

RESEARCH ARTICLE

Examining the effectiveness of an intensive, 2-week treatment program for military personnel and veterans with PTSD: Results of a pilot, open-label, prospective cohort trial

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Abstract

Objective This study aimed to examine the effectiveness of cognitive processing therapy (CPT) for posttraumatic stress disorder (PTSD) when administered on a daily basis during a 2-week period of time.

Method In an open-label, prospective cohort pilot trial, 20 U.S. military personnel and veterans diagnosed with PTSD or sub-threshold PTSD participated in 12 daily sessions of CPT. Primary outcomes included Clinician Administered PTSD Scale for DSM-5 and PTSD Checklist for DSM-5 scores. Secondary outcomes included Patient Health Questionnaire-8 and Beck Scale for Suicide Ideation (BSSI) scores. Interviews and self-report scales were completed at pretreatment, posttreatment, and 6 months after the treatment.

Results Relative to baseline, PTSD symptom severity and rates of PTSD diagnosis were significantly reduced at posttreatment and 6-month follow-up. Depression symptom severity did not significantly improve, but suicide ideation significantly decreased at 6-month follow-up.

Conclusions Daily administration of CPT is associated with significant reductions in PTSD and suicide ideation.

KEYWORDS

cognitive processing therapy, military, posttraumatic stress disorder, psychotherapy, veteran

1 | INTRODUCTION

Posttraumatic stress disorder (PTSD) is considered one of the “signature injuries” of the U.S. military operations in Iraq and Afghanistan (Institute of Medicine, 2012), and is the most frequently diagnosed psychiatric condition among veterans of these two conflicts (Tanielian et al., 2008). Research suggests that incidence rates and severity of PTSD increase subsequent to combat exposure (Castro & McGurk, 2007), with estimated rates of probable PTSD among veterans of Iraq and Afghanistan ranging from 5%–20% (Hoge et al., 2004; Hoge, Terhakopian, Castro, Messer, & Engel, 2007; Hoge et al., 2005; Milliken, Auchterlonie, & Hoge, 2007; Tanielian et al., 2008). PTSD among military personnel and veterans is not just a consequence of combat; however, many military personnel and veterans experience noncombat-related traumas such as sexual assault and domestic abuse, or have histories of early life trauma such as child abuse that can also contribute to PTSD. Regardless of the type of traumatic event, PTSD is associated with numerous of functional problems and negative outcomes among military personnel including occupational and marital dissatisfaction, intimate partner violence, alcohol and substance abuse, and suicide (Hoge et al., 2004; Hoge et al., 2005; Back et al., 2014; Finley, Baker, Pugh, & Peterson, 2010; Jakupcak et al., 2007; Panagioti, Gooding, & Tarrier, 2009).

Of the various psychological treatments that have been proposed and developed for the treatment of PTSD, cognitive behavioral therapy (CBT) has garnered strong empirical support. Cognitive processing therapy (CPT) is one particular type of CBT that has been tested extensively across multiple samples including military personnel and veterans. Results of a recent meta-analysis indicated that CPT was efficacious for reducing PTSD with very large reductions in symptom severity, although effect sizes tended to be smaller in samples with higher proportions of veterans (Watts et al., 2013). With respect to loss of PTSD diagnosis, an estimated 53% of individuals with PTSD who receive CPT will no longer meet criteria for the disorder after the completion of CPT (National Center for PTSD, 2017). Long-term follow-up studies conducted in nonmilitary samples suggest the beneficial effects of CPT endure for up to 10 years posttreatment (Resick, Williams, Suvak, Monson, & Gradus, 2012). More recent studies indicate CPT is also associated with significant reductions in suicide ideation (Bryan et al., 2016; Gradus, Suvak, Wisco, Marx, & Resick, 2013; Resick et al., 2017), potentially due to its effects on PTSD and depression symptom severity (Bryan et al., 2016; Gradus et al., 2013). In light of these empirical findings, the *VA/DOD Clinical Practice Guideline for the Management of Posttraumatic Stress* (Department of Veterans Affairs & Department of Defense, 2017) recommends CPT as a first-line treatment for military personnel and veterans with PTSD.

Despite its efficacy, many military personnel and veterans with PTSD will not receive CPT (or other recommended treatments) for a variety of reasons. For example, many clinicians choose not to administer evidence-based treatments despite their proven efficacy (Becker, Zayfert, & Anderson, 2004). Unfortunately, up to 75% of veterans in the VA system do not receive minimally adequate care up to 3 years after their most recent deployments, and a median of 7.5 years passed from a veteran's initial mental health care appointment to the receipt of minimally adequate mental health treatment (Maugen, Madden, Cohen, Bertenthal, & Seal, 2012). This low rate of service has been attributed in part to pervasive mental health stigma within the military and veteran community (Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009), although other data suggest that logistical barriers to care—e.g., cost of care, geographic separation from treatment sources, and scheduling conflicts—are more strongly correlated with service utilization than stigma (Acosta et al., 2014; Valenstein et al., 2014). These logistical barriers are, in large part, the result of the typical operations of the healthcare system itself, which offers psychological treatments like CPT almost exclusively in medical or clinical settings that may have limited hours of operation and/or may be located geographically distant from service members and veterans. Greater flexibility in intervention delivery is therefore needed to reach those who are unwilling or unable to access treatments through prevailing service delivery models. Treatments and interventions that can be delivered in novel settings using formats that are more acceptable, attractive, and convenient could circumvent both logistical and stigma-related barriers to care.

Data further indicate that clinical improvement and recovery rates, defined as loss of PTSD diagnosis, tend to be higher among patients who complete CPT compared with those that drop out of treatment early, which supports the possibility of “dosing” effects (e.g., Resick et al., 2008; Resick, Nishith, Weaver, Astin, & Feuer, 2002).

Further supporting the “dosing” hypothesis is research showing that overall clinical improvement and recovery rates can be increased among patients with slower recovery trajectories by adding sessions of CPT to the typically administered 12-session protocol (Galovski, Blain, Mott, Elwood, & Houle, 2012). Data also suggest that PTSD outcomes are moderated by session frequency, such that CPT sessions spaced closer together yield better effects than CPT sessions that are spaced further apart (Gutner, Suvak, Sloan, & Resick, 2016). Taken together, these studies suggest that PTSD outcomes could potentially be enhanced if CPT is delivered in a format that is (a) relatively compressed and (b) easy for patients to attend all scheduled sessions, two characteristics that may be interconnected. Specifically, treatment that is compressed into a relatively shorter window may be easier for service members and veterans to complete for a number of reasons including motivation (e.g., treatment could be completed before motivation wanes), convenience (e.g., regular treatment attendance may be easier during relatively briefer periods of time), and less interference with other aspects of life (e.g., taking time off from work). A recently published trial of prolonged exposure therapy for PTSD found that daily administration of the treatment during a 2-week window was noninferior to weekly administration of the treatment during an 8-week window (Foa et al., 2018). These findings support the feasibility of more aggressive administration of trauma-focused therapies without loss of efficacy.

In light of these possibilities, the National Center for Veterans Studies (NCVS) at The University of Utah created the R&R program, an intensive, 2-week treatment program for service members and veterans diagnosed with PTSD in partnership with the National Ability Center (NAC), a nonprofit recreational and adaptive sports center located in Park City, Utah, described in further detail below. Although the past decade has seen a proliferation of veteran-oriented programs set in recreational and/or outdoor settings, few incorporate empirically supported treatments for PTSD and almost no rigorous research exists regarding the potential efficacy of such programs (Bryan & Bryan, 2016). To date, there are also no known studies examining the potential efficacy of CPT when delivered in such a high-intensity format. In light of these knowledge gaps, the present study entails a report of preliminary outcomes resulting from an open-label, prospective cohort pilot study of an intensive, 2-week treatment program that included CPT as the central treatment for PTSD. Consistent with the results of previous CPT studies, we hypothesized that PTSD, depression, and suicide ideation would significantly decline from pretreatment to posttreatment.

2 | METHOD

2.1 | Participants

Participants were 20 U.S. military personnel and veterans meeting diagnostic criteria for PTSD or subthreshold PTSD (defined below). The gender distribution was 60% male and 40% female. Fifteen percent of participants were 25–34 years of age, 45% were 35–44 years, 25% were 45–54 years, and 15% were 55 years or older. Self-reported racial identification (participants could endorse multiple options) was 95% white, 5% black, and 5% Native American. Hispanic/Latino ethnicity was endorsed by 10% of participants. Approximately one-third (35%) were currently serving in the military and 65% were veterans no longer in service. Of those who were current service members, all were in the National Guard or Reserves. Branch of service included 55% Army, 35% Air Force, 5% Marine Corps, and 10% Navy. Service era included 70% Post-9/11 (Iraq and Afghanistan), 15% Persian Gulf, and 15% Vietnam. Index traumas included 45% combat or deployment related, 45% sexual trauma, 5% witnessing an accidental death, and 5% childhood sexual abuse.

2.2 | Procedures

Military personnel and veterans were recruited through a variety of methods including online social media advertisements, referrals from community agencies and nonprofits, and mental health professionals. Military personnel and

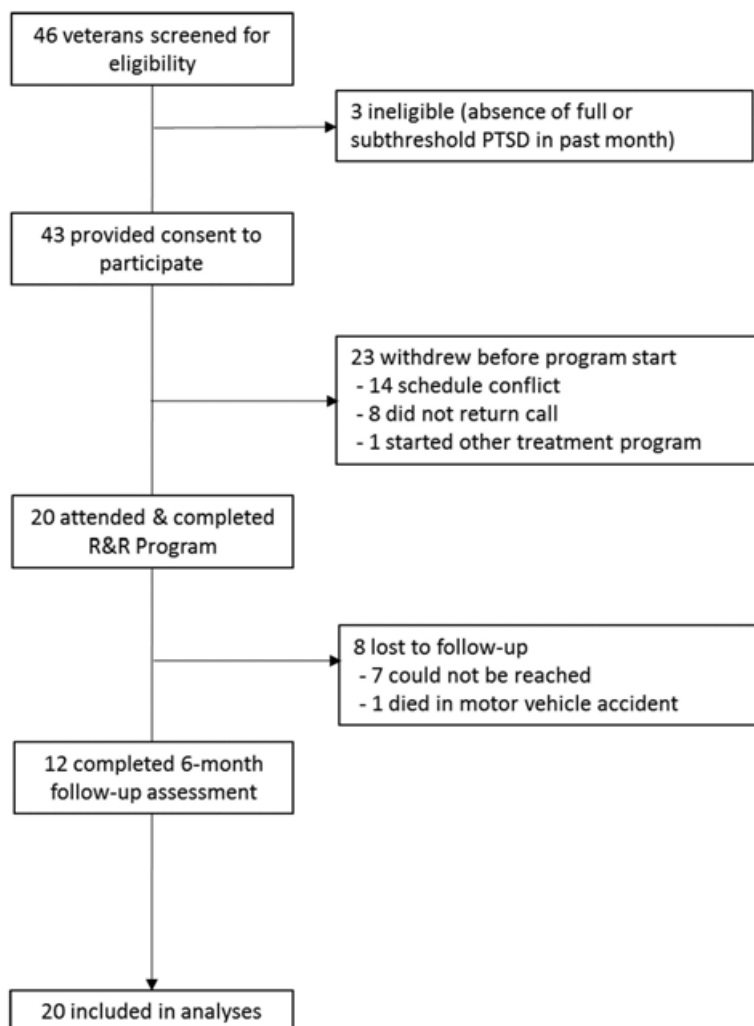


FIGURE 1 Flow of participants through the study

veterans contacted the NCVS at The University of Utah to schedule a phone or in-person diagnostic interview for eligibility determination. Inclusion criteria included meeting full diagnostic criteria for PTSD or subthreshold PTSD (defined as meeting diagnostic criteria for all but one symptom cluster), which was established with the Clinician Administered PTSD Scale for DSM-5 (CAPS-5), described below. Exclusion criteria were severe suicide risk warranting immediate psychiatric hospitalization and/or severe substance dependence warranting medical management. Eligible service members and veterans completed the informed consent process via phone. Those consenting to participate were sent an email with an embedded hyperlink that connected them to an online survey to complete self-report scales. Participants traveled to Utah for the 2-week program and were provided room and board at the NAC. Participants completed follow-up self-report measures at 3 and 6 months posttreatment, and were reinterviewed with the CAPS by independent evaluators on the final day of the program (assessing symptoms during the past week) and at 6 months posttreatment (assessing symptoms during the past month). The flow of participants through the study is displayed in Figure 1. Of note, one participant died in a motor vehicle accident that was unrelated to study participation approximately 5 months posttreatment. Study procedures were approved by The University of Utah Institutional Review Board.

2.3 | Treatment

The R&R Program provides CPT in a format designed to circumvent logistical barriers to care and to maximize treatment completion in several ways. First, the program is 2 weeks in duration, thereby enabling service members and veterans to take time away from work and/or other obligations during a condensed period of time that can be easier to schedule than taking smaller amounts of time on a weekly basis spread over several months. In light of this 2-week period of time, the 12 sessions of CPT are scheduled on a daily basis, which can increase the likelihood of treatment completion and magnify the intensity of dosing. Next, the program's setting in a recreational, adaptive sports facility allows for service members and veterans to participate in a range of activities offered by the NAC (e.g., hiking, biking, archery, swimming, skiing), which could enhance the attractiveness and appeal of the program. Finally, because service members and veterans can attend at no cost and can be accompanied by their family members, the program may also circumvent other common logistical barriers to care.

The central component of the R&R Program is individual CPT, a 12-session cognitive therapy that focuses on the patient's subjective appraisals of stressful life events, with a particular focus on several core areas including safety, trust, power and control, self-worth, and intimacy. Patients are taught to evaluate their automatic thoughts and core beliefs (referred to as "stuck points") using a series of worksheets aimed at helping them replace unhelpful or maladaptive appraisals with more functional appraisals. Consistent with most recent version of the CPT manual (Resick et al., 2017), the R&R Program employed CPT without a written trauma account. Studies support CPT's efficacy when administered without this procedure (e.g., Chard, Schumm, McIlvain, Bailey, & Parkinson, 2011; Resick et al., 2008; Resick et al., 2015; Resick et al., 2017), and a dismantling study found a faster trajectory of recovery when the written trauma account was omitted (Resick et al., 2008). Individual CPT sessions were scheduled once per day in the morning. To maintain the full dose of CPT within the context of a compressed timeline, patients were instructed to complete a week's worth of worksheets and assignments each day. All patients completed at least 11 of the CPT's 12 sessions.

CPT was augmented with recreational programming scheduled by the NAC. These activities varied according to the season, and included activities such as hiking, mountain biking, rock climbing, swimming, skiing, snowshoeing, high ropes course, equine-assisted activities, and archery. Both patients and their families were invited to attend any of the recreational activities. In addition, psychoeducational sleep classes based on the principles of CBT for insomnia (CBT-I; Manber et al., 2014) were offered four times during the program (twice per week). As a part of these classes, participants maintained a sleep diary, which was reviewed by the clinician to track progress and provide customized recommendations for improving sleep.

2.4 | Clinicians

CPT clinicians included one licensed clinical psychologist and two postdoctoral clinical psychology trainees. All three clinicians had completed CPT training with follow-up consultation. One clinician additionally completed CPT trainer and consultant training. CPT clinicians met as a group daily to review cases and ensure treatment fidelity. This daily case review was led by the CPT consultant and followed the consultation model used for CPT provider training and implementation. Given the effectiveness (versus efficacy) focus of this study, fidelity ratings and scores were not obtained; however, no significant issues related to fidelity were noted or observed. In addition to the CPT clinicians, one clinical psychology doctoral student conducted all psychoeducational sleep groups under the supervision of the licensed psychologist, who was trained in CBT-I.

2.5 | Measures

2.5.1 | Clinician Administered PTSD Scale for DSM-5

The CAPS-5 (Weathers et al., 2013) is an interviewer-administered diagnostic instrument for PTSD. Each item corresponds a DSM-5-defined diagnostic criterion, and is rated on a 5-point scale ranging from 0 (*absent*) to 4 (*extreme or incapacitating*). For a symptom to be considered present, it must meet a minimum threshold score of 2 (*moderate*)

during the past month. The CAPS-5 also includes items that rate overall severity of symptom distress and degree of social and occupational functioning. The 20 symptom items are summed to provide an overall metric of PTSD symptom severity. To meet full criteria for a diagnosis of PTSD, a participant must report at least one intrusion symptom, one avoidance symptom, two negative alterations in cognition and mood symptoms, and two hyperarousal symptoms at or above threshold scores, and must report moderate or higher subjective distress or impairment in socio-occupational functioning. Subthreshold PTSD was defined as reporting only three of the four symptom clusters at or above threshold scores, consistent with the “three-of-four” method described by McLaughlin et al. (2015) and similar to the approach used by Marmar et al. (2015). The CAPS-5 was administered at pretreatment and 6 months posttreatment. Internal consistency estimates in the present sample were, respectively, .90 and .85. A past-week version was also created for the present study to assess PTSD severity at posttreatment.

2.5.2 | PTSD Checklist for DSM-5

The PTSD Checklist for DSM-5 (PCL-5) (Blevins, Weathers, Davis, Witte, & Domino, 2015) is a 20-item self-report scale that assesses the severity of each DSM-5-defined symptom for PTSD during the past month on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*). Items are summed to provide an overall metric of PTSD symptom severity. The PCL-5 was administered at pretreatment and 3 and 6 months posttreatment. Internal consistency estimates in the present sample were, respectively, .95, .98, and .97.

2.5.3 | Patient Health Questionnaire-8

The Patient Health Questionnaire-8 (PHQ-8) (Kroenke, Spitzer, & Williams, 2001) is a self-report scale that assesses the frequency of each DSM-5-defined symptom for depression during the past 2 weeks on a 4-point scale ranging from 0 (*not at all*) to 3 (*nearly every day*). The scale's ninth item, which assesses frequency of suicide ideation, was excluded from the total score to reduce potential overlap with a separate method for assessing suicide ideation, described below. Items are summed to provide an overall metric of depression symptom severity. The PHQ-8 was administered at pretreatment and 3 and 6 months posttreatment. Internal consistency estimates in the present sample were, respectively, .82, .93, and .89.

2.5.4 | Beck Scale for Suicide Ideation

The Beck Scale for Suicide Ideation (BSSI) (Beck, Kovacs, & Weissman, 1979) is a 19-item interviewer-administered instrument for assessing the incidence and severity of suicide-related thoughts, intentions, plans, and preparatory behaviors. Each item is rated on a three-point scale, with higher scores reflecting greater severity. All participants completed the first five items, which serve as screening items. Those who positively endorsed active suicide ideation (item 4) or passive suicide ideation (item 5) were then asked the remaining 14 items. Items are summed to provide an overall metric of suicide ideation. The BSSI was administered at pretreatment and 6 months posttreatment. Internal consistency estimates for the five screening items (among all participants) in the present sample were, respectively, .85 and .85. Internal consistency estimates for all 19 items (among those endorsing suicide ideation) were .90 and .87.

2.6 | Data analytic approach

The primary analysis focused on CAPS-5 total scores over time using an intent-to-treat approach in which all available data points from all participants were included regardless of treatment completion or adherence. The primary hypothesis (i.e., change in PTSD symptom severity) was tested using a series of generalized linear mixed regression models with time entered as a fixed effect, an autoregressive covariance matrix to account for intercorrelated repeated measures, and restricted maximum likelihood estimation. Generalized linear mixed regression was also used to handle missing data associated with attrition during follow-up. To test change in the proportion of participants meeting full diagnostic criteria for PTSD and experiencing any suicide ideation over time, a generalized linear proportions model for binary data (i.e., presence of absence of PTSD diagnosis or suicide ideation) was used. With respect to the CAPS,

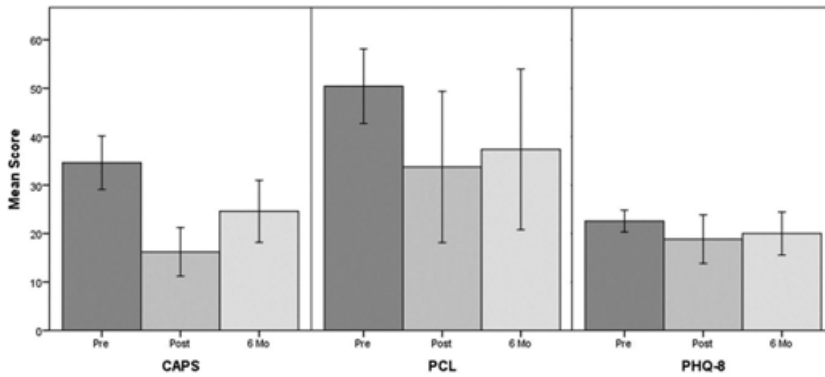


FIGURE 2 Change in posttraumatic stress disorder (PTSD) and depression measures over time

models tested change from pretreatment to posttreatment and from pretreatment to 6-month follow-up. With respect to the PHQ-8, models tested change from pretreatment to 3-month follow-up and pretreatment to 6-month follow-up. With respect to the BSSI, the model tested change from pretreatment to 6-month follow-up. Reliable change indices and standardized mean difference effect sizes were calculated to assess the overall magnitude of change over time. The reliable change index represents the minimum amount of change that would be expected to occur less than 5% of the time as a result of random fluctuations and/or measurement error, and is calculated based on the standard error of measurement (Jacobson & Truax, 1991). Using this method, the reliable change indices included change scores larger than 9 on the CAPS-5 and PCL, larger than 6 on the PHQ-8, and larger than 7 on the BSSI. Regarding statistical power, a sample size of 20 with three repeated measurements with an estimated intraclass correlation of .50 yields 80% power to detect a moderately sized standardized mean difference ($d = .59$). Previous studies of CPT have reported within-group effect sizes nearly double this value (e.g., Resick, Galovski et al., 2008; Resick, Wachen et al., 2017).

3 | RESULTS

At pretreatment, 17 (85.0%) participants met full criteria for PTSD and 3 (15.0%) met criteria for subthreshold PTSD based on CAPS-5 interviews. Mean pretreatment CAPS-5 ($M = 34.6$, $SD = 11.8$), PCL ($M = 50.4$, $SD = 16.0$), PHQ-8 ($M = 22.6$, $SD = 4.7$), and BSSI ($M = 7.7$, $SD = 7.8$) scores indicated participants were experiencing a severe level of distress. Mean CAPS-5, PCL, and PHQ-8 scores over time are displayed in Figure 2.

3.1 | Posttreatment PTSD severity and diagnosis

From pretreatment to posttreatment, patients reported a statistically significant decline in CAPS-5 scores ($M = 34.6$, $SD = 11.8$ vs. $M = 16.2$, $SD = 10.7$; $F(1,19) = 45.22$, $p < .001$), and reliable improvement occurred in 75.0% of participants. The estimated proportion of participants meeting full diagnostic criteria for PTSD significantly declined from 85.0% ($SE = 8.0\%$) at pretreatment to 25.0% ($SE = 9.7\%$) at posttreatment ($OR = .06$ [.02, .24], $p < .001$). Patients also reported a statistically significant decline in PCL scores ($M = 50.4$, $SD = 16.0$ vs. $M = 33.8$, $SD = 24.6$; $F(1,29) = 5.28$, $p = .029$), and reliable change occurred in 69.2% of participants.

3.2 | Follow-up PTSD severity and diagnosis

From posttreatment to 6-month follow-up, patients reported a statistically significant increase in CAPS-5 scores ($M = 16.2$, $SD = 10.7$ vs. $M = 24.6$, $SD = 10.1$; $F(1,12) = 6.28$, $p = .027$). The estimated proportion of participants meeting full diagnostic criteria for PTSD increased slightly from 25.0% ($SE = 9.7\%$) at posttreatment to 43.4% ($SE = 14.2\%$) at

6-month follow-up, but this change was not statistically significant ($OR = 2.21 [9.62, .51], p = .293$). PCL scores did not significantly change from posttreatment to 6-month follow-up ($M = 33.8, SD = 24.6$ vs. $M = 37.4, SD = 19.8; F(1,6) = .05, p = .832$).

From pretreatment to 6-month follow-up, patients reported a statistically significant decline in CAPS-5 scores ($M = 34.6, SD = 11.8$ vs. $M = 24.6, SD = 10.1; F(1,13) = 12.04, p = .004$), but the decline in PCL scores fell short of statistical significance (see Figure 2). Reliable improvement in CAPS-5 scores occurred in 50.0% of participants, whereas reliable improvement in PCL scores occurred in only 45.5% of participants. The estimated proportion of participants meeting full diagnostic criteria for PTSD significantly declined from 85.0% ($SE = 8.0\%$) at pretreatment to 43.4% ($SE = 14.2\%$) at the 6-month follow-up ($OR = .18 [.05, .68], p = .012$).

3.3 | Posttreatment depression severity

From pretreatment to 3-month follow-up, patients reported a slight decline in depression symptoms, but this difference was not statistically significant ($M = 22.6, SD = 4.7$ vs. $M = 18.8, SD = 7.9; F(1,18) = 2.87, p = .107$). Reliable change in PHQ-8 scores occurred in 21.7% of participants.

3.4 | Follow-up depression severity

From posttreatment to 6-month follow-up, severity of depression symptoms did not significantly change ($M = 18.8, SD = 7.9$ vs. $M = 20.0, SD = 5.3; F(1,6) = 1.77, p = .230$). From pretreatment to 6-month follow-up, severity of depression symptoms did not significantly change ($M = 22.6, SD = 4.7$ vs. $M = 20.0, SD = 5.3; F(1,15) = 1.65, p = .219$; see Figure 2). Reliable change in PHQ-8 scores occurred in 11.8% of patients.

3.5 | Follow-up suicide ideation severity

From pretreatment to 6-month follow-up, severity of suicide ideation significantly declined ($\chi^2(1) = 5.12, p = .024$) from $M = 8.0 (SE = 1.6)$ to $M = 3.9 (SE = 1.9)$. The estimated proportion of participants endorsing any level of suicide ideation declined from 65.5% ($SE = 10.6\%$) at pretreatment to 41.0% ($SE = 14.7\%$) at 6-month follow-up, but this difference was not statistically significant ($OR = .37 [.09, 1.50], p = .162$). From pretreatment to the 6-month follow-up, reliable change on the BSSI occurred in 55.6% of participants who reported recent suicide ideation at pretreatment.

There were no suicide attempts during treatment or the 6-month follow-up period.

4 | DISCUSSION

Results of the present study indicate that daily administration of CPT holds considerable promise as a model for rapidly and effectively treating military personnel and veterans with PTSD. To our knowledge, this is the first study to examine clinical outcomes among patients with PTSD during and after daily administration of CPT. As expected, military personnel and veterans in the present study showed large and statistically significant reductions in PTSD symptom severity and rates of PTSD diagnosis across a variety of trauma types. Participants also reported significant reductions in the severity of suicide ideation over time. These results align with previous studies showing positive effects on PTSD symptoms and suicide ideation among military personnel and veterans treated with CPT (Bryan et al., 2016; Chard et al., 2011; Resick et al., 2015; Resick, Monson, & Chard, 2016). Of note, these results were obtained in a sample characterized by a wide range of trauma types: military (e.g., combat, training mishaps), adult sexual trauma, and childhood trauma (i.e., witnessing the accidental death of a parent).

In contrast to these observed reductions in PTSD symptoms and suicide ideation, depression severity did not change in the present study. This diverges from previous research finding significant reductions in depression severity after the

completion of CPT (Chard et al., 2011; Resick et al., 2002; Resick et al., 2015). Although the effect was in the expected direction, it is possible the lack of significant findings suggest that intensively delivered, daily CPT may have less of an effect on depression symptoms than CPT administered on a weekly or biweekly basis. Another possibility is that the small sample yielded insufficient statistical power to detect a significant decline. This likelihood of this possibility may be supported by the observed reductions in suicide ideation, which suggests that treatment likely had some impact on severe depression symptoms. It may be that characteristics of participants who select to participate in a program like R&R contribute to this finding. That is, many of the participants in the program were from rural communities, had low socioeconomic status, and/or were facing significant life stressors other than PTSD (e.g., homelessness, unemployment). The lack of social or economic resources are strongly linked to the onset and maintenance of depression symptoms (Kessler & Bromet, 2013) and may have been more pronounced in this sample compared with participants in randomized controlled trials for CPT. In addition, because participants were engaged in treatment removed from their everyday lives, stressors not directly related to PTSD, which would naturally come up and likely be targeted on worksheets over a three-month treatment, may have not had the opportunity or time to emerge during a 2-week treatment. Thus, in the daily delivery of CPT within a retreat format, clinicians may have less opportunity to address cognitions regarding general life stress that may be depression-maintaining.

From a clinical perspective, the present results suggest that military personnel and veterans with PTSD can be rapidly treated using an aggressive treatment model housed within a nontraditional setting. Critically, outcomes of the present study are comparable to those observed in studies and settings employing more traditional treatment models (e.g., weekly or biweekly sessions), which suggests that CPT retains its efficacy even when administered intensively during very brief periods of time. If replicated, these findings may point to an alternative treatment delivery model that could increase treatment accessibility for many military personnel and veterans with PTSD, a population with relatively low rates of mental healthcare utilization (Hoge et al., 2004; Maguen, Madden, Cohen, Bertenthal, & Seal, 2012; Valenstein et al., 2014). The 2-week intensive program was associated with higher treatment completion rates and lower dropout rates as compared with reported rates in many clinical trials and naturalistic studies for trauma-focused therapy (see Imel, Laska, Jakupcak, & Simpson, 2013, for review). Specifically, 100% of participants attended 11 of 12 CPT sessions, which far exceeds the minimum criteria for treatment completion (i.e., attending at least 9 of 12 sessions). By comparison, only 56% of patients with PTSD who receive treatment attend at least eight sessions of therapy, the threshold for a "minimally adequate dose" of psychotherapy (Wang et al., 2005). This finding has important implications for institutions where clinic utilization may decrease due to no-shows and high dropout rates. Research should continue to focus on how to make innovative changes to increase access and decrease dropout rates within our evidenced-based treatments.

The present findings should be interpreted with consideration for several limitations in mind. First, although the central component of the R&R Program is CPT, service members and veterans also participated in additional program components that could have influenced outcomes, such as sleep classes and recreational activities. Second, because no comparison condition was employed, we are unable to speak to the relative effectiveness of the program as compared with other treatment approaches and intervention methods. Future research employing a dismantling or component analysis design is needed to tease apart the relative contributions of each activity. Third, the present sample was relatively small in size ($N = 20$), consistent with a pilot trial design. Because small sample sizes can lead to overestimation of effect sizes, the present results should be considered preliminary until studies utilizing larger samples can be conducted. This is especially important when considering attrition over time. Although attrition in the present study was comparable to previously published PTSD trials (Imel et al., 2013), caution in generalizing results is nonetheless warranted. Fourth, posttreatment assessments occurred at slightly different times, depending on the method used. Specifically, interview-based outcomes (CAPS-5) were administered immediately posttreatment whereas self-report outcomes (PCL and PHQ-8) were not assessed approximately 2 months later. This occurred because, as a pilot trial, we were attempting to identify the optimal assessment schedule when using different assessment methods with different timeframes of interest (i.e., past day, past week, or past month). This gap in posttreatment assessment limits our ability to more clearly describe patterns of change across various assessment methods. A final limitation of this study is the restriction of treatment to only 12 sessions owing to the time-limited nature of the program. Previous studies

indicate that treatment response can be enhanced for slow responders by increasing the dose of CPT beyond 12 sessions (Galovski et al., 2012). Because the R&R Program is only two weeks longer, this option was not available for those participants who might have otherwise benefited from additional CPT sessions.

5 | CONCLUSIONS

The present study provides preliminary empirical support for the effectiveness of an innovative service delivery model that includes intensive treatment regimens for service members and veterans with PTSD. Critically, the present results indicate that CPT significantly reduces PTSD symptoms and rates of diagnosis when delivered intensively during a relatively brief window of time, a format that could enhance treatment accessibility and completion.

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