

Assessment and Treatment of Combat-Related PTSD in Returning War Veterans

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Abstract Over the past 9 years approximately 2 million U.S. military personnel have deployed in support of Operation Iraqi Freedom in Iraq and Operation Enduring Freedom in and around Afghanistan. It has been estimated that 5–17% of service members returning from these deployments are at significant risk for combat-related posttraumatic stress disorder (PTSD). Many of these returning war veterans will seek medical and mental health care in academic health centers. This paper reviews the unique stressors that are related to the development of combat-related PTSD. It also reviews evidence-based approaches to the assessment and treatment of PTSD, research needed to evaluate treatments for combat-related PTSD, and opportunities and challenges for clinical psychologists working in academic health centers.

Keywords Posttraumatic stress disorder · Improvised explosive devices · Deployment

Introduction

Over the past 9 years approximately 2 million U.S. military personnel have deployed in support of Operation Iraqi

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Freedom (OIF) in Iraq and Operation Enduring Freedom (OEF) in and around Afghanistan (Tanielian & Jaycox, 2008). The development of acute stress disorder (ASD), posttraumatic stress disorder (PTSD), and other combat and operational stress reactions are some of the most significant psychological risks of this exposure (Engelhard et al., 2007; Helmer et al., 2007; Hoge, Auchterlonie, & Milliken, 2006; Hoge et al., 2004; Hoge, Terhakopian, Castro, Messer, & Engel, 2007; Hotopf et al., 2006; Kolkow, Spira, Morse, & Grieger, 2007; Lapierre, Schwegler, & LaBauve, 2007; Martin, 2007; Milliken, Auchterlonie, & Hoge, 2007; Smith et al., 2008; Tanielian & Jaycox, 2008). A wealth of epidemiological and treatment-outcome research is available regarding PTSD from civilian-related traumas, such as sexual assault, physical assault, and motor vehicles. However, much less is known about combat-related PTSD, especially in terms of treatment of PTSD in active-duty military and recently discharged OIF/OEF veterans. This article outlines both the strengths and limitations of the current literature and how it can inform the assessment and treatment of combat-related PTSD in both military and civilian academic health centers. Specific topics include an overview of the epidemiology and etiology of PTSD, the traumatic experiences most often encountered during deployments in support of OIF/OEF, empirically supported assessments and treatments for PTSD, and the opportunities and challenges of this area of work and research.

Epidemiology of Posttraumatic Stress Disorder

Epidemiological findings of large civilian studies provide important background information for understanding PTSD in general, as well as a solid context for understanding combat-related PTSD specifically. The National

Comorbidity Survey (NCS) provides important epidemiological information about PTSD in civilians as well as military personnel (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). The NCS evaluated PTSD symptoms for 5,877 individuals between the ages of 15 and 54 in the United States. The results indicated that the lifetime prevalence of PTSD in the American sample was 8%, and a higher percentage of women (10%) met PTSD criteria than men (5%). Interestingly, more men (61%) reported exposure to potentially traumatic events than women (51%). These differences suggest that other factors, such as the type of trauma, may also play an important role in the development of PTSD. For example, the NCS study found that rape was the trauma most likely to cause PTSD for both men (65%) and women (46%). However, less than 1% of men reported a history of rape as compared with 9% of women. Combat-related trauma was found to be the second most common cause of PTSD in men (39%), whereas no women in this study reported exposure to combat-related trauma.

In addition to type of trauma, research by Kilpatrick et al. (1989) found that the risk for PTSD was compounded with the increasing combination of several traumatic factors involved in a single traumatic event. In this study, female adult crime victims ($N = 294$) reported the presence or absence of rape, life threat, and physical injury during the crime-related event. The rate of PTSD in the sample was found to increase precipitously based on the presence of one, two, or all three of these factors. For the group who reported that they had not been raped during the crime, the rate of PTSD was 9% (no life threat, no injury), 21% (life threat, but no injury), 25% (injury, but no life threat), and 31% (life threat and injury). The rate of PTSD was significantly higher in the group who reported that they had been raped. In this group the rate of PTSD was 29% (no life threat, no injury), 58% (injury, but no life threat), 69% (life threat, but no injury), and 79% (life threat and injury). These results suggest that the development of PTSD is highly likely in some situations involving a combination of several extreme traumatic factors as part of the same traumatic event. Similar data is not currently available for combat-related trauma. Nonetheless, it is the opinion of the authors that some extreme traumatic events that occur during military deployments, such as blast explosions resulting in mass casualties, also place military service members at high risk for the development of PTSD.

Recent research has also evaluated the risk of combat-related PTSD in U.S. military combat personnel ($N = 3,671$) returning from deployments to OIF and OEF (Hoge et al., 2004). Results suggest that PTSD prevalence is strongly and positively correlated with combat experiences, such as being attacked or shot at, firing on or killing the enemy, and seeing or handling human remains. Specific

analyses revealed a linear progression with an increase in PTSD corresponding to more firefights and higher rates of PTSD among service members who were wounded or injured. Although most research has targeted military combatants, a recent report indicated that the risk for combat-related PTSD exists even for those not officially identified as combatants (Peterson, Wong, Haynes, Bush, & Schillerstrom, 2010). Overall, published studies reporting the rates of combat-related PTSD and PTSD symptoms in OIF/OEF veterans vary considerably, with some reporting rates as low as 5% (Hoge et al., 2006; Smith et al., 2008) and others reporting rates as high as 30–45% (Helmer et al., 2007; Lapierre et al., 2007). This wide range varies depending on the assessment approach used, the population evaluated, and the time frame of the evaluation.

Trauma Exposure During Deployments to Iraq and Afghanistan

Recent research on U.S. Army Soldiers and Marines returning from a deployment in support of OEF/OIF ($N = 3,671$) who responded to an anonymous survey indicated high rates of trauma exposure (Hoge et al., 2004). The most common types of exposures were artillery, rocket or mortar fire (87%); gunshot (80%); seeing dead bodies or human remains (65%); being attacked or ambushed (74%); and knowing someone seriously injured or killed (63%).

Explosive devices, particularly the improvised explosive devices known as IEDs, have been the most common cause of injury and death for U.S. service members deployed to Iraq and Afghanistan. Those who survive IED blasts often have sustained severe and mutilating injuries. From October 2001 to July 2010, the three most common causes of hostile death in OEF/OIF were explosive device ($n = 2,688$), gunshot ($n = 1,607$), and rocket-propelled grenade ($n = 74$) (Department of Defense [DoD], 2010). Among those wounded in action in OEF/OIF, the three most common causes of injury were explosive device ($n = 25,652$), gunshot ($n = 3,816$), and artillery/mortar/rocket fire ($n = 3,001$) (DoD, 2010).

Research examining the long-term effects of injuries incurred by these combat threats provides additional information on the most common forms of trauma exposure as reported by soldiers. Hoge et al. (2008) reported mechanisms of injury among Army Infantry Soldiers ($N = 2,252$) who were recruited from two brigades to voluntarily complete an anonymous survey 3–4 months after returning from Iraq. Of those soldiers who reported having been injured during their deployment ($n = 819$), the mechanisms of injury included blasts or explosions (47%); falls (37%); vehicle accidents (18%); fragment or shrapnel (14%); bullets (2%); and other mechanisms (24%).

The survival rate for military service members wounded in action during a deployment in support of OIF/OEF is approximately 90% (Gawande, 2004). This survival rate is the highest in history and significantly exceeds the 76% survival rate for those injured during the Gulf War in 1990 and during the war in Vietnam. The use of body armor, up-armored vehicles, improved aeromedical evacuation, improved tourniquets, and advanced medical interventions have all contributed to this increased survival rate (Gawande, 2004; Kragh et al., 2009; Peterson, Baker, & McCarthy, 2008; Peterson, McCarthy, Busheme, Campise, & Baker, 2011). However, a consequence of this improved survival rate is that those who survive have often sustained severe and mutilating injuries. Body armor can protect vital organs, but those who survive may have sustained limb amputations, severe facial injuries, or significant burns (Kauvar et al., 2006; Lew, Walker, Wenke, Blackbourne, & Hale, 2010; Owens et al., 2008). Exposure to the grotesque and mutilating injuries of war are hypothesized to be one of the most common factors contributing to combat-related PTSD (Peterson, Cigrang, & Isler, 2009).

Etiology of Posttraumatic Stress Disorder

PTSD is one of the few mental disorders with a clear etiology. PTSD is caused by exposure to a traumatic stressor or bearing witness to such an event. Although there are a variety of pre- and post-exposure factors that influence the severity and duration of symptoms, PTSD does not develop in the absence of such a traumatic event. There are three primary categories of risk factors for the development of combat-related PTSD: (1) the type and severity of the trauma (or traumas), (2) individual factors (gender, age, socioeconomic status, education, intelligence, race, psychiatric history, and previous trauma exposure), and (3) environmental factors such as social support and life stress after trauma exposure (Peterson et al., 2009).

One of the simplest models of PTSD is the behavioral model. This model is based on both operant and respondent learning theory and involves the development of conditioned stimuli and conditioned responses after a potentially traumatic event (Keane, Zimering, & Caddell, 1985; Zoellner, Eftekhari, & Bedard-Gilligan, 2008). For example, exposure to an IED explosion in a town center resulting in mass casualties (unconditioned stimulus) would result in an unconditioned response involving significant physical (e.g., fight or flight response), emotional (e.g., fear, disgust), and cognitive reactions (e.g., helplessness, guilt) for many if not most individuals. In turn, the traumatic event may lead to the development of conditioned stimuli (e.g. memories of the event, being in crowded places, smell of smoke) and conditioned responses (e.g. anxiety, palpitations, escape or

avoidance). The conditioned response can be conceptualized as an automatic fight or flight response that occurs in response to a false alarm. Other models of PTSD also include cognitive components and the development of a cognitive fear network (Foa, Hembree, & Rothbaum, 2007). Service members often assess level of danger by cognitively linking specific details related to the stimuli (e.g., trash piled alongside a road, IED explosion, human carnage) and their responses to the event (e.g., fear, anger, disgust). After returning from a deployment, a soldier might incorrectly label relatively safe stimuli (e.g., roadside trash, broken down car, driving under an overpass) as dangerous and then fail to learn corrective information and change their cognitive interpretation of potential danger.

Assessment of Combat-Related PTSD

The most common approach to the assessment of combat-related PTSD is a general clinical interview with emphasis on the 17 criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994). The completion of a trauma interview (cf., Foa et al., 2007) will help ensure that appropriate trauma-related details are assessed. Many clinicians are hesitant to ask questions during the initial clinical assessment related to the specific details of the primary traumatic event (e.g., exposure to severely injured individuals, human remains) because of concerns that the patient will become distressed. The use of a structured clinical interview and standardized self-report measures can decrease patient distress by providing structure to the assessment process. In addition to a general clinical interview, there are a number of structured clinical interviews as well as objective self-report measures for the assessment of combat-related PTSD (Kaloupek et al., 2010).

Clinician Administered PTSD Scale (CAPS)

The CAPS is a 45- to 60-min structured interview developed to assess the severity of PTSD (Blake et al., 1995). It is a 30-item instrument that contains separate 0–4 frequency and intensity scales for the 17 symptoms of PTSD in Criterion B, C and D of the DSM-IV. The CAPS correlates well with self-report measures of subjective distress, and it is sensitive to symptom improvement in treatment studies (Weathers, Ruscio, & Keane, 1999; Weathers, Keane, & Davidson, 2001).

PTSD Symptom Scale, Interview Version (PSS-I)

The PSS-I is a 20-min, 17-item clinical interview that evaluates each of the DSM-IV PTSD symptoms during the

past 2 weeks on a combined frequency/severity scale (Foa, Riggs, Dancu & Rothbaum, 1993). The PSS-I is comparable to the CAPS yet takes considerably less time to administer (Foa & Tolin, 2000). Each symptom is rated on a 4-point scale ranging from 0 (not at all) to 3 (very much) resulting in a total score ranging from 0 to 51. The PSS-I is psychometrically sound and is positively correlated with measures of trauma, depression and anxiety (Foa et al., 1993). As compared with the Structured Clinical Interview for DSM-III-R (SCID), the PSS-I correctly identified the PTSD status in 94% of subjects. There is also a self-report version of the PSS-I, the PTSD Symptom Scale, Self Report (PSS-SR). The PSS-SR was originally developed by Foa et al. (1993), and later modified to assess both frequency and severity of symptoms (Falsetti, Resick, Resnick, & Kilpatrick, 1993 as cited in Coffey, Dansky, Falsetti, Saladin, & Brady, 1998).

PTSD Checklist-Military Version (PCL-M)

The PCL-M is a 17-item self-report measure that evaluates how much participants have been bothered by PTSD symptoms in the past month as a result of a traumatic event (Weathers, Litz, Herman, Huska, & Keane, 1993). Each item of the PCL-M is scored on a 5-point scale ranging from 1 (“not at all”) to 5 (“extremely”) resulting in a total score ranging from 17 to 85. The measure is divided into three subscales: re-experiencing symptoms (items 1–5); avoidance/emotional numbing symptoms (items 6–12); and hyperarousal symptoms (items 12–17). In the most recent studies using the PCL-M to assess combat-related PTSD in service members injured in Iraq or Afghanistan (Grieger et al., 2006; Hoge et al., 2004, 2008; Smith et al., 2008) subjects were categorized as positive for PTSD if they reported at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms, each present at the level of moderate or higher during the past month, and if they received a total severity score of 50 or higher. The PCL-M is psychometrically sound (Keen, Kutter, Niles, & Krinsley, 2008). This is the instrument recommended to assess posttraumatic stress in military members by the VA/DoD Clinical Practice Guideline for the Management of Post-Traumatic Stress (Department of Veterans Affairs (VA) & DoD, 2004).

Primary Care PTSD (PC-PTSD)

The PC-PTSD is a 4-item self-report measure that asks about intrusive thoughts, avoidance behaviors, hypervigilance, and numbing symptoms over the past month consistent with the DSM-IV diagnosis for PTSD (Calhoun

et al., 2010; Prins et al., 2003; Ouimette, Wade, Prins, & Schohn, 2008; van Dam, Ehrling, Vedel, & Emmelkamp, 2010). Each item of the PC-PTSD is scored “yes” or “no.” Scores can range from 0 to 4.

The VA/DoD Clinical Practice Guideline for the Management of Post-Traumatic Stress recommends the PC-PTSD as a PTSD screening tool with a score of 2 or greater being considered a positive screening for possible PTSD (VA & DoD, 2004). The PC-PTSD questions are also part of the DoD mandated Post-Deployment Health Assessment (PDHA) and Reassessment (PDHRA) administered to all service members within 1–2 weeks and again within 3–6 months of returning from combat operations.

The use of the 4-item PTSD and the PCL-M as screening tools for PTSD was validated by comparing them to a structured interview in soldiers returning from a combat deployment (Bliese et al., 2008). Either two or three “yes” responses on the PC-PTSD and scores between 30 and 34 on the PCL-M yield the most efficient screening for PTSD in primary care settings. Item analysis of the instruments determined that the most discriminate questions in both instruments were related to symptoms of avoidance.

Post-Deployment Health Assessment (PDHA) and Post-Deployment Health Re-Assessment (PDHRA)

In April 2003, the DoD mandated that all service members complete the Post-Deployment Health Assessment (PDHA; DoD, 2008a) immediately upon return from any deployment to review each service member’s current health (including mental health and psychosocial issues), possible deployment-related exposures, and deployment-related health concerns (Hoge et al., 2006). Questions related to mental health concerns cover PTSD symptoms, depression, suicidal ideation, aggression, and interest in receiving mental health services. The form is completed either electronically or on paper surveys immediately before leaving the country or within 1–2 weeks of returning home. The Post-Deployment Health Re-Assessment (PDHRA; DoD, 2008b) was instituted by the DoD in June 2005 in response to concerns that mental health problems might be missed because of the early timing of the PDHA (Milliken et al., 2007). The PDHRA is given to all service members 3–6 months after return from deployment and is otherwise very similar to the PDHA in content and method of administration. Both the PDHA and PDHRA aim to promote the early identification and needs for treatment of mental health problems among combat veterans; neither is diagnostic for any mental or physical health problem.

Treatment of Combat-Related PTSD

A variety of treatments are available for combat-related PTSD; however, not all approaches have been equally researched. With the significant national interest in PTSD in returning war veterans, knowledge of evidence-based interventions is essential for psychologists working in academic health centers. Unfortunately, with the proliferation of innovative treatment approaches, it is often difficult to differentiate snake oil from penicillin. Many alternative treatments have emerged such as thought field therapy, energy therapy, yoga, animal-based therapies, meditation, tai chi, massage therapy, Reiki, and others. Some of these programs have been implemented in military settings including intensive treatment programs lasting from 2 or 3 weeks to 6 months. Unfortunately, there is little scientific evidence to support the efficacy of these alternative intervention approaches.

One of the reasons for the proliferation of alternative treatments is the lack of randomized controlled trials (RCTs) targeting the treatment of combat-related PTSD in active-duty military personnel. Despite this evidence, the VA/DoD Clinical Practice Guideline (CPG) for the Management of Post-Traumatic Stress (VA & DoD, 2004) has provided recommendations for the treatment of combat-related PTSD based on a panel of subject matter experts. The CPG recommends the use of cognitive behavior therapy (cognitive therapy, exposure therapy, stress inoculation training, eye movement desensitization and reprocessing) and medication (sertraline and paroxetine) as first-line interventions for combat-related PTSD treated in specialty clinic settings.

A limitation of the VA/DoD CPG is that it was not based specifically on a thorough review of the scientific evidence. With concerns about the rising numbers of returning veterans with combat-related PTSD, the VA requested an independent review of the scientific data through the National Academy of Sciences' Institute of Medicine (IOM, 2007). The IOM completed what is arguably one of the most rigorous reviews to date on the scientific evidence on the treatment of PTSD. The IOM committee reviewed nearly 2,800 research abstracts. After the application of criteria to only include the most methodologically sound studies the IOM narrowed the list of studies down to 90 RCTs, 37 pharmacotherapy studies, and 53 psychotherapy studies. In the final report, the IOM committee found that only exposure-based therapies (e.g., Prolonged Exposure and Cognitive Processing Therapy) have enough empirical support to conclude that they are effective for treating PTSD. The IOM also concluded that research on other treatments such as eye movement desensitization and reprocessing, cognitive restructuring, coping skills training, group format psychotherapy, and pharmacotherapy were

not sufficient to determine their effectiveness in treating PTSD. In addition, the IOM concluded that current research on the treatment of PTSD in U.S. veterans is inadequate to answer questions about interventions, settings, and lengths of treatment that are applicable in this specific population.

Prolonged Exposure Therapy

Prolonged Exposure (PE) is the treatment approach with the most scientific support for its efficacy (Foa et al., 1999; Foa et al., 2005; Foa, Rothbaum, Riggs, & Murdock, 1991; Schnurr et al., 2007). PE consists of 10–12 sessions of 90 min each, and the therapy has four main components: psychoeducation, breathing retraining, imaginal exposure, and in vivo exposure (Foa et al., 2007). Patients are educated about the development and treatment of PTSD, are taught slow breathing techniques to promote relaxation, and practice imaginal and in vivo exposure to promote habituation to the feared trauma memory. Although PTSD patients typically avoid thoughts and situations that are reminders of the trauma, PE requires confrontation of trauma memories by having patients repeatedly retell the trauma story (imaginal exposure) and confront feared situations associated with the trauma (in vivo exposure).

One study evaluated the efficacy of PE as compared to stress inoculation training (SIT), the combination of PE and SIT, or a wait list condition for the treatment of female victims of physical or sexual assault (Foa et al., 1999). At posttreatment, only 40% of PE participants met criteria for PTSD compared to 58% of those receiving SIT, 60% in the combined PE/SIT group, and 100% in the wait list condition.

Another study evaluated whether the efficacy of PE might be enhanced by the addition of cognitive therapy (Foa et al., 2005). In this study, female assault survivors were randomly assigned to PE, PE plus cognitive restructuring (PE/CR), and a wait list control. The results indicated that both PE and PE/CR reduced PTSD by about 50% versus only 20% in the wait list condition, and the treatment gains were maintained over the 9-month follow-up period.

PE has also been demonstrated to be effective for the treatment of acute stress disorder. In a study of civilians, 90 patients were randomly assigned to receive five weekly sessions of exposure therapy, cognitive restructuring, or a wait-list group (Bryant et al., 2008). Intent-to-treat analyses indicated that at posttreatment, only 33% of patients in the exposure group had PTSD as compared to 63% in the cognitive restructuring and 77% in the wait-list group.

In contrast to the extensive civilian research on PE, PE research in military personnel is lacking. Case studies have reported the effectiveness of PE for five Israeli veterans with chronic combat-related PTSD (Nacasch et al., 2007),

for three American active-duty personnel in the deployed setting (Cigrang, Peterson, & Schobitz, 2005), and for 10 American veterans treated in a VA PTSD clinic (Rauch et al., 2009). The largest study of PE in military personnel to date found that PE had superior outcomes to a present-centered therapy in female veterans (Schnurr et al., 2007). Though results from Schnurr and colleagues provide important evidence for the effectiveness of PE for military personnel, the study cannot conclude the effectiveness of PE for combat-related PTSD, specifically since the majority of participants' index events were sexual traumas (68%) and only about 6% were war-zone exposures.

Cognitive Processing Therapy

Cognitive Processing Therapy (CPT), another empirically supported treatment for PTSD, consists of approximately 12 one-hour sessions (Resick, Monson, & Chard, 2008). CPT includes psychoeducation about PTSD, cognitive restructuring, and exposure. In the exposure component of CPT, the patient writes an account of the trauma to reread at home and read aloud during therapy. A recent dismantling study of CPT, however, suggests that CPT without the trauma account, or CPT with cognitive therapy only, has similar outcomes to the full protocol (Resick, Galovski, et al., 2008). The cognitive therapy component of CPT begins with an impact statement in which the patient describes the impact of the trauma on his or her perspective of self, others, and the world (Resick, Monson, et al., 2008). The impact statement helps to identify maladaptive cognitions about the trauma, such as "it's all my fault" and "I can't trust anyone." These cognitions can emerge when a traumatic experience does not make sense in the context of previous beliefs. Throughout therapy, problematic cognitions are identified and challenged through Socratic questioning until more accurate beliefs about self, others, and the world replace any distorted cognitions. The last few sessions of CPT focus on cognitions related to specific topics that are often particularly problematic in PTSD, including safety, trust, power, esteem, and intimacy (Resick, Monson, et al., 2008). CPT is based on information processing theory, which suggests that networks of fear consist of stimuli, responses, and the interpretation of the meaning of stimuli and responses (Lang, 1977). As in PE, CPT involves confronting the feared situation. However, in PE, confrontation itself is seen as sufficient to provide enough new information to modify the fear memory structure. Rather than relying on confrontation to spontaneously cause change in cognitions, CPT directly targets change in cognitions through an emphasis on cognitive restructuring (Resick & Schnicke, 1992).

Similar to PE, research supporting the effectiveness of CPT for PTSD is primarily in the civilian population.

Wait-list controlled trials have additionally found that CPT is effective for treating PTSD in sexual abuse survivors (Chard, 2005; Resick & Schnicke, 1992) and incarcerated males (Ahrens & Rexford, 2002). Furthermore, a large randomized controlled trial comparing PE, CPT, and a minimal attention control group found that 80% of participants treated with PE or CPT no longer met criteria for PTSD at the posttreatment point, and these treatment gains were maintained over the 9-month follow-up period (Resick et al., 2002). One study evaluated the efficacy of CPT for the treatment of military veterans ($N = 60$) as compared to a wait-list condition (Monson et al., 2006). The results indicated that 40% of the sample receiving CPT no longer met criteria for a PTSD diagnosis at the posttreatment assessment.

In summary, PE and CPT are the two treatments with the strongest empirical support for their efficacy in civilian populations. Randomized clinical trials of PE and CPT for civilian traumas have found large effect sizes, and in most studies the majority of patients are treated to the point of remission or loss of diagnosis. Indeed, recent data from Resick et al.'s (2002) original RCT comparing PE and CPT have indicated that about 80% of participants in each group have continued to do well and no longer meet criteria for PTSD at the 5-year follow-up point (Resick, 2010). However, much less is known about the treatment of combat-related PTSD. Most studies have included already discharged military veterans (e.g., Vietnam veterans) and the effect sizes have been considerably smaller than those in studies of civilians (Keane, Fairbank, Caddell, & Zimmerman, 1989; Schnurr et al., 2007). It is not known if these differences are because (1) combat trauma is uniquely different and more difficult to treat than civilian trauma, (2) published studies have treated veterans decades after the initial trauma exposure, (3) there are often significant comorbid conditions (e.g., substance abuse, chronic medical conditions, homelessness, etc.) in military veterans, or (4) many military veterans are receiving disability compensation for their PTSD.

Pharmacological Treatment

Pharmacological treatments are one of the most commonly used approaches for the treatment of PTSD. Although combined medication and psychotherapy are commonly used in most clinical settings, no published studies to date have directly compared the individual or combined efficacy of pharmacotherapy and psychotherapy. Paroxetine and sertraline are two selective serotonin reuptake inhibitors (SSRIs) that have been approved by the Food and Drug Administration for the treatment of PTSD. These same two medications are recommended by the VA/DoD CPG for the Management of Post-Traumatic Stress (VA & DoD, 2004).

These guidelines are currently being revised and are scheduled to be published in 2011.

Although many RCTs of medications have been conducted, three of the seminal studies provide a representative perspective of the overall research evidence. The efficacy of paroxetine was evaluated in a double-blind, placebo-controlled study ($N = 307$) of civilians with PTSD (Tucker et al., 2001). At week 12, the paroxetine group showed significantly greater reduction of PTSD symptoms (29%) as compared to the placebo group (16%). Although paroxetine was significantly more effective than placebo, the effect size and amount of reduction in PTSD symptoms were considerably lower than has been found in studies of PE and CPT.

Similar results were found in a double-blind, placebo-controlled study of sertraline in a sample of civilians ($N = 208$) with PTSD (Davidson, Rothbaum, van der Kolk, Sikes, & Farfel, 2001). At the 12-week point, 60% of the participants receiving sertraline were considered responders as compared to 38% for placebo. However, another double-blind, placebo-controlled study of military veterans ($N = 169$) was unable to demonstrate the efficacy of sertraline in the treatment of PTSD (Friedman, Marmar, Baker, Sikes, & Farfel, 2007). This study was conducted in a VA clinic setting involving patients with predominantly combat-related PTSD. The results indicated that there were no significant differences between sertraline and placebo on any of the primary or secondary efficacy measures at endpoint.

In terms of general clinical practice with psychopharmacologic interventions, providers typically target key PTSD symptom clusters and seek to use medication interventions to address these symptoms as opposed to the underlying etiology. Although there are several published recommended algorithms for pharmacologic treatment of PTSD, such as the International Psychopharmacology Algorithm Project's rubric (Davidson et al., 2005), typically providers follow a more symptomatic approach driven by general guidelines. Specifically, all medication interventions should include an evidence-based psychotherapy component. When initiating medication management, a risk-benefit analysis should be conducted. First-line medication interventions should be monotherapy with either an SSRI or a serotonin-norepinephrine reuptake inhibitor. Monotherapy should be optimized with appropriate titration of dosages before progressing to polypharmacy (Benedek & Ursano, 2009). Augmenting agents for consideration include atypical antipsychotics, tricyclic antidepressants, and other antidepressants such as trazodone and mirtazapine. Augmenting strategies should be driven by symptom presentation. Lastly, benzodiazepines, while very efficacious in the treatment of acute anxiety often associated with PTSD, are typically avoided as a long-term treatment strategy for PTSD due to the risk of

tolerance and dependence and the medication's potential to undermine exposure-based treatment interventions.

Adrenergic agents such as Beta-blockers showed initial promise in the mitigation of the length and severity of PTSD illness if administered in a critical period immediately succeeding the traumatic event (Pitman et al., 2002), but more recent evidence has been more ambiguous about its efficacy (Stein, Kerridge, Dimsdale, & Hoyt, 2007). Alpha-blockers such as prazosin have shown great promise in the treatment of PTSD related nightmares and are often included in a clinical approach to PTSD when such sleep disturbances are present (Miller, 2008). Although many providers will also use anticonvulsant medicines in the treatment of PTSD to assist with mood stability, there are no studies in the literature to support this practice.

Dissemination of Evidence-Based Practices for the Treatment of PTSD

Despite the development of effective treatments for PTSD, most returning service members are not receiving even minimally adequate treatment (Tanielian & Jaycox, 2008). At least part of this problem stems from several dissemination problems. Many therapists do not offer evidence-based treatments because they have not received training in them (Shafran et al., 2009), and training in evidence-based practices at the graduate level is insufficient (Gunter & Whittal, 2010; Weissman et al., 2006; Woody, D'Souza, & Dartman, 2006). Furthermore, training for experienced therapists is not widely available, and when it is available, time and money may not be available to support participation (Gunter & Whittal, 2010; Shafran et al., 2009).

In addition to training shortfalls, improving the dissemination of evidence-based practices for PTSD will require attention to three additional types of barriers: patient concerns about potential treatment complications; the concerns and opinions of therapists regarding the treatment approaches (Cook, Schnurr, & Foa, 2004); and the lack of organizational support such as lack of time to attend training, lack of training opportunities, lack of supervision of new skills, and lack of support for specific practices (Rauch et al., 2009; Ruzek & Rosen, 2009).

Therapists' personal beliefs about specific treatments, concerns about the artificiality of RCTs, and lack of motivation to change can prevent adoption of evidence-based practices for PTSD (Addis, Wade, & Hatgis, 1999). Becker, Zayfert and Anderson (2004) found in their survey of licensed psychologists that despite interest and training in exposure therapy, only a small minority (17%) reported using it to treat PTSD. A number of barriers to use were identified. A lack of training was the main reason, but the sample also indicated reluctance to use the approach due to

concerns over contraindications and complications related to treatment.

Rosen et al. (2004) also reported low endorsement of the use of PE among VA providers, despite its indication as a first-line treatment approach in the International Society for Traumatic Stress Studies practice guidelines (Foa, Keane, & Friedman, 2000). One of the reasons therapists gave for their reluctance was their concern that patients will worsen through exposure therapy. Cahill, Foa, Hembree, Marshall, and Nacasch (2006) reported that the research evidence to date indicates that exposure therapy reduces the likelihood of symptom worsening and that the worsening observed after exposure therapy is not any higher than after other treatments. Further, when symptom worsening occurred, it was not associated with either worse treatment outcomes or with increased dropout rates. Effective dissemination efforts for exposure therapy will need to confront misinformation about potential harm with discussion of research findings that debunk such myths (Cahill et al., 2006; Cook et al., 2004).

Therapists may also hold beliefs that may lead them to doubt the applicability of RCTs to clinical practice (Gunter & Whittal, 2010). They may perceive the patients treated in trials as having less severe symptoms and fewer comorbid problems than patients they see. They may also perceive RCTs' greater availability of therapist resources such as supervision, lower clinical loads, and regular outcomes monitoring to be too dissimilar to their clinical setting (Shafran et al., 2009).

Therapist concerns may be best addressed through training and supervision in supportive practice organizations. Practicing within a network of providers who have experience with a therapeutic approach and with expert supervision available can alleviate such clinical concerns. In addition, trainers can address concerns and myths regarding treatment approaches in a way that alleviates therapists' concerns.

Organizational dissemination efforts include both top-down policy approaches and bottom-up training-focused models. Beginning in 2006, the VA and the DoD rolled out intensive workshop trainings in CPT and PE. Psychologists working in academic health settings would benefit from receiving training in at least one of these treatment approaches. The Center for Deployment Psychology at the Uniformed Services University in Bethesda, Maryland offers workshop training in PE, CPT, and other topics to allow civilian psychologists to provide high-quality deployment-related behavioral health services to military personnel and their families (see www.deploymentpsych.org). Although thousands of VA and DoD therapists have been trained to date, these various methods of training and supervision have not been formally evaluated through either treatment adherence monitoring or patient outcomes evaluation.

Research studies with smaller, community-based clinics also offer evidence of effective dissemination of PE. Foa et al. (2005) report successful dissemination of PE at academic- and community-based treatment centers for female assault victims. The study provided therapists with an initial five-day training in PE with weekly supervision and two-day booster workshops every 6 months for the first 2 years. The therapists' treatment-adherence ratings indicated competency in the treatment, and the treatment was highly effective in reducing patients' PTSD severity.

Gunter and Whittal (2010) propose a four-step model of dissemination for cognitive behavioral treatments of anxiety that is likely to transfer to implementation efforts for PTSD treatment practices. After accumulating an evidence base through efficacy studies, transportability studies, dissemination studies, and system evaluation research that addresses treatment effectiveness, cost effectiveness, and patient satisfaction variables (Chorpita & Nakamura, 2004), support should be sought based on appeals to clinical practice guidelines and cost effectiveness. Such support would come from professional development organizations, government bodies, and private health insurance companies. Health care organizations in particular should be strong advocates of treatments that are both efficacious and cost effective. Strong support from the government could also quell individual provider resistance to practice change. After garnering the necessary support for use of specific practices, training and implementation should take place, followed by a feedback loop to research and development to further refine practices based on patient and therapist input.

It is clear that awareness of the research evidence and the provision of training at workshops are not sufficient to promote widespread adoption of a specific treatment. In order to promote the adoption of effective treatments, dissemination approaches must be developed and evaluated. Effective dissemination requires attention to patient, therapist, and organizational barriers, including the availability of funding for training and organizational support for implementation of new practices (Gunter & Whittal, 2010). Future research can improve our knowledge of effective dissemination of evidence-based practices for PTSD by addressing each of these types of barriers through training content and when designing implementation efforts.

Opportunities and Challenges for Psychologists in Academic Health Centers

Many returning war veterans with PTSD retire or separate from active-duty military service and return to communities throughout the United States. Many of these military

veterans are either not eligible for military or VA health-care or are located in communities where these services are not available. Psychologists working in academic health settings have the opportunity to offer services to these veterans with combat-related PTSD. However, these psychologists have the ethical obligation to ensure they have been adequately trained to provide the highest quality evidence-based treatments.

One of the most significant challenges is the lack of outcome data on treating combat-related PTSD in active-duty military personnel and recently discharged veterans. Research psychologists working in academic health settings have the opportunity to conduct research on the assessment and treatment of combat-related PTSD. Considerable funding opportunities exist through the National Institute of Mental Health and the DoD to support research in this area. The STRONG STAR Multidisciplinary PTSD Research Consortium received DoD funding in 2008 from the Office of Congressionally Directed Medical Research Programs' Psychological Health and Traumatic Brain Injury Research Program to develop and evaluate approaches for the prevention and treatment of combat-related PTSD in active-duty military and recently discharged OIF/OEF veterans (see www.strongstar.org). South Texas Research Organizational Network Guiding Studies on Trauma And Resilience (STRONG STAR) is comprised of 16 research studies including 8 clinical trials. Studies are evaluating variations of PE and CPT treatment formats (intensive daily treatment, group treatment, couples treatment), treatment locations (in garrison, in deployed locations, in primary care settings), and treatment for patients with a variety of comorbid conditions (alcohol abuse, chronic pain, burn). The results of the STRONG STAR studies will address many of the currently unanswered questions regarding the treatment of combat-related PTSD. Undoubtedly, this research will also identify additional questions and challenges to be addressed by future investigations, some of which may provide opportunities for psychologists working in academic health settings.

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