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Identifying Patterns of Symptom Change During a Randomized Controlled Trial of Cognitive Processing Therapy for Military-Related Posttraumatic Stress Disorder

Alexandra Macdonald
Boston University and VA Boston Healthcare System

Candice M. Monson, Susan Doron-Lamarca, and Patricia A. Resick
National Center for Posttraumatic Stress Disorder

Tibor P. Palfai
Boston University

Cognitive processing therapy (CPT) for posttraumatic stress disorder (PTSD) has been shown to reduce symptoms of PTSD in a veteran population. This study explored patterns of self-reported symptom change during CPT. Veterans (N = 60) with PTSD were randomized to receive CPT immediately or after 10 weeks. We hypothesized that those treated immediately would evidence initial symptom stability followed by decline compared with those who waited, whose PTSD symptoms would remain stable. The best model fit based on deviance statistics and Bayesian information criteria comparisons was one in which participants treated immediately showed more rapid initial decline followed by a slower rate of PTSD symptom improvement relative to those who waited, who showed a stable level of symptomatology. Findings suggest that CPT produces quick and maintained improvements in veterans. The effect sizes for change between those who received CPT immediately and those who waited were approximately medium sized. Implications of findings are discussed.

Cognitive–behavioral therapies (CBTs) have been shown to be the most efficacious form of treatment for posttraumatic stress disorder (PTSD; Bradley, Greene, Russ, Dutra, & Westen, 2003). Cognitive processing therapy (CPT; Resick, Monson, & Chard, 2007; Resick & Schnicke, 1992) is a specific form of CBT that has been found in a variety of trauma populations to be an efficacious treatment for PTSD and comorbid conditions (see Resick, Monson, & Gutner, 2007 for review). For example, in a sample of veterans with combat-related PTSD, Monson and colleagues (2006) found significant improvements in total clinician-assessed and self-reported PTSD symptoms in the CPT condition as compared with the waitlist (WL) condition. Although research indicates that CPT is an effective intervention for PTSD, like many empirically supported treatments, questions remain as to the specific mechanisms of change in symptom presentation during and following treatment. One line of research that may shed light on the processes underlying change is the examination of symptom change across treatment. Notably, several researchers have suggested that examining nonlinear patterns of individual change over the course of therapy can improve understanding of an intervention, such as what promotes or prevents symptom change (Hayes, Laurenceau, Feldman, Strauss, & Cardaciotto, 2007). The current study extends prior findings in PTSD treatment by comparing patterns of self-reported symptom change across multiple assessments during treatment, representing an important step in understanding

Alexandra Macdonald, Psychology Department, Boston University, and VA Boston Healthcare System; Candice M. Monson, Women's Health Science Division, National Center for Posttraumatic Stress Disorder; Susan Doron-Lamarca, Behavioral Science Division, National Center for Posttraumatic Stress Disorder; Patricia A. Resick, Women's Health Science Division, National Center for Posttraumatic Stress Disorder; Tibor P. Palfai, Psychology Department, Boston University.

Candice M. Monson is now at the Department of Psychology, Ryerson University.

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Correspondence concerning this article should be addressed to: Alexandra Macdonald, VA Boston Healthcare System (116B), 150 S. Huntington Avenue, Jamaica Plain, MA. E-mail: Alexandra.Macdonald@va.gov.

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the overall process of change in efficacious psychotherapies (Barkham, Stiles, & Shapiro, 1993; Borkovec & Miranda, 1999).

In their early review of psychotherapeutic process of change, Howard, Kopta, Krause, and Orlinsky (1986) found that symptom change was best characterized by an initial rapid decline followed by a slower decline or a plateau. Although this pattern has been observed in studies focused specifically on depression (e.g., Illardi & Craighead, 1994), within the anxiety disorder literature, findings remain equivocal. For example, Penava, Otto, Maki, and Pollack (1998) found evidence for rapid initial declines in symptoms among panic disorder participants; however, other researchers have found a pattern of initial maintenance, or even brief exacerbation of anxiety symptoms during early phases of cognitive–behavioral treatments of anxiety disorders (Heimberg & Becker, 2002).

Although questions have been raised regarding the potential for trauma-focused interventions to result in initial exacerbation of PTSD symptoms (e.g., Kilpatrick & Best, 1984), few studies have investigated patterns of symptom change during the course of PTSD treatment. Foa, Zoellner, Feeny, Hembree, and Alvarez-Conrad (2002) found that the majority of participants who received prolonged exposure therapy (PE) improved following treatment. Only 10.5% of participants reported brief PTSD symptom increases during exposure intervention. By posttreatment assessment, there were no differences in PTSD symptoms between participants who had experienced symptom exacerbation and those who had not. These findings suggest that symptom exacerbation is an exception in PE and is not predictive of ultimate response to treatment.

Nishith, Resick, and Griffin (2002) examined patterns of symptom change across CPT and PE in a large sample of female rape victims. They found a pattern of change in reexperiencing and hyperarousal symptoms in both treatment conditions that was characterized by symptoms initially remaining constant or increasing slightly, followed by a more rapid decrease in symptoms (i.e., a quadratic pattern). In the PE condition, there was also a similar quadratic pattern of change in avoidance/numbing symptoms. Within CPT, avoidance/numbing symptoms declined in a linear fashion across treatment, characterized by a constant rate of change over time. The authors suggested that the linear pattern of decline for avoidance/numbing in the CPT condition reflected the immediate focus on overcoming avoidance of the traumatic memory through a written statement about the meaning of the event. The initial increase (or maintenance) seen in other symptom clusters was interpreted as a response to the removal of the participants' main coping strategy of avoidance/numbing.

More recently, in a sample of women who experienced sexual or physical assault, Resick and colleagues (2008) conducted a dismantling study of CPT using three treatment conditions: CPT, CPT without the written account, and written account only in which participants wrote an account of the assault multiple times without any cognitive therapy. The investigators tested both linear and quadratic patterns of symptom change over the course of treatment. They did not find support for a quadratic pattern of change in any condition and concluded the symptom declines were best represented by a linear pattern of change. Within the full CPT condition, significant symptom declines were evidenced by session 6, indicating that symptom declines occurred relatively early in CPT treatment.

Although the extant PTSD treatment literature has made progress in identifying patterns of symptom change across treatment, the possibility of faster rates of improvement in early sessions (e.g., Howard et al., 1986; Penava et al., 1998) remains untested in the trauma treatment literature. This logarithmic pattern involves greater improvements in earlier sessions of therapy followed by a slower rate of change in later sessions or follow-up assessments. An additional area of needed investigation involves the treatment of the effortful avoidance and numbing symptoms. Heretofore, these symptoms have been combined in across-treatment analyses despite substantial research to support disaggregating the effortful avoidance and emotional numbing symptoms of PTSD (King, Leskin, King, & Weathers, 1998). When disaggregating these clusters, researchers have found that emotional numbing symptoms are associated with higher rates of relationship distress (Riggs, Byrne, Weathers, & Litz, 1998; Riggs, Monson, Glynn, & Canterino, 2009) and may predict poorer treatment outcomes (Taylor et al., 2001). The present investigation aimed to address these limitations.

Building on prior research (Monson et al., 2006), we used hierarchical linear modeling to examine the treatment response trajectory of total self-reported PTSD symptoms and the four different clusters of PTSD symptoms in a sample of military veterans. For each outcome variable (i.e., PTSD total scores and PTSD symptom cluster scores), models for quadratic, linear, and logarithmic patterns of change were compared with each other to determine which model provided the best fit in estimating expected change in PTSD symptoms during treatment. Based on prior research (Nishith et al., 2002), it was hypothesized that (a) symptom changes over the course of CPT would be distinct from the WL condition, in which there would be little or no symptom change; and (b) a quadratic pattern of change would provide the best fit for reexperiencing, emotional numbing, and hyperarousal symptoms, whereas a linear pattern of change would provide the best model fit for effortful avoidance symptoms. Findings from this study can identify the likely course of PTSD symptom change during CPT compared with WL, further addressing questions of potential symptom exacerbation during trauma-focused interventions.

METHOD

Participants & Procedure

This project is part of a randomized controlled clinical trial assessing the efficacy of CPT for military-related PTSD. A more

Table 1. Pooled and Grouped Demographic Characteristics

	CPT $n = 30$		WL $n = 30$		Total $N = 60$	
	n	%	*n*	%	*n*	%
Male	28	93.3	26	86.7	54	90.0
Non-White race	2	6.7	3	10.0	5	8.3
Married	21	70.0	22	73.3	43	71.1
PTSD disability	15	50.0	14	46.7	29	48.3
Period of service						
Vietnam war	25	83.3	23	76.7	48	80.0
Other era	5	16.7	7	23.3	12	20.0
Served in warzone	24	80.0	26	86.7	50	83.3
Index trauma						
Combat	24	80.0	23	76.7	47	78.3
Sexual	3	10.0	7	23.3	10	16.7
Noncombat physical assault	3	10.0	0	0.0	3	5.0
Current comorbid diagnoses	22	73.3	22	73.3	44	73.3
Mood disorder	16	53.3	17	56.7	33	55.0
Other anxiety disorder	13	43.3	16	53.3	29	48.3
Substance abuse	1	3.3	0	0.0	1	1.7
Lifetime comorbid diagnoses	29	96.7	30	100.0	59	98.3
Mood disorder	25	83.3	28	93.3	53	88.3
Other anxiety disorder	17	56.7	19	63.3	36	60.0
Substance abuse or dependence	25	83.3	23	76.7	48	80.0
Number of psychiatric medications						
No medication	4	13.3	8	26.7	12	20.0
One medication	4	13.3	4	13.3	8	13.3
Two or more medications	22	73.3	18	60.0	40	66.7
Psychiatric medication type						
SSRI	11	36.7	11	36.7	22	36.7
Other antidepressant	18	60.0	13	43.3	31	51.7
Benzodiazepine/barbiturate	12	40.0	12	40.0	24	40.0
Mood stabilizer	1	3.3	5	16.7	6	10.0
Antipsychotic	10	33.3	4	13.3	14	23.3
Other psychotherapy during the trial						
Individual therapy	4	13.3	7	23.3	11	18.3
Group therapy	10	33.3	8	26.7	18	30.0
Family/couples therapy	1	3.3	2	6.7	3	5.0
Self-help	1	3.3	0	0.0	1	1.7

Note. CPT = cognitive processing therapy; WL = wait list; PTSD = posttraumatic stress disorder; SSRI = selective serotonin reuptake inhibitor.

complete description of the method for the randomized controlled trial is available in the article reporting the primary outcomes (Monson et al., 2006). Ninety-three male and female veterans were referred to the study from a Veterans Administration (VA) Medical Center, and 60 were randomly assigned to receive CPT immediately (CPT) or assigned to a waiting list (WL) for 10 weeks prior to receiving the therapy (see Table 1 for demographic information). The mean age was 54.0 ($SD = 6.3$) years. There were no statistically significant differences between the two groups on demographic characteristics. Inclusion criteria included a diagnosis of PTSD due to a military trauma. Exclusion criteria included current, uncontrolled psychotic or bipolar disorder, current substance dependence (those with substance abuse diagnoses were included), current suicidal or homicidal ideation, significant cognitive impairment, unstable psychopharmacological regimen (2 months of stability was required), and psychotherapy specifically for PTSD.

There was a 16.6% overall rate of dropout from therapy; 20% in the CPT condition and 13% in the WL condition.

Eligibility was determined in three phases. First, clinicians referred potential participants meeting preliminary diagnoses, and medical records were reviewed for inclusion/exclusion criteria. Next, participants were invited into the clinic in the VA and provided with a description of the study from study personnel and reviewed the informed consent form. Veterans then provided written informed consent and began the initial assessment. This assessment included a clinician interview and self-report materials, completed by the participant, both of which occurred in the clinic. These were used to determine if they met inclusion/exclusion criteria. Seven master's- and doctoral-level clinicians who were blind to condition assignment obtained the informed consent, conducted the clinical interviews, and monitored the completion of the self-reports, all of which occurred in the clinic at the VA Medical Center.

Self-reports were completed at baseline, midtreatment (or after 3 weeks of waiting), posttreatment (or after 6 weeks of waiting), and 1 month posttreatment (or after 10 weeks of waiting). All assessments were conducted in the clinic, regardless of condition. In keeping with intention-to-treat principles, all participants were followed for assessment regardless of treatment attendance. During treatment, participants in the CPT condition were assessed after sessions 2, 4, 8, and 10. Clinicians gave the measures to participants immediately prior to the beginning of the next session (i.e., sessions 3, 5, 9, and 11).

Measures

The Clinician-Administered Posttraumatic Stress Disorder Scale (CAPS; Blake et al., 1995) is a clinical interview that was used to determine PTSD diagnostic status according to the *Diagnostic Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (*DSM-IV-TR*; American Psychiatric Association [APA], 2000) and severity of clinician-rated symptoms. Independent clinicians, blinded to condition, conducted the CAPS assessments. Reliability for the CAPS administration was excellent as assessed by an independent clinical psychologist for approximately 10% of the interviews (two-way intraclass correlation of severity was .72 to .99 across symptom clusters).

The Posttraumatic Stress Disorder Checklist-Military Version (PCL-M; Weathers, Litz, Herman, Huska, & Keane, 1993) is a 17-item self-report measure of the severity of PTSD symptoms found in the *DSM-IV-TR* and has been used in various trauma populations (e.g., Ruggiero, Del Ben, Scotti, & Rabalais, 2003). Previous research has found support for a 4-factor structure of PTSD using various versions of the PCL, which included disaggregated effortful avoidance (questions 6 and 7) and emotional numbing (questions 8–12; Asmundson et al., 2000; Palmieri & Fitzgerald, 2005). The coefficient α for the PCL-M was .81 in this sample.

Treatment

Cognitive processing therapy is a manualized, 12-session, cognitive–behavioral therapy that has a primary focus on cognitive interventions for PTSD (Resick, Monson, & Chard, 2007; Resick & Schnicke, 1992). Six doctoral-level clinicians with prior experience treating PTSD provided the treatment to an individual, twice-weekly basis whenever possible. All sessions were videotaped and an expert clinician in CPT rated 10% of the possible treatment sessions for (a) protocol adherence, (b) therapist competence, (c) presence of nonspecific elements (e.g., warmth, empathy), and (d) competence of nonspecific elements. Adherence was assessed by indicating presence/absence of an expected element of the session, while competence in delivery used a 7-point Likert scale rating of 1 (*Not at All Good*) to 7 (*Excellent*). Ratings of CPT adherence indicated that the delivery of the essential elements of the therapy was good, with 93% of these elements delivered. Competence in providing these protocol-specific treatment elements was likewise good, with an average rating of 5.4 (5 = *Good*, 6 = *Very Good*). Adherence to the nonspecific but essential elements was excellent, with 100% of the elements delivered. Competence in providing these nonspecific treatment elements was very good, with an average rating of 6.1. The overall therapist skill rating across all sessions was good, with an average of 5.0.

Statistical Analyses

Power analyses for the proposed study were conducted using a repeated measures, within-between statistical test in the GPOWER program (Faul, Erdfelder, Lang, & Buchner, 2007) to accurately test the nested model statistical analyses. A nonspheric bias among the correlations was detected in the repeated measures, as is expected with assessments given across time (i.e., correlations among time points closer in proximity will be stronger than those correlations among distal assessments). Thus, a nonsphericity correction using Geisser-Greenhouse's Epsilon was used ($\varepsilon = .92$; Faul et al., 2007). An α value of .05 was selected. Power was estimated at .81 for a small effect size and .99 for a medium effect size (Cohen, 1988). A Hedge's g effect size for total PCL-M scores among the intention-to-treat sample was .90 at follow-up (see Monson et al., 2006), and a brief analysis of the individual symptom cluster effect sizes reveals a range of effect sizes from .63 to .87 at follow-up. Thus, this study was adequately powered to detect medium effect size changes in PTSD symptoms.

Randomization date was the point from which all future time points were calculated. The time variable was allowed to vary in the analyses and was calculated by summing the number of weeks from an individual's randomization date to subsequent assessment points, producing a continuous predictor of time.

Hierarchical linear modeling (HLM; Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2004; Singer & Willett, 2003) was used to investigate the effect of treatment on changes in PTSD

symptoms over time. HLM estimates change within individuals by estimating a trajectory for each participant including coefficients for an intercept (e.g., baseline PTSD status) and slope (i.e., PTSD symptoms over time relationship). Using HLM, differences between individuals in the overall within-individual trajectory of change can be estimated while taking into account the dependence of repeated measures within participants. Furthermore, relevant to these data, HLM can estimate models with incomplete data, and can take into account unbalanced data resulting from varying measurement intervals within participants (Singer & Willett, 2003). Thus, missing data was not imputed, but rather HLM was allowed to estimate trajectories with missing data.

Five models were conducted with PCL-M total and individual symptom cluster scores (i.e., reexperiencing, effortful avoidance, emotional numbing, and hyperarousal) as the dependent variables. To ensure the correct estimation of variance and covariance structure, baseline measures were included in the model as the first occasion of measurement of the repeated measures. Time, in a form corresponding to the specific pattern of change being tested, was included as a level-1 predictor in the models. To test a linear pattern of change, a nontransformed time term was used. To test a quadratic pattern of change, a quadratic time term consisting of the squared time variable was included in the model with untransformed time. To test a logarithmic pattern of change, analyses were conducted using natural log-transformed time (Mosteller & Tukey, 1977; Singer & Willett, 2003). Treatment condition assignment was included as a level-2 predictor of between-individual change in PTSD and baseline PTSD status.

To evaluate the relative fit of the models, deviance statistics were used to calculate Bayesian information criteria (BIC; Singer & Willet, 2003). Smaller BIC scores indicate a better-fitting model. To determine the best-fitting model, BIC difference scores were computed by subtracting each model's BIC score from another model's BIC (e.g., linear BIC − logarithmic BIC). Raferty's (1995) standards were used to describe the magnitude of the differences. Larger BIC difference scores indicate greater differences between two models (0–2 = *weak*, 2–6 = *positive*, 6–10 = *strong*, and > 10 = *very strong*); the model with the smaller BIC is deemed superior. In addition to the model fit statistics, effect sizes were calculated using partial correlation coefficients (*pr)* and described based on Cohen's (1988) guidelines for effect sizes.

RESULTS

In all comparisons, the absolute BIC values indicated superiority of the logarithmic model of symptom changes relative to the linear and quadratic models (see Table 2). The BIC difference statistics favoring the logarithmic model ranged from 3.5 to 17.1, suggesting a meaningful advantage in all comparisons. Given that the logarithmic model of expected change in PTSD was the best-fitting model for the observed data, all subsequent analyses were conducted using the log-transformed time variable in level-1 of the models.[1]

There were no baseline differences between the CPT and WL conditions in PCL-M total or subscale severity scores indicating effective randomization of participants to condition. As expected, there were no main effects of time on PCL-M total or symptom cluster scores, indicating no significant within-individual increase or decrease in symptoms for the combined group of participants from both conditions. Consistent with hypothesis, there were significant time-by-condition effects such that participants in the CPT condition versus the WL condition evidenced more reductions in PCL-M total scores, with faster improvements in the early sessions compared with the later sessions and follow-up, as presented in Table 2 and Figure 1 (WL $B = -1.6$, CPT $B = -2.7$, $p = .03$). Condition was also significantly related to change in PCL-M avoidance symptoms, with participants in CPT demonstrating greater initial rapid decrease in avoidance compared with participants in WL, as presented in Table 2 and Figure 2 (WL $B = 0.0$, CPT $B = -0.5$, $p = .04$). Such significant change was not observed for the influence of condition upon change in PCL-M numbing (WL $B = -0.4$, CPT $B = -0.8$, $p = .08$) or hyperarousal (WL $B = -0.5$, CPT $B = -0.7$, $p = .07$). The effect sizes between CPT and WL for change in PCL-M total ($pr = .29$) and avoidance symptoms ($pr = .27$) were approximately medium sized.

DISCUSSION

The current study expanded upon extant findings related to patterns of symptom change across CPT for PTSD within a veteran sample using advanced statistical modeling methods that take advantage of the multilevel structure of the data. Overall self-reported PTSD symptoms declined in the CPT condition compared with the WL condition. Among the individual PTSD symptom clusters, the CPT condition evidenced significant self-reported symptom reductions over time compared with WL in effortful avoidance. There were also declines in emotional numbing and hyperarousal symptoms in CPT compared with WL that just failed to meet traditional levels of statistical significance. Contrary to hypothesis, the best-fitting model for symptom change across CPT compared with WL was one involving rapid initial declines, followed by a slower rate of symptom change. Although our findings are different from Nishith et al. (2002), in which PTSD symptoms were found first to plateau and then decline, our results are consistent with the larger psychotherapy literature in which more rapid improvements

[1] All model analyses were run using data from the CPT condition only to confirm that data from the WL was not affecting the overall shape of change in the active treatment condition. Using only the CPT condition data, results remained consistent with the full model, i.e., the logarithmic pattern of symptom change is the best-fitting model. Thus for parsimony, only results from the full model are presented; they are available from the first author.

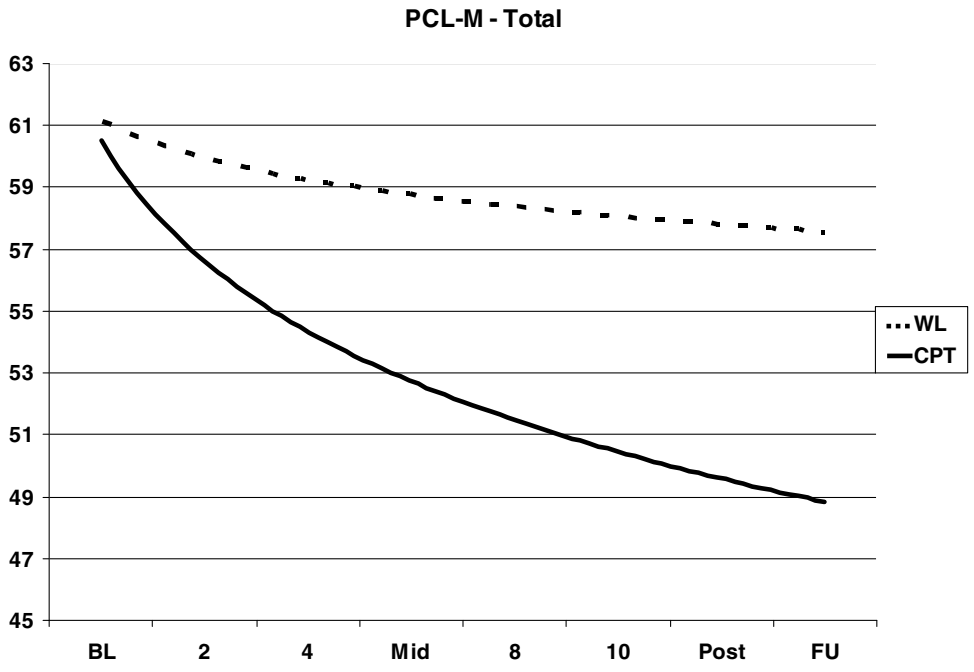

Figure 1. Change in PCL-M total symptoms as a function of treatment condition. PCL-M = PTSD Checklist, military version; CPT = cognitive processing therapy condition; WL = waitlist condition; BL = baseline; Mid = session 6 or after 3 weeks of waiting; FU = 1-month follow-up.

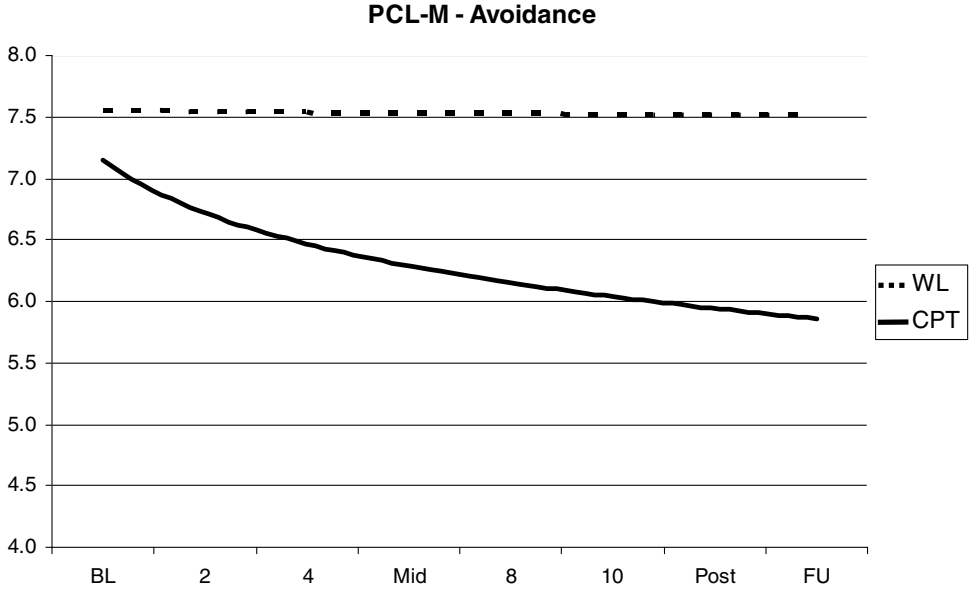

Figure 2. Change in PCL effortful avoidance symptoms as a function of treatment condition. PCL-M = PTSD Checklist, military version; CPT = cognitive processing therapy condition; WL = waitlist condition; BL = baseline; Mid = session 6 or after 3 weeks of waiting; FU = 1-month follow-up.

Table 2. Hierarchical Linear Modeling Results for Change in PTSD Symptoms Using Logarithmic Transformation of Time

							BIC		
	B	*SE*	*t*	*df*	*pr*	*p*	Log	Linear	Quadratic
PCL–M total									
Baseline (level 1)							2,026.7	+12.1	+10.1
Waiting list	61.0	1.8	33.7	57	.98	<.001			
CPT	0.2	2.5	0.1	57	.01	.929			
Change over time (level 2)									
Waiting list	−1.6	1.0	−1.6	57	.21	.106			
CPT	−2.7	1.2	−2.3	57	.29	.027			
PCL–M Reexperiencing									
Baseline (level 1)							1,532.1	+7.2	+14.9
Waiting list	16.5	0.7	24.0	57	.95	<.001			
CPT	1.2	1.0	1.2	57	.15	.245			
Change over time (level 2)									
Waiting list	−0.7	0.5	−1.5	57	.19	.152			
CPT	−0.7	0.5	−1.4	57	.18	.175			
PCL–M Avoidance									
Baseline (level 1)							1,141.9	+3.5	+16.2
Waiting list	7.6	0.3	22.2	57	.95	<.001			
CPT	−0.3	0.5	−0.7	57	.09	.507			
Change over time (level 2)									
Waiting list	0.0	0.2	−0.1	57	.01	.914			
CPT	−0.5	0.2	−2.1	57	.27	.036			
PCL–M Numbing									
Baseline (level 1)							1,469.1	+10.3	+12.2
Waiting list	17.9	0.7	27.0	57	.96	<.001			
CPT	−1.5	0.9	−1.6	57	.20	.121			
Change over time (level 2)									
Waiting list	−0.4	0.3	−1.2	57	.16	.236			
CPT	−0.8	0.5	−1.8	57	.23	.081			
PCL–M Hyperarousal									
Baseline (level 1)							1,403.6	+16.8	+17.1
Waiting list	19.0	0.6	31.2	57	.97	<.001			
CPT	0.8	0.8	1.0	57	.13	.328			
Change over time (level 2)									
Waiting list	−0.5	0.3	−1.6	57	.21	.119			
CPT	−0.7	0.4	−1.8	57	.23	.074			

Note. PTSD = posttraumatic stress disorder; PCL-M = PTSD Checklist, military version; CPT = cognitive processing therapy; this represents the difference from the waiting list condition. Thus, at level 1, CPT represents the difference in baseline PCL-M scores between the two conditions and at level 2, CPT represents the difference in the steepness of the slope of change over time between the two conditions; the interaction of time-by-condition. BIC = Bayesian information criteria; *pr* = partial correlation coefficient (*r*) effect size.

have been found in early sessions of psychotherapy (Howard et al., 1986). These results are also congruent with prior research examining cross-session symptom change in a trial of group CBT for panic disorder (Penava et al., 1998).

Testing for logarithmic patterns of change in PTSD symptoms across treatment is a novel contribution to PTSD treatment research because prior studies have not examined this possible pattern of change (e.g., Bryant et al., 2008; Resick et al., 2008).

Findings from this study suggest that this trauma-focused intervention did not exacerbate PTSD symptoms, and in fact can result in quick symptom reductions early in treatment. This is an important finding that may improve patients' willingness to engage in trauma-focused intervention. In fact, in a study of college women presented with a sexual assault scenario, Cochran, Pruitt, Fukuda, Zoellner, and Feeny (2009) found that practical considerations, including anticipated speed of treatment response, were predictive of type of treatment for sexual assault-related PTSD symptoms. Increasing engagement in mental health services is a particularly relevant concern among a veteran population. Although approximately 25% of returning Iraq and Afghanistan veterans report trauma-related mental health problems, only between 7% to 11% report receiving professional help in the past month (Hoge et al., 2004). Informing veterans of CPT's ability to produce symptom reduction quickly may increase their willingness to engage in therapy.

In addition to patients' concerns, many practitioners continue to believe that trauma-focused interventions can lead to symptom exacerbation (Becker, Zayfert, & Anderson, 2004; Zayfert, & Becker, 2000). Findings from this study and others (e.g., Foa et al., 2002) argue against the notion that, in general, individuals receiving trauma-focused PTSD treatments will get worse before they get better. Continued dissemination of empirical support for the tolerability of trauma-focused interventions, and the lack of evidence for symptom exacerbation, may help assuage practitioners' and clients' wariness of trauma-focused treatment.

Although this study makes several important contributions to the literature, it is not without its limitations. First, the occasions of assessment were unbalanced between the CPT and WL conditions because of the differing number of administrations of the PCL-M by condition, as well as the scheduling of assessments based on time in the WL condition and the number of sessions completed in the CPT condition. Although HLM is adept at handling unbalanced data, the variance between the two conditions can affect the statistical estimations of between-group differences. This may account for the slightly lower effect sizes found between CPT and WL in the current analyses compared with Monson and colleagues' (2006) effect sizes found for the PCL-M across the four primary assessment points in the study. Second, symptom severity across treatment was assessed only via self-report, and some studies have found discrepancies between CAPS and PCL-M scores in prior studies with combat-exposed veterans (Forbes, Creamer, & Biddle, 2001). However, Monson and colleagues (2008) found support for concordance between changes in PCL-M and CAPS scores over time using data from the current trial. Third, although this study extended findings of trajectories of symptom change in CPT beyond women with PTSD resulting from sexual and physical assault, few women and minorities were in the current sample, limiting the generalizability of the study's findings. In addition, military-related trauma was selected for inclusion in the study. There may be particular characteristics of trauma type or individual differences that influence the efficacy of CPT. Further research with other trauma populations is necessary to determine if these results replicate across other treatment groups. Finally, this sample was comprised of mainly Vietnam-era veterans; it will be important to replicate these findings in samples of veterans of the wars in Iraq and Afghanistan.

The comparison of models of PTSD symptom change across treatment in this study suggests that CPT can produce relatively quick and maintained improvements in PTSD in a population that has, in general, minimally benefited from prior treatment efforts. This study also provides further empirical support that trauma-focused interventions do not typically exacerbate PTSD symptom during the course of treatment. In this time of alarmingly high numbers of service members returning with posttraumatic mental health symptoms (Hoge, Auchterlonie, & Milliken, 2006), it is imperative that effective treatments be developed and provided for this population. The current study advances understanding of the response of PTSD symptoms during treatment, which may ultimately yield more efficient and effective PTSD interventions for those who experience these symptoms as a result of military trauma.

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