are least likely to utilize and adhere to treatment for PTSD, there was little agreement between the specialists I interviewed. I expected factors such as gender, age, occupation, branch of service, race, and education level to come up commonly in my discussions. However, none of them were identified by more than three of the interviewees. After examining responses to multiple questions, it appeared that a common theme emerged on this topic: the people who have the most to lose were described as the least likely to seek treatment for PTSD. This can mean different people in different environments. Several of the interviewees identified higher-ranking servicemembers, aviators, and members of special operations forces as those who have a lot to lose from seeking treatment. They can potentially be disqualified from performing their duties and/or removed from leadership positions if it becomes known that they struggle with PTSD. Therefore, these individuals, and others with much to lose, are less likely to seek treatment. It is the responsibility of the DoD to ensure that the risks associated with seeking mental healthcare are minimized so that everyone feels comfortable getting the care they need, regardless of their rank, position or occupation.

When I asked the behavioral health specialists what they thought of my findings related to combat exposure, symptom severity, and treatment utilization, there was resounding consensus among them. They all explained in similar terms that greater combat exposure leads to greater

symptoms of PTSD and depression, and that those with worse symptoms are more likely to seek treatment because they feel the greatest effects on functioning. Even without much explanation of my results, they all saw a clear causal chain between combat, PTSD and depression symptoms, and treatment seeking and adherence. Their opinions were consistent with past literature supporting the relationship between symptom severity and treatment seeking (Vogt, 2011; Stecker, Shiner, Watts, Jones, & Conner, 2013; Kutter, Wolf, & McKeever, 2004). This supports the idea that the DoD and VA should focus resources toward screening and treating those who have been exposed to the most combat or other trauma.

My early analyses of the survey data indicated that there was an effect of rank on the outcomes, with lower enlisted servicemembers and veterans being more likely to utilize and adhere to treatment. Due to these results, I included specific questions about rank in my interviews. However, my final statistical tests with the survey data did not find significant effects from rank. Nevertheless, the interviewees were generally unsurprised at the idea that lower enlisted troops would be more likely to seek treatment for PTSD. The reasons they gave varied, as previously shown. This raises the question of whether rank is itself a predictor of treatment-seeking behavior or simply an indicator of something else, such as time constraints or combat exposure amount. More research is needed to clarify the relationship between rank and treatment seeking.

Similarly, none of the interviewees were surprised that I had found women to be more likely to utilize and adhere to treatment for PTSD in my survey analyses. However, many of them struggled to explain why this gender effect exists. Several remarked that women show better engagement than men in healthcare in general, and mental healthcare is no different. Others explained that the social expectations of machismo and self-reliance among men contribute to their relative lack of treatment seeking. Overall, I perceived a general belief among the interviewees that this difference between the genders is deeply engrained in our culture and not likely to be changed easily or quickly. It is unclear how effective any efforts within the DoD or VA to address this gender effect might be.

The most interesting results from my survey analyses that I shared with the interviewees were the differences between patients in the MHS and the VHA. Many of the specialists with whom I spoke seemed intrigued by the idea that veterans were more likely to initiate treatment for PTSD, but servicemembers attended a greater average number of follow-up appointments. The discussions surrounding this finding revealed several important differences between the MHS and the VHA, as previously described in the results section. To summarize, it appears as though there are fewer barriers to initiating care for veterans than for servicemembers, but the MHS is better suited to handle its patient load than the VHA. Therefore, the DoD should focus on eliminating the barriers to accessing care already discussed, and the VHA should focus on improving treatment accessibility for veterans.

### *Recommendations from interviewees*

During my interviews with behavioral health specialists, I often found that the discussions turned to barriers to seeking treatment in the military, even when my questions were directed at other subjects. I hypothesized that stigma would be a prevalent barrier identified by the interviewees, but they more often spoke of the real potential for negative career consequences from seeking treatment. Surrounding the potential embarrassment, revocation of security clearances and flight privileges, and damaged chances of promotion was the primary policy issue: treatment confidentiality. If mental healthcare for servicemembers was fully confidential, commanders and peers would never find out about a particular servicemember's struggles, and these negative effects and the barriers to treatment they present would disappear. Understandably, decision-makers within the military are hesitant to providing such confidentiality, as it withholds potentially important information about servicemembers from their commanders. However, my discussions with behavioral health specialists demonstrate that it is essential for the DoD to re-examine the current policies and weigh the potential costs and benefits of providing greater confidentiality to servicemembers who would benefit from treatment for PTSD, but are discouraged from seeking it.

When discussing steps that can be taken by the DoD and VA to improve utilization of and adherence to treatment for PTSD, the most prevalent topic in the interviews was greater availability of providers. The interviewees recommended both longer hours at their clinics and hiring more providers. It was clear through my interactions with them that the demands from veterans and servicemembers seeking treatment exceeded their current capacities. An obvious solution for the VHA and the MHS would be to hire more providers and extend clinic hours to include evenings and weekends. Unfortunately, this may be one of the most expensive potential changes to be made. The number of mental health specialists in uniform is very limited, and it is understandably difficult to offer competitive wages to civilian specialists and bring them into the MHS or the VHA. Additionally, extending clinic hours not only means hiring more providers, but administrative support staff as well. These staff members are typically servicemembers within the MHS, so the DoD would either have to find uniformed personnel to fill these roles from a shrinking military or hire and train civilians to do these jobs. In any case, the potential costs of improving appointment availability for servicemembers and veterans are significant.

Besides hiring more providers, many of the interviewees recommended that the VHA and the MHS offer more training in evidence-based treatments to their behavioral health specialists. Particularly among the military providers with whom I spoke, many felt that not enough was being invested to ensure that evidence-based treatments are available and properly delivered to as many servicemembers and veterans as possible. Besides the lack of providers being trained, there appeared to be little supervision of and feedback to the providers who currently utilize evidence-based treatments, such as PE and CPT, in these healthcare systems. The interviewees who used these treatments seemed to be doing so in a vacuum, without continual support from

their colleagues or leadership to ensure that they are delivering these specific treatments correctly. Refresher training and periodic supervision to validate treatment practices would help these providers better utilize evidence-based treatments. Their comments echoed past research that showed training for providers varied in quality and quantity (Sharpless & Barber, 2011). Additionally, training more providers in these modalities would better equip them to treat servicemembers and veterans suffering from PTSD.

Hiring more providers, extending clinic hours, and providing more training in evidence-based treatments are all relatively expensive changes. Fortunately, the interviewees also offered some less-expensive efforts that can be made to improve treatment utilization and adherence in the MHS and the VHA. Several of the providers I interviewed were advocates for greater use of telehealth. Using video conferencing to deliver psychotherapy to patients in their homes or at clinics close to them can remove many of the transportation and time barriers which can prevent veterans from receiving treatment for PTSD. However, there are some safety and security concerns involved in telehealth that should be considered and mitigated, if possible. Steps should be taken to ensure that patients participating in telehealth are not home alone with access to weapons, in the event that they become suicidal or violent during treatment. Additionally, sensitive information should not be transmitted via unsecure internet connections during video teleconferences.

In addition to telehealth, several of the interviewees expressed their support of mobile applications which assist in treatment, such as *PE Coach*. They explained that “apps” like these make PE much easier for the patients by allowing them to record and listen to their exposure sessions on their phones and receive reminders to complete their assignments and attend appointments. The DoD and VA should continue to develop, test and market mobile applications for use in PTSD treatment.

A third relatively inexpensive step to be taken by the VHA to improve PTSD treatment utilization and adherence is to provide greater education to its staff on military culture and unique challenges faced by veterans. Several of the VHA providers with whom I spoke were frustrated that many of their colleagues were unaware of how the military experiences of veterans can affect their treatment. This ignorance drives a cultural divide between providers and the veterans they treat and makes it more difficult to establish therapeutic trust and rapport. Some of the interviewees suggested that the VHA institute an educational program for its providers soon after hiring to ensure that they all have at least a basic understanding of military culture and the difficulties faced by transitioning veterans.

Finally, both the DoD and VA should make greater efforts to reach out in their communities and educate servicemembers, veterans, and their families about PTSD and how to receive treatment. One interviewee clearly explained their belief that many Americans are generally unaware of mental health issues in general, and PTSD specifically. The DoD and VA have made multiple efforts to educate servicemembers and veterans on the signs and symptoms of PTSD (such as PTSD Awareness Month), but this education should be extended more to families and

separated veterans. This education should be delivered at pre-deployment and post-deployment briefings, through advertisements, in MHS and VHA waiting areas, and through military family organizations. All servicemembers, veterans, and their family members should have easy access to information about PTSD and the steps to receive proper treatment.

The recommendations given by the interviewees involving telehealth, smartphone applications, and education campaigns deserve further exploration and testing before widespread implementation. It is important to note that there has been little research conducted on delivering PE through teleconferencing platforms or on smartphone applications to assist in PTSD treatment. As relatively inexpensive changes, it may be tempting for policymakers within the DoD and VA to quickly adopt such changes, but their potential benefits on PTSD treatment utilization and adherence should be carefully estimated before resources are dedicated to them. The recommendations just presented were the results of my discussions with behavioral health specialists, but are not necessarily the most efficient ways to improve treatment utilization and adherence. My recommendations for improvement, incorporating my findings from the surveys and interviews, are presented in Chapter 5.

## 5. Conclusions, Policy Recommendations, and Further Research

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Multiple methods were used to collect and analyze data for the purpose of writing this dissertation, the goal of which was to identify ways in which utilization of and adherence to treatment for PTSD can be improved among servicemembers and veterans. Analyzing survey data allowed for the identification of sub-groups of the servicemember and veteran populations which may be less likely to utilize and/or adhere to treatment. Interviews with behavioral health specialists who had experience treating these populations provided important insight into why some individuals who suffer from PTSD may be less likely to seek or continue treatment. The combined knowledge gained from these research efforts have manifested into numerous policy recommendations. This chapter describes the conclusions drawn from these analyses, recommendations to the Departments of Defense and Veterans Affairs, and topics which require further research.

### Research Conclusions

Chapters 3 and 4 separately presented the results of the survey and interview analyses, respectively. This section combines the results from all of the data sources to draw overall conclusions from the total research effort. In doing so, greater support is provided for the policy recommendations than by using single sources. The research conclusions are divided into six topics, which are organized in the sub-sections below: combat, symptoms and treatment associations, demographic variables, treatment experiences, barriers to treatment, administrative practices, and education.

#### *Combat, symptoms and treatment associations*

The analyses of data from both surveys and interviews with behavioral health specialists indicated strong associations between combat exposure, PTSD symptom severity, and treatment utilization and adherence. In the survey data, there was a clear trend that those servicemembers and veterans who experienced more combat were more likely to present greater symptoms of PTSD. Similarly, more symptoms and combat experiences were significantly related to several measures of greater PTSD treatment utilization and adherence.

Due to their cross-sectional nature, it was impossible to infer causal relationships between combat exposure, symptom severity, and treatment utilization/adherence from the survey data alone. However, the discussions with behavioral health specialists provided compelling evidence of causation. These experts overwhelmingly agreed that more combat experiences create greater chances of experiencing traumatic events which cause PTSD. Therefore, in survey samples such as those used for this dissertation, the veterans and servicemembers who saw more combat

should display higher PTSD symptom severity. Additionally, the specialists who were interviewed agreed that those individuals with the greatest symptoms of PTSD often experience the greatest distress, and are therefore most likely to seek and continue treatment in the hope of relief. In short, the interviewees clearly described a causal relationship of more combat experiences causing more PTSD symptoms, which cause greater treatment utilization and adherence among servicemembers and veterans.

A few of the interviewees remarked that it is good news that the servicemembers and veterans from the survey samples with the worst symptoms were receiving the most treatment. This meant that the people who really needed it were getting care. However, the surveys likely did not capture many of the veterans who are debilitated by PTSD and its comorbid conditions, such as depression and substance abuse. These are the veterans who are suffering the most, but are often not able to seek or continue care due to homelessness or unemployment (Schottenbauer et al., 2008). It is logical that servicemembers and veterans who show signs of PTSD, but do not feel significant negative effects, would seek less treatment than those who are debilitated by the disorder. However, this trend in data does not necessarily represent efficiency. There are likely many people who are not being captured by research efforts and are not making it into the VHA or the MHS for the care they need. The policy recommendations below address how the DoD and VA can better care for these individuals through improved screening and outreach.

It is also important to highlight that branch of service and military specialty were not substantially predictive of the measures used for PTSD treatment utilization and adherence. It was assumed that these variables would be strongly related to combat exposure, and therefore to symptom severity and treatment utilization/adherence. By design, there are more combat-related specialties in the Army and Marine Corps than in the Air Force and Navy. Historically, servicemembers in these combat-related specialties have experienced more combat (and therefore, more combat-related trauma) than their counterparts in non-combat specialties. However, the results of these analyses suggest that branch of service and military specialty are not sufficient substitutes for combat exposure when predicting PTSD treatment utilization and adherence. Particularly in the recent OEF/OIF era, combat exposure is not always determined by branch or specialty. All four branches and nearly every specialty have sustained casualties in these wars. Therefore, when predicting PTSD symptoms and treatment utilization/adherence, it is more appropriate to measure combat exposure directly, rather than assuming individuals from certain branches or specialties experience more combat than others.

The analysis of probable PTSD and unmet healthcare needs revealed some important information related to branch of service and military specialty, as well. From the samples used, it appeared as though there was a care delivery discrepancy between the Army and the Air Force. Airmen were more likely to have unmet needs, whereas the majority of soldiers with probable PTSD had sought treatment. Similarly, those from non-combat military specialties and those with less combat exposure were less likely to have sought treatment for their probable PTSD. This is likely a reflection of the trends in combat exposure, symptom severity, and treatment

seeking just described. However, this also reveals that there are many individuals with probable PTSD who are not seeking treatment, and they are more likely to come from the Air Force or non-combat specialties. It could be that these individuals are more likely to ignore or deny their symptoms because they believe servicemembers in their roles are not supposed to develop PTSD. It is important for the DoD and VA to let servicemembers and veterans know that anyone exposed to trauma can develop PTSD (and should seek treatment if they do), regardless of their role in the military.

### *Results from demographic analyses were limited*

The analyses of demographic factors did not reveal any major discrepancies in treatment utilization or adherence which would require large-scale policy manipulation. The DoD and VA are limited in their options for addressing demographic discrepancies in treatment seeking, and these options mainly include attempts to target specific groups through awareness campaigns. Therefore, efforts to improve PTSD treatment utilization and adherence should be focused in other areas.

Many articles on this topic have highlighted the differences between demographic groups from the samples used in past research efforts. Naturally, it assumed that clear differences in PTSD treatment utilization and adherence would be observed in these analyses along the lines of race, gender, age, education, marital status, and income. There are logical explanations for why men, racial minorities, single, younger, less-educated and poorer individuals would all be less likely to utilize and adhere to treatment for PTSD than their counterparts. However, these analyses revealed that only gender was consistently predictive of the outcomes selected. These results (or lack thereof) have potentially important policy implications.

It was clear from the survey analyses that women, in general, were more likely than men to utilize and adhere to treatment for PTSD. There was consensus among the behavioral health specialists interviewed that this finding is both logical and unsurprising. What is unclear, however, is the exact reason why men are seeking treatment for PTSD at lower rates. The interviewees offered explanations related to societal expectations of self-reliance and “machismo,” but there was a general sense that not much can be done to change this trend. Regardless, it is important that the DoD and VA recognize that men may be harder to engage and persuade to seek the treatment they need. The policy recommendations in the next section address what can be done to effectively target more male servicemembers and veterans.

If the results of the analyses had suggested that certain demographic sub-groups of the servicemember and veteran populations were less likely to utilize and adhere to treatment for PTSD, a logical recommendation would be that future campaigns by the DoD and VA to raise awareness and engage people in treatment be specifically aimed at these sub-groups. There may still be reason to believe that some individuals – such as those from economically disadvantaged backgrounds – face greater barriers to accessing treatment, and that there may be actions which could be taken to assist these individuals, in particular. However, the results suggest that the

primary focus of efforts and resources should not be on leveling utilization and adherence between demographic sub-groups because there do not appear to be significant discrepancies. Instead, broader initiatives should be taken to address the problems which face all servicemembers and veterans who struggle to obtain effective treatment for PTSD, regardless of demographic differences.

### *Treatment experiences influence continuation*

Before analyzing the survey data, past research led me to believe that I would find relationships between treatment experiences and adherence. Specifically, I expected to observe that servicemembers and veterans who saw specialists and received psychotherapy would attend more appointments than those who did not. The collective literature suggested that those who received longer appointments would have built greater rapport with their providers and would have gone to more appointments as a result. These suspicions about the data were confirmed, but perhaps for a number of different reasons.

Since cross-sectional data were used in the analyses, it is difficult to justify that the respondents to the surveys who attended more appointments did so because they saw specialists, spent sufficient time with them, and received effective treatments. Alternatively, it could simply be the case that those who saw only primary care providers attended fewer appointments because they did not follow up with referrals to specialists. As the behavioral health specialists described in the interviews, most PCPs will refer patients who present with mental health concerns to a specialist right away. It makes sense that many of the respondents to the surveys who only saw PCPs only attended one appointment. Treatment adherence in this case may have nothing to do with quality of care or treatment effectiveness, but the simple fact that the PCPs could not do much for these patients other than give referrals, to which many of the respondents may not have followed.

Several of the interviewees also described how they would not prescribe medications or begin an evidence-based treatment protocol until they had completed several sessions with a patient. If this is true for many specialists in the VHA and the MHS, it means that patients who only attend a few appointments before dropping out never get prescribed medication or a psychotherapy regimen. Ideally, individuals who receive these empirically-supported treatments experience their benefits and therefore continue to seek treatment. However, it could be the case in these survey data that treatment receipt was related to number of appointments attended simply because these respondents were not offered these treatments until they reached a certain number of appointments.

The specialists who were interviewed explained that PCPs are often very pressed for time and typically spend less time with each patient than specialists. It would therefore make sense that the survey respondents who only saw PCPs (and only attended one appointment) had shorter appointments. The last finding – that longer appointments are associated with more appointments – can also be explained by rapport built with providers and effectiveness of treatment. If patients

who receive longer appointments do not build better rapport and see positive effects, they would be more inclined to stop treatment because it would be a bigger waste of time for them. In support of this latter explanation, almost all of the specialists interviewed stressed the importance of connecting with their patients and building trust in order to deliver effective treatment.

These findings may be explained simply by how the data were collected, so it is difficult to prove that these associations are evidence of treatment effectiveness in relation to care continuation. However, the information gathered from conversations with behavioral health specialists reinforce the assertions that specialty care, delivery of evidence-based treatments and longer appointments all lead to better treatment adherence (as represented by more appointments attended). Clearly, longitudinal studies are needed to clarify these relationships, but these results support the recommendations given below.

### *Significant barriers to treatment persist*

Perhaps some of the most interesting findings from the analyses were those which came from comparing care initiation and continuation between servicemembers in the MHS and veterans in the VHA. Many of the behavioral health specialists with whom I spoke were initially confused by the comparison, but they quickly provided insightful and logical explanations for what was observed in the survey data. The trend that veterans were more likely to seek initial appointments, but less likely than servicemembers to continue with follow-up appointments highlights some important differences in barriers experienced by these two populations. It also provides insight into the difference between treatment utilization and adherence.

The outcomes which were examined in the survey data represented two similar, yet distinct constructs: treatment utilization and treatment adherence. Utilization, as it is used here, represents behaviors which indicate that an individual intends to receive treatment for their disorder. They seek out such treatment by attending an initial intake appointment with either a primary care provider or a specialist and voice their concerns. Adherence, on the other hand, represents behaviors which indicate that an individual actually follows through with their intention to receive treatment and improve their health. They continue to schedule and attend appointments and they engage in psychotherapy and/or take medications prescribed for their condition. Adherence requires utilization, but not the other way around. In the survey analysis, it appeared as though the veteran respondents exhibited greater initial utilization, but the servicemember respondents exhibited greater long-term adherence.

The survey respondents who sought treatment through the VHA were significantly more likely than their active duty counterparts to have attended an initial behavioral health appointment in the previous year. In Chapter 3, an explanation was offered that described how servicemembers feel greater stigma toward initiating mental healthcare than veterans. After speaking with behavioral health specialists, it became clear that stigma may not be the only barrier contributing to this difference. The military maintains potentially serious consequences to seeking care for PTSD, including loss of security clearances, disqualification from flying or

other duties, and early separation. Veterans do not face these consequences for seeking treatment. Additionally, treatment confidentiality is not guaranteed in the MHS like it is in the VHA. However, as the interviewees explained, once servicemembers “break the ice” and attend an initial appointment, they experience fewer barriers to continuing treatment than their veteran counterparts in the VHA.

The interviewees pointed to unique barriers which veterans face to explain why in the survey sample there was a lower average number of appointments attended by veterans than by active duty servicemembers. As they explained, veterans often have to take time off from work and travel significant distances to attend appointments at VHA clinics and hospitals. Additionally, many VHA facilities have greater demand than capacity, so it can be difficult for veterans to schedule timely follow-up appointments. In contrast, MHS facilities are on military installations and most servicemembers can easily receive time off to attend appointments. It is often also easier to obtain convenient appointments at MHS facilities, and servicemembers are held accountable for missed appointments. Clearly, servicemembers and veterans experience some different barriers, which help explain differences in treatment seeking and continuation.

In a perfect world, servicemembers and veterans would not be faced with these barriers. It is not reasonable to expect the DoD and VA to completely remove barriers to accessing treatment for PTSD, but these results highlight the places where efforts should be focused. Specifically, the DoD should focus on removing negative consequences associated with seeking mental healthcare and on providing greater confidentiality to servicemembers. The VA, on the other hand, should improve appointment availability and reduce the logistical burdens to veterans who require regular treatment. The policy recommendations below outline specific ways in which the DoD and VA can make these improvements.

### *Lack of common administrative practices and institutional support for evidence-based treatments*

One of the more shocking findings from the interview analysis was the lack of commonality in administrative practices by the behavioral health specialists who were interviewed. From talking with them, there did not appear to be standardized protocols for referring patients or scheduling them for follow-up appointments in either the MHS nor the VHA. This does not mean that the MHS and the VHA do not have such protocols written into their institutional policies, but if they do, these protocols are not being followed consistently by the specialists who were interviewed.

When referring patients to specialists who could provide psychotherapy, some of the psychiatrists interviewed explained that they conducted “warm hand-offs” by introducing their patients to the specialists. Others simply wrote the referrals in the electronic medical record systems and told their patients to schedule appointments with the specialists. The specialists interviewed who provided psychotherapy echoed this inconsistency: sometimes PCPs or psychiatrists would introduce them to patients, and sometimes patients would just show up in

their offices. It was clear from the interviews that the “warm hand-off” approach is superior in ensuring treatment continuation. By simply noting the referral and telling the patient to schedule an appointment with a new provider, all of the responsibility is placed on the patient and accountability is eliminated. When patients are introduced to their new providers through a “warm hand-off,” they establish new relationships and often feel responsible for coming back to scheduled appointments, as explained by the interviewees.

Appointment scheduling practices also appeared to follow two distinct tracks. Some of the specialists had explained in the interviews how they made sure they scheduled follow-up appointments with each of their patients before they left each session. This either involved the provider going into the computerized scheduling system and setting the appointment themselves or walking with the patient to the front desk and ensuring that the receptionist scheduled the next appointment. Other interviewees, however, described how they would leave the scheduling up to their patients. This meant either telling the patient to see the receptionist on their way out or giving them the clinic’s phone number to call and schedule their next appointment. Again, this latter approach places all of the responsibility on the patient and removes all accountability. Several of the interviewees explained that it is vital that patients leave with their next appointment already scheduled. Otherwise, they are much less likely to come back.

Besides a lack of standardization in referral and scheduling practices, the interviews with behavioral health specialists from the MHS, in particular, revealed a lack of institutional support for evidence-based treatments, such as prolonged exposure (PE) therapy. Providers from the MHS explained that they often did not have the time needed to deliver PE as it was intended since it required 90-minute sessions but they could only schedule 60-minute sessions in their clinics. Additionally, several of them expressed frustration with not getting enough training opportunities to stay up-to-date on the latest treatment practices and to sharpen their skills. A general lack of supervision or feedback for the providers delivering evidence-based treatments means that it is difficult to ensure they are effective. The recommendations below outline how the VHA and the MHS can institute policies to address the apparent lack of common administrative practices and to provide greater support for behavioral health specialists to use evidence-based PTSD treatments.

### *There remains great need for education*

Greater education for servicemembers, veterans and their families about PTSD and its treatment was a topic that resonated throughout the discussions with behavioral health specialists. Several of them remarked that initiating PE was often difficult because it took several sessions for patients to understand the theory behind the therapy. Since patients suffering from PTSD often experience significant avoidance to reminders of their trauma, it is understandable that many of them would be skeptical of directly confronting their traumatic memories through PE. However, as the interviewees explained, once they are taught the basic theory of exposure therapy, many patients are willing to try PE. The question that remains is how many people

suffering from PTSD never seek treatment because they never receive this education and they continue to avoid exposure? Greater efforts by the DoD and VA to publicize the availability of evidence-based treatments like PE and to educate the public about them can only improve treatment seeking and continuation.

More broadly, a few of the interviewees explained that treatment utilization and adherence could be improved if everyone had a better understanding of PTSD and how to seek treatment. Although a lot of scientific and media attention has been given to PTSD over the last decade, many people still do not understand even the basic concepts of this disorder. Much of the educated and/or military population knows what PTSD is and that it is a major issue for the military and veteran communities. However, many struggle to explain how PTSD develops in response to trauma, some of the factors which affect its development, and how it can be treated. Furthermore, when questioned about if and how they would get help if they were to develop symptoms of PTSD, many servicemembers are often hesitant to answer. It is important to again note that the analyses did not reveal differences in treatment utilization or adherence between sub-groups with different education levels. The topic here is education specific to PTSD and its treatment. There are simple steps the military can take to better educate its members and their families about PTSD and seeking care, which are described in the recommendations section below.

## Policy Recommendations

The policy recommendations provided here are divided into three levels, which correspond to different scopes of policy concentration. The first is that of the individual servicemember or veteran. Recommendations for this level seek to improve the lives of individuals suffering from PTSD in direct ways. This is labeled the tactical level because it is most intimately tied to the people who need assistance. The second level is that of the healthcare providers who treat patients suffering from PTSD; mainly the MHS and the VHA. Recommendations for this level seek to better enable providers to give effective treatment to servicemembers and veterans. This is referred to this as the operational level because it is where the majority of the day-to-day work with patients occurs. Finally, the third level is that of the greater DoD and VA. Recommendations for this level seek large-scale policy changes and other efforts to make it easier for servicemembers and veterans to access the care they need. This is the strategic level because it encompasses the largest systems involved in PTSD treatment utilization and adherence. The specific policy recommendations are presented here in sub-sections corresponding to the tactical, operational and strategic levels.

### *Tactical – Improving the lives of individual patients*

Education and awareness campaigns for PTSD and its treatment within the military context serve multiple purposes. They can reduce perceived stigma associated with PTSD, they can

educate servicemembers, veterans and their families about PTSD and its treatments, and they can help servicemembers and veterans feel more comfortable in seeking treatment. All branches of the military currently use pamphlets, fliers, videos, and unit-based briefings to spread the word about many different topics, including PTSD. The VA successfully urged Congress to designate June as National PTSD Awareness Month in 2013, and the DoD launched the Real Warriors Campaign in 2009 to promote public awareness of PTSD. Previous messages through these media have undoubtedly helped to educate servicemembers, veterans and their families about PTSD, but some specific improvements should be made.

Instead of manufacturing stories which illustrate the struggles of PTSD for use in educational media, the DoD and VA should take advantage of the wealth of experiences from its members. My experiences in the military and discussions with other servicemembers and healthcare professionals have revealed common complaints about the realism of the vignettes often used for PTSD education. When stories seem fake or unrealistic, they are less likely to be taken seriously by the audience. As several behavioral health specialists explained in the interviews, people are more likely to seek treatment for PTSD when they have seen their peers do it successfully. Hearing their stories establishes credibility and trust in the MHS and the VHA. The DoD and VA would do well to find servicemembers and veterans who were successful at receiving treatment for PTSD and have them tell their stories so that others can learn from them. Naturally, such individuals may be reluctant to share their personal health information, so they should be offered complete anonymity. For those who wish to remain anonymous, they could write down their experiences to be shared in pamphlets or on posters. Others should be featured in videos as a way to humanize the mental healthcare process for servicemembers and veterans.

The interviews revealed a lack of knowledge among servicemembers and veterans about specific PTSD treatments. Therefore, the content of the educational material provided to them should be targeted more toward treatment options. This does not mean that the DoD and VA should stop providing education about the signs and symptoms of PTSD. They should continue those efforts and also educate servicemembers and veterans on what they can expect if they seek care for PTSD. According to several of the behavioral health specialists who were interviewed, there is very little publicity for the treatment options available. Servicemembers and veterans need to know that there are evidence-based treatments, such as PE, available through the MHS and the VHA. They should also be given basic descriptions of how these treatments work. This education should help servicemembers and veterans better understand how PTSD develops and how it can be reversed, as well as help them make better decisions regarding their treatment.

Finally, these educational materials should be targeted toward the right audiences. They should be used to inform servicemembers and veterans about the discrepancies in treatment seeking behaviors between men and women revealed by the survey analyses and supported by past research. They should provide the message that it is just as acceptable for men to seek treatment for PTSD as it is for women. Additionally, there should be clear messaging that anyone exposed to trauma can develop PTSD, regardless of occupational specialty or branch of

service. Effective educational campaigns should encourage more servicemembers and veterans to seek and continue treatment for PTSD, and decrease discrepancies between genders, branches, and occupational specialties.

### *Operational – Improving the ability of providers to treat patients*

The results of the analyses indicate that access to specialty care and evidence-based treatments are very important for continuation of PTSD treatment. Servicemembers and veterans often initiate care by seeing their primary care providers, who serve as the bridge to specialty care. To continue on the right track, primary care providers must make referrals to behavioral health specialists and future appointments must be scheduled in a timely manner. Out of this research effort, the two most important recommendations for helping mental healthcare providers to improve PTSD treatment adherence in the MHS and the VHA are to establish standard procedures for making referrals and for scheduling future appointments. Without commonly accepted methods for referring and scheduling patients, there remain significant cracks through which patients can fall.

As explained in the conclusions section of this chapter, the best practice identified by behavioral health specialists for referring patients to specialty PTSD care involves a “warm hand-off.” In this case, the referring provider introduces the patient to the gaining specialist in person and creates a personal connection before treatment begins. Several of the interviewees explained that in small, multi-disciplinary clinics, this “warm hand-off” is relatively easy because the two providers are co-located. In other circumstances, however, providers may not be near each other or even in the same building. In such cases, use of a care facilitator is appropriate and necessary. Examples of a care facilitator include a nurse, social worker, or other behavioral health specialist who is embedded in the referring provider’s unit. This person could either walk with the patient to meet the gaining provider, call the gaining provider with the patient, or follow up with the patient to ensure that they have at least scheduled an appointment with the gaining provider. In any case, it is imperative that the patient is connected with the gaining provider and is not forced to complete the referral on their own, without help from the referring provider or a care facilitator.

The same concept of removing total responsibility from the patient is at the center of the recommendation to create standard procedures for scheduling future appointments in the MHS and the VHA. Again, the behavioral health specialists interviewed identified a best practice of ensuring that patients always have their next appointment scheduled before leaving the care facility. This can be done by either requiring that each provider be responsible for scheduling their own appointments or that an administrative staff member work with patients to schedule appointments after they are done being seen by their providers. However, it is not efficient to allow both providers and administrative staff to handle scheduling. Sharing this responsibility can lead to both parties assuming the other is completing this task. When this happens, all of the responsibility for scheduling can fall on the patient, and the probability of treatment dropout is

increased. The most efficient allocation of scheduling responsibilities may vary between healthcare systems and facilities, but policies should be implemented to ensure that a single person is responsible for appointment scheduling for each patient.

Greater utilization of behavioral health providers embedded in primary care settings would also assist the MHS and the VHA in keeping patients in treatment for PTSD. Several of the interviewees explained how embedded BH specialists were able to help PCPs identify patients suffering from PTSD and move these patients into specialty care. Referrals are made simpler because patients do not have to go to a different clinic for specialty care and “warm hand-offs” are easily accomplished. This model also adds confidentiality by allowing patients to go to primary care clinics for PTSD treatment, rather than having to go to a mental health clinic and running the risk of being seen by their peers. Obviously, it is not logistically feasible to combine all specialty and primary care clinics under common roofs. However, when designing new facilities, healthcare administrators would be wise to co-locate primary care and mental health clinics. At the very least, the VHA and the MHS should consider embedding a BH specialist in every primary care clinic to facilitate referrals and improve access to specialty care for PTSD.

A finding of this research which should be of high concern to the MHS was that evidence-based treatments – PE in particular – cannot be feasibly delivered as designed in at least some facilities. The behavioral health specialists from the MHS who were interviewed described appointment time limitations which prevented them from delivering full 90-minute sessions, as directed by the PE protocol. It is illogical for the MHS to send its clinicians to be trained in PE but then not provide them with the necessary resources to practice it effectively. Therefore, the MHS should alter or create policies to ensure that its clinicians who deliver PE can schedule at least 90 minutes per weekly session for each of their patients. This may mean altering the scheduling system, training more clinicians in PE, and/or hiring more specialists.

A questionable clinical practice identified through the interviews with behavioral health specialists was that of completing several sessions before offering an evidence-based treatment to a patient suffering from PTSD. Multiple interviewees described how they would not be in a hurry to start a treatment plan, but instead “take it at the patient’s rate” and consider their personal preferences. Past literature has supported the practice of collaborating with patients on their treatment plans to improve adherence (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008), but waiting several sessions to offer a treatment creates a greater opportunity for dropout. Patients who attend multiple sessions without receiving a prescription for medication or beginning exposure may feel that their continued attendance will not be worthwhile. One interviewee remarked that they usually offer medication to patients with PTSD symptoms in the first meeting so that they can begin to feel relief right away and have a good first impression of treatment. Clearly, behavioral health specialists should not push any particular treatment modalities on their patients, but perhaps some of them are being too cautious when initiating evidence-based treatments for PTSD. Starting some type of treatment right away may be a way

to improve adherence, but more research is needed to determine the best balance between patient collaboration and provider assertiveness.

Additional research efforts are also needed to address the apparent inconsistencies between randomized controlled trials (RCTs) for PTSD treatments and clinical realities. As described by many of the interviewees, RCTs often do not accurately represent clinical constraints and patient populations. Specifically, PE protocols which involve shorter and/or fewer appointments with more inclusive servicemember and veteran samples should be developed and tested to better accommodate the real-world environments of the MHS and the VHA. Additionally, more trials of PE involving telehealth and other technology-assisted delivery techniques are needed. The results of such research efforts will help VHA and MHS clinicians better deal with the nuances and constraints inherent in clinical practice and deliver more effective treatment.

Providing a wider range of evidence-based treatment options can also improve treatment continuation among servicemembers and veterans. Many clinicians have explained that there is no single treatment for PTSD which works for everyone, and personal preferences of the patients often determine course of treatment. By offering more types of evidence-based treatment, the VHA and the MHS would improve the odds that each patient finds an effective method to reduce their symptoms of PTSD. Widening the treatment options not only involves training more of their own clinicians on more modalities, but also providing more referrals to specialists outside of the VHA and the MHS. The DoD should allow for referrals to providers of complementary and alternative medicine through TRICARE, and both healthcare systems should alter their policies to allow for more outside referrals, in general. Of course, the DoD and VA should invest in research efforts to develop and test new evidence-based treatment modalities to determine the most appropriate distribution of resources in the process of providing a wider range of treatment options.

### *Strategic – Improving policies of the greater DoD and VA*

The DoD should strongly consider changing its policies which create barriers to seeking mental healthcare. Specifically, a lack of patient-provider confidentiality in the MHS, security clearance questions related to mental healthcare, and forced medical separations are issues that require greater attention and policy revisions.

Mental healthcare confidentiality was a concern among many of the behavioral health specialists interviewed. They explained that servicemembers will be reluctant to seek care for PTSD as long as their providers are able and/or required to report their conditions to their commanders. Indeed, among IW survey respondents showing probable PTSD, nearly a third endorsed poor treatment confidentiality as a reason they might not seek mental healthcare. Most of the other potential career consequences, such as loss of reputation, loss of responsibilities, and delayed promotion stem from the fact that commanders have access to their troops' private health information. The current policy is well intentioned: it seeks to provide commanders with ample information upon which they can base manning and assignment decisions. However, the

adverse consequence is that many servicemembers either delay treatment or refuse to seek it altogether. As a solution, updated policies should provide for greater confidentiality to ensure that commanders can only receive information from healthcare providers related to fitness for duty and work limitations (e.g. light duty only, cannot fly, cannot handle weapons). This would allow commanders to make appropriate decisions without knowing the exact nature of their troops' private health matters.

Several of the interviewees also explained that fear of losing security clearances can prevent servicemembers from seeking care. The U.S. government currently uses Standard Form 86 "Questionnaire for National Security Positions" (SF86) to collect background information on individuals seeking security clearances, to include members of the military. Question 21 on SF86 asks if the respondent has "consulted with a health care professional regarding an emotional or mental health condition" in the last seven years. This item exempts counseling for "adjustments from service in a military combat environment" and for sexual assault. For servicemembers and veterans who have received care for combat-related PTSD, it is ambiguous whether they should answer "yes" or "no" to this item. If they answer "yes," they must provide more information about the specific care they received and further investigation is initiated, which may delay or prevent clearance. If they answer "no," they run the risk of their honesty being questioned if their treatment history is later revealed, which may also affect their clearance. The ambiguity in SF86 question 21 clearly needs to be removed. The question should either be restructured to identify specific mental health conditions which may affect a person's ability to safeguard classified information, or the exemptions should clearly include language for PTSD. Providing this clarity will allow servicemembers and veterans suffering from PTSD to seek treatment without fear of it affecting their security clearances, and it will also better enable individuals to provide honest information about their mental healthcare histories.

Although it was not originally part of the interview protocol, the military's medical separation process was brought up in discussion. After further investigation, it is clear that the DoD should reconsider how it conducts medical separation determinations regarding PTSD. From speaking with behavioral health specialists and researching the services' official instructions and regulations, there appears to be a significant flaw in the medical separation process which may prevent servicemembers from seeking treatment. If a provider feels that a servicemember's condition is too serious for them to remain in service, they can refer the servicemember to a Medical Evaluation Board (MEB), which determines if the servicemember meets retention standards for their specific occupation. If the MEB decides against retention, it then refers to the Physical Evaluation Board (PEB), an administrative board which determines if the servicemember is fit for continued service and what their disability benefits should be. These determinations are made based on the servicemember's medical records, and the board members do not meet or examine the servicemember in person. Additionally, a provider must refer a servicemember to an MEB within 1 year of diagnosis of a condition that does not meet retention standards and from which the servicemember is not expected to recover (AR 40-501; AFI 36-

3212; AFI 44-172; SECNAVINST 1850.4E). The problem is that providers can refer servicemembers to an MEB at any time in that year and without their permission. From speaking with providers, it appears as though servicemembers who are referred to MEB/PEB are more often being separated than retained/rehabilitated.

Therefore, a servicemember suffering from PTSD who wants to remain in the military would understandably be reluctant to meet with a provider who could easily put them on the road to forcible separation. Policies should be created in every branch of the military to ensure that servicemembers are afforded a period in which they can receive treatment without fear of being forcibly separated due to PTSD (and perhaps other conditions). During this time, providers would not be able to refer servicemembers to an MEB without their permission and would continue to offer treatment. These “grace periods” would allow servicemembers to seek and receive treatment so that they have an honest chance at rehabilitation before they are determined to be unfit for duty. Determining the exact duration of these “grace periods” would require careful consideration by the services, but six months may be a good estimate. Of course, servicemembers should always be given the opportunity to request referral to an MEB if they feel their conditions prevent their continued service. If these changes are adopted, the military could transform the MEB into more of a rehabilitation tool and less of a way to remove servicemembers from duty.

Greater efforts should also be made to identify servicemembers suffering from PTSD as early as possible. Both the survey analyses and discussions with behavioral health providers indicate that many people do not seek treatment until their symptoms develop to a point where they significantly impact functioning. The DoD can take steps to more efficiently screen servicemembers for lower levels of PTSD symptoms and encourage them to seek treatment earlier. These steps include restructuring the post-deployment health screening process and creating closer relationships between behavioral health specialists and military units.

As discussed in Chapter 2, the timing of administration and consequences of symptom endorsement from the Post-Deployment Health Assessment (PDHA) can lead to underreporting of PTSD symptoms after deployments. A new approach to screening servicemembers for probable PTSD would involve a short questionnaire with items related to potentially traumatic events experienced while deployed. Unlike perception of symptoms, these events are objective – either someone experienced them or they did not – so there is less room for misrepresentation. Since greater trauma exposure is related to greater symptoms of PTSD (as shown by the survey and interview analyses and past literature), those servicemembers who meet a certain threshold of traumatic experiences should be evaluated by a clinician to determine likelihood of PTSD development. This process should allow the DoD to better screen returning servicemembers for PTSD while reducing the potential for underreporting of symptoms. However, such a process (and the exact questionnaire to be used) needs to be developed and tested in parallel with the current use of the PDHA, rather than replacing it immediately. Use of both the PDHA and this new process may perhaps be the most efficient screening method.

The DoD should find ways to better integrate behavioral health providers into military units, especially those which deploy often. My interactions with behavioral health providers, commanders, and other servicemembers through my research and experiences in the military have revealed that people are more likely to seek care early and often when they know their providers ahead of time. Air Force Special Operations Command (AFSOC) currently attaches psychiatrists and psychologists to its Special Tactics teams. These providers interact with the Airmen on a daily basis and build relationships with them before they deploy. When the Airmen return, these providers are equipped to quickly identify symptoms of PTSD and already have the rapport built to begin effective counseling. Additionally, much of the counseling and treatment provided in this environment is “off the record,” so the Airmen do not have to worry about negative career consequences from seeking treatment. Several of the specialists interviewed described smaller efforts in the past in which they were attached to a specific unit, but there do not appear to be any widespread efforts of this type in the conventional military. The DoD should experiment with applying the AFSOC model to more units in order to build more trust between servicemembers and behavioral health providers.

The barriers specific to the VHA, which were identified by the behavioral health specialists interviewed, also show areas for improving veterans’ access to care. Appointment availability is a common topic of concern for the VHA, as often portrayed in public media. Bureaucratic inefficiencies undoubtedly contribute to the congestion of patients, but the limited capacity of VHA facilities is likely also at fault. From speaking with VHA providers, it seems clear that there are not enough providers to effectively treat the number of veterans seeking care. The simplest, yet likely most expensive solution, is to hire more providers and build more facilities. Alternatively, the VHA could refer more veterans to civilian providers. This would not only reduce congestion and increase the number of patients being seen, but many veterans would likely be more satisfied with this option because it would remove some logistical barriers.

Several of the interviewees explained that since most VA medical facilities are centrally located in cities, many veterans who live in rural areas must travel long distances to receive care. The result is that some veterans must sacrifice time at work or with their families to continue treatment, and some may discontinue treatment when the costs of this time and travel become too high. In addition to referring veterans to civilian providers closer to their homes, the VHA can reduce logistical burdens by expanding its use of teletherapy. As explained by the interviewees, providing evidence-based therapies such as PE through teleconferencing platforms may be highly effective while eliminating logistical burdens because the patients can stay in their homes. However, it is important to remember that existing literature on teletherapy is scant. Therefore, the VHA should conduct more research on the effectiveness, costs, and safety of teletherapy before implementing it on a large scale. Nevertheless, expansions of civilian provider referrals and teletherapy would likely lead to increases in PTSD treatment adherence among veterans.

Lastly, a major overhaul of the VA’s incentive structure for veterans could improve its ability to effectively treat veterans suffering from PTSD, but the potential backlash from this overhaul

could be severe. Several of the behavioral health specialists from the VHA who were interviewed expressed frustration with the entanglement of VA disability benefits and care receipt. The fact that maintaining a disability rating from PTSD requires continuation of treatment means that some veterans are actually incentivized to not get better. They may continually come to treatment, but may not fully engage for fear that if their symptoms improve they will lose their disability benefits. If this is true, it means that there are veterans in the VHA who are not benefitting from its services while other veterans who need care are waiting in long lines to enter treatment. To remedy this problem, the VA should alter its incentive structure by either removing treatment attendance from disability determinations altogether, or by tying financial incentives to treatment engagement and willingness to improve health. The goal of the VHA should be to treat veterans to a point where they no longer need treatment, not keep them in the system forever. Alternatively, a simple and generous approach would be to guarantee lifetime benefits to veterans diagnosed with and treated for PTSD, regardless of symptom improvement. Of course, whenever the VA considers altering veteran benefits, there are sure to be vocal opponents among veterans' advocacy groups and in Congress. Therefore, if the VA makes policy changes such as these, emphasis should be placed on the benefits of the reforms to all veterans.

## Further Research

The cross-sectional nature of the survey data used in the analyses limited the inferences which could be drawn. Without longitudinal data showing changes in attitudes or behaviors of the respondents over time, it was impossible to infer causality with any degree of certainty. The information gained from the discussions with behavioral health specialists supplemented the survey findings to clarify what factors likely had causal relationships. The small convenience sample of behavioral health specialists used in this research creates limitations as well. It is very difficult to generalize findings based on a sample like this, which is why the intent was never to do so. The purpose of the interviews was always to supplement the survey findings; to provide possible explanations for the results and to identify areas for improvement in the MHS and the VHA. On their own, the surveys and the interviews were limited in their abilities to answer the research questions. But together, their findings complemented each other and provided valuable insights. However, the analyses also revealed areas where further research is needed.

Greater efforts should be made toward identifying differences in PTSD treatment utilization and adherence between demographic groups, military branches, occupational specialties, and ranks. Previous research has indicated differences among certain sub-groups from the servicemember and veteran populations which may be important to consider when crafting effective policies. For example, differences in treatment seeking behaviors between branches of the military would suggest that differing policies are to blame, and altering them to be more similar could close the gap in treatment seeking. The findings of gender being linked to multiple

outcomes currently stand without an explanation upon which the DoD and VA can act to affect change. It may be known that women are more likely to seek treatment than men, but the reasons and the path to change are unclear. Unfortunately, the limitations of the data likely prevented the revelation of any definitive effects of the other variables in this group. Therefore, collecting and analyzing data on servicemember and veteran characteristics in relation to treatment utilization and adherence over time would greatly benefit our understanding of how membership in certain groups may affect treatment seeking.

Conducting longitudinal effectiveness trials of PTSD treatment in the VHA and the MHS would reveal important effects of demographic and military factors, as well as other useful information. Such trials would track real patients as they receive treatment as it is typically delivered in these health systems. Data would be collected on patients' symptom severities, attitudes, and beliefs regarding treatment throughout their time in care. Treatment experiences, such as type of provider seen, treatments prescribed and followed, engagement, and appointment attendance would also be recorded in an objective manner (rather than patient self-report). These longitudinal data would allow for better observation of how all of these factors interact and influence treatment adherence over time. They would also help to validate the current measures of minimally adequate care and to develop new measures, if necessary. Additionally, it would be possible to examine how treatment barriers are related to numerous factors. One of the biggest concerns from examining the cross-sectional survey data was that the respondents with the worst symptoms had reported receiving the most treatment, which raises questions of treatment effectiveness. Longitudinal effectiveness trials would clarify how effectively the VHA and the MHS are currently treating servicemembers and veterans suffering from PTSD. This is knowledge that these analyses simply could not produce.

## Final Remarks

In writing this dissertation, the goal was to discover ways in which PTSD treatment utilization and adherence could be improved for U.S. servicemembers and veterans. After analyzing responses from two surveys and over a dozen interviews with behavioral health specialists, the research questions have been addressed and appropriate policy recommendations have been provided as a result.

These analyses have helped explain how combat exposure, symptom severity and other factors can influence treatment utilization and adherence, and how these relationships are important to consider when identifying servicemembers and veterans who could benefit from mental healthcare. It has also been shown how the treatment experiences of a servicemember or veteran can greatly influence their decision to continue treatment. Barriers to initiating and continuing care for PTSD were also identified and explained in this dissertation, to include differences in barriers experienced by servicemembers and veterans.

The recommendations presented in this dissertation were developed by combining the results of the survey analyses, interviews with behavioral health providers, and previous research. As a servicemember myself, I have a vested interest in seeing that the DoD and VA provide the best care possible to the people who risk their health and wellbeing to defend our country. This means changing administrative practices, providing greater education, removing barriers to seeking care, and investing in the development and delivery of evidence-based treatments for PTSD, among other efforts.

I have learned through the process of writing this dissertation that providing effective care for PTSD to servicemembers and veterans is a very complex undertaking. It involves efforts by multiple departments and agencies within the government, personal initiative by healthcare providers, support from families and friends, and determination from servicemembers and veterans to overcome many barriers. However, I have also learned that there are definitive, often simple, steps that can be taken to help more servicemembers and veterans enter and succeed in treatment. It is up to the decision makers within the DoD and VA to implement the recommendations presented here and attempt to improve utilization of and adherence to treatment for PTSD.

## Appendix A. Predictor Variables from VAOS Data used in Analysis.

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Category	Variable Description	Variable Type	Possible Values
Demographics			
	Age	Scalar	Years (18-34)
	Gender	Dichotomous	Male, Female
	Race	Nominal	White, Black, Hispanic, Other
	Education level	Ordinal	No school, Elementary, Some high school, High school graduate, Some college, College graduate
	Marital status	Dichotomous	Married, Unmarried
	Number of children	Scalar	Integers
	Income level	Ordinal	<\$10K, \$10-50K, \$50-100K, >\$100K
	Weight	Scalar	Pounds
	College attendance	Nominal	Not attending, Attending community college, Attending technical college, Attending state university, Attending private university
Military Factors			
	Total time deployed	Scalar	Months
	Number of deployments	Scalar	Integers
	Combat exposure severity	Scalar	0-11 scale (Number of traumatic events experienced during deployment)
	Total time in service	Scalar	Years
	Combat MOS	Dichotomous	Combat specialty, Non-combat specialty
	Branch of service	Nominal	Air Force, Army, Marine Corps, Navy, Coast Guard
	Veteran status	Nominal	Honorable discharge, General under honorable discharge, Other than honorable discharge, Retired
	Rank at separation	Ordinal	Any pay grade
Treatment Factors			
	Average appointment length	Ordinal	<15 min, 15-30 min, 30 min, 30-60 min, >60 min
	Provider type	Dichotomous	Specialist, Primary Care Physician
	Receipt of medication prescription	Dichotomous	Yes, No
	Helpfulness of provider	Ordinal	Not at all helpful, Somewhat helpful, Very helpful, Extremely helpful
	Helpfulness of medication	Ordinal	Not at all helpful, Somewhat helpful, Very helpful, Extremely helpful

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Category	Variable Description	Variable Type	Possible Values
Diagnostic Factors			
	PTSD diagnosis	Dichotomous	Yes, No
	Depression diagnosis	Dichotomous	Yes, No
	TBI diagnosis	Dichotomous	Yes, No
	AUD diagnosis	Dichotomous	Yes, No
	SAD diagnosis	Dichotomous	Yes, No
	PTSD symptom severity	Ordinal	0-4 scale (higher scores worse symptoms; measured by PC-PTSD)
	Depression symptom severity	Ordinal	0-6 scale (higher scores worse symptoms; measured by PHQ-2)
	Anxiety symptom severity	Ordinal	0-21 scale (higher scores worse symptoms; measured by GAD-7)
	Distress severity	Ordinal	0-3 scale (higher scores more distress)
	AUD symptom severity	Ordinal	0-40 (higher scores more alcohol use; measured by AUDIT)
	Marijuana use	Dichotomous	Yes, No
Attitude Measures			
	Treatment attitudes toward self	Ordinal	6-30 scale (higher scores more negative attitudes)
	Treatment attitudes toward others	Ordinal	6-30 scale (higher scores more negative attitudes)
	Attitudes toward seeking care	Ordinal	0-30 scale (higher scores more positive attitudes)

## Appendix B. Predictor Variables from IW Data used in Analysis.

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Category	Variable Description	Variable Type	Possible Values
Demographics			
	Age	Scalar	Years
	Gender	Dichotomous	Male, Female
	Race	Nominal	White, Black, Hispanic, Other
	Marital status	Dichotomous	Married, Unmarried
	Number of children	Scalar	Integers
	Income level	Ordinal	<\$10K, \$10-50K, \$50-100K, >\$100K
Military Factors			
	Total time deployed	Scalar	Months
	Number of deployments in Iraq or Afghanistan	Scalar	Integers
	Last deployment in Iraq or Afghanistan	Dichotomous	Yes, No
	Combat exposure severity	Scalar	0-11 scale (Number of traumatic events experienced during deployment)
	Total time in service	Scalar	Years
	Combat military specialty	Dichotomous	Yes, No
	Branch of service	Nominal	Air Force, Army, Marine Corps, Navy
	Duty status	Nominal	Active duty, Reserve, Separated or Retired
	Rank at survey	Ordinal	Any pay grade
	Deployment between the two surveys	Dichotomous	Yes, No
	Military career intentions	Nominal	Stay in until retirement, Stay in past current commitment, Undecided, Leave after current commitment
Treatment Factors			
	Average appointment length	Ordinal	<15 min, 15-30 min, 30 min, 30-60 min, >60 min
	Provider type	Dichotomous	Specialist, Primary Care Physician
	Receipt of medication prescription	Dichotomous	Yes, No
	Receipt of any CBT	Dichotomous	Yes, No
	Helpfulness of provider	Ordinal	Very helpful, Somewhat helpful, A little helpful, Not at all helpful
	Helpfulness of medication	Ordinal	Very helpful, Somewhat helpful, A little helpful, Not at all helpful
	Satisfaction with treatment	Ordinal	Very satisfied, Satisfied, Neither satisfied or dissatisfied, Dissatisfied, Very dissatisfied

Category	Variable Description	Variable Type	Possible Values
Diagnostic Factors			
	PTSD diagnosis	Dichotomous	Yes, No
	Depression diagnosis	Dichotomous	Yes, No
	TBI diagnosis	Dichotomous	Yes, No
	GAD diagnosis	Dichotomous	Yes, No
	SAD diagnosis	Dichotomous	Yes, No
	Panic disorder diagnosis	Dichotomous	Yes, No
	Personality disorder diagnosis	Dichotomous	Yes, No
	PTSD symptom severity	Scalar	5-85 scale (higher scores worse symptoms; measured by PCL-M)
	Depression symptom severity	Scalar	0-24 scale (higher scores worse symptoms; measured by PHQ-8)
	TBI symptom severity	Scalar	0-11 scale (higher scores worse symptoms; measured by BTBIS)
	Binge drinking days	Scalar	Days per month
Miscellaneous Factors			
	Number of physical injuries from deployments	Scalar	Number of injuries
	Disability rating received	Dichotomous	Yes, No
	Disability percentage	Scalar	0-100%
	Primary health insurance type	Nominal	MHS, VHA, Medicaid, Other, None
	Insurance coverage for medications	Dichotomous	Yes, No
	Insurance coverage for therapy	Dichotomous	Yes, No
	Work status	Nominal	Working, Student, Not working
	Hours worked per week	Scalar	Hours
	Number of people in the household	Scalar	Number of people
	Number of children in the household	Scalar	Number of children
	Credit card debt amount	Ordinal	\$0-999, \$1,000-2,999, \$3,000-4,999, \$5,000-9,999, \$10,000 or more
	Relationship length	Scalar	Months
	Relationship happiness	Ordinal	Very unhappy, Unhappy, Neither happy nor unhappy, Happy, Very happy
Self-Reported Barriers			
	Wanted help, did not receive it	Dichotomous	Yes, No
	Total number of barriers reported	Scalar	Number of barriers

<b>Category</b>	<b>Variable Description</b>	<b>Variable Type</b>	<b>Possible Values</b>
	Logistical barrier(s) reported	Dichotomous	Yes, No
	Fear of loss(es) from treatment reported	Dichotomous	Yes, No
	Concern(s) of effectiveness reported	Dichotomous	Yes, No
	Negative opinion(s) toward treatment reported	Dichotomous	Yes, No

## Appendix C. Semi-Structured Interview Questions.

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### **Section 1: Background Information**

What is your job specialty?

How long have you worked in this role?

What kind of facility do you work in (DoD, VHA, Civilian)?

How long have you worked at your current location?

Do you have past experience in the military, and if so, in what capacity?

On average, about how many patients do you treat for PTSD in a month?

### **Section 2: Patient-Provider Interactions**

How would you describe your interaction with primary care providers and other specialists when treating a patient suffering from PTSD?

How are patients referred to you/how do you initially connect with them?

How do you share information about patients with other providers?

What shortfalls in your working relationships with other providers may prevent patients with PTSD from accessing or adhering to treatment?

Please describe a typical first meeting with a new patient suffering from PTSD.

Do you use mental health screeners or full diagnostic interviews at intake?

How do you wrap up an initial appointment with a new patient?

How do you ensure that patients return for future appointments?

### **Section 3: Expectations for Successful Treatment**

What approaches/treatments do you typically use to treat PTSD?

How many sessions of therapy and of what durations do you typically prescribe?

How do you decide which treatments to prescribe?

What are your views on using exposure therapy to treat patients suffering from PTSD?

How do you view the effectiveness and feasibility of prolonged exposure therapy?

How do you decide to keep using PE with a patient or discontinue it?

How do you think patients suffering from PTSD view exposure therapy?

What specific barriers do you believe patients experience with exposure therapy?

### **Section 4: Differences in Treatment Adherence**

Are there any specific factors which you believe prevent patients from returning for treatment?

(After presenting my results related to symptom severity, combat exposure, rank, gender, and healthcare system) Why do you think these factors are related to treatment utilization and adherence in the samples I examined?

Which treatment options do you think are easier for patients to adhere to?

Can these easier treatments be just as effective as the harder treatments?

### **Section 5: Recommendations for Improvement**

What do you think can be done to get more patients to utilize and adhere to treatment for PTSD?

What can be done to address any systemic issues within the MHS/VHA/Civilian care system?

What can your facility, specifically, do differently?

What specific policies should be changed or created, and how?

What are some other efforts that should be made by providers, healthcare administrators, the DoD or the VA?

What are your thoughts on using modified exposure therapies, such as virtual reality exposure therapy?

Is there anything I did not ask that I should have, or anything else you'd like to add?

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