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A Randomized Clinical Trial of Group Cognitive Processing Therapy Compared With Group Present-Centered Therapy for PTSD Among Active Duty Military Personnel

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Objective: To determine whether group therapy improves symptoms of posttraumatic stress disorder (PTSD), this randomized clinical trial compared efficacy of group cognitive processing therapy (cognitive only version; CPT-C) with group present-centered therapy (PCT) for active duty military personnel. ***Method:*** Patients attended 90-min groups twice weekly for 6 weeks at Fort Hood, Texas. Independent assessments were administered at baseline, weekly before sessions, and 2 weeks, 6 months, and 12 months posttreatment. A total of 108 service members (100 men, 8 women) were randomized. Inclusion criteria included PTSD following military deployment and medication stability. Exclusion criteria

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included suicidal/homicidal intent or other severe mental disorders requiring immediate treatment. Follow-up assessments were administered regardless of treatment completion. Primary outcome measures were the PTSD Checklist (Stressor Specific Version; PCL-S) and Beck Depression Inventory-II. The Posttraumatic Stress Symptom Interview (PSS-1) was a secondary measure. ***Results:*** Both treatments resulted in large reductions in PTSD severity, but improvement was greater in CPT-C. CPT-C also reduced depression, with gains remaining during follow-up. In PCT, depression only improved between baseline and before Session 1. There were few adverse events associated with either treatment. ***Conclusions:*** Both CPT-C and PCT were tolerated well and reduced PTSD symptoms in group format, but only CPT-C improved depression. This study has public policy implications because of the number of active military needing PTSD treatment, and demonstrates that group format of treatment of PTSD results in significant improvement and is well tolerated. Group therapy may an important format in settings in which therapists are limited.

What is the public health significance of this article?
This study comparing two forms of group therapy for posttraumatic stress disorder (PTSD) has public policy implications because of the number of active duty military needing PTSD treatment, and demonstrates that group format of treatment of PTSD results in significant improvement and is well tolerated. Group therapy may be an important format in settings in which therapists are limited.

Keywords: posttraumatic stress disorder, active military, cognitive processing therapy, present-centered therapy, randomized clinical trial

Posttraumatic stress disorder (PTSD) is a serious problem among active duty military personnel (Hoge et al., 2004; Mental Health Advisory Team [MHAT] 6, 2009a, 2009b; Tanielian & Jaycox, 2008). The estimated prevalence of combat-related PTSD among military personnel returning from deployment to Iraq and Afghanistan ranges from 5% (Hoge, Auchterlonie, & Milliken, 2006; Smith et al., 2008) to 45% (Helmer et al., 2007) depending on assessment approach, sample, time frame, and location (Peterson, Wong, Haynes, Bush, & Schillerstrom, 2010). A well-designed observational study of over 18,000 U.S. Army soldiers returning from deployment to Iraq or Afghanistan found that the self-reported prevalence of PTSD was 15% (Thomas et al., 2010). Unlike during the war in Vietnam, the Department of Defense (DoD) and Department of Veterans Affairs (VA) have been assessing and treating PTSD during the wars in Iraq and Afghanistan rather than years afterward. However, most treatment studies are still occurring with veterans who may have had PTSD for many years by the time they are discharged and seek treatment. In contrast to extensive clinical trials conducted among civilians and veterans with chronic PTSD, little research has been conducted on the treatment of PTSD in active duty military personnel from any combat era.

Recent double-blind, placebo-controlled randomized clinical trials (RCTs) of PTSD in military veterans have not found benefits of active medications over placebo, and have suggested that medications may be of limited benefit for combat-related PTSD (Friedman, Marmar, Baker, Sikes, & Farfel, 2007; Krystal et al., 2011). There has been limited PTSD psychotherapy research conducted with active military samples. Although there have been a number of RCTs of military veterans, only three RCTs and a few open trials of therapy for PTSD have been conducted among active military. In the open trials (Cigrang et al., 2011; Engel et al., 2008; Gray et al., 2012), the effect sizes from pre- to posttreatment were large and promising. However, these studies lacked the scientific rigor of an RCT and had small sample sizes and short follow-ups, making it difficult to determine overall treatment efficacy. A small RCT of 20 active duty personnel compared virtual reality graded exposure to unspecified treatment as usual (McLay et al., 2011). The virtual reality group reported greater improvement in clinician-rated PTSD symptoms than the treatment-as-usual group. However, the assessments were nonblinded to condition and there was no follow-up assessment. A larger RCT ($N = 123$) compared a complementary and alternative medicine approach with an unspecified treatment as usual (Jain et al., 2012). The intervention, called "Healing Touch with Guided Imagery," reported large effect sizes. However, without an independent and blinded assessment or a follow-up of any kind, it is unknown whether the results were related to nonspecific effects of treatment and whether they lasted beyond the therapy. The third RCT was an Internet-based self-management intervention compared with supportive treatment with a small sample ($N = 45$) as a proof-of-concept design (Litz, Engel, Bryant, & Papa, 2007).

Cognitive processing therapy (CPT) is an evidenced-based, trauma-focused cognitive therapy for PTSD that has been found to be efficacious in both civilian and veteran RCT studies (Bass et al., 2013; Forbes et al., 2012; Monson et al., 2006; Resick, Nishith, Weaver, Astin, & Feuer, 2002), with long-lasting results over 5 to 10 years (Resick, Williams, Suvak, Monson, & Gradus, 2012). A recent meta-analysis found CPT to have the highest average effect size of any treatment for PTSD (Watts et al., 2013). In a dismantling study of the treatment, a cognitive only version (CPT-C), which does not include written trauma accounts, was shown to be equally effective as CPT (Resick et al., 2008). A recent study of a variable-length CPT treatment found the majority of participants needed fewer than 12 sessions to achieve remission (Galovski, Blain, Mott, Elwood, & Houle, 2012).

Previous research has found limited evidence that PTSD can be successfully treated in a group format (Institute of Medicine, 2008). CPT was originally developed as a group treatment (Resick & Schnicke, 1992), but until recently, no RCT was done using

groups only or with active military. In one RCT using a wait-list control, group CPT combined with individual treatment for adults with childhood sexual trauma (Chard, 2005) showed greater improvement in PTSD symptoms, and the gains were maintained through a 1-year follow-up. An RCT in the Democratic Republic of Congo found group CPT-C to be more effective than individual supportive therapy, even though therapists had low education and the protocol was modified for illiterate participants (Bass et al., 2013). Recently, group CPT-C was found to be efficacious in an equivalence trial comparing in-person and telehealth treatment among veterans (Morland et al., 2014).

Before starting a larger study to compare individual and group CPT-C, it was deemed important to determine whether group CPT-C worked at all in an active duty population, so a portion of the grant sample (our goal was 100) was carved out to conduct this first smaller study. The purpose of the present study was to determine the efficacy of group CPT-C compared with group present-centered therapy (PCT) for PTSD in an active duty military sample. Group PCT for PTSD was chosen to provide an active comparison condition that was quite different from CPT-C. PCT was previously used in two large veteran trials (Schnurr et al., 2003, 2007) and has sufficient empirical support to classify it as an evidence-based treatment (Frost, Laska, & Wampold, 2014). The hypotheses of this study were that CPT-C would demonstrate effectiveness in group settings and would be significantly more efficacious than group PCT.

Method

Participants

Participants were 108 active duty U.S. Army soldiers (100 men, 8 women) seeking treatment for PTSD at the Fort Hood military base, after deployments to or near Iraq or Afghanistan. Patient demographics are shown in Table 1 and did not differ across conditions. Participants were recruited from direct referrals from military providers through their electronic record system or advertisements (see Figure 1, Journal Article Reporting Standards Flowchart; APA Publications and Communications Board Working Group on Journal Article Reporting Standards, 2008). All participants were active duty, activated reservists, or activated National Guard members, age 18 or older, who spoke and read English. Eligibility required experience of a Criterion A traumatic event as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM–IV–TR*; American Psychiatric Association, 2000) that occurred during military deployment. However, the diagnosis of PTSD may have been based on another, worse Criterion A event at anytime in their lives. Participants were stable on psychotropic medications for 6 weeks prior to study entry and, at baseline, were asked to keep their regimens unchanged throughout the treatment period in consultation with their prescribers to minimize potential confounds. To promote voluntary attendance at group sessions and minimize work-related conflicts, patients also received support from their unit commanders to participate.

Exclusion criteria were as minimal as possible. They included current suicide or homicide risk meriting crisis intervention, active psychosis, and moderate to severe traumatic brain injury. Other comorbid conditions (e.g., substance abuse, personality disorders) were not reasons for exclusion.

Instruments

The PTSD Checklist (Stressor Specific Version; PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993) was the primary outcome measure. The PCL-S is a 17-item self-report measure, se-

Table 1
Demographic Characteristics

Characteristic	CPT-C ($N = 56$)	PCT ($N = 52$)	t, χ^2	p
Age, mean (*SD*)	31.8 ± 7.3	32.4 ± 7.9	0.41	0.68
Education			1.88	.39
High school or less	17 (30%)	18 (35%)		
Some college/Associate's degree	36 (64%)	28 (54%)		
College/Graduate degree	3 (5%)	6 (12%)		
Married/Cohabiting	46 (82%)	40 (77%)	0.45	0.50
Male	52 (93%)	48 (92%)	0.01	0.91
Ethnicity/Race			2.70	0.45
Black	11 (20%)	11 (21%)		
Hispanic	5 (9%)	10 (19%)		
White	35 (63%)	27 (52%)		
Other	5 (9%)	4 (8%)		
Months in service	118.7 ± 72.3	129.3 ± 81.3	0.72	0.48
# Deployments	2.0 ± .9	2.3 ± .9	1.35	0.18
Grade			0.06	0.81
E3–E4	20 (36%)	12 (23%)		
E5	15 (27%)	24 (46%)		
E6	12 (21%)	7 (13%)		
E7–E9	7 (12%)	8 (15%)		
WO2–WO5	2 (4%)	1 (2%)		

Note. Tests in the upper section are t with $df = 106$. Tests in the lower section are χ^2 with $df = 1$, except $df = 3$ for Ethnicity/Race. The test for grade is the Mantel-Haenszel χ^2 for linear trend. CPT-C = cognitive processing therapy, cognitive only version; PCT = present-centered therapy.

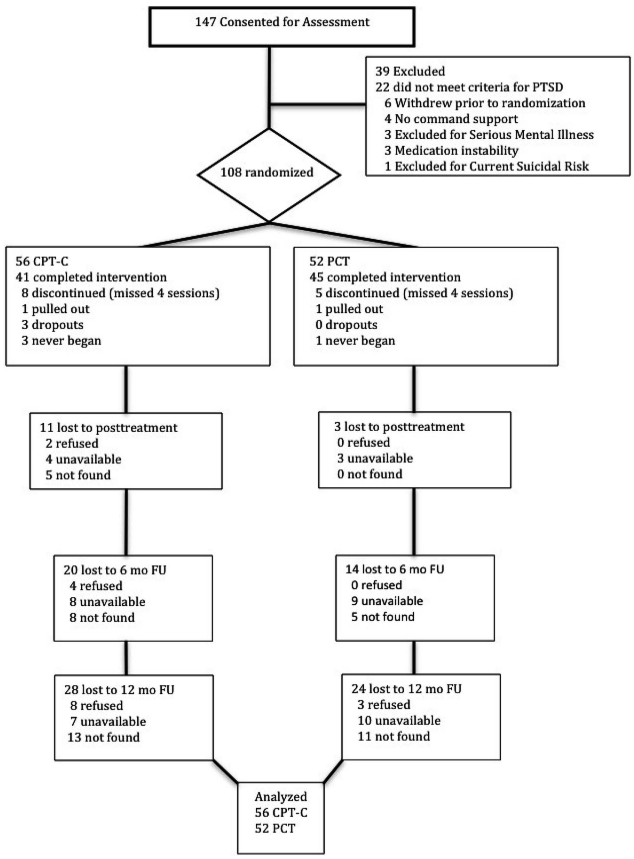

Figure 1. Journal Article Reporting Standards flowchart (APA Publications and Communications Board Working Group on Journal Article Reporting Standards, 2008). CPT-C = cognitive processing therapy, cognitive only version; FU = follow-up; PCT = present-centered therapy.

lected for its dimensional sensitivity, with higher scores (range 17 to 85) reflecting greater PTSD severity. Scoring is based on how much the patient is bothered by the symptoms for the past week on a scale from 1 (*not at all*) to 5 (*extremely*). The PCL-S has good concordance with the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995), which is the gold standard measure of PTSD (Monson et al., 2008; Weathers, Keane, & Davidson, 2001). The standard clinically significant change criteria (Jacobson & Truax, 1991) for the PCL-S is a 10-point change (Monson et al., 2008). The alpha coefficient for the PCL-S for this sample at baseline was .84.

The Beck Depression Inventory II (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item self-report questionnaire widely used to measure the severity of depressive symptoms. The alpha coefficient for the BDI-II for this sample at baseline was .91. The PCL-S and BDI-II were collected pretreatment, weekly during treatment, 2 weeks after treatment, and at 6- and 12-month follow-up periods.

The PTSD Symptom Scale–Interview (PSS-I; Foa, Riggs, Dancu, & Rothbaum, 1993) was used for PTSD diagnosis at pretreatment and repeated posttreatment and at follow-ups. The PSS-I was used rather than the CAPS to reduce assessment burden in an operational active duty military population. It has been recognized as a gold-standard diagnostic assessment similar to the CAPS to be considered as part of common data element assessments for PTSD (Kaloupek et al., 2010). The PSS-I is a 17-item clinical interview that evaluates *DSM–IV–TR* (American Psychiatric Association, 2000) PTSD symptoms on a frequency/severity scale of 0 to 3 (0 = *not at all*; 1 = *once per week or less/a little*; 2 = *2–4 times per week/somewhat*; 3 = *5 or more times per week/very much*). A score of 1 or more over the past 2 weeks counted as a PTSD symptom toward diagnosis. After the items were assessed, there was one item added to determine whether the symptoms had been present for the past month in order to establish the time frame necessary for PTSD diagnosis. The alpha coefficient on the PSS-I at baseline was .71.

The Life Events Checklist (LEC; Gray, Litz, Hsu, & Lombardo, 2004) includes a list of 16 different potentially traumatic life events that that are commonly associated with PTSD symptoms, and was designed to facilitate the diagnosis of PTSD and has good psychometric properties. In this study, the LEC was also used to identify the index event and focus of the PTSD treatment. For each potentially traumatic life event, each nominal point was scored separately, as either 0 (*not endorsed by participant*) or 1 (*endorsed by participant*). For this article, we averaged the number lifetime events experienced, and number of events witnessed. The index event was confirmed by one of the future therapists in a trauma interview that reviewed the LEC used for the PTSD assessment, and determined whether the participant still agreed on the index event as the worst traumatic event resulting in PTSD symptoms.

Procedures

The study was approved by institutional review boards at Brooke Army Medical Center, the University of Texas Health Science Center at San Antonio, and the VA Boston Healthcare System. Data were collected between February 2011 and June 2013. Participants willing to engage in group therapy were prescreened for potential study eligibility. Participants signed informed consent documents and completed diagnostic assessments and self-report measures. Those who met inclusion–exclusion criteria were randomized into CPT-C or PCT groups when 16 to 20 participants had been enrolled, resulting in 8 to 10 participants per group (two groups running simultaneously, with six cohorts total).

Independent evaluators (IEs) with master's or doctoral degrees in psychology were trained to criterion and certified to administer the PSS-I. Each PSS-I was audiotaped. IEs were blind to treatment condition and rarely scheduled to administer multiple assessments to the same participant. A clinical psychologist with extensive research and clinical experience with the PSS-I provided training and reviewed at least two audio-recorded interviews for each IE. IEs were required to have a high level of agreement with the PSS-I trainer (agreement on diagnosis and score within three total severity points). To maintain a high degree of interrater reliability and to prevent drift, IEs rated a randomly selected PSS-I interview, and these ratings were compared with ratings for the two gold-standard raters. The acceptable range for each interview was ±3 points from the average of the two gold-standard raters, as well as agreement on PTSD diagnosis. During these calibration exercises, which were held via weekly teleconference, IEs and trainers discussed their respective ratings. Whenever rater drift was identified, individual feedback was provided to resolve scoring issues. In addition, at least 5% of each IE's interviews were randomly

selected to examine reliability. Interrater reliability was calculated using Cohen's (1960) kappa and an intraclass correlation coefficient (ICC; Shrout & Fleiss, 1979). The gold-standard rater's diagnosis was compared with the IEs' diagnosis for each co-rated interview. The interrater reliability for 80 interviews was very good ($\kappa = .83$). In addition, a two-way random effects ICC based on absolute agreement of total severity scores was excellent (ICC = .97).

Prior to starting therapy, participants met individually with therapists to discuss their trauma history and confirm the index event to target in treatment. Groups met twice weekly for 6 weeks for 90-min sessions with CPT- and PCT-certified therapists. The same therapists were used for both arms of the study. Participants were dropped from treatment if they missed four group treatment sessions, but were asked to continue with the assessments. If they were pulled out of treatment by the military because of deployment, work assignments, or discharge, they were also asked to continue with the follow-up assessments. None of the participants were paid for their involvement in the study or any of the assessments.

Adverse events (AEs) were monitored using a rigorous method similar to medication clinical trials—an approach seldom used in psychotherapy trials (Peterson, Roache, Raj, Young-McCaughan, & the STRONG STAR Consortium, 2013). Prior to each session, participants completed a form to identify significant medical or psychosocial problems or symptoms occurring since the previous session. After each session, therapists assessed whether any clinically significant changes occurred that might qualify as an AE. Psychological symptoms, social issues (e.g., divorce, arrest), physical injuries, and medical illnesses were all considered. Relatedness to study procedures was determined by consensus review with the study team after the therapist discussed relatedness with the participant. Participant-reported increases in PTSD symptoms were counted as an AE if the PCL-S total for that session was at least 15 points higher than at baseline (one standard deviation from baseline). Increased depression was counted as an AE when the BDI-II score for that session was at least 10 points higher than baseline.

Therapists and fidelity. Five female civilian therapists with limited CPT-C experience prior to the trial were trained with an official 3-day CPT workshop and a 1-day PCT workshop. All therapists received regular consultation from the first or second author, who viewed videotapes of sessions, provided detailed feedback, and met for a weekly conference call. Two therapists conducted each group and the pairs were changed throughout the study. All therapists conducted the two types of treatment in approximately equal numbers.

Two clinicians, independent of the study, who were trained in CPT-C and PCT rated a random sample of 35% of the treatment sessions using adherence and competence rating forms modified from previous studies (Chard, 2005; Monson et al., 2006; Resick et al., 2008; Resick & Schnicke, 1992). Twenty percent of these sessions were scored by both raters to establish reliability. Adherence to the two treatment protocols was rated by the presence of essential elements and absence of proscribed elements. For CPT-C, 100% of all unique and essential elements were included in all sessions, and there were no proscribed elements. For PCT, 86% of essential elements were delivered (failure to check daily diary was the most common missing element), and there were no proscribed elements. Competence was rated on a 5-point scale (1 = *poor*, 5 = *excellent*, with *satisfactory* as the midpoint). For CPT-C, the average therapist competence score was 4.1 ± .8 (good), and 96% of all elements were rated "satisfactory" or better. The average competence score for PCT was 4.1 ± .6 (good), and 100% of the elements were rated "satisfactory" or better.

Treatments. CPT-C is a cognitive therapy that focuses on why patients believe the index event occurred, how that event affected their beliefs about self and others, and how to differentiate thoughts from facts. Patients then learn to label events, thoughts, and subsequent emotions, while the therapist helps them examine the facts and context of the trauma through Socratic questioning. Using progressive worksheets, patients are taught to examine their own thoughts and emotions and develop new, more balanced thinking about traumatic events.

PCT also focuses on PTSD symptoms, but it does not include discussion of traumatic events. The emphasis is on helping patients manage current symptoms through problem solving. Because PCT was conducted in groups for this study, the focus on current problem solving and symptom management was more structured than in previous studies of individual PCT (Frost et al., 2014). In each session, the group chose a theme to address (e.g., isolation, going into crowds) and then generated and evaluated possible solutions to practice. Any discussion of the trauma was redirected back to the present time. Exposure to feared situations, if generated as a strategy by patients, was not forbidden.

Statistical analysis. Because of the reported strength of PCT in prior studies, the study was powered for a medium effect size ($d = 0.50$) with 10 assessment points for 100 participants on the primary outcomes. The analyses of PCL-S and BDI-II data used mixed effects regression models with repeated measures, treating postbaseline data as the dependent variable and baseline as a covariate. The fixed design effects were treatment condition (CPT-C/PCT), the linear effect of time, and the interaction of treatment and time. Therefore, time effects were the slope (change per assessment) and group differences in slope. The trajectory of PCL-S scores was similar during and after treatment, so a linear model for time was used. The trajectory of the BDI-II changed during follow-up in both treatment conditions, so a piecewise linear model was used that allowed the slopes to change. In all analyses, repeated measures were modeled using an unstructured covariance matrix based on likelihood criteria (Akaike's Information Criterion). These analyses used SAS PROC MIXED, version 9.3. Percentage of clinically significant change of at least 10 points on the PCL-S was also calculated for each group (Monson et al., 2008).

The PSS-I was not analyzed as a primary outcome because of lack of sufficient power (with only four assessments, compared with 10 assessments using the PCL-S) to detect significant differences between groups. PSS-I severity was analyzed as a secondary outcome with mixed effects regression models, with treatment, time, and their interaction as fixed effects, and baseline as a covariate, but outcome data were only obtained posttreatment and at 6- and 12-month follow-ups. In addition, the correlations between the PSS-I severity and PCL-S scores for both treatments at the three posttreatment assessments (.82 to .94) were high, supporting the use of the PCL-S as a measure with excellent concurrent validity with the independent blind interviews of PTSD with the PSS-I (see Table 2). AEs are presented descriptively and were

examined statistically as the probability of an AE per session attended, because patients had different numbers of sessions and follow-up visits, and thus different numbers of opportunities to report AEs. These were Poisson regression models, with treatment group as the independent variable and the log of number of treatment sessions (or follow-up visits) as an offset variable.

Three participants who did not start treatment and had no postbaseline data were excluded because they would not contribute to the slopes. We explored possible clustering effects of both patient cohort or therapy groups by including them as random effects in preliminary analyses, but the estimated variance components were zero. Variability of therapy groups was examined with F tests. Hypothesis tests were performed at unadjusted $p = .05$. Differential attrition was addressed in supplemental analyses with inverse propensity weighting based on generalized mixed models using age, treatment condition, session, and the baseline score as predictors (Austin, 2011; Hirano, Imbens, & Ridder, 2003; Lunceford & Davidian, 2004).

Results

Traumatic Events

All but one participant identified a deployment-related trauma as their index traumatic event. Deployment-related index events were diverse and included traumas related to aftermath of battle, traumatic loss, and moral injury in addition to traditional life-threat traumas. One participant identified childhood sexual abuse as the index event. On the LEC, the groups did not differ with regard to their trauma histories, and averaged 8.81 ($SD = 3.97$) lifetime traumatic events that they either experienced directly or witnessed.

PTSD Severity on the PCL-S

PTSD severity on the PCL-S was reduced in both treatment conditions (Tables 3 and 4; both ps $< .0001$), but more so in CPT-C (Table 3; Treatment × Linear Time interaction, $p = .012$). Scores in CPT-C had dropped about 12 points from baseline PCL-S versus about 7 points in PCT. Improvement continued in both conditions during follow-up (see Table 4). Outcomes and slopes in CPT-C groups were more consistent, particularly during the latter half of treatment (Tables 3 and 4). The variability of group means (see Figure 2, which shows each cohort from baseline set at zero) was significantly greater for PCT at Week 5 ($p = .002$), Week 6 ($p = .078$), and posttreatment ($p = .011$; all F tests are two-tailed, with $df = 5, 5$).

Table 2
Pearson Correlations Between PCL-S and PSS-I by Time Point and Group

Assessment	N[a]	Total sample	CPT-C	PCT
Baseline	108 (56, 52)	0.55	0.51	0.59
Posttreatment	93 (44, 49)	0.83	0.85	0.82
6-month	69 (34, 35)	0.91	0.94	0.90
12-month	52 (25, 27)	0.86	0.87	0.86

Note. PCL-S = PTSD Checklist, Stressor Specific version; PSS-I = Posttraumatic Symptom Scale–Interview; CPT-C = cognitive processing therapy, cognitive only version; PCT = present-centered therapy.
[a] Ns are total sample (CPT, PCT).

Table 3
Slopes and Significance Tests

Effect	Slope ± SE[a]	t	p
PCL-S during treatment and follow-up			
CPT-C	−1.00 ± .11	−8.98	<.0001
PCT	−0.60 ± .11	−5.49	<.0001
Difference	−0.40 ± .16	2.55	0.012
BDI-II during treatment			
CPT-C	−0.41 ± .10	−4.06	<.0001
PCT	−0.13 ± .10	−1.31	0.193
Difference	−0.28 ± .14	−1.99	0.049
BDI-II during follow-up			
CPT-C	0.57 ± .44	1.3	0.197
PCT	0.22 ± .42	0.52	0.608
Difference	0.35 ± .60	0.59	0.555

Note. BDI-II = Beck Depression Inventory II; CPT-C = cognitive processing therapy, cognitive only version; PCL-S = PTSD Checklist, Stressor Specific version; PCT = present-centered therapy.
[a] Slopes represent change per session. PCL-S $df = 102$; BDI-II $df = 103$.

Percentage of clinically significant change of 10- point drop or more on the PCL-S (see Figure 3) were analyzed with estimates of proportions from a generalized linear mixed model. In the CPT-C group, 49% achieved a clinically meaningful change compared with 34% in the PCT condition at posttreatment (*ns*). At 6- and 12-month follow-up, 59% and 56% in the CPT-C condition had improved at least 10 points, respectively, whereas for PCT participants, 41% and 50% improved at least 10 points during the two follow-ups. There were no significant differences between conditions.

Depression Severity on the BDI-II

BDI-II scores dropped between baseline and Week 1 in both conditions (see Table 3). Because the BDI-II Week 1 assessment was done before the first group session, these changes occurred prior to starting treatment and thus cannot be specific effects of the group treatments. After Week 1, improvement continued in CPT-C (Table 4; $p < .0001$), but not in PCT ($p = .19$), which was a significant group difference (Tables 3 and 4; $p = .049$). Relative to baseline, improvement in CPT-C was large ($d = 0.7$), and it remained significant even at the 1-year follow-up ($t = 2.32$, $df = 106$, $p = .022$, $d = 0.5$). Most of the improvements in PCT occurred before the first group session, and scores no longer differed from baseline at 1 year ($t = 1.1$, $df = 106$, $p = .26$, $d = 0.2$).

PTSD Severity on the PSS-I

Improvements in PTSD severity on the PSS-I were highly significant and continued after treatment ended in both treatments (see Table 5). Within-group effect sizes increased from 0.66 at posttreatment to 1.21 at 1 year for CPT-C, and from 0.45 at posttreatment to 1.01 for PCT at 1-year follow-up. However, between-groups differences in change from baseline were small and not significant (ds = 0.21 at posttreatment, 0.22 at 6 months, and 0.21 at 12 months posttreatment).

Table 4
PCL-S and BDI-II Outcomes From Baseline to 1 Year

Means	PCL-S			BDI-II		
	CPT-C	PCT	*Ns*	CPT-C	PCT	*Ns*
Baseline	59.3 ± 10.1	58.5 ± 10.6	56/52	27.9 ± 10.2	27.9 ± 12.2	56/52
Week 1	60.8 ± 1.0	58.6 ± 1.0	49/45	26.0 ± 1.0	24.7 ± 1.0	50/50
Week 2	59.5 ± 1.3	59.5 ± 1.3	44/45	24.8 ± 1.0	25.1 ± 1.0	44/46
Week 3	56.6 ± 1.6	56.7 ± 1.6	42/43	25.0 ± 1.3	25.8 ± 1.3	44/44
Week 4	54.4 ± 1.6	54.5 ± 1.6	41/42	24.2 ± 1.4	26.1 ± 1.3	38/44
Week 5	52.9 ± 1.7	54.3 ± 1.6	37/42	24.0 ± 1.3	24.3 ± 1.3	41/44
Week 6	48.5 ± 1.8	52.9 ± 1.8	34/42	21.3 ± 1.5	23.6 ± 1.5	36/43
Posttreatment	47.8 ± 1.9	51.2 ± 1.9	45/49	19.9 ± 1.4	23.7 ± 1.4	44/49
6-month	46.8 ± 2.0	50.2 ± 2.0	34/37	21.1 ± 1.8	24.7 ± 1.7	34/39
1-year	46.1 ± 2.3	48.6 ± 2.2	26/28	22.7 ± 2.1	25.8 ± 2.1	27/27
	Within		Between	Within		Between
Effect sizes (*d*)						
Baseline to posttreatment	−1.1	−0.7	−0.4	−0.7	−0.4	−0.3
Baseline to 6 month	−1.2	−0.8	−0.4	−0.6	−0.3	−0.3
Baseline to 1 year	−1.3	−1.0	−0.3	−0.5	−0.2	−0.3

Note. Baseline entries are means ± *SD*; entries after baseline are baseline-adjusted means ± *SE*. Within-group effect sizes are change from baseline divided by the baseline standard deviation (PCL *SD* = 10.3; BDI-II *SD* = 11.1). *Ns* are CPT-C/PCT with data. BDI-II = Beck Depression Inventory II; CPT-C = cognitive processing therapy, cognitive only version; PCL-S = PTSD Checklist, Stressor Specific Version; PCT = present-centered therapy.

Attrition

Patients in CPT-C completed fewer sessions and left treatment earlier. The average number of sessions attended was 8.4 ± 3.5 for CPT-C and 9.8 ± 2.3 for PCT ($t = 2.3$, $df = 96$, $p = .02$). Nineteen percent in PCT attended all 12 group sessions, versus 9% for CPT-C. Proportions completing assessments were generally lower for CPT-C, but the differences in improvement rates remained significant in propensity-weighted analyses for both PCL-S ($p = .004$) and BDI-II ($p = .049$).

AEs

A detailed summary of AEs is included in Table 6. A total of 54 AEs were reported by 41 subjects during the active treatment portion of the study. There were no significant differences between the number of AEs or probability per session in the CPT-C and PCT conditions (5.5% and 6.3%, respectively; $\chi^2 = 0.27$, $df = 1$, $p = .61$). Thirteen AEs involving 10 patients (19%) in CPT-C and 3 (6%) in PCT were coded as related to study procedures. Not surprisingly, most of these (69%) were increases in PTSD symptoms occurring

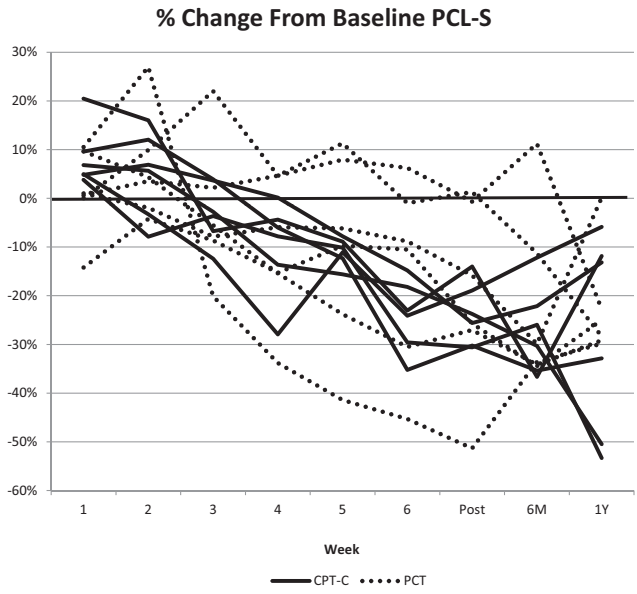

Figure 2. Percent change from baseline (set at 0) PCL-S score in 12 therapy groups. PCL-S = PTSD Checklist, Stressor Specific version; CPT-C = cognitive processing therapy, cognitive only version; PCT = present-centered therapy.

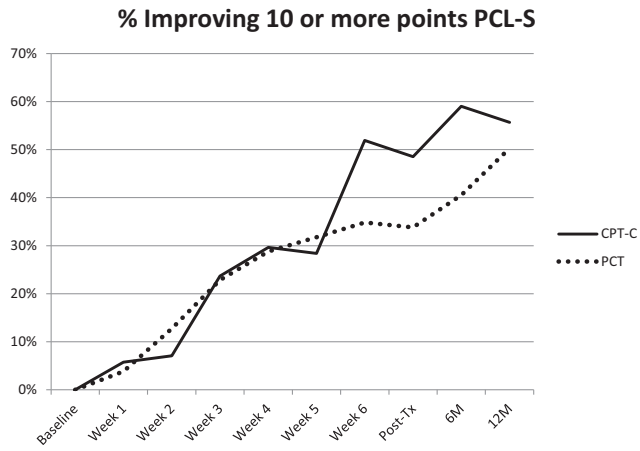

Figure 3. Percentage of participants who improved by at least 10 points (clinically significant change) on the PTSD Checklist, Stressor Specific version (PCL-S) for cognitive processing therapy (CPT-C) and present-centered therapy (PCT) at each data collection point.

Table 5
PSS-I-Severity Scores

Visit	Mean severity			
	CPT-C	PCT	*t*	*p*
Baseline	27.7 ± 7.4	27.1 ± 7.0	.43	.67
Posttreatment	23.0 ± 1.3	23.9 ± 1.3	.53	.60
6-month	20.0 ± 1.5	21.0 ± 1.5	.46	.65
12-month	19.0 ± 1.4	19.9 ± 1.4	.45	.66
Significance of within-group changes				
Baseline-Post	.001	.013		
Baseline-6 month	<.0001	<.0001		
Baseline-12 month	<.0001	<.0001		
Post-6 month	.034	.038		
Post-12 month	.006	.004		
6 month-12 month	.570	.490		

Note. Baseline entries are means ± *SD*. Entries after baseline are baseline-adjusted means ± *SE*s. CPT-C = cognitive processing therapy, cognitive only version; PCT = present-centered therapy; PSS-I = PTSD Symptom Scale–Interview.

primarily early in the trauma-focused CPT-C group. Most AEs were considered related to the underlying medical and psychosocial conditions of active duty PTSD patients rather than related to treatment. The overall probabilities of related AEs per session were low for both groups, with more occurring with CPT-C (2.1%) than PCT (0.6%; $\chi^2 = 4.5$, $df = 1$, $p = .034$). Fortunately, only a minority of patients reported any AEs, and few resulted in a hospital or emergency room visit. There were no completed suicides in either group and only one unrelated psychiatric hospitalization in the PCT group. None of the treatment dropouts reported AEs.

Discussion

This study was the first rigorous RCT of face-to-face psychotherapy for combat-related PTSD in active duty military personnel. It demonstrated that PTSD symptom severity can be decreased by group therapy in this setting, similar to other individual PTSD trials in civilians and veterans. Significant improvements were seen in both conditions in PTSD symptom severity up to 1 year, and CPT-C was found to be more efficacious than a present-focused therapy. Attrition was somewhat higher in CPT than PCT, but outcomes were unchanged in weighted analyses, indicating that even though participants attended fewer sessions, CPT-C still had significantly greater improvement compared with PCT. The decrease in the PCL-S is similar to effect size changes in PTSD symptoms observed in other studies (Forbes et al., 2012; Monson et al., 2006; Watts et al., 2013).

Unlike previous trials of individual CPT, effects of treatment on depression symptoms were more modest than on PTSD symptoms. This may have been because many participants suffered unique combat-related traumatic events—such as the traumatic loss of fellow soldiers—that they were reticent to address in the context of group treatment. However, reductions in depression symptoms favored CPT-C. By the 1-year follow-up, CPT-C maintained a medium effect size, with significant improvement over baseline. With PCT, improvements in depression symptoms appeared to be largely attributable to nonspecific effects of entering treatment and did not persist to the 1-year follow-up.

Table 6
Adverse Events (AEs)

	During treatment		During follow-up	
	CPT-C	PCT	CPT-C	PCT
# Patients assessed	53	51	49	49
# Clinical visits reporting	473	508	110	115
# Patients reporting AEs	20	21	13	15
# AEs reported	25	29	19	26
# Related to study	10	3	0	0
# Unrelated to study	15	26	19	26
# Hospitalizations	0	1	1	5
# ER only visits	4	6	2	5
# Reporting study-related AEs				
Increased PTSD	8	2	0	0
Increased depression	0	1	0	0
Suicidal ideation	1	0	0	0
Headaches[a]	1	0	0	0
# Reporting study-unrelated AEs				
Increased PTSD	3	4	1	1
Increased depression	1	4	0	0
Suicidal ideation	1	3	1	2
Suicide attempt	0	0	1	0
Homicidal ideation	0	1	0	2
Grief	0	1	0	0
Anxiety	0	2	0	1
Increased drug/alcohol	0	1	0	2
Hostility-Anger	0	1	0	1
Social disturbance	0	1	0	2
Accident[a]	0	0	1	1
Injury[a]	4	1	3	4
Pain[a]	0	4	5	3
Other medical[a]	4	2	6	5
Headaches[a]	2	1	1	2
AEs by type				
Psychosocial	14	21	3	11
Medical[a]	11	8	16	15
% Psychosocial	56%	72%	16%	42%

Note. CPT-C = cognitive processing therapy, cognitive only version; ER = emergency room; PCT = present-centered therapy.
[a] Denotes medical illness or injury.

There were no serious AEs such as suicide attempts or psychiatric hospitalizations related to participation in trauma-focused treatment in this military sample. There was one psychiatric hospitalization during PCT, not considered study-related. The most common study-related adverse event was a temporary increase in PTSD symptoms, which is expected for a trauma-focused therapy such as CPT-C. However, even an increase in PTSD symptoms was rare, occurring in only about 2% of CPT-C therapy sessions.

The structure of CPT-C may account for the relative consistency in outcomes across cohorts compared with PCT, as seen in Figure 2 and the statistical findings. PTSD steadily declined in all cohorts of CPT-C, whereas symptom changes in the PCT condition were much more variable across cohorts. Given the less structured format of the PCT treatment, it is likely that the intervention varied based on unique aspects of the group makeup. These findings lend support for the benefits of a structured protocol such as CPT-C for consistency.

By the posttreatment assessment, all of the CPT-C groups had symptoms well below baseline levels, and by the follow-up time points, both conditions were below baseline. Unlike many studies, the participants in this study continued to improve after treatment

ended. It is unclear whether this reflects a trend unique to active duty military personnel, differences related to treating PTSD in a group format, or other unexamined factors. A second study using a similar active duty sample is currently underway to compare group with individual CPT-C in order to address some of these questions. One disadvantage of group CPT-C is that each session builds on the previous session, and patients who miss sessions do not receive portions of the therapy. In individual treatment, patients who miss sessions can continue treatment without losing any content or the flow of the therapy. In this study, those who missed four sessions were considered to have fallen too far behind and were dropped from the group. In fact, the majority of participants did not receive a complete course or dose of treatment. The average number of sessions among those who received CPT-C was eight instead of 12. However, the propensity-weighted analyses indicated that the findings were still significant despite the CPT-C participants receiving fewer sessions than PCT participants or less than the usual 12 sessions for CPT. This is consistent with research indicating that symptom remission can be achieved with fewer than 12 sessions of CPT (Galovski et al., 2012). Whether receiving the full dose of therapy would have improved findings is unknown. The majority of participants improved by at least 10 points by the follow-ups, which is the clinically significant reduction for the PCL (Monson et al., 2008). However, the results still leave much room for improvement. On average, almost half of the patients remained quite distressed. Group therapy may be a good first step followed by individual therapy for those who have not shown improvement. Another study underway using a similar sample is examining variable length CPT-C to see if outcomes improve for some patients with additional sessions.

The interview-based assessment of PTSD severity using the PSS-I is highly correlated with the PCL and confirms that group therapy is efficacious in this population with independent blind assessment. However, one limitation of the study is that because there were only a few data points for the PSS-I, the sample size was not large enough to detect anything but large differences between treatments, which were not found. The effect size difference on the interview-based measure between the two treatments was small.

An additional limitation is that our follow-up rates were lower than hoped for, because following these active duty service members after treatment proved challenging in this highly mobile population. In the year following treatment, many participants were reassigned to other duty stations, retired from active duty service, or were separated from service. In addition, unlike studies conducted in civilian populations, DoD research regulations prohibit the payment of service members for psychological assessments. Nevertheless, reductions in PTSD symptoms in this study are similar to intent-to-treat effect sizes in other PTSD studies (Forbes et al., 2012; Monson et al., 2006; Watts et al., 2013), suggesting that group therapy is a viable mode of treatment in active military patients. Another limitation was the inability to recruit many women at this base, preventing gender comparisons in this sample.

In summary, the purposes of this study were to determine whether group therapy would improve PTSD symptoms among active military personnel, and whether CPT-C, a trauma-focused treatment, would be more efficacious than PCT, a present-focused treatment. The answer to both questions is "yes." Both CPT-C and PCT resulted in large effect reductions in PTSD, but rate of improvement in PTSD severity was significantly greater with CPT-C. Notably, CPT-C also significantly improved depression, with large effect size gains during treatment that remained during follow-up. There were few AEs associated with either treatment. Group treatment for PTSD is well tolerated and results in significant improvement in active duty military personnel. A question for the future is whether individual CPT-C will prove more efficacious than group CPT-C. PCT, when conducted in a group setting as a structured problem-solving therapy for current symptoms and life problems, was also found to be efficacious for PTSD symptoms but not for depressive symptoms. Additional research is also warranted testing different formats and types of treatments to determine ways to achieve higher rates of remission for combat-related PTSD in military personnel.

References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

APA Publications and Communications Board Working Group on Journal Article Reporting Standards. (2008). Reporting standards for research in psychology: Why do we need them? What might they be? *American Psychologist, 63,* 839–851. http://dx.doi.org/10.1037/0003-066X.63.9.839

Austin, P. C. (2011). An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivariate Behavioral Research, 46,* 399–424. http://dx.doi.org/10.1080/00273171.2011.568786

Bass, J. K., Annan, J., McIvor Murray, S., Kaysen, D., Griffiths, S., Cetinoglu, T., . . . Bolton, P. A. (2013). Controlled trial of psychotherapy for Congolese survivors of sexual violence. *The New England Journal of Medicine, 368,* 2182–2191. http://dx.doi.org/10.1056/NEJMoa1211853

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory–II.* San Antonio, TX: Psychological Corporation.

Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Gusman, F. D., Charney, D. S., & Keane, T. M. (1995). The development of a Clinician-Administered PTSD Scale. *Journal of Traumatic Stress, 8,* 75–90. http://dx.doi.org/10.1002/jts.2490080106

Chard, K. M. (2005). An evaluation of cognitive processing therapy for the treatment of posttraumatic stress disorder related to childhood sexual abuse. *Journal of Consulting and Clinical Psychology, 73,* 965–971.

Cigrang, J. A., Rauch, S. A. M., Avila, L. L., Bryan, C. J., Goodie, J. L., Hryshko-Mullen, A., & Peterson, A. L. (2011). Treatment of active-duty military with PTSD in primary care: Early findings. *Psychological Services, 8,* 104–113. http://dx.doi.org/10.1037/a0022740

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20,* 37–46. http://dx.doi.org/10.1177/001316446002000104

Engel, C. C., Oxman, T., Yamamoto, C., Gould, D., Barry, S., & Stewart, P., . . . Dietrich, A. J. (2008). RESPECT-Mil: Feasibility of a systems-level collaborative care approach to depression and post-traumatic stress disorder in military primary care. *Military Medicine, 173,* 935–940.

Foa, E. B., Riggs, D. S., Dancu, C. V., & Rothbaum, B. O. (1993). Reliability and validity of a brief instrument for assessing post-traumatic stress disorder. *Journal of Traumatic Stress, 6,* 459–473. http://dx.doi.org/10.1002/jts.2490060405

Forbes, D., Lloyd, D., Nixon, R. D. V., Elliott, P., Varker, T., Perry, D., . . . Creamer, M. (2012). A multisite randomized controlled effectiveness trial of cognitive processing therapy for military-related posttraumatic stress disorder. *Journal of Anxiety Disorders, 26,* 442–452. http://dx.doi.org/10.1016/j.janxdis.2012.01.006

Friedman, M. J., Marmar, C. R., Baker, D. G., Sikes, C. R., & Farfel, G. M. (2007). Randomized, double-blind comparison of sertraline and placebo for posttraumatic stress disorder in a Department of Veterans Affairs setting. *Journal of Clinical Psychiatry, 68,* 711–720. http://dx.doi.org/10.4088/JCP.v68n0508

Frost, N. D., Laska, K. M., & Wampold, B. E. (2014). The evidence for present-centered therapy as a treatment for posttraumatic stress disorder. *Journal of Traumatic Stress, 27,* 1–8. http://dx.doi.org/10.1002/jts.21881

Galovski, T. E., Blain, L. M., Mott, J. M., Elwood, L., & Houle, T. (2012). Manualized therapy for PTSD: Flexing the structure of cognitive processing therapy. *Journal of Consulting and Clinical Psychology, 80,* 968–981. http://dx.doi.org/10.1037/a0030600

Gray, M. J., Litz, B. T., Hsu, J. L., & Lombardo, T. W. (2004). Psychometric properties of the life events checklist. *Assessment, 11,* 330–341. http://dx.doi.org/10.1177/1073191104269954

Gray, M. J., Schorr, Y., Nash, W., Lebowitz, L., Amidon, A., Lansing, A., . . . Litz, B. T. (2012). Adaptive disclosure: An open trial of a novel exposure-based intervention for service members with combat-related psychological stress injuries. *Behavior Therapy, 43,* 407–415. http://dx.doi.org/10.1016/j.beth.2011.09.001

Helmer, D. A., Rossignol, M., Blatt, M., Agarwal, R., Teichman, R., & Lange, G. (2007). Health and exposure concerns of veterans deployed to Iraq and Afghanistan. *Journal of Occupational and Environmental Medicine, 49,* 475–480. http://dx.doi.org/10.1097/JOM.0b013e318042d682

Hirano, K., Imbens, G. W., & Ridder, G. (2003). Efficient estimation of average treatment effects using the estimated propensity score. *Econometrica, 71,* 1161–1189. http://dx.doi.org/10.1111/1468-0262.00442

Hoge, C. W., Auchterlonie, J. L., & Milliken, C. S. (2006). Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. *JAMA: Journal of the American Medical Association, 295,* 1023–1032. http://dx.doi.org/10.1001/jama.295.9.1023

Hoge, C. W., Castro, C. A., Messer, S. C., McGurk, D., Cotting, D. I., & Koffman, R. L. (2004). Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *The New England Journal of Medicine, 351,* 13–22. http://dx.doi.org/10.1056/NEJMoa040603

Institute of Medicine. (2008). *Treatment of posttraumatic stress disorder: An assessment of the evidence*. Washington, DC: The National Academies Press.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59,* 12–19. http://dx.doi.org/10.1037/0022-006X.59.1.12

Jain, S., McMahon, G. F., Hasen, P., Kozub, M. P., Porter, V., King, R., & Guarneri, E. M. (2012). Healing Touch with Guided Imagery for PTSD in returning active duty military: A randomized controlled trial. *Military Medicine, 177,* 1015–1021. http://dx.doi.org/10.7205/MILMED-D-11-00290

Kaloupek, D. G., Chard, K. M., Freed, M. C., Peterson, A. L., Riggs, D. S., Stein, M. B., & Tuma, F. (2010). Common data elements for posttraumatic stress disorder research. *Archives of Physical Medicine and Rehabilitation, 91,* 1684–1691. http://dx.doi.org/10.1016/j.apmr.2010.06.032

Krystal, J. H., Rosenheck, R. A., Cramer, J. A., Vessicchio, J. C., Jones, K. M., Vertrees, J. E., . . . the Veterans Affairs Cooperative Study No. 504 Group. (2011). Adjunctive risperidone treatment for antidepressant-resistant symptoms of chronic military service-related PTSD: A randomized trial. *JAMA: Journal of the American Medical Association, 306,* 493–502. http://dx.doi.org/10.1001/jama.2011.1080

Litz, B. T., Engel, C. C., Bryant, R. A., & Papa, A. (2007). A randomized, controlled proof-of-concept trial of an Internet-based, therapist-assisted self-management treatment for posttraumatic stress disorder. *The American Journal of Psychiatry, 164,* 1676–1684. http://dx.doi.org/10.1176/appi.ajp.2007.06122057

Lunceford, J. K., & Davidian, M. (2004). Stratification and weighting via the propensity score in estimation of causal treatment effects: A comparative study. *Statistics in Medicine, 23,* 2937–2960. http://dx.doi.org/10.1002/sim.1903

McLay, R. N., Wood, D. P., Webb-Murphy, J. A., Spira, J. L., Wiederhold, M. D., Pyne, J. M., & Wiederhold, B. K. (2011). A randomized, controlled trial of virtual reality-graded exposure therapy for post-traumatic stress disorder in active duty service members with combat-related post-traumatic stress disorder. *Cyberpsychology, Behavior and Social Networking, 14,* 223–229. http://dx.doi.org/10.1089/cyber.2011.0003

Mental Health Advisory Team (MHAT) 6. (2009a). *Operation Enduring Freedom 2009 Afghanistan*. Office of the Command Surgeon US Forces Afghanistan (USFOR-A) and Office of the Surgeon General United States Army Medical Command. Retrieved from http://armymedicine.mil/pages/mental-health-advisory-team-vi-information.aspx

Mental Health Advisory Team (MHAT) VI. (2009b). *Operation Iraqi Freedom 07–09*. Office of the Surgeon Multi-National Corps-Iraq and Office of the Surgeon General United States Army Medical Command. Retrieved from http://armymedicine.mil/pages/mental-health-advisory-team-vi-information.aspx

Monson, C. M., Gradus, J. L., Young-Xu, Y., Schnurr, P. P., Price, J. L., & Schumm, J. A. (2008). Change in posttraumatic stress disorder symptoms: Do clinicians and patients agree? *Psychological Assessment, 20,* 131–138. http://dx.doi.org/10.1037/1040-3590.20.2.131

Monson, C. M., Schnurr, P. P., Resick, P. A., Friedman, M. J., Young-Xu, Y., & Stevens, S. P. (2006). Cognitive processing therapy for veterans with military-related posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 74,* 898–907. http://dx.doi.org/10.1037/0022-006X.74.5.898

Morland, L. A., Mackintosh, M. A., Greene, C. J., Rosen, C. S., Chard, K. M., Resick, P., & Frueh, B. C. (2014). Cognitive processing therapy for posttraumatic stress disorder delivered to rural veterans via telemental health: A randomized noninferiority clinical trial. *Journal of Clinical Psychiatry, 75,* 470–476. http://dx.doi.org/10.4088/JCP.13m08842

Peterson, A. L., Roache, J. D., Raj, J., Young-McCaughan, S., & the STRONG STAR Consortium. (2013). The need for expanded monitoring of adverse events in behavioral health clinical trials. *Contemporary Clinical Trials, 34,* 152–154. http://dx.doi.org/10.1016/j.cct.2012.10.009

Peterson, A. L., Wong, V., Haynes, M. F., Bush, A. C., & Schillerstrom, J. E. (2010). Documented combat-related mental health problems in military noncombatants. *Journal of Traumatic Stress, 23,* 674–681. http://dx.doi.org/10.1002/jts.20585

Resick, P. A., Galovski, T. E., O'Brien Uhlmansiek, M. O. B., Scher, C. D., Clum, G. A., & Young-Xu, Y. (2008). A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interpersonal violence. *Journal of Consulting and Clinical Psychology, 76,* 243–258. http://dx.doi.org/10.1037/0022-006X.76.2.243

Resick, P. A., Nishith, P., Weaver, T. L., Astin, M. C., & Feuer, C. A. (2002). A comparison of cognitive-processing therapy with prolonged exposure and a waiting condition for the treatment of chronic posttraumatic stress disorder in female rape victims. *Journal of Consulting and Clinical Psychology, 70,* 867–879. http://dx.doi.org/10.1037/0022-006X.70.4.867

Resick, P. A., & Schnicke, M. K. (1992). Cognitive processing therapy for sexual assault victims. *Journal of Consulting and Clinical Psychology, 60,* 748–756. http://dx.doi.org/10.1037/0022-006X.60.5.748

Resick, P. A., Williams, L. F., Suvak, M. K., Monson, C. M., & Gradus, J. L. (2012). Long-term outcomes of cognitive-behavioral treatments for posttraumatic stress disorder among female rape survivors. *Journal of*

Consulting and Clinical Psychology, 80, 201–210. http://dx.doi.org/10.1037/a0026602

Schnurr, P. P., Friedman, M. J., Engel, C. C., Foa, E. B., Shea, M. T., Chow, B. K., . . . Bernardy, N. (2007). Cognitive behavioral therapy for posttraumatic stress disorder in women: A randomized controlled trial. *JAMA: Journal of the American Medical Association, 297,* 820–830. http://dx.doi.org/10.1001/jama.297.8.820

Schnurr, P. P., Friedman, M. J., Foy, D. W., Shea, M. T., Hsieh, F. Y., Lavori, P. W., . . . Bernardy, N. C. (2003). Randomized trial of trauma-focused group therapy for posttraumatic stress disorder: Results from a Department of Veterans Affairs cooperative study. *Archives of General Psychiatry, 60,* 481–489. http://dx.doi.org/10.1001/archpsyc.60.5.481

Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin, 86,* 420–428. http://dx.doi.org/10.1037/0033-2909.86.2.420

Smith, T. C., Ryan, M. A. K., Wingard, D. L., Slymen, D. J., Sallis, J. F., Kritz-Silverstein, D., & the Millennium Cohort Study Team. (2008). New onset and persistent symptoms of post-traumatic stress disorder self reported after deployment and combat exposures: Prospective population based US military cohort study. *BMJ: British Medical Journal, 336,* 366–371. http://dx.doi.org/10.1136/bmj.39430.638241.AE

Tanielian, T., & Jaycox, L. H. (2008). *Invisible wounds of war: Psychological and cognitive injuries, their consequences, and services to assist recovery*. Santa Monica, CA: RAND Corporation.

Thomas, J. L., Wilk, J. E., Riviere, L. A., McGurk, D., Castro, C. A., & Hoge, C. W. (2010). Prevalence of mental health problems and functional impairment among active component and National Guard soldiers 3 and 12 months following combat in Iraq. *Archives of General Psychiatry, 67,* 614–623. http://dx.doi.org/10.1001/archgenpsychiatry.2010.54

Watts, B. V., Schnurr, P. P., Mayo, L., Young-Xu, Y., Weeks, W. B., & Friedman, M. J. (2013). Meta-analysis of the efficacy of treatments for posttraumatic stress disorder. *Journal of Clinical Psychiatry, 74,* e541–e550. http://dx.doi.org/10.4088/JCP.12r08225

Weathers, F. W., Keane, T. M., & Davidson, J. R. (2001). Clinician-administered PTSD scale: A review of the first ten years of research. *Depression and Anxiety, 13,* 132–156. http://dx.doi.org/10.1002/da.1029

Weathers, F., Litz, B. T., Herman, D. S., Huska, J. A., & Keane, T. M. (1993, October). *The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility*. Paper presented at the annual meeting of the International Society for Traumatic Stress Studies, San Antonio, TX.

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