



## Prolonged exposure therapy for combat-related posttraumatic stress disorder: An examination of treatment effectiveness for veterans of the wars in Afghanistan and Iraq

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### ABSTRACT

The Veteran's Health Administration (VHA) has launched a large-scale initiative to promote prolonged exposure (PE) therapy, an evidence-based treatment for PTSD. While existing randomized controlled trials (RCTs) unambiguously support the efficacy of PE in civilian and some military populations, there is a need to better understand the course of treatment for combat Veterans of the current wars receiving PE in normative mental healthcare settings. The current study investigates 65 Veterans receiving care at an urban VA medical center. All Veterans were diagnosed with PTSD via a structured interview and treated with PE. Measures of PTSD and depression were collected pre- and post-treatment and every two sessions during treatment. Dependent means *t*-tests were used to estimate pre- and post-treatment *d*-type effect sizes. Additionally, hierarchical linear models (HLM) were used to investigate treatment effects over time, relationships between patient characteristics and outcomes, and to provide estimates of  $R^2$ -type effect sizes. Results indicate that PE in regular VA mental healthcare contexts can be as effective as when implemented in carefully conducted RCTs.

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As of December 2009 over two million Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) U.S. troops have been deployed overseas (Defense Manpower Data Center, 2009). Of those who have returned, as many as 20% appear to be suffering from mental health difficulties, inclusive of combat-related posttraumatic stress disorder (PTSD; Hoge, Auchterlonie, & Millikin, 2006; Army Surgeon General's MHAT-V, 2008; Rand Center for Military Health Policy, 2008); and as many as half of those meeting criteria for PTSD or depression seek mental healthcare (Rand Center for Military Health Policy, 2008). Within the next decade, there will likely be hundreds of thousands of Veterans seeking psychiatric services within the Veteran's Health Administration (VHA). In anticipation of this potential influx, the VHA has increased efforts to address the trauma-related symptoms of its Veterans, including large scale initiatives to train VA clinicians in the use of empirically supported treatments for PTSD (VA, 2009).

Existing studies support efficacy of exposure therapy for civilians (Foa et al., 1999, 2005; Marks, Lovell, Noshirvani, Livanou, & Thrasher, 1998; Resick, Nishith, Weaver, Astin, & Feuer, 2002) and Veterans (Cooper & Clum, 1989; Keane, Fairbank, Caddell, & Zimering, 1989; Schnurr et al., 2007) with PTSD. The most recent VA/Department of Defense (DoD) Clinical Practice Guidelines identified exposure therapy as one of the four evidence-based psychotherapies for PTSD (VA/DoD, 2004), and the Institute of Medicine recognized exposure therapies as the only treatment approach with sufficient efficacy data for combat-related PTSD (IOM, 2007). In this regard, exposure therapy is broadly considered the frontline intervention for combat-related PTSD.

Despite the evidence base for efficacy of exposure-oriented therapies, it has been noted that such interventions are not routinely incorporated into VA clinical practice. In a survey of six large VA Medical Centers (VAMCs), Rosen et al. (2004) found that use of psycho-education and coping skills training were frequently reported by VA clinicians. However, few clinicians (i.e., less than 5%) reported routine use of exposure-based interventions for PTSD. These study findings are consistent with the broader dissemination literature that suggests many public-sector settings do not

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adequately or consistently use evidence based practices, particularly with regard to the treatment of PTSD (Drake et al., 2001; Frueh et al., 2001; Frueh, Grubaugh, Cusack, & Elhai, 2009; Hanson, Hesselbrock, Tworowski, & Swan, 2002).

In light of the anticipated influx of returning Veterans with PTSD and VHA's recent initiatives to incorporate the use of empirically supported treatments for PTSD into clinical practice, there is a need to better understand how OEF/OIF Veterans receiving services at VAMC's will respond to empirically validated treatment. Few recent PTSD treatment outcome studies within the VA have included meaningful numbers of OEF/OIF Veterans (Frueh et al., 2007; Rauch et al., 2009; Ready et al., 2008; Schnurr et al., 2007; Tuerk, Yoder, Ruggiero, Gros, & Acierno, 2010). Beyond questions about how OEF/OIF Veterans, in particular, will respond to evidence-based treatment, there is also a need to ensure that empirically supported treatments, such as exposure therapy, can be effectively implemented in VA healthcare settings by VA providers. Such data would serve to bridge the longstanding gap between research and practice and assist Veterans to receive the best possible care for their trauma-related mental health needs.

The current study presents clinical outcome data on 65 OEF/OIF Veterans treated with the manualized Prolonged Exposure (PE) intervention for PTSD (PE; Foa, Hembree, & Rothbaum, 2007) by VA clinicians. These data are timely as, to the authors' knowledge, there are no published studies on the efficacy or effectiveness of exposure therapy for combat-related PTSD using an exclusive sample of OEF/OIF Veterans. However, given recent dissemination efforts within VA healthcare settings, we anticipate a number of effectiveness studies in the near future. The results of the current investigation, and of those to come, can be used to inform a broad understanding of the relative effectiveness of PE for OEF/OIF-related PTSD as well as an understanding of how patient characteristics may interact with treatment outcomes.

## 1. Methods

### 1.1. Study overview

The current investigation is a *post hoc* effectiveness study using archival data from patients treated by a PTSD Clinical Team (PCT) in an urban VA Medical Center (VAMC). All Veterans were diagnosed with combat-related PTSD and treated with PE as part of their routine clinical care. Measures of PTSD and depression were collected pre- and post-treatment, as well as every 2 weeks during treatment. Veterans were not subject to protocol-driven exclusion criteria or given incentives to participate in treatment. This study was conducted with full approval from relevant Institutional Review Boards (IRBs).

### 1.2. Sample and treatment setting

The current sample consists of 65 OEF/OIF Veterans: 11% Female; 39% Black, 57% White; 5% Hispanic, mean age, 31.77 years ( $SD=8.19$ ). Two outliers in the age distribution exerted disproportional influence on the mean age; the modal age of the sample was 27. Sixty-seven percent (67%) of the sample had a service-connected disability rating for PTSD or were in the process of applying for such disability compensation during treatment. Table 1 displays patient characteristics including military branch and the result of PTSD disability rating for those who applied. Patients were identified for treatment through referrals from primary care providers, general mental health providers, and case managers to the PCT. Patients were then formally assessed and a PTSD diagnosis via the Clinician Administered PTSD Scale (CAPS, Blake et al., 1995) was confirmed before assignment to treatment.

Therapist assignment was based on provider availability in line with normative operating procedures of an outpatient psychotherapy clinic. The current sample represents all OEF/OIF patients with a combat-related trauma assigned to a PE provider between 8/3/07 and 10/28/09. All patients were treated by two clinical psychologists and one social worker (MSW) with specialized training in trauma work and in PE. Treatment sessions were not coded for treatment fidelity; however, therapists participated in weekly group supervision as part of routine clinical practice to guard against therapist drift in skills.

### 1.3. Intervention

Prolonged Exposure (PE; Foa et al., 2007) is a manualized, 90-min, weekly, treatment protocol that consists of the following major components: (a) psycho-education regarding common reactions to trauma and a detailed rationale for treatment; (b) self assessment of anxiety using subjective units of distress (SUDs); (c) repeated *in vivo* exposure to situations avoided due to distress; and (d) repeated, prolonged imaginal exposure to traumatic memories followed by processing or discussion of the memories. *In vivo* exposure involves having the patient approach a hierarchy of feared, but safe, trauma-related situations as homework between sessions. Imaginal exposure involves assisting patients to repeatedly recount their traumatic event(s) in detail, while vividly imagining the event(s). Treatment sessions are audio-taped for patients to review between sessions for additional exposure. Because the current investigation is an effectiveness study of PE conducted with Veterans in the ecological context of a PCT clinic, the length of treatment varied by patient and was informed by ongoing psychometric assessment and collaborative evaluation of progress.

### 1.4. Measures

*PTSD Checklist–Military Version* (PCL-M; Weathers, Huska, & Keane, 1991). The PCL-M is a 17-item self-report measure of PTSD symptoms based on *DSM-IV* criteria. Scores on the PCL-M range from 17 to 85 with higher scores reflecting greater PTSD severity. The instrument has good diagnostic efficiency ( $>.70$ ) and robust psychometric properties (Blanchard, Jones Alexander, Buckley, & Forneris, 1996).

*Beck Depression Inventory-II* (BDI-II-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item self-report measure that assesses behavioral and affective symptoms of depression. Scores on the BDI-II range from 0 to 63 with higher scores reflecting greater depression severity. The BDI-II demonstrates adequate convergent validity, discriminant validity, test–retest reliability ( $r=.93$ ), and good internal consistency ( $\alpha < .92$ ; Beck et al., 1996; Steer & Clark, 1997).

### 1.5. Statistical analyses

Repeated measures, dependent means *t*-tests were used to compare pre–post-treatment effects on the PCL-M and BDI-II for the entire intent-to-treat (ITT) sample and for the treatment completers sub-sample. Statistically significant differences were qualified using *d*-type effect sizes. In the current study, a treatment completer was defined as any patient who completed at least six sessions of PE. The six session benchmark was selected based on prior clinical experience with OEF/OIF patients, many of whom respond to treatment rapidly after the onset of exposure, and thus, do not remain in treatment after they experience significant symptom amelioration. In addition to analyzing pre–post-differences with *t*-tests, hierarchical linear modeling (HLM) was used to analyze the ITT longitudinal data. HLM is a practical strategy for analyzing effectiveness data because the method does not assume

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