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Comparing Effectiveness of CPT to CPT-C Among U.S. Veterans in an Interdisciplinary Residential PTSD/TBI Treatment Program

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Cognitive processing therapy (CPT) is a leading cognitive–behavioral treatment for posttraumatic stress disorder (PTSD) and a front-line intervention according to the U.S. Department of Veterans Affairs treatment guidelines. The original CPT protocol entails the creation of a written trauma account and use of cognitive therapy. Cognitive processing therapy–cognitive therapy only (CPT-C) does not involve a written account and in a previous study resulted in faster symptom improvement and fewer dropouts than standard CPT. This study sought to replicate these findings by comparing the effectiveness of CPT to CPT-C in a sample of 86 U.S. male veterans receiving treatment in a PTSD residential program for individuals with a history of traumatic brain injury. CPT and CPT-C were delivered in a combined individual and group format as part of a comprehensive, interdisciplinary treatment program. Outcomes were self- and clinician-reported PTSD and self-reported depression symptoms. Multilevel analysis revealed no significant difference for PTSD symptoms, but did show a greater decrease in depression at posttreatment ($d = 0.63$) for those receiving CPT. When an experiment-wise α correction was applied, this effect did not remain significant.

Advances in the knowledge, assessment, and treatment of posttraumatic stress disorder (PTSD) have been notable in the past 10 years (Institute of Medicine, 2008). Among these developments is the recommendation that cognitive–behavioral therapies (CBTs) be considered first-line treatments for PTSD. Cognitive processing therapy (CPT; Resick, Monson, & Chard, 2007) and prolonged exposure (PE; Foa, Hembree, & Rothbaum, 2007) are two cognitive–behavioral therapies shown to be efficacious and effective in a broad range of civilian and veteran samples and are considered to be best-practice models for the treatment of PTSD by the U.S. Department of Veterans Affairs (VA), U.S. Department of Defense (DoD), and International Society for Traumatic Stress Studies (Foa, Keane, Friedman, & Cohen, 2008; VA/DoD, 2004). CPT has demonstrated efficacy or effectiveness for both men and women, Australian veterans, and U.S. veterans with various trauma histories (Alvarez, McLean, Harris, Rosen, Ruzek, & Kimerling, 2011; Chard, 2005; Forbes et al., 2012; Monson et al., 2006; Resick, Nishith, Weaver, Astin, & Feuer, 2002; Surís, Link-Malcolm, Chard, Ahn, & North, 2013).

A dismantling study of CPT was conducted to evaluate the active components of the treatment protocol (Resick et al., 2008), which was delivered in individual sessions, and included three conditions: (a) the standard CPT protocol, which entails creating a written trauma account and delivering cognitive therapy; (b) the CPT protocol delivered without the written account (cognitive processing therapy–cognitive therapy only; CPT-C); and (c) the written account only (WA). Resick and colleagues (2008) found that all three conditions significantly reduced symptoms of PTSD and depression, but the full CPT protocol was not significantly different from either component provided alone. In comparison to CPT, CPT-C yielded a faster decline in PTSD symptoms (significant improvement at Week 2 for CPT-C compared to Week 3 for CPT and Week 5 for WA) and had a lower rate of dropout (22% for CPT-C compared to 26% for WA and 34% for CPT). These results, if replicated, suggest that CPT-C may be the more advantageous form of delivery when administering CPT. Moreover, they suggest that the cognitive component may be the most beneficial

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for symptom change within the CPT protocol. It is important to consider, however, that the sample examined in the Resick et al. (2008) study consisted of females who met the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychological Association, 2000) criteria for PTSD based on an index trauma of interpersonal violence (e.g., child sexual abuse, adult sexual assault, adult sexual victimization, domestic violence). Thus, although the study was well-controlled, the generalizability of these results to other samples, such as to males, or individuals who experienced other types of trauma (e.g., combat) is unknown. More research is needed before stronger inferences can be made about the relative effectiveness of CPT-C and when and for whom it should be recommended over standard CPT. Such work would not only have implications for CPT practitioners, but could inform the broader literature concerning the relative effectiveness of PTSD treatments that favor a predominantly cognitive approach.

Despite findings supporting the efficacy of CPT-C, limited research exists examining the effectiveness of the treatment in clinical settings. In the largest sample studied, Chard, Schumm, McIlvain, Bailey, and Parkinson (2011) examined the effectiveness of CPT-C (combined individual and group format), with adjunctive treatment, in a residential treatment program for 42 veterans with PTSD and a history of traumatic brain injury (PTSD and TBI). Study results demonstrated significant reductions in PTSD and depression over the course of CPT-C during an 8-week residential program; veterans with a history of moderate to severe TBI experienced the most benefit. The effectiveness of this treatment modality was also shown in two case studies, including a veteran with PTSD and a history of severe TBI (McIlvain, Walter, & Chard, 2013), and a veteran with PTSD and comorbid alcohol dependence, who was treated with CPT-C enhanced with content to address heavy alcohol consumption (McCarthy & Petrakis, 2011).

The current study intended to build upon the current state of the literature by confirming findings from the previous Chard et al. (2011) study and extending the findings by (a) evaluating the effectiveness of CPT and CPT-C, as adapted for veterans receiving treatment in an integrative residential PTSD/TBI program; (b) determining if CPT and CPT-C significantly differ in effectively reducing PTSD and depression; and (c) examining if the severity of TBI is predictive of outcome. The residential PTSD/TBI program provides valuable data in that it was initially designed based upon CPT-C and over time was substituted for CPT. The study is the first of which we are aware to examine the use of CPT in a sample specifically of veterans with PTSD and a history of TBI, which is important because clinicians might be apprehensive about using the trauma account with this population. Based on the findings of Resick and colleagues (2008), we hypothesized that CPT and CPT-C would not differ in their reduction in PTSD and depression over the course of residential PTSD/TBI treatment.

Method

Participants and Procedure

The sample included 86 U.S. male veterans who met current *DSM-IV-TR* diagnostic criteria for PTSD, had a history of TBI, and were admitted to an 8-week, interdisciplinary, residential PTSD/TBI program at a VA hospital between the years of 2008 and 2013 and received either CPT-C ($n = 46$) or CPT ($n = 40$) as the primary trauma-focused treatment approach. Specifically, CPT-C was offered to veterans from 2008–2011 and CPT was offered from 2011–2013. Of the 86 veterans in the sample, data from 32 of the 46 veterans who received CPT-C had been included in the Chard et al. (2011) study. Demographics for each group are in Table 1.

All participants met full PTSD criteria, as assessed with the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995) and based on the participants' index trauma (i.e., the trauma veterans reported as the most traumatic or distressing event). The most commonly reported index trauma was combat (74.4% among all participants). In addition to PTSD, all participants had a history of TBI, which was determined by VA medical record review and a clinical interview with a neuropsychologist. Severity of TBI was categorized as mild, moderate, or severe based upon the VA/DoD practice guidelines (2009). Mild TBI was defined as loss of consciousness (LOC) $<$ 30 minutes or posttraumatic amnesia (PTA) $<$ 24 hours. Moderate TBI was defined as LOC $>$ 30 minutes (but $<$ 24 hours) or PTA $>$ 24 hours (but $<$ 7 days). Severe TBI was defined as LOC $>$ 24 hours or PTA $>$ 7 days. TBI severity was classified based on the most severe injury. The majority of the sample (79.4% of all participants) endorsed a history consistent with mild TBI (mTBI). Veterans with all TBI severity levels were represented (see Table 1) and were eligible for treatment if they were able to complete activities of daily living and did not have ongoing medical issues that required significant care beyond that provided at the satellite hospital location. All veterans in the sample were at least 1-year post-TBI.

All research procedures were conducted under a waiver of written consent based on archival data granted by the University of Cincinnati Institutional Review Board and the VA Research and Development Office. Assessments were conducted using the same standard procedure, regardless of whether veterans received CPT or CPT-C. Upon admission to the program, veterans completed comprehensive evaluations of psychological, neuropsychological, speech/cognitive, and occupational functioning. At midtreatment (Week 4), participants were readministered self-report measures of PTSD and depression symptoms. Posttreatment assessments were conducted during the final 4 days of the treatment program. Veterans were reassessed with the same pretreatment measures. The clinician-assessed psychological measures at posttreatment were administered by mental health professionals who were not the veteran's treating clinician. Interrater reliability could not be evaluated as

Table 1
Demographics Separately by Treatment Group

	CPT ($n = 40$)		CPT-C ($n = 46$)	
	n	%	*n*	%
Variable				
Race/ethnicity				
White	32	80.0	34	74.0
African American	8	20.0	8	17.4
Latino	0	0.0	2	4.3
Native American	0	0.0	2	4.3
Marital status				
Married/remarried	14	35.0	23	50.0
Divorced	15	37.5	11	23.9
Never married	10	25.0	8	17.4
Separated	1	2.5	3	6.5
Widowed	0	0.0	1	2.2
Employment status				
Employed	4	10.0	5	11.1
Unemployed	9	22.5	12	26.7
Disabled	24	60.0	26	57.8
Retired	3	7.5	1	2.2
Student	0	0.0	1	2.2
Service era				
Vietnam	5	12.5	2	4.3
Post Vietnam	4	10.0	3	6.5
Persian Gulf	6	15.0	12	26.1
Iraq (OIF)	25	62.5	28	60.9
Afghanistan (OEF)	0	0.0	1	2.2
Index trauma[a]				
Combat	27	67.5	37	80.4
Adult sexual assault	2	5.0	3	6.5
Assault with weapon	1	2.5	2	4.3
Transportation accident	1	2.5	2	4.3
Witness to death	1	2.5	1	2.2
TBI severity				
Mild	27	79.4	31	70.5
Moderate	4	11.8	12	27.2
Severe	3	8.8	1	2.3
Antidepressant use				
Pretreatment	31	77.5	40	87.0
Posttreatment	26	81.3	37	92.5
Multiple TBIs				
Yes	30	75.0	31	67.4
No	10	25.0	15	32.6
Comorbid MDD				
Yes	28	70.0	35	76.1
No	12	30.0	11	23.9

Note. CPT = cognitive processing therapy; CPT-C = cognitive processing therapy–cognitive therapy only; OIF = Operation Iraqi Freedom; OEF = Operation Enduring Freedom; TBI = traumatic brain injury; MDD = major depressive disorder.

[a]The five index traumas common to both treatment groups. Eight participants in the CPT group and one participant in the CPT-C group reported other types of trauma.

diagnostic interviews and treatment sessions were not recorded as part of standard clinical care. Data were obtained through chart review and as a result, item-level data were unavailable, precluding tests of internal consistency.

The PTSD/TBI residential program in this study was an 8-week, interdisciplinary treatment program that utilized CPT and CPT-C as the primary trauma-focused treatment, but these were delivered at different times in the program's history. Specifically, CPT-C was used from December 2008 to March 2011, whereas CPT was used from April 2011 to March 2013. Both treatments were delivered in the combined individual and group format (Chard, Resick, Monson, & Kattar, 2009). All participants received CPT or CPT-C in the combined format. The combined format includes individual sessions, where veterans can process trauma-related details, as well as group sessions, where veterans have the opportunity to learn and practice skills with other group members. The individual and group CPT and CPT-C sessions occurred twice per week and lasted 60 and 90 minutes, respectively. In the TBI/PTSD program, treatment consisted of 14 individual CPT or CPT-C sessions and 14 group CPT or CPT-C sessions, which is two more sessions than the standard protocol. Fourteen sessions were provided in the TBI/PTSD program to allow for additional repetition of skills. In the 14-session protocol, there is an extra session related to the Challenging Questions Sheet and an extra session regarding the Challenging Beliefs Worksheet. The CPT or CPT-C group and individual sessions were led by psychologists and social workers; however, the interdisciplinary treatment team staff assisted veterans' participation in CPT or CPT-C by helping to identify maladaptive beliefs, encourage completion of relevant worksheets, and establish a supportive environment to allow for challenging maladaptive beliefs.

In addition to individual and group CPT, veterans attended approximately 15 psychoeducation groups per week, such as anger management, relapse prevention, and communication skills. Psychoeducation groups lasted 60 minutes each in duration. CogSMART (Twamley, Noonan, Savla, Schiehser, & Jak, 2008), a cognitive enhancement group, was provided to teach skills and compensatory strategies for cognitive impairments, regardless of the etiology of impairment (e.g., TBI, psychiatric disorder, effects of substances, etc.).

Veterans also received additional individual treatment, such as speech/cognitive and occupational therapy, which was determined based on individual needs. Typically, veterans received individual speech/cognitive therapy 2–3 times per week aimed at improving attention, memory, and executive functioning abilities. Participants generally attended one occupational therapy session per week and worked toward individually identified functional goals. Lastly, veterans received psychopharmacological treatment or medication management as appropriate. It should be noted that aside from the differences in CPT treatment, all veterans participated in the same adjunctive groups (i.e., CogSMART, relapse prevention, etc.) and specialty services (e.g., speech/cognitive therapy, occupational therapy).

Measures

The Clinician Administered PTSD Scale (CAPS; Blake et al., 1995) is a structured interview used to assess the frequency and severity of each of the 17 PTSD symptoms outlined in the *DSM-IV-TR*. A symptom was counted toward meeting diagnostic criteria using the "½ rule" (i.e., frequency reported at least once or twice in the past month; intensity reported at least at a moderate level; Weathers, Ruscio, & Keane, 1999). The frequency and intensity scores for each symptom were then summed to create a total severity score. Research has demonstrated the reliability and validity of the CAPS (Blake et al., 1995; Weathers et al., 1999), including among veteran samples (Weathers, Keane, & Davidson, 2001). The period of assessment used for the CAPS was the past month at pretreatment and the past week at posttreatment. The 1-week time period at posttreatment was utilized for repeated assessment in a relatively brief duration of time (Weathers et al., 2001) and helped ensure that the assessment period did not significantly coincide with the treatment period.

The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 1996) is a semistructured interview designed to evaluate current and past Axis I disorders. Research indicates that the SCID is a reliable and valid instrument (Shear et al., 2000). For the current study, the SCID-I was used to assess for current, comorbid major depressive disorder (MDD), which is included for descriptive purposes.

The PTSD Checklist-Stressor Specific Version (PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993) is a commonly used, self-report measure of PTSD that is consistent with the 17 diagnostic criteria outlined in the *DSM-IV-TR*. Items are rated on a 5-point scale, which are then added to yield a total severity score (range 17–85; higher scores indicate greater symptom distress). Prior research has shown that the PCL-S has sound psychometric properties (Weathers et al., 1993). Comparable to the CAPS assessment, the period used for the PCL-S at pretreatment was the past month and at posttreatment was the past week.

The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item, self-report measure of depressive symptoms. Each item is rated on a 4-point scale (range 0–63; higher scores are suggestive of greater depression severity). The BDI-II is widely used and has established reliability and validity (Beck et al., 1996). The period utilized for the BDI-II was the past 2 weeks for both pre- and posttreatment.

Data Analysis

Analysis was conducted in two stages. First, participants in the CPT and CPT-C groups were compared on pretreatment characteristics using *t* tests and χ^2 analyses. Groups were compared with regard to the rate of treatment completion, age, race, education, marital status, employment status, antidepressant use, service era, index trauma type, TBI severity, history of multiple TBIs, self- and clinician-reported PTSD symptom severity, and self-reported depression symptom severity.

Second, multilevel modeling (MLM; e.g., Heck, Thomas, & Tabata, 2010) was used to test for within- and between-group differences on self- and clinician-reported PTSD and self-reported depression and examine whether TBI severity was predictive of outcome. MLM has been shown to offer several advantages over traditional repeated-measures approaches, such as analysis of variance, including increased power and better handling of missing data (e.g., Gueorguieva & Krystal, 2004). A random intercept and slope were specified in all models to account for variability across participants' symptom trajectories (e.g., Heck et al., 2010). To protect against Type I error, a Bonferroni correction was applied to the multilevel models. Prior to conducting these, the effect of participants' cohort assignments on treatment outcome was examined using the intercepts only multilevel method recommended by Hox (2002). These analyses were performed to ensure that significant variability in outcome could not be accounted for by participants' assignments to residential cohorts.

No participants were missing data on the CAPS or PCL-S at pretreatment, and one participant (1.2%) was missing data on the BDI-II. At midtreatment, nine participants (10.5%) were missing data on the PCL-S and eight participants (9.3%) on the BDI-II. At posttreatment, 15 participants (17.4%) were missing data on the CAPS, 16 (18.6%) on the PCL-S, and 15 (17.4%) on the BDI-II. Missing data were distributed relatively evenly across groups and were handled using restricted maximum likelihood estimation (REML).

For models involving the PCL-S and BDI-II, time was coded as 0 = pretreatment, 1 = midtreatment, and 2 = posttreatment; for models involving the CAPS, time was coded as 0 = pretreatment and 1 = posttreatment. All analyses were performed using PASW Statistics version 17 (SPSS, Inc., 2008).

Results

Comparison of pretreatment group characteristics yielded no significant difference on any variable. With regard to TBI severity, the groups did not differ regardless of whether individuals with a history of moderate and severe TBI were grouped together and compared with mild TBI (i.e., a 2×2 χ^2 analysis) or examined separately (i.e., a 2×3 analysis). As no pretreatment differences were found, no additional variables were included in multilevel analyses. The groups also did not differ significantly on treatment variables, such as the number of sessions attended, $t\ (84) = -0.21$, $p = .833$ or rate of program completion, $\chi^2(1, N = 86) = 0.34$, $p = .560$). The average number of sessions attended for the sample was 13.16 ($SD = 3.56$) and the rate of completion was 83%.

Covariance parameter estimates were nonsignificant across all outcomes and intraclass correlation coefficients indicated that, respectively, 1.4%, 0.7%, and 1.5% of the variability in CAPS, PCL-S, and BDI-II outcome could be accounted for

Table 2
Summary of Multilevel Analyses Examining Between-Group Effects on Treatment Outcomes

	PCL-S			CAPS			BDI-II		
Variable	*B*	*SE*	*t*	*B*	*SE*	*t*	*B*	*SE*	*t*
Intercept	64.11	1.51	42.41***	77.28	2.37	32.67***	35.12	1.56	22.51***
Time	−8.97	1.35	−6.66***	−30.77	3.20	−9.62***	−5.46	0.87	−6.29***
Treatment type	−0.95	2.21	−0.43	−0.98	3.47	−0.28	0.38	2.30	0.17
Time × Treatment Type	2.04	1.99	1.03	−2.23	4.75	−0.47	−2.95	1.29	−2.29*

Note. $N = 86$. Estimates of fixed effects reported. Treatment type was coded 0 (CPT-C), 1 (CPT). PCL-S = PTSD Checklist-Specific Version; CAPS = Clinician Administered PTSD Scale; BDI-II = Beck Depression Inventory-II.
*$p < .05$. **$p < .01$. ***$p < .001$.

by cohort nesting. Taken together, these results do not indicate that significant variability in outcome can be accounted for by cohort assignments. Nine multilevel models were subsequently analyzed. In the first three models, within-group effects (the effect of time on participants' PCL-S, BDI-II, and CAPS scores) were examined. Participants' PCL-S ($B = -8.03$, $SE = 0.99$, $p < .001$), BDI-II ($B = -6.80$, $SE = 0.66$, $p < .001$), and CAPS scores ($B = -31.76$, $SE = 2.35$, $p < .001$) were found to significantly decrease over time (with coefficients indicating the unstandardized decrease corresponding to each unit increase in time).

The next three models tested for between-group differences. As shown in Table 2, a Time × Group interaction was not found for the PCL-S or CAPS, showing that changes in self- and clinician-reported PTSD symptoms did not differ as a function of group membership. An interaction was found for the BDI-II, such that participants in the CPT group reported a greater decrease in depression than participants receiving CPT-C (see Table 3). The average CPT participant reported a decrease in depressive symptoms from the severe to mild range, whereas the average CPT-C participant experienced a decrease in depressive symptoms from the severe to moderate range. The Cohen's *d* effect size associated with the difference in groups' pre- to posttreatment BDI-II mean scores was 0.63. The interaction did not remain significant when a Bonferroni correction was applied to protect against possible Type I error (i.e., the null hypothesis could not be rejected at an α level of .017). Thus, this result should be interpreted with caution. With regard to other effects, the Cohen's *d* effect size associated with the difference in groups' pre- to posttreatment change was 0.39 on the PCL-S and 0.12 on the CAPS.

Table 3
Means and Standard Deviations of Treatment Groups at Pre-, Mid-, and Posttreatment

	CPT ($n = 40$)		CPT-C ($n = 46$)	
Time points	*M*	*SD*	*M*	*SD*
PCL-S				
Pretreatment	62.25[a]	11.50	63.15[b]	9.95
Midtreatment	58.64[c]	11.60	58.17[d]	13.14
Posttreatment	47.75[e]	16.09	43.45[f]	14.47
BDI-II				
Pretreatment	35.26[a]	11.23	34.52[b]	10.75
Midtreatment	27.67[c]	11.83	32.64[g]	15.42
Posttreatment	18.88[e]	10.98	23.28[h]	11.49
CAPS				
Pretreatment	76.30[a]	16.59	77.28[b]	15.32
Posttreatment	42.84[e]	17.23	46.0[h]	20.57

Note. $N = 86$. Mean scores calculated using pairwise deletion. The CAPS was not administered at midtreatment. CPT = cognitive processing therapy; CPT-C = cognitive processing therapy–cognitive therapy only; PCL-S = PTSD Checklist Specific Version; BDI-II = Beck Depression Inventory-II; CAPS = Clinician Administered PTSD Scale.
[a]$n = 40$. [b]$n = 46$. [c]$n = 36$. [d]$n = 41$. [e]$n = 32$. [f]$n = 38$. [g]$n = 42$. [h]$n = 39$.

In addition to the depressive symptom reduction noted above, participants in both groups demonstrated clinically significant changes in PTSD as assessed by the CAPS and PCL-S (see Table 3). A clinically significant improvement on the CAPS has been defined, using Jacobson and Truax's (1991) reliable change index, as exceeding a 12-point reduction (Forbes et al., 2012; Monson et al., 2006). CPT and CPT-C participants displayed mean pre- to posttreatment CAPS reductions of 33.46 and 31.23, respectively. Similarly, PCL-S scores for both groups dropped below one proposed cutoff for possible PTSD (i.e., 50 suggested by Weathers et al., 1993).

Lastly, three additional multilevel models investigated whether TBI severity was predictive of outcome. Given the limited number of individuals in our sample with a history of severe TBI, veterans with a moderate and severe TBI history were grouped together and compared to those with mild TBI. A Time × Group interaction was not found on any of the three outcome variables; TBI severity was not a predictor of treatment outcome.

Discussion

We compared the effectiveness of CPT and CPT-C, as delivered in the individual and group format, in two groups of male

veterans with a history of TBI receiving residential treatment for PTSD and TBI. Groups were compared with respect to self- and clinician-reported PTSD and self-reported depression. Results from multilevel analyses revealed that both groups reported a decrease across all outcomes over the course of treatment, and that TBI severity was not predictive of outcome. The magnitudes of PTSD and depressive symptom reductions were similar to those found in past studies on CPT (Forbes et al., 2012; Monson et al., 2006; Resick, Nishith, Weaver, Astin, & Feuer, 2002; Surís et al., 2013), regardless of whether the trauma account was included in the treatment. Although groups in the current study did not differ on the rate at which their PTSD symptoms decreased, groups did differ on depression, such that participants receiving CPT reported greater symptom reduction. This difference was most apparent between pre- and midtreatment assessments.

Our findings were both comparable to, and divergent from, those of Resick et al.'s (2008) CPT dismantling study and Chard et al.'s (2011) prior investigation of this residential program. In particular, neither Resick et al. nor the current study found significant differences between CPT and CPT-C at posttreatment on self-reported PTSD symptoms. Participants in the Resick study, however, demonstrated a faster decline in self-reported PTSD symptoms. It is possible that not replicating this finding in the current study was due to having fewer assessment time points to measure change. In addition, our results differed from Chard et al. in that TBI severity was not predictive of treatment outcome. This inconsistency could be due to the increase in sample size that has occurred since this prior investigation (Chard et al. had a relatively small sample, $N = 42$, and may have been more susceptible to outliers). Further study is needed to replicate these findings.

Also in contrast to Resick et al. (2008), we found that the CPT group evidenced greater decreases on self-reported depression symptoms relative to the CPT-C group, whereas Resick did not demonstrate a group difference. This finding is an interaction with a moderate effect, and did not maintain statistical significance when an alpha correction was applied. Thus, this result is equivocal and needs replication. It is also possible, however, that the difference in treatment effectiveness for depression was not spurious and is important to consider possible reasons for why the CPT group reported greater relief from depression symptoms and why our results differ somewhat from those of Resick et al. (2008).

One potential reason for why the current study found that CPT was a more effective treatment for self-reported depression is that the CPT modality impacted residential treatment in a way that enhanced effects on depression symptoms. For example, CPT may have interacted with the extra support provided in a milieu setting, or with the other treatments provided in the residential program, to result in significantly decreased self-reported depression symptoms in comparison to CPT-C. Furthermore, it is possible that characteristics of the respective samples may account for differences in the results. For example, in the Resick study, the sample consisted of women with index traumas of interpersonal violence who met inclusion criteria typically found in randomized controlled trials (i.e., no recent medication changes, no current substance dependence). In contrast, the current sample included male veterans with a history of TBI who generally endorsed combat as their index trauma and met less restrictive inclusion criteria. Moreover, in the Resick study, 50% of participants met diagnostic criteria for MDD at pretreatment based on the SCID compared to 73.3% in the current sample.

Additionally, unique aspects of our study design (e.g., the use of a nonrandomized clinic sample, the provision of CPT in a combined individual and group residential format) may account for inconsistencies across the two studies. For example, treatment dropout was noticeably different. Specifically, in our study, we found that veterans were equally likely to complete the residential treatment program regardless of treatment group, and that the overall rate of dropout was relatively low (17%). In contrast, Resick and colleagues (2008) found that CPT-C had fewer dropouts than CPT, with rates of 22% and 34%, respectively. The difference in the setting of the treatment (i.e., residential vs. outpatient) may have contributed to the divergent rates of dropout between the current study and Resick et al. (2008). The residential setting may potentially interact with CPT-C and CPT in a way that minimizes dropout. For example, the ancillary treatments provided may increase tolerance for trauma-focused treatment. Additionally, the residential treatment setting may offer additional support (e.g., by staff or other cohort members) that may in turn reduce dropout from the treatment program. The differential dropout rates between the studies could also be accounted for by other factors related to the residential treatment setting, such as veterans traveling considerable distance to receive treatment, living out-of-state, and having greater comorbid conditions.

This study had a number of limitations. Importantly, although CPT and CPT-C were delivered as the primary treatment component in the residential programming, other psychoeducation groups, specialty services (e.g., speech/cognitive therapy, occupational therapy), medication management, and possibly even the therapeutic setting may have influenced treatment outcome. Furthermore, this was an effectiveness study of two variations of an evidence-based treatment modality administered at different times in the program's history—it was not designed or implemented as a randomized controlled trial. As a result, this study cannot address the efficacy of CPT and CPT-C as delivered in the residential program. With regard to our analytic plan, the analyses performed examine between-group differences on treatment outcomes; however, these models do not specifically test for equivalence, which we hypothesized. As treatment was delivered as part of routine clinical care, ratings of treatment fidelity were not obtained nor were item-level data. The assessment period may overlap to some degree with the treatment period, as postassessments are completed during the final days of the treatment program (after therapy sessions have been completed, but while veterans are still at the facility). Thus, the timing of assessment may not entirely reflect posttreatment

symptoms. Finally, participants in the study consisted of veterans receiving care in a residential PTSD/TBI program, which may limit the generalizability to other treatment programs or patient populations.

Despite these limitations, the study has several strengths. First, aside from the primary trauma-focused treatment (CPT and CPT-C), the other residential treatment components (e.g., scheduled programming of specialty services and psychoeducation groups provided; program co-leads) remained constant between groups and over time, limiting threats to internal validity. Nonetheless, it is not possible to rule out that subtle variation in programming affected results. Similarly, patient preference for treatment received, therapist experience over time, and stressors present during treatment may have influenced results, although these factors may be present in treatment outcome research more generally. Symptom change and progress were longitudinally measured with well-validated, self-report and clinician-assessed instruments. The study provided additional support for the notion that adaptations to a standard protocol do not necessarily reduce effectiveness, particularly among veterans with PTSD and a history of TBI.

In summary, for individuals with comorbid MDD, CPT may provide greater symptom relief than CPT-C. Furthermore, results suggest that PTSD and depression may respond differently to trauma-focused treatment, so efforts to further understand this response may be important, particularly for individuals with comorbid conditions. Given that our findings were observed in a specific population and were somewhat discrepant from prior research, replication is necessary. Moreover, such efforts would be strengthened by attention to individual characteristics that may moderate treatment response following CPT or CPT-C.

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