Predictors of Differential PTSD Treatment Outcomes Between Veteran and Civilian Women After Cognitive Processing Therapy

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Objective: This study used data from a recent randomized clinical trial (RCT) that found differences between women veterans and civilians in posttraumatic stress disorder (PTSD) treatment response, with civilians demonstrating greater improvement than did veterans. Despite having similar PTSD severity scores at baseline, veterans scored roughly 18 points higher than civilians did on the Clinician-Administered PTSD Scale (CAPS) at posttreatment ($p < .01$). This study sought to identify the clinical and treatment variables that were associated with the differential response to treatment demonstrated by the women in the RCT. Method: Veteran ($n = 21$) and civilian ($n = 105$) women with PTSD received cognitive processing therapy (CPT) for PTSD. These secondary data analyses used structural equation modeling to investigate the role of 7 clinical and treatment variables to explain the reduced treatment response to CPT in veterans compared to civilians. Results: Using structural equation modeling, we found that differences in CAPS scores at posttreatment were largely mediated by negative posttraumatic cognitions, as measured by the Posttraumatic Cognition Inventory (PTCI). Although veterans and civilians had similar PTCI scores at baseline, civilians had significantly lower PTCI scores at posttreatment, which predicted lower CAPS scores at posttreatment. This mediation appeared to be at least in part explained by lower treatment expectancies by veterans compared to civilians. Conclusions: Future research should be focused on further understanding and addressing these 2 treatment outcome predictors in an effort to reduce the gap in PTSD treatment outcomes between veterans and civilians.

Keywords: PTSD, trauma, cognitive behavior therapy, treatment response, women veterans

Women who have served in the military are a rapidly growing population with elevated rates of military-related stress, trauma exposure, and posttraumatic stress disorder (PTSD; Street, Vogt, & Dutra, 2009). Prior research has suggested that veterans benefit from treatment less than do their civilian counterparts for a number of mental health disorders, including PTSD (Bradley, Schwartz, & Kaslow, 2005; Morland et al., 2015), depression (Hundt, Barrera, Robinson, & Cully, 2014), and generalized anxiety disorder (Barrera et al., 2015). The current study aims to identify factors that account for differential PTSD treatment response among veteran...
Baseline PTSD Symptoms

One characteristic that may contribute to poorer PTSD treatment response among veterans is higher baseline PTSD symptoms (Scott et al., 2014). Whereas some researchers have found no relationship between baseline symptom severity and PTSD treatment outcomes (Munley, Bains, Frazee, & Schwartz, 1994), other studies have found higher levels of pretreatment PTSD symptoms to be associated with greater treatment benefit (e.g., Karatzias et al., 2007). The current study explores the influence of baseline PTSD symptoms on differential PTSD treatment outcomes.

Comorbid Depression

Another baseline characteristic that may contribute to poorer treatment response among veterans is higher rates of medical and psychiatric comorbidity. Comorbid PTSD and depression among veterans has been associated with increased illness burden, poorer prognosis, and delayed response to treatment (Campbell et al., 2007), but conflicting findings exist. Higher levels of depression have been found to predict better PTSD outcomes (Rizvi, Vogt, & Resick, 2009), less favorable outcomes (Duffy, Gillespie, & Clark, 2007), and no difference in PTSD treatment outcomes (Ehlers et al., 2013). Given the inconsistent findings regarding the role of psychiatric comorbidities in PTSD treatment response, the current study investigates this relationship.

Lifetime Interpersonal Trauma History and Relationship to Perpetrator

Trauma-related factors may also explain the differential treatment response observed between women veterans and civilians. Women veterans have higher rates of and more severe forms of interpersonal trauma exposure (e.g., physical assault, child sexual abuse, adult sexual assault) than do women in the general population (Zinzow, Grubaugh, Monnier, Sufioletta-Maierle, & Frueh, 2007). Interpersonal trauma by a known perpetrator has been strongly associated with a range of negative psychological and physical health outcomes, including more PTSD symptoms (Ullman, Townsend, Filipas, & Starzynski, 2007) and anxiety, dissociation, and physical health complaints (Goldsmith, Freyd, & DePrince, 2012) and is most toxic when the victim is dependent upon the perpetrator for fulfillment of basic needs such as safety (Freyd, 1996). Researchers have suggested that sexual harassment and/or assault experienced during military service, termed military sexual trauma (MST) is more deleterious than is civilian sexual assault because it is an interpersonal trauma often perpetrated by a fellow service member whom the victim is dependent upon for survival (Allard, Nunmink, Gregory, Kles, & Platt, 2011). Furthermore, MST is associated with greater risk for PTSD relative to traumatic sexual events experienced by civilian women (Suris, Lind, Kashner, & Borman, 2007). Given the differences in interpersonal trauma burden between civilians and veterans, we examine lifetime interpersonal trauma exposure as a predictor of differential treatment response.

Repeated Trauma Exposure

Women veterans are vulnerable to repeated trauma exposure, including traumatic experiences before, during, and after their military service (Himmelfarb, Yeager, & Mintz, 2006; Kimerling et al., 2016; Sadler, Booth, Mengeling, & Doebbeling, 2004; Street et al., 2009). Experiencing multiple traumatic events has been associated with more severe PTSD in veterans (Scott et al., 2014). Thus, overall trauma load may account for differential treatment responses between veterans and civilians.

Posttraumatic Cognitions

A final trauma-related factor that may contribute to differential treatment response between veterans and civilians is high levels of negative posttraumatic cognitions at pretreatment. Negative posttraumatic cognitions (e.g., “My life has been destroyed by the trauma”) are dysfunctional thoughts that have been implicated in the development and maintenance of PTSD (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). Negative posttraumatic cognitions are associated with increased PTSD symptom severity (Startup, Makgegenene, & Webster, 2007), and reductions in negative cognitions are associated with reductions in PTSD symptoms (Foa & Rauch, 2004; Kleim et al., 2013; Schumm, Dickstein, Walter, Owens, & Chard, 2015; Zalta et al., 2014). Exposure to MST and betrayal in the context of military service might make women veterans vulnerable to higher rates of negative posttraumatic cognitions compared to their civilian counterparts. For example, the power hierarchy of the military and values around unit cohesion in the military may create more barriers to disclosure for victims of MST, compared to the case for victims of civilian sexual assault. Limited and delayed disclosure of sexual trauma also limits social support (Bradley et al., 2005) and may leave military women vulnerable to self-blame and guilt after sexual assault, thus contributing to negative posttraumatic cognitions. The current study investigates the role of negative posttraumatic cognitions in differential treatment response.

Concurrent Treatment

Engagement in concurrent treatment, including use of psychotropic medication, individual therapy, group therapy, and case management, may be expected to result in more favorable PTSD treatment outcomes. Although Tarrier, Sommerfield, Pilgrim, and
Faragher (2000) found no relationship between the use of psychotropic medication and PTSD treatment outcome, van Minnen et al. (2002) found evidence of a negative association between benzodiazepine use and treatment outcome, with benzodiazepine use predicting dropout. Research on the impact of concurrent treatment on PTSD treatment outcomes has been sparse because most treatment studies exclude participants involved in concurrent psychotherapy treatment; thus, this study examines this relationship.

**Treatment Expectancy**

Treatment expectancy has also been identified as a factor that may impact response to treatment. Studies have found that greater treatment expectancy predicts better engagement in treatment sessions (Meyer et al., 2002) and better treatment outcomes (Dew & Bickman, 2005). Given the eligibility of veterans and active duty military (Monson et al., 2006). Low treatment expectancies may therefore explain poorer treatment outcomes among women veterans relative to civilian women.

**Current Study Hypotheses**

The present study sought to identify factors that may explain the poorer treatment response that was observed among veteran women, compared to civilian women, in a randomized clinical trial (RCT; Morland et al., 2015) of cognitive processing therapy (CPT; Resick, Monson, & Chard, 2007; Resick, & Schnicke, 1992). Given the mixed findings for many of the independent variables, we proposed exploratory hypotheses. We hypothesized that baseline PTSD symptoms, comorbid depression, lifetime interpersonal trauma and relationship to perpetrator, exposure to non interpersonal traumatic and stressful events, levels of negative posttraumatic cognitions, concurrent mental health services, and treatment expectancy would be related to veteran status and, therefore, explain poorer treatment outcomes among women veterans relative to civilian women.

**Method**

**Design**

This study was a secondary analysis of data from a prospective RCT that assessed the noninferiority of full-protocol CPT provided to veteran and civilian women via clinical video teleconferencing (CVT) compared to the traditional, in-person modality (Morland et al., 2015). Assessments were conducted at baseline and 2 weeks, 3 months, and 6 months posttreatment. Noninferiority analyses comparing changes in PTSD symptoms over the course of treatment indicated no significant differences between modalities on treatment outcomes at any time point. See (Morland et al., 2015) for the CONSORT table and a full description of the RCT and clinical outcomes.

**Participants**

The intent-to-treat (ITT) sample was composed of 126 women (21 veterans, 105 civilians) who met study criteria and attended the first session of CPT. Table 1 provides participant demographic and background characteristics. No significant differences were found between veterans and civilians on demographic (age, ethnicity, marital status) or current or lifetime major depressive disorder. Veteran and civilian women with PTSD were recruited through a variety of methods, such as the Department of Veterans Affairs (VA) clinical sites; Vet Centers; community providers; community outreach events; and radio, newspaper, and Internet advertisements. There was one clinical site that participated in the study and seven treatment providers that delivered CPT to study participants. All veterans were receiving care from the VA. Of the veterans, 57.1% served in the Army, 28.6% in the Navy, and 23.8% in the Marines, with 9.5% serving in two branches of the military. Only 4.8% (one woman) served during the Vietnam War era, whereas 33.3% served during Desert Storm or Desert Shield; 71.4% served during the Operation Iraqi Freedom, Operation Enduring Freedom, or Operation New Dawn war era; and 23.8% served in other war eras between Vietnam and Operation Iraqi Freedom. The sample size discrepancy between veterans and civilians is attributable to recruitment challenges.

Study inclusion criteria were a diagnosis of current PTSD as assessed via the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995) and, for those taking psychotropic medications, a stable medication regimen for a minimum of 45 days prior to study entry. The version of the CAPS used corresponded to the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM–IV; American Psychiatric Association, 1994). Exclusion criteria were significant cognitive impairment or history of organic mental disorder, active psychotic symptoms or disorder, active homicidal or suicidal ideation (i.e., hospitalization for suicidality in the past 6 months or active suicide plan and intent to harm), current substance dependence, and unwillingness to refrain from

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Veterans (n = 21)</th>
<th>Civilians (n = 105)</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>42.05</td>
<td>47.30</td>
<td>.065</td>
</tr>
<tr>
<td>Self-reported primary ethnicity</td>
<td></td>
<td></td>
<td>.153</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>16</td>
<td>15.24</td>
</tr>
<tr>
<td>Caucasian</td>
<td>10</td>
<td>50</td>
<td>47.62</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>1</td>
<td>14</td>
<td>14.28</td>
</tr>
<tr>
<td>Otherb</td>
<td>9</td>
<td>22</td>
<td>22.86</td>
</tr>
<tr>
<td>Married</td>
<td>5</td>
<td>26</td>
<td>24.76 .936</td>
</tr>
<tr>
<td>Current major depressive disorder</td>
<td>8</td>
<td>27</td>
<td>25.71 .322</td>
</tr>
<tr>
<td>Lifetime major depressive disorder</td>
<td>17</td>
<td>74</td>
<td>70.48 .594</td>
</tr>
</tbody>
</table>

* Differences between conditions for demographic and other baseline characteristics (p values) were assessed using chi-square tests of independence for categorical or ordinal variables and a t test for the continuous variable age.  

b Included Hispanic, Black, and Native American.
substance abuse during treatment. After meeting study criteria, women were randomized into either the CVT or in-person treatment conditions using a block randomization scheme. Participants provided written VA institutional review board–approved informed consent prior to participating in any study-related activities.

Clinical Outcome Variable: PTSD Symptoms

The primary clinical outcome was posttreatment PTSD severity ratings. The total possible range of CAPS scores is 0–136. In the current study, the mean CAPS score was 67.13 (SD = 16.00, range = 31–104) at pretreatment, indicating a positive PTSD diagnosis, and 40.31 (SD = 25.69, range = 0–102) at posttreatment, which is not indicative of a positive PTSD diagnosis in the total study sample. Cronbach's alpha for total CAPS scores at each time point ranged from .85 to .95.

Exogenous Predictor Variables

History of interpersonal trauma. We used 12 items from the Life Stressors Checklist—Revised (LSC–R; Wolfe, Kimerling, Brown, Chestman, & Levin, 1996) to assess each woman’s lifetime exposure to interpersonal trauma. Each item measured whether a woman had experienced a potentially traumatic event during her lifetime (e.g., emotional abuse, physical assault, sexual assault, victim of hate crime). Of the 12 possible events, women endorsed experiencing an average of 6.04 events (SD = 2.40), with scores ranging from 0 to 11 events. A total of 122 women in the sample reported a history of interpersonal trauma.

History of noninterpersonal traumatic and stressful events. The sum of the remaining 19 items from the LSC–R and one additional item assessing exposure to combat was used as a measure of other traumatic and stressful experiences. Women reported experiencing an average of 10.43 (SD = 3.45) such events during their lifetime, with scores ranging from 1 to 18 events.

Depressive symptoms. Depressive symptoms were measured with the Beck Depression Inventory–II (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II assesses 21 cognitive and emotional symptoms, 14–19 minimal depressive symptoms, 19–29 moderate, and 29+ severe. Scores in this sample ranged from 0 to 55 (M = 27.95, SD = 11.93), indicating moderate levels of depression. Cronbach’s alpha for BDI-II scores was .92.

Concurrent mental health (MH) services. During the pretreatment psychosocial interview, women were asked whether they currently were receiving any of four types of MH services: (a) individual psychotherapy, (b) group psychotherapy, (c) medication management, and (d) case management services. The total number of concurrent MH services was used as a control variable. Women reported accessing an average of 2.76 services (SD = 1.18).

CAPS criterion a codings. Participants were asked to report their most distressing traumatic event, which was used as the primary target of CPT and anchored the CAPS interview across time points. A number of aspects of these traumatic events were rated based on brief descriptions summarized by interviewers, including the nature of the event; developmental period during which the event occurred (e.g., childhood, adolescence, adulthood); and identity of the attacker, such as a stranger (n = 48 of 177), known attacker (n = 65 of 177), or family member (n = 64 of 177). Known attacker was coded as a dichotomous variable (0 = no, 1 = yes). Due to multicollinearity issues, type of index trauma was not included as a predictor in the structural equation modeling (SEM) models.

Intervening Variables

Treatment expectancy. Participants’ beliefs about treatment credibility and expected outcomes were assessed at Session 2 using the four-item Treatment Expectancy Questionnaire (TEQ; Borkovec & Nau, 1972). Scores ranged from 4 to 40, with a mean of 31.25 (SD = 7.71), indicating at least moderate levels of positive expectancies. Cronbach’s alpha was .91.

Posttraumatic cognitions. Negative posttraumatic cognitions were measured at baseline and at posttreatment using the Posttraumatic Cognitions Inventory (PTCI; Foa et al., 1999). This 33-item measure uses a 7-point scale and assesses negative thoughts and beliefs often reported following exposure to traumatic events. PTCI total scores ranged from 34 to 219 (M = 139.20, SD = 38.34) at pretreatment and 33 to 204 at posttreatment (M = 85.90, SD = 39.76), which is similar to PTCI total scores found in other PTSD-positive populations (Foa et al., 1999). Cronbach’s alpha ranged from .95 to .97.

Procedures

Individual CPT was provided via CVT or in person once or twice a week for a total of twelve 90-min sessions. All treatment sessions were conducted in the same modality. All assessments were conducted in person by assessors who were blind to the participant’s treatment condition. Therapist adherence to the CPT protocol and competence were independently reviewed by one of three experienced CPT practitioners and found to be very high as assessed using a standardized rating system (Menez, Cha, Wong, & Morland, 2014). Interrater reliability, as measured by kappa, was 1.00 for fidelity ratings and .67 for competency ratings (intraclass correlation of .92). Adherence to the treatment protocol was very high (99.3%) for 2,703 items across the 325 sessions rated. There were no notable deviations from the CPT protocol.

Women completed baseline assessments, which included a psychosocial interview to collect background and functioning information; a CAPS; and selected modules from the Structured Clinical Interview for DSM–IV (Spitzer, Williams, Gibbon, & First, 1997) for substance use disorder exclusionary criteria and comorbidity diagnoses. A battery of questionnaires assessed other clinical factors such as depressive symptoms, posttraumatic cognitions, and exposure to traumatic life events.

Statistical Analyses

Primary analyses were calculated on data from the 126 women constituting the ITT sample. We used structural equation modeling (SEM) to investigate the role of clinical and treatment variables to explain differential treatment response to CPT. The outcome variable was total CAPS scores at posttreatment. Primary hypotheses focused on the effects of five exogenous variables (history of interpersonal trauma, history of other stressors, pretreatment de-
pressive symptoms, concurrent MH services, and knowing one’s attacker for Criterion A event) as well as two intervening variables (treatment expectancy and negative posttraumatic cognitions during treatment). We focused on (a) whether each variable predicted posttreatment CAPS scores and (b) whether the predictor variable’s inclusion in the model attenuated the effect of veteran status on posttreatment CAPS scores. Model fit was assessed using the model’s chi-square value, comparative fit index (CFI; Bentler, 1990), root-mean-square of approximation (RMSEA; Steiger, 1990), and standardized root-mean-square residual (SRMR). Indicators of good model fit were CFI > .95, RMSEA < .06, and SRMR < .08 (Hu & Bentler, 1999). SEM analyses were conducted in Mplus 7.1 (Muthén & Muthén, 1998–2014). Missing data were handled using maximum likelihood estimation. Results from Little’s missing completely at random test supported no patterns in the missingness of data, χ²(159) = 141.53, p = .836. We used robust estimators to address nonnormality of data. The parent study is registered with clinicaltrials.gov (Morland et al., 2015).

**Results**

Table 2 presents descriptive statistics of all predictor and outcome variables. Chi-square analyses indicated that veterans and civilians did not differ in their primary traumas except for civilians’ (75.0%) being more likely than veterans (52.4%) to report knowing the perpetrators of their index traumas, χ²(1) = 4.36, p = .04. Veterans and civilian participants did not significantly differ in their number of concurrent mental health services or pretreatment CAPS, BDI-II, and PTCI scores. However, significant differences were found between veterans and civilians on treatment expectancies and posttreatment CAPS and PTCI scores (see Table 2).

**Individual SEM Models**

### Baseline regression model (Model 1)

Each predictor was first tested separately in a model that included only pretreatment CAPS and veteran status. All SEM models fit the data well (see Table 3). The baseline regression model (Model 1) is depicted in Figure 1a. Results showed that baseline CAPS scores did not differ significantly between groups; however, veterans scored significantly higher than did civilians on posttreatment CAPS after controlling for baseline CAPS scores. The subsequent models tested whether higher levels of interpersonal trauma, noninterpersonal traumatic and stressful events, baseline depressive symptoms, concurrent MH services, knowing one’s attacker, lower treatment expectancy, and higher levels of posttraumatic cognitions were related to veteran status and predicted poorer PTSD treatment response.

**History of interpersonal trauma (Model 2).** Lifetime history of interpersonal trauma was added to the baseline model. Results indicated that a history of interpersonal trauma significantly predicted both pre- and posttreatment CAPS scores (see Figure 1b). However, the effect of veteran status on posttreatment CAPS remained significant (p = .004). Because interpersonal trauma predicted posttreatment CAPS, it was retained in later models.

**History of noninterpersonal traumatic and stressful events (Model 3).** We tested the effect of lifetime history of noninterpersonal traumatic and stressful events (see Figure 1c), which did not significantly predict either pre- or posttreatment CAPS or alter the effect of veteran status on posttreatment CAPS (p = .007) and therefore was not retained in subsequent analyses.

**Pretreatment depressive symptoms (Model 4).** Model 4 assessed the effect of BDI-II scores on CAPS outcomes (see Figure 1d). Pretreatment BDI-II scores were related significantly and positively to pretreatment CAPS scores (p < .001). However, they did not significantly predict posttreatment CAPS scores and did not affect the relationship between veteran status and posttreatment CAPS scores (p = .002). BDI-II scores were not used in subsequent models.

**Concurrent MH services (Model 5).** As depicted in Figure 1e, the number of concurrent MH services did not predict either pre- or posttreatment CAPS scores and did not alter the relationship between veteran status and CAPS at posttreatment (p = .003). Therefore, the variable was not retained in later analyses.

**Criterion A: Known attacker (Model 6).** Whether a woman reported knowing her attacker did not predict either pre- or posttreatment CAPS scores (see Figure 1f) or change the strength of the relationship between veteran status and posttreatment CAPS (p = .002) and was therefore not used in subsequent models.

**Treatment expectancy (Model 7).** Scores from the TEQ were entered into the baseline model as an intervening variable between veteran status and posttreatment CAPS (see Figure 2a). Veterans scored significantly lower on the TEQ than did civilians (p < .001); however, the TEQ did not predict posttreatment CAPS (p = .104). The indirect effect of veteran status on posttreatment CAPS through the TEQ was not significant (p = .124). We retained the TEQ in the final model due to the significant difference in TEQ scores between veterans and civilians.

**Negative posttraumatic cognitions (Model 8).** The effects of pre- and posttreatment PTCI scores on pre- and posttreatment CAPS scores are depicted in Figure 2b. Baseline PTCI scores did not significantly differ between veterans and civilians (p = .98; see Table 2) and was not included in this model. Higher pre- and posttreatment PTCI scores significantly predicted higher pre- and posttreatment CAPS scores. To increase model fit, we added one parameter based on modification indices: CAPS posttreatment...
scores’ being predicted by pretreatment PTCI scores. The indirect effect of veteran status on posttreatment CAPS scores via post-treatment PTCI scores was significant (unstandardized parameter estimate = 13.43, \(p < .001\)) and reduced the direct effect of veteran status on posttreatment CAPS scores to 4.78 points (\(p = .353\)). Thus, the differences in CAPS outcomes between groups was largely explained by veterans’ demonstrating smaller reductions in posttreatment PTCI scores despite having similar pretreatment PTCI scores.

Table 3  
Model Fit Statistics for All SEM Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictor variable</th>
<th>(\chi^2) statistic</th>
<th>CFI</th>
<th>RMSEA [90% CI]</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Baseline model</td>
<td>(X^2(0, N = 126) = 0, p = 1.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Lifetime history of IPT</td>
<td>(X^2(1, N = 126) = .87, p = .38)</td>
<td>1.00 .00 [0.00, .23] .03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Noninterpersonal traumatic events</td>
<td>(X^2(1, N = 126) = .91, p = .34)</td>
<td>1.00 [0.00, .23] .03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 BDI-II at pretreatment</td>
<td>(X^2(1, N = 126) = .19, p = .66)</td>
<td>1.00 [0.00, .18] .01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Concurrent MH services</td>
<td>(X^2(1, N = 126) = .21, p = .64)</td>
<td>1.00 [0.00, .18] .01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Criterion A: Known attacker</td>
<td>(X^2(1, N = 126) = .54, p = .46)</td>
<td>1.00 [0.00, .21] .02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Treatment expectancies</td>
<td>(X^2(1, N = 126) = .21, p = .65)</td>
<td>1.00 [0.00, .23] .01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Posttraumatic cognitions</td>
<td>(X^2(1, N = 126) = .21, p = .90)</td>
<td>1.00 [0.00, .08] .01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Integrated model</td>
<td>(X^2(2, N = 126) = 2.2, p = .58)</td>
<td>1.00 [0.00, .18] .01</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. SEM = structural equation modeling; CFI = comparative fit index; RMSEA = root-mean-square error of approximation; CI = confidence interval; SRMR = standardized root-mean-square residual; IPT = interpersonal trauma; BDI-II = Beck Depression Inventory–II; MH = mental health.

Figure 1. Partial SEM results for exogenous models with unstandardized parameter estimates. SEM = structural equation modeling; veteran status = dichotomous variable indicating civilian (0) or veteran (1); T1 = pretreatment; T2 = posttreatment; CAPS = Clinician-Administered PTSD Scale; IPT = interpersonal trauma; BDI = Beck Depression Inventory; MH = mental health; KA = known attacker. * \(p < .05\). ** \(p < .01\). *** \(p < .001\).
Final Integrated Model

Figure 3 depicts the final model, which included variables in the baseline model plus variables found to be related to posttreatment CAPS and/or veteran status: (a) history of interpersonal trauma, (b) treatment expectancy, and (c) negative posttraumatic cognitions. The effect of veteran status on CAPS scores at posttreatment was reduced from 17.74 points in the baseline model to 4.06 points \((p = .411)\), which is neither statistically nor clinically significant. Similar to the case in Model 8, there was a significant indirect effect of veteran status on CAPS scores at posttreatment via PTCI scores at pretreatment (unstandardized parameter estimate = 10.06, \(p = .001\)), whereby veterans did not show the same reductions in negative posttraumatic cognitions as did civilians.

Discussion

Substantial research efforts have resulted in the development of highly effective PTSD treatments, but there is still room for improvement. A sizable proportion of individuals do not benefit or benefit minimally from these treatments, with 32%–72% not achieving PTSD remission and 30%–51% not achieving clinically meaningful reductions in symptoms (Bradley et al., 2005; Steen-...
produce such differing findings. Negative cognitions and/or treatment expectations, for example, may help explain some of the differences between studies.

As predicted, the veteran women in the current study did report lower treatment expectancy at baseline than did the civilian women, and this explained, in part, the smaller reduction in negative posttraumatic cognitions that was found to fully mediate the decreased treatment benefit experienced by the veteran women on PTSD symptoms. The current study therefore provides support for previous studies of the roles of negative posttraumatic cognitions and poor treatment expectancy on PTSD treatment outcomes (Dew & Bickman, 2005; Foa & Rauch, 2004; Kleim et al., 2013). It is the first study to provide empirical support for the increased levels of these variables in veterans compared to civilians, however. Should these findings be replicated, identifying reasons for the relatively lower treatment expectancy level and negative posttreatment cognitions in veterans will be critical in informing the development of interventions to address them.

Given that CPT is a cognitive therapy and the protocol can be delivered to individuals regardless of military status, trauma history, and cognitive framework, it is somewhat surprising that veterans did not benefit as much as did civilians, in part due to their negative cognitions. However, it may be necessary to identify and then focus the cognitive restructuring work that is done in CPT on these problematic cognitions and expectancies early on in the course of treatment. Some efforts may also be necessary before PTSD treatment begins, for example in a pretreatment psychoeducation and/or cognitive restructuring skills-building intervention to address cognitions and expectancies that might interfere with therapeutic engagement in PTSD treatment. An important variable that remains to be studied is cognitive flexibility. Given that veterans and civilians did not differ in baseline cognitions, it may be that it is in cognitive flexibility that they differ and that this may be related to their differences in treatment expectancy.

This study is one of the first to investigate predictors of treatment outcome disparities between veteran and civilian women and to specifically examine the role of trauma cognitions and treatment expectancy. The exclusion of men as participants in this study limits the generalizability of these findings to women. Therefore, similar research needs to be conducted with men. Other limitations of this study include the relatively small number of veterans compared to civilians in the sample and the omission of other potential predictors of treatment outcomes that many vary between veterans and civilians (e.g., other comorbid psychological and physical health symptoms, prior treatment for PTSD, and childhood experiences of abuse). In addition, although the number of different types of concurrent mental health services was tabulated and compared by group, one or more of those services may have differed by group and/or contributed to outcomes. Finally, the CAPS for the DSM–IV was used in the current study. Future research will benefit from use of the most recent version of the CAPS Scale for the DSM–5 (American Psychiatric Association, 2013).

This study provides initial evidence that negative cognitions could explain the disparity in PTSD treatment outcomes between veteran and civilian women. Further research is needed to replicate our findings and to continue to identify treatment outcome predictors. Such research will also benefit other individuals who share some of the same pretreatment characteristics as do veterans. Future research should focus on further addressing predictors of PTSD treatment outcomes among both veteran and civilian women to improve mental health treatments.

References


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