Research paper

A psychometric evaluation of the Posttraumatic Cognitions Inventory with Veterans seeking treatment following military trauma exposure

Minden B. Sexton[a,b,*], Margaret T. Davis[a,b,c], Diana C. Bennett[a,b], David H. Morris[a,b], Sheila A.M. Rauch[d,e]

[a] VA Ann Arbor Healthcare System, Ann Arbor, MI, United States
[b] University of Michigan Medical School, Department of Psychiatry, Ann Arbor, MI, United States
[c] Yale University School of Medicine, New Haven, CT, United States
[d] Emory University School of Medicine, Atlanta, GA, United States
[e] Atlanta VA Medical Center, Atlanta, GA, United States

ARTICLE INFO

ABSTRACT

Trauma-related beliefs have salient relationships to the development and maintenance of Posttraumatic Stress Disorder (PTSD) following stress exposure. The Posttraumatic Cognitions Inventory (PTCI) has the potential to be a standard assessment of this critical construct. However, some critical aspects of validity and reliability appear to vary by population. To date, the PTCI has not been psychometrically evaluated for use with military-specific traumas such as combat and military sexual trauma (MST). Based on exploratory and confirmatory analyses with 949 Veterans seeking trauma-focused treatment for military traumas, we found a four factor model (negative view of the self, negative view of the world, self-blame, and negative beliefs about coping competence) provided the best fit. In contrast, the original three factor model was not confirmed. Both models demonstrated convergent and discriminative validity. Although gender was associated with PTCI total and factor scores, differences did not persist after controlling for trauma type. MST was associated with higher PTCI scores even when controlling for gender, though the clinical magnitude of these differences is likely negligible. Internal reliability validity was demonstrated with PTCI total and subscale scores.

1. Introduction

Theory and extant research have identified clinically meaningful connections between negative posttraumatic cognitions and PTSD symptoms. Cognitive models of PTSD suggest that preexisting negative beliefs about the self and others facilitate the development of PTSD by both expediting fear conditioning and maintaining the perceptions of continuing threat and inability to cope (Ehlers and Clark, 2000; Foa and Rothbaum, 1998). Additional cognitive vulnerability models postulate that the distress experienced by individuals with PTSD yields a sense of vulnerability which fosters development of negative beliefs (Shahar et al., 2013). Empirical research has supported a connection between posttraumatic cognitions and the persistence and severity of PTSD symptom. More specifically, studies find that reductions in negative beliefs are associated with decreased PTSD symptoms (Zalta et al., 2014), and that chronic PTSD symptoms are associated with worsening negative cognitions (Dekel et al., 2013). Further, Shahar et al. (2013) identified a cyclical pattern between PTSD symptoms and negative cognitions. Clinical research also suggests that the best validated

interventions for PTSD (e.g., Prolonged Exposure, Cognitive Processing Therapy) result in decreased PTSD symptoms and negative cognitions (Foa and Rauch, 2004; Iverson et al., 2015) and change in thoughts appears to drive symptom change (Kumpula et al., 2016; Schumm et al., 2015). The significance of negative trauma-specific cognitions as mediators of posttraumatic functioning seems clear. As such, it is critical that assessment instruments designed to gauge such cognitions are psychometrically robust.

To this end, Foa and colleagues designed the Posttraumatic Cognitions Inventory (PTCI), a 36-item self-report questionnaire, to assess for and characterize the nature of posttraumatic cognitions (Foa et al., 1999). This widely used measure has the potential to be a standard assessment of this critical construct. Utilizing negative beliefs derived from clinical and theoretical foundations, the authors rigorously evaluated the psychometric properties of the scale with individuals without trauma histories, those with histories of trauma but not experiencing PTSD, and those with moderate or greater severity of PTSD. Their initial analyses yielded a three factor solution with 33 items comprised of three subscales: Negative Cognitions about Self

---

(SELF), Negative Cognitions about the World (WORLD), and Self-Blame (BLAME) subscales. Three original items were included in the initial version of the scale with a recommendation for further evaluation, and not used in scoring. Their initial investigation found excellent internal consistency reliability, high convergent validity with PTSD symptom severity, and good discriminative validity to distinguish between those with and without PTSD following trauma.

Since its introduction, research examining the PTCI has included participants with a wide variety of trauma histories (e.g. Daie-Gabai et al., 2011), including physical and sexual assault (Foa et al., 1999; Van Emmerik et al., 2006) and motor vehicle accidents (e.g. Beck et al., 2004), for which the interpersonal nature of the events may vary. To date, PTCI validation studies have supported three-factor structures and identified acceptable model fit for samples who have experienced assault. However, the BLAME subscale has proven less consistently associated with PTSD symptom severity following non-interpersonal traumas, suggesting that the validity of the PTCI may vary depending on trauma type (Su and Chen, 2008). In addition, results have varied widely with respect to support for using all items of the PTCI and the dependability of items to load on anticipated factors. This evidence, coupled with the frequent use of convenience populations in PTCI validation studies, may limit our conclusions regarding the psychometric constancy of the PTCI with trauma-exposed individuals.

Veterans with exposure to military combat and sexual traumas experience PTSD at higher rates than non-military samples (Kang et al., 2005; Tolin and Foa, 2006), and evidence suggests that negative post-traumatic cognitions are highly prevalent among Veterans presenting for trauma-focused care (Rauch et al., 2009). While military combat traumas (MCT) often share some of the interpersonal aspects of civilian assault trauma, the PTCI has not been empirically evaluated for use in the context of combat trauma. Relatedly, though some psychometric studies are based on physical and sexual assault survivors, it is unknown whether the PTCI will retain its utility following experiences of military sexual trauma (MST). The possibility that Veterans' experiences of sexual trauma within the context of military culture differ from those experienced by their civilian counterparts in unique ways that influence cognitions and beliefs concerning self and others warrants consideration. For example, the military prizes unit cohesiveness and bodily strength. As such, survivors of MST may be more likely to believe military peers would be unsupportive of efforts to report assaultive behaviors (Burns et al., 2014; Suris and Lind, 2008). Similarly, those who have experienced MST may be more prone to believing they are to blame for not being able to physically deter an attack. Nonetheless, researchers have been using the PTCI with combat Veterans and identified that the PTCI has clinical utility in mediating associations between PTSD and anger or pain, for example (Germain et al., 2015; Porter et al., 2013). Yet, without establishing the psychometric characteristics of the PTCI for Veterans with military-specific traumas, the generalizability and interpretability of these findings is limited. The current study aimed to address this gap in the literature by evaluating the validity and reliability of the PTCI in a sample of treatment-seeking Veterans and directly contrasted the pervasiveness of negative cognitions between those seeking care for combat and military sexual traumas while taking gender into consideration.

While no currently published studies have examined gender differences in the PTCI among American military Veterans, studies of other populations suggest that significant gender differences exist, particularly for SELF. In a sample of Israeli adults with exposure to heterogeneous trauma types, for example, women reported higher scores on SELF, whereas no differences were found on the PTCI total score or the WORLD or BLAME scales (Daie-Gabai et al., 2011). Similarly, Moser et al. (2007) examined the PTCI among trauma-exposed college students and found that the associations between the WORLD and BLAME scales with PTSD symptoms were no longer significant once gender and other relevant variables were included in the model. Unfortunately, in Veteran populations, gender and trauma type are often conflated as

women Veterans are more likely to present for treatment secondary to sexual trauma while men are more likely to seek care for combat events. To address this concern, we also investigated gender differences on PTCI total and subscale scores with and without controlling for trauma type.

To further assess the psychometric performance of the PTCI with Veterans, we aimed to explore its factor structure in treatment-seeking Veterans and contrasted the performance of our empirically-derived factor model with that originally proposed by Foa et al. (1998). PTCI responses were also compared to self-reported symptom and coping scales to establish convergent validity, and internal reliability was investigated using both models. We hypothesized negative cognitions would be positively correlated with PTSD and depression symptom scales and negatively correlated with a scale of resilient coping.

2. Method

2.1. Participants and procedure

Participants were 949 Veterans presenting for trauma-focused treatment at a Midwestern Veterans Healthcare Administration PTSD specialty clinic between 2006 and 2013. At their initial visit, Veterans completed self-report questionnaires, (including the PTCI), as part of the intake and treatment planning process. In order to investigate the psychometric performance of the PTCI following military-specific traumas, only Veterans with complete PTCIs who endorsed primary combat or military sexual traumas were included in analyses. The VA Ann Arbor Healthcare System's Human Subject Committee approved the research protocol.

2.2. Measures

2.2.1. Posttraumatic Cognitions Inventory (PTCI)

This study utilized the original 36-items of the PTCI developed by Foa et al. (1999). The initial instrument included 33 validated items and three additional items recommended for further assessment. The self-report items contain responses ranging from 1 (*totally disagree*) to 7 (*totally agree*). The original factor structure supported a three-factor model including Negative Cognitions About the Self (SELF, 21 items), Negative Cognitions About the World (WORLD, seven items), and Self-Blame (BLAME, five items). The PTCI has demonstrated adequate convergent and discriminant validity in some samples though the recommendation to retain all of the items has varied by population as previously discussed. In the present analyses, we utilized the 36-item version to explore the factor structure of the PTCI and contrasted our findings with Foa's 33-item version.

2.2.2. PTSD checklist-civilian (PCL-C)

The PCL-C (Weathers et al., 1993) is 17-item self-report assessment of PTSD symptom severity based on DSM-IV-TR (APA, 2000) diagnostic criteria. Items are scored from 1 (*not at all*) to 5 (*extremely*) with participants rating how bothered they have been by the presence of the symptom during the past month with total scores ranging from 17 to 85. The PCL-C has demonstrated adequate reliability and validity (Ruggiero et al., 2003).

2.2.3. Patient health questionnaire-9 (PHQ-9)

Depressive symptoms were evaluated with the PHQ-9 (Kroenke et al., 2001), a nine-item self-report screen. Items responses range from 0 (*not at all*) to 3 (*nearly every day*). Scores above nine are generally considered reflective of moderate or greater symptom severity and scores above 13 suggest a current major depressive episode. The PHQ-9 has demonstrated good reliability and validity (Beard et al., 2016; Inoue et al., 2012; Kroenke et al., 2001).