



## Effectiveness of a rational emotive behavior therapy (REBT)-informed group for post-9/11 Veterans with posttraumatic stress disorder (PTSD)

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### ABSTRACT

Various treatments aimed for posttraumatic stress disorder (PTSD) have been developed for Veterans, but many are not formatted for use in groups, do not address common psychiatric comorbidities, and include inherent barriers (e.g., substantial time commitment). This program evaluation study aimed to examine the effectiveness of a five-session treatment, a Rational Emotive Behavior Therapy (REBT)-Informed Group focused on changing irrational beliefs to address comorbid depression and anxiety (as well as anger and guilt) among post-9/11 Veterans with PTSD. Participants ( $n = 47$ ) completing the REBT-Informed Group demonstrated significant reductions at posttreatment in depression and PTSD symptoms. Compared to Veterans in a ten-session treatment-as-usual group ( $n = 47$ ), there was no significant difference in PTSD symptom improvement despite the reduction in number of sessions. The study demonstrates that a five-week group treatment for PTSD comorbid with depression or anxiety in post-9/11 Veterans – a therapy that may be uniquely suited to a military or Veteran population, but potentially generalizable to civilians as well – can lead to significant reductions in depression and PTSD symptoms. Future directions include development of a manual for dissemination and replication of findings of the REBT-Informed Group to other military or Veterans Affairs medical centers.

### ARTICLE HISTORY

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PTSD; depression; REBT; treatment; Veteran

**What is the public significance of this article?**—This study shows that by changing “irrational” beliefs to address depression and anxiety (as well as anger and guilt) among post-9/11 Veterans with Posttraumatic Stress Disorder (PTSD), symptoms of depression, anxiety, and PTSD can decrease without directly addressing a previous trauma. The five-session treatment, a Rational Emotive Behavior Therapy (REBT)-Informed Group, may be uniquely suited to a military or Veteran population, but potentially applicable to civilians, which could impact countless numbers of people suffering from mental health difficulties.

Posttraumatic stress disorder (PTSD) is a recognized health concern in Veterans, especially those returning from the wars in Iraq and Afghanistan. Overall estimated PTSD prevalence in post-9/11 Veterans was 23%. However, these estimates ranged from 1.4 to 60% likely due to variability in sampling strategies, combat exposure, military context, and the method for reporting PTSD (Fulton et al., 2015). PTSD is often diagnosed with comorbid depression and anxiety, as well as other emotion-related concerns including anger and guilt (e.g., Flory & Yehuda, 2015; Nixon & Nearmy, 2011).

Several treatments for PTSD have been developed or adapted for Veteran cohorts (e.g., Prolonged Exposure [PE] Therapy: Foa, Hembree, & Rothbaum, 2007; Cognitive Processing Therapy [CPT]: Resick et al., 2017; Eye Movement Desensitization and Reprocessing [EMDR] Therapy; Shapiro, 2007). Individual evidence-based treatments (EBTs) demonstrate greater improvement in PTSD symptom severity compared to group formats, likely related to insufficient exposure to each participant’s trauma (e.g., Haagan, Smid, Knipscheer, & Kleber, 2015; Resick et al., 2017). However, there are concerns about individual trauma-focused treatment including feasibility, treatment barriers, and limited focus on comorbidities (see commentary by Steenkamp & Litz, 2013). PTSD Clinical Teams (PCTs) within the Department of Veterans Affairs (VA) have a large volume of patients proportionate to provider availability. This has often rendered individual EBTs with each patient unfeasible, necessitating the development of group treatments (Sloan, Bovin, & Schnurr, 2012). However, effect sizes for group treatments vary, ranging from large (e.g., Schumm, Dickstein, Walter, Owens, & Chard, 2015) to negligible (e.g., Dunn et al., 2007). Meta-analytic work (Sloan, Feinstein, Gallagher, Beck, & Keane,

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2013) demonstrated significant within-group PTSD symptom reduction among group treatments compared to waitlist conditions, but negligible improvement compared to various treatments that control for nonspecific benefits of therapy.

Barriers to treatment (e.g., PTSD-related stigma, work schedules, time commitment, provider availability) can either increase dropout or decrease initial engagement in treatment (Murphy & Smith, 2018) and may be mitigated through group treatment. For example, research has indicated that Veterans with PTSD report stigma related to being labeled as “crazy,” “dangerous or violent,” and responsible for their disorder, but that engagement with fellow Veterans increases feelings of being understood and decreases self-stigma (Mittal et al., 2013). In addition, current EBTs often do not specifically address comorbidities; however, psychiatric comorbidity (e.g., PTSD and depression or anxiety or both) is more the norm than the exception, and has been shown to result in increased dropout rates and greater treatment resistance (Flory & Yehuda, 2015; Murphy & Smith, 2018). Bryant, Moulds, Guthrie, Dang, and Nixon (2003) showed that non-completion of exposure therapy was associated with higher pre-treatment scores on measures of depression, avoidance, and catastrophizing cognitions compared to treatment completion. Taken together, these findings support Flory and Yehuda’s suggestion that targeting depression or attempting to increase retention may be useful in maximizing PTSD treatment effectiveness. However, few treatments that address comorbid conditions and treatment barriers exist in the literature (Nixon & Nearmy, 2011).

To address some of these concerns and provide an introductory PTSD treatment without discussion of trauma, Lynch et al. (2015) developed PTSD Recovery Group at the Hunter Holmes McGuire VA Medical Center (VAMC) in Richmond, Virginia. This group was designed to target physical, emotional, cognitive, social, and spiritual changes that often follow exposure to war. PTSD Recovery Group is ten sessions and provides psychoeducation and coping strategies, examines cognitions that may affect emotions or behaviors, encourages exposure to counteract avoidance, and addresses emotional numbing, anger, and substance use. Program evaluation data have demonstrated a large effect in the reduction of overall PTSD symptoms (Fala, Coleman, & Lynch, 2016). Additionally, the group addresses barriers to treatment, as Veterans are not encouraged to discuss their specific trauma during group and stigma may be reduced through engagement with fellow Veterans (Mittal et al., 2013). Thus, the PTSD Recovery Group is currently the standard first option of treatment for Veterans at the Richmond VAMC who indicate that they are not ready for an

individual EBT. However, the ten-week commitment is taxing for some Veterans, and the group does little to address comorbidities, including depression and guilt.

Rational Emotive Behavior Therapy (REBT) is a treatment that could address comorbid depression and anxiety in Veterans with PTSD in a brief format. REBT is a cognitive- and behavior-based treatment grounded in the theory that reduction of irrational beliefs leads to decreases in negative emotions (e.g., depression, anxiety, anger, guilt; Ellis, 1962, 1992) and has been shown to be as efficacious as Cognitive Therapy (CT) and pharmacotherapy in reducing depressive symptoms (David, Szentagotai, Lupu, & Cosman, 2008). REBT is well suited for the treatment of PTSD as it addresses the cognitive underpinnings in the development and maintenance of psychopathology (Hyland & Boduszek, 2012). Moreover, REBT addresses key dysfunctional cognitions (i.e., irrational beliefs) present within PTSD symptomology including: 1) Demandingness (i.e., “absolute” statements often involving “should, must, have to, need to”), 2) Catastrophizing (i.e., statements describing things as “awful, terrible, horrible, the worst”), 3) Low Frustration Tolerance (i.e., statements such as “I can’t stand it”), and 4) Depreciation (i.e., overgeneralization of negatives, disqualification of positives; David et al., 2008; Hyland, Shevlin, Adamson, & Boduszek, 2015). Research shows that irrational beliefs affect posttraumatic stress symptomology and that trauma-specific variations in irrational belief types are associated with relevant posttraumatic stress symptoms (Hyland et al., 2015). These results provide support for the REBT model of psychopathology and highlight the role of irrational beliefs as cognitive vulnerability factors in posttraumatic stress responses.

The REBT-Informed Group reviewed in the current study was developed by the first author over ten years of clinical practice and has been used in clinical settings with active duty military and Veteran populations. The group was initially adapted from the work of Burns (1980) with a significant focus on CT methods for treating anxiety and depression. It consisted of four, two-hour sessions to increase feasibility in the context of Navy shipboard deployments as the first author was an active duty psychologist in the United States Navy at the time. Active duty service members dealing with anxiety or depression were eligible for the group, regardless of PTSD diagnosis. Modifications expanded focus to Veterans with PTSD while continuing to address comorbid depression and anxiety, as well as anger and guilt. The group includes many aspects of CT (e.g., control, mind reading, fortune telling) but has evolved to substantially emphasize techniques of REBT theory (e.g., a focus on the specific irrational beliefs noted above; David et al., 2008; Hyland et al., 2015). The content is now delivered over five, 90-minute sessions to be consistent with the time limits of other VA groups.

The REBT-Informed Group addresses several gaps in PTSD treatment. By focusing on conditions comorbid with PTSD in a group format, both self-stigma and treatment-seeking stigma may be reduced, given evidence suggesting that self-stigma in Veterans may be more related to PTSD than to depression symptoms (Barr, Davis, Diguseppi, Keeling, & Castro, 2019) and that Veterans with PTSD report reductions in self-stigma when engaging with similar peers (Mittal et al., 2013). Additionally, the group emphasizes present concerns without processing traumatic memories, which may be an enticing initial option for Veterans with high levels of avoidance (Fala et al., 2016). Content targets irrational beliefs, which may help increase cognitive flexibility for future trauma-related treatment (e.g., CPT; Resick et al., 2017). The brief treatment approach may be attractive to Veterans with external commitments (e.g., limited leave time from work, school) and treatment-related stigma (Bryant et al., 2003). Moreover, the group format and reduced session count increases access to treatment (Sloan et al., 2012). Finally, to our knowledge, this is the first study assessing an REBT-Informed treatment in the context of combat-related PTSD.

To evaluate the relative effectiveness of the REBT-Informed Group to treatment as usual, this study utilizes program evaluation data from the five-session REBT-Informed Group (i.e., a group initially designed to reduce anxiety and depression, but adapted to diminish PTSD symptoms as well) and data from the ten-session PTSD Recovery Group (i.e., a group created for and having demonstrated effectiveness at reducing PTSD symptoms). As this was a post-hoc, effectiveness-based study, groups were not randomized and comparison was exploratory in nature to evaluate relative effectiveness. The primary aims of this archival study were: (1) to examine the effectiveness of the REBT-Informed Group based on symptom outcome measures (i.e., PTSD, depression, anxiety, irrational beliefs) and (2) to compare the effectiveness of the five-session REBT-Informed Group in decreasing PTSD symptoms to that of a ten-session treatment-as-usual group. We hypothesized that completion of the REBT-Informed Group would result in improvements in self-reported PTSD, depression, anxiety symptoms, and irrational beliefs. We also hypothesized that the REBT-Informed Group would demonstrate similar improvements in self-reported PTSD symptoms as those seen in the PTSD Recovery Group.

## Method

### Participants

This study analyzed archival clinical data for post-9/11 military Veterans ( $N = 94$ ) completing either the REBT-Informed Group ( $n = 47$ ) or the PTSD Recovery Group

( $n = 47$ ). Demographic and sample information is presented in Table 1. The sample was largely male (88.30%), Black/African American (61.70%), and non-Hispanic (92.55%). Mean participant age was 44.89 years ( $SD = 8.61$ ). A plurality of participants was married (48.94%) and a majority worked full-time (52.13%). Most participants were currently taking psychiatric medication for PTSD (72.34%) and had experienced combat trauma exclusively (71.28%). A majority of participants had been in the Army (74.47%) and were enlisted (89.36%). The mean number of deployments was 2.41 ( $SD = 1.32$ ). The mean total service connection percentage was 81.81 ( $SD = 23.05$ ). The mean PTSD service connection percentage was 40.00 ( $SD = 28.09$ ). There were no significant differences between the groups on any of the demographic variables.

### Measures

The *Posttraumatic Stress Disorder (PTSD) Checklist for DSM-5 (PCL-5; Weathers et al., 2013)* is a 20-item questionnaire, corresponding to DSM-5 symptom criteria for PTSD. The self-report Likert-type scale asks individuals to rate the intensity of their responses to “very stressful experiences” over the past month, ranging from 0 (*not at all*) to 4 (*extremely*). The PCL-5 has demonstrated good test-retest reliability ( $r = .82$ ) and convergent and discriminant validity ( $r_s = .74-.85$ ,  $r_s = .31-.60$ , respectively; Blevins, Weathers, Davis, Witte, & Domino, 2015). Overall internal consistency in this study was .92 at Time 1 and .93 at Time 2 and ranged from .91 to .93 across groups and time points. Total sum scores as well as cluster scores were used in the present study. The PCL-5 was assessed at pre- and post-treatment for both groups.

The *Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001)* is a 9-item measure assessing the frequency of depressive symptoms within the past two weeks. Items are rated from 0 (*not at all*) to 3 (*nearly every day*), with a range of 0 to 27. Positive predictive value has been demonstrated (31–51% depending on the cut-point), similar to other instruments. Internal consistency in this study was .83 at Time 1 and .84 at Time 2. Total sum scores were used. The PHQ-9 was assessed at pre- and post-treatment for the REBT-Informed Group.

The *Generalized Anxiety Disorder 7-item (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006)* is a seven-item measure that assesses the frequency of generalized anxiety symptoms over the past two weeks. Items are rated from 0 (*not at all*) to 3 (*nearly every day*), ranging between 0 and 21. The GAD-7 has demonstrated good test-retest reliability ( $r = .83$ ) as well as criterion and construct validity ( $r_s = .72-.75$  with other related anxiety measures). Internal consistency in this study was .90 and .88 at Time 1 and Time 2, respectively. Total sum scores

**Table 1.** Basic, psychiatric, and military demographic information of sample ( $N = 94$ ).

	REBT-Informed Group ( $n = 47$ )		PTSD Recovery Group ( $n = 47$ )		Group comparison $p$ -value
	$N$ ( $M$ )	% ( $SD$ )	$N$ ( $M$ )	% ( $SD$ )	
<i>Gender</i>					.75
Female	5	10.64	6	12.77	
Male	42	89.36	41	87.23	
<i>Race</i>					.19
Asian	0	0.00	2	4.26	
Black/African American	27	57.45	31	66.96	
Native Hawaiian/Pac.Islander	0	0.00	1	2.13	
White/Caucasian	18	38.30	13	27.66	
Unknown	2	4.26	0	0.00	
<i>Ethnicity</i>					.60
Hispanic	3	6.38	3	6.38	
Non-Hispanic	43	91.49	44	93.62	
Unknown	1	2.13	0	0.00	
<i>Age</i>	43.55	7.73	46.23	9.30	.13
<i>Marital status</i>					.80
Married	21	44.68	25	53.19	
Never married	8	17.02	6	12.77	
Divorced	6	12.77	6	12.77	
Separated	3	6.38	1	2.13	
Remarried	9	19.15	9	19.15	
<i>Employment status</i>					.47
Full-time	27	57.45	22	46.81	
Non-stable	1	2.13	0	0.00	
Unemployed	10	21.28	9	19.15	
Retired	7	14.89	13	27.66	
Disabled	2	4.26	3	6.38	
<i>Trauma history</i>					.53
Combat	35	74.47	32	68.09	
Accident	0	0.00	1	2.13	
Combination of traumas <sup>a</sup>	12	25.53	14	29.79	
<i>Taking medications for PTSD</i>					.90
No	8	17.02	7	14.89	
Yes, currently	33	70.21	35	74.47	
Yes, in the past	6	12.77	5	10.64	
<i>Previously completed PTSD Recovery Group</i>					< .001
No	15	31.91	44	93.62	
Yes	32	68.09	3	6.38	
<i>Branch of service</i>					.14
Air Force	5	10.64	1	2.13	
Army	32	68.09	38	80.85	
Marine Corps	3	6.38	2	4.26	
Navy	3	6.38	2	4.26	
National Guard	1	2.13	1	2.13	
Reserves	3	6.38	0	0.00	
More than one branch	0	0.00	3	6.38	
<i>Highest rank</i>					1.00
Enlisted	42	89.36	42	89.36	
Officer	3	6.38	3	6.38	
Unknown	2	4.26	2	4.26	
<i>Number of deployments</i>	2.32	1.09	2.51	1.52	.48
<i>Service connection</i>					
Average SC % Total	80.00	22.46	83.62	23.72	.45
Average SC % PTSD	44.26	27.41	35.74	28.42	.14
<i>Baseline PCL-5 scores</i>					
Total	55.96	13.50	50.55	14.34	.06
Re-experiencing	14.00	4.16	12.79	4.10	.16
Avoidance	5.70	1.96	5.81	1.83	.79
Negative Cognitions/Mood	18.57	5.75	16.34	6.15	.07
Arousal	17.68	4.19	15.62	4.34	.02

<sup>a</sup>Combination of traumas includes combat as well as either childhood physical, sexual, or emotional abuse, adult physical abuse, or military sexual trauma (MST). SC = Service Connection; REBT = Rational emotive behavior therapy; PTSD = Posttraumatic stress disorder; PCL-5 = PTSD Checklist for DSM-5.

were used. The GAD-7 was assessed at pre- and post-treatment for the REBT-Informed Group.

The *Irrational Belief Scale* (IBS; Malouff & Schutte, 1986) is a 20-item measure used to assess the self-reported strength of various irrational beliefs. Items are

rated from 1 (*not at all*) to 5 (*extremely*) for a total range of 20 to 100. Higher scores indicate stronger irrational beliefs. The IBS demonstrates adequate test-retest reliability and construct validity ( $r_s = .47-.62$  with theoretically similar constructs; Warren & Zgourides, 1989). Internal

consistency in this study was .84 and .83 at Time 1 and Time 2, respectively. Total sum scores were used. The IBS was assessed at pre- and post-treatment for the REBT-Informed Group.

### Procedure

This post-hoc, non-randomized treatment outcome study was approved by the Institutional Review Board (IRB) at the Central Virginia VA Healthcare System (VAHCS). Participants were enrolled in treatment with the PTSD Clinical Team (PCT) between October 2016 and February 2018. Veterans are referred for PTSD intake assessment from a variety of sources (e.g., primary care, Traumatic Brain Injury [TBI] clinic, other mental health providers, self-referral). Veterans who have served in combat or a warzone and are determined at an intake with a provider (licensed clinical psychologist or social worker) to have PTSD or subthreshold PTSD related to combat are eligible for care within the PCT. Providers utilize semi-structured interviews and the PCL-5 to arrive at a diagnosis. Veterans are referred following the intake assessment, completion of a previous group, or upon re-referral after a break in treatment, based on providers' clinical judgment in collaboration with Veterans' treatment goals and interests. Veterans with no history of PTSD treatment and no substance use issues are typically referred to the PTSD Recovery Group. If Veterans' presenting concerns and treatment goals are consistent with depression, anxiety, anger, or guilt, or they express reluctance to engage in a ten-session group, they are typically referred to the REBT-Informed Group. Veterans expressing interest in individual EBT for PTSD may elect that option. Thus, Veterans may have previously started or completed another group (e.g., PTSD Recovery Group) or may have previously started and prematurely ended individual treatment prior to referral to the REBT-Informed Group. Additionally, Veterans are allowed to participate in a given group more than one time.

The primary study sample consists of individuals enrolled in the REBT-Informed Group. A random sample of PTSD Recovery Group participants from the same time period as the REBT-Informed Group was used as a matched comparison group. As the PTSD Recovery Group uses just the PCL-5 as an outcome measure and does not generally assess depression or anxiety symptoms, the PCL-5 was the only measure available for comparison analysis. PTSD Recovery Group participants who were post-9/11 Veterans and did not complete the REBT-Informed Group during the selected time period were eligible for random sampling. These participants ( $n = 76$ ) were entered into a random selection process in order to match the sample size of the REBT-Informed Group

( $n = 47$ ). Notably, participants in either sample may have previously participated in a PTSD Recovery Group, defined as attending at least two sessions; most had not completed all ten sessions. Veterans in the PCT often start treatment with PTSD Recovery Group so these participants are a representative sample of treatment-seeking individuals. As Table 1 shows, there were no significant differences in demographic, psychiatric, military variables, or PTSD symptom severity, with the exception that individuals in the REBT-Informed Group had greater Hyperarousal cluster scores at baseline than those in the PTSD Recovery Group,  $t(92) = -2.35, p = .02$ . Over two-thirds of the REBT-Informed Group sample had previously participated in a PTSD Recovery Group, compared to just over 6% of the PTSD Recovery Group sample, resulting in a significant difference,  $\chi^2(1) = 38.28, p < .001$ .

### Data analysis

Analyses were conducted using SPSS (version 26; Armonk, NY: IBM Corp.). Prior to conducting primary analyses, data were inspected for normality, outliers, and missing data (Tabachnick, Fidell, & Ullman, 2007). All variables were normally distributed (skewness and kurtosis were within acceptable ranges;  $\pm 2, \pm 7$ , respectively; George & Mallery, 2019), and there were minimal outliers (notably, six Time 1 scores on the IBS were significantly lower than the average, but were not outside of the appropriate range for this measure and were retained in analyses). Given the clinical nature of the study and measurement, missing data are expected. Those who did not complete at least 20% of the items in measures of depression, anxiety, or PTSD at both pre- and post-group were excluded from analyses. In the REBT-Informed Group, 8% of individuals did not complete the PHQ-9 or GAD-7 and 28% did not complete the IBS, because it was added later in the program evaluation process. The remaining item-level missingness across all participants was very rare (less than 1% of data) and determined to be missing at random using Little's (1988) MCAR test. Missing items were imputed using Expectation-Maximization in SPSS (Bernaards & Sijtsma, 2000).

To examine the effectiveness of the REBT-Informed Group based on symptom outcome measures (i.e., Primary Aim 1), we conducted a series of paired  $t$ -tests to analyze changes in symptom scores from baseline to post-intervention across all outcome measures (PCL-5, PHQ-9, GAD-7, and IBS). Glass' *delta* was used to determine effect sizes due to concerns that the treatment itself affected a combined standard deviation (Glass, McGaw, & Smith, 1981). To compare the effectiveness of the REBT-Informed Group to that of treatment-as-usual (i.e., PTSD Recovery Group;

Primary Aim 2), we first compared groups across a range of demographic and clinical characteristics. Then, we conducted a mixed model Analysis of Variance (ANOVA) to examine changes in PCL-5 scores across time to determine if there was an effect of group by time. We repeated these analyses across the four PCL-5 symptom clusters to determine if changes and differences were apparent for specific symptom clusters.

## Results

Participants completing the REBT-Informed Group attended about 90% of its five sessions ( $M = 4.51$ ,  $SD = 0.51$ ) while participants completing the PTSD Recovery Group attended about 84% of its ten sessions ( $M = 8.38$ ,  $SD = 1.28$ ). For the REBT-Informed Group, 17 Veterans were coded as “dropouts” while seven others did not complete treatment for medical, work-, or childcare-related reasons, resulting in a dropout rate of 26.56% and a “non-completion” rate of 33.80%. Dropout or “non-completion” rates were not available for the PTSD Recovery Group.

For Primary Aim 1, means, standard deviations,  $t$ -test results, and effect sizes across all measures for the REBT-Informed Group are presented in Table 2 (and Supplemental Figure 1). Results show statistically significant decreases in PTSD, depression, and anxiety symptoms with medium, small-to-medium, and small effect sizes, respectively. PTSD symptom clusters showed similar findings, with significant differences in Re-experiencing (medium effect size) as well as Negative Cognitions/Emotional Numbing and Hyperarousal (small-to-medium effect sizes). No significant change in Avoidance was found (though a small effect). Significant decreases were also

found in irrational belief scores (small-to-medium effect size). After implementing a Bonferroni adjustment for multiple testing ( $p = .00625$ ), depression and PTSD symptoms (total and Re-experiencing) remained significant, and Negative Cognitions/Emotional Numbing and irrational beliefs nearly reached the adjusted significance threshold ( $p = .007$ ).

For Primary Aim 2, we compared changes in PTSD symptoms as measured by PCL-5 scores (total and by symptom cluster) across the REBT-Informed and PTSD Recovery Groups in a series of mixed model ANOVAs. See Table 2 for means, standard deviations, and effect sizes (see also Supplemental Figure 2). For total PTSD symptom scores, the interaction of time by group membership,  $F(1, 92) = 0.12$ ,  $p = .73$ , was not significant, meaning that differences in total PTSD symptoms from Time 1 to Time 2 did not depend on the group in which a person participated. An overall significant main effect of time was found,  $F(1, 92) = 28.87$ ,  $p < .001$ , such that Time 1 scores were significantly higher than Time 2 scores for the groups as a whole. There was also a significant main effect of group, such that participants in the REBT-Informed Group had higher PCL-5 scores overall than participants in the PTSD Recovery Group,  $F(1, 92) = 5.18$ ,  $p = .03$ . The difference between the two groups was the same at each time point. Each group demonstrated a medium effect in reduction of total PTSD symptoms: REBT-Informed Group Glass'  $\delta = 0.44$ ; PTSD Recovery Group Glass'  $\delta = 0.47$ .

Examination of each symptom cluster also demonstrated no significant interactions [Re-experiencing,  $F(1, 92) = 0.48$ ,  $p = .49$ ; Avoidance,  $F(1, 92) = 2.04$ ,  $p = .16$ ; Negative Cognitions/Emotional Numbing,  $F(1, 92) = 0.00$ ,  $p = .96$ ; Hyperarousal,  $F(1, 92) = 1.21$ ,  $p = .27$ ]. That is, cluster score differences from Time 1 to

**Table 2.** Means, standard deviations,  $t$ -tests, and effect sizes ( $N = 94$ ).

	Time 1 <i>M (SD)</i>	Time 2 <i>M (SD)</i>	<i>t</i>	<i>df</i>	<i>p</i>	Glass' $\delta$
<i>REBT-Informed Group</i>						
PHQ-9	16.03 (5.21)	14.05 (5.37)	4.03	42	< .001	0.38
GAD-7	14.86 (4.98)	13.45 (4.55)	2.35	42	.023	0.28
IBS	72.23 (10.41)	68.81 (9.01)	2.86	32	.007	0.33
PCL-5 Total	55.96 (13.50)	49.98 (13.50)	3.46	46	.001	0.44
Re-experiencing	14.00 (4.16)	12.00 (4.38)	3.65	46	.001	0.48
Avoidance	5.70 (1.96)	5.23 (1.98)	1.59	46	.119	0.24
Neg. Cognitions/Mood	18.57 (5.75)	16.40 (5.35)	2.81	46	.007	0.38
Hyperarousal	17.68 (4.19)	16.34 (4.11)	2.62	46	.012	0.32
<i>PTSD Recovery Group</i>						
PCL-5 Total	50.55 (14.34)	43.75 (13.27)	4.16	46	< .001	0.47
Re-experiencing	12.79 (4.10)	11.28 (3.80)	3.38	46	.001	0.37
Avoidance	5.81 (1.83)	4.79 (1.82)	4.06	46	< .001	0.56
Neg. Cognitions/Mood	16.34 (6.15)	14.22 (5.04)	2.86	46	.006	0.34
Hyperarousal	15.62 (4.34)	13.47 (4.23)	4.09	46	< .001	0.50

Effect sizes calculated using Glass'  $\delta = (M_{T1} - M_{T2})/SD_{T1}$  (Glass et al., 1981). Measures are the Patient Health Questionnaire-9 (PHQ-9) for depression, Generalized Anxiety Disorder 7-item (GAD-7) for anxiety, Irrational Belief Scale (IBS) for irrational beliefs, and Posttraumatic Stress Disorder (PTSD) Checklist for DSM-5 (PCL-5) for PTSD symptoms.

Time 2 did not depend on the group in which a person participated. Further, each symptom cluster demonstrated a significant main effect of time such that Time 1 scores were significantly higher than Time 2 scores for the groups as a whole [Re-experiencing,  $F(1, 92) = 24.66, p < .001$ ; Avoidance,  $F(1, 92) = 14.77, p < .001$ ; Negative Cognitions/Emotional Numbing,  $F(1, 92) = 16.04, p < .001$ ; Hyperarousal,  $F(1, 92) = 22.61, p < .001$ ]. Between-group differences were not found for the Re-experiencing,  $F(1, 92) = 1.58, p = .21$ , or Avoidance clusters,  $F(1, 92) = 0.25, p = .62$ . Between-group differences were found for the Negative Cognitions/Emotional Numbing and Hyperarousal clusters; participants in the REBT-Informed Group had higher symptoms than participants in the PTSD Recovery Group,  $F(1, 92) = 4.69, p = .03$ , and  $F(1, 92) = 9.78, p = .002$ , respectively. These differences were the same at each time point on each symptom cluster. See [Table 2](#) for effect sizes of these comparisons.

Finally, given that participants represent individuals in ongoing treatment, many had previously attended PTSD Recovery Group prior to completing another PTSD Recovery Group or REBT-Informed Group. To determine whether prior PTSD Recovery group was associated with outcomes, follow-up analyses were conducted; see Supplemental Table 1 for means, standard deviations, and effect sizes of these comparisons. Individuals in the REBT-Informed Group showed a decrease in total PCL-5 scores over time,  $F(1, 45) = 10.64, p = .002$ , regardless of prior PTSD Recovery Group attendance [interaction,  $F(1, 45) = 0.04, p = .85$ ; group,  $F(1, 45) = 1.98, p = .17$ ]. Group membership also did not impact score changes over time when examined separately by symptom clusters (all  $ps > .06$ ). Regarding those in the PTSD Recovery Group, while results are interpreted with caution, given a cell size of 3, those who had not previously engaged in PTSD Recovery Group demonstrated decreases in symptoms while those who had participated in PTSD Recovery Group demonstrated increases in symptoms.

## Discussion

This was the first study of which we are aware to examine the effectiveness of an REBT-Informed Group on symptoms of depression, anxiety, and PTSD among post-9/11 Veterans diagnosed with PTSD. The REBT-Informed Group aims to address depression and anxiety (as well as anger and guilt) by becoming aware of, challenging, and changing irrational beliefs, thereby decreasing PTSD symptoms (David et al., 2008; Hyland et al., 2015). Many Veterans in the REBT-Informed Group noted that military culture often employs “irrational” beliefs (e.g., Demandingness and Catastrophizing), suggesting that an REBT-Informed treatment may be uniquely suited to

this population. This study also provides an important examination of PTSD symptoms within a largely Black/African American sample.

As hypothesized, completion of the REBT-Informed Group was associated with significant decreases in depression and total PTSD symptoms. Examination of PTSD symptom clusters demonstrated significant decreases in Re-experiencing (medium effect), Negative Cognitions/Emotional Numbing (small-to-medium effect), and Hyperarousal (small-to-medium effect), but not Avoidance (small effect). The group also had a small effect on anxiety, although findings were not robust to adjustment for multiple testing. Irrational beliefs also nearly reached a Bonferroni-adjusted significance level of improvement with a small-to-medium effect. Findings highlight the potential clinical benefit of a five-session, REBT-Informed treatment approach 1) to address comorbid depression and anxiety in a PTSD population and 2) to improve PTSD symptoms without direct trauma-focused intervention. That this treatment was able to significantly reduce PTSD symptoms in a cohort with comorbidities of PTSD is also encouraging, as few PTSD treatments focus on comorbidities (Flory & Yehuda, 2015; Nixon & Nearmy, 2011), and individuals with PTSD and comorbid depression, anxiety, or both are likely to be relatively resistant to treatment (Murphy & Smith, 2018).

We compared the REBT-Informed Group to the PTSD Recovery Group (Fala et al., 2016; Lynch et al., 2015) on symptoms of PTSD among post-9/11 Veterans. We hypothesized that the REBT-Informed Group would demonstrate similar improvements in PTSD symptoms as the PTSD Recovery Group, despite including half the number of sessions. Although the non-randomized, non-controlled design of this study limits the direct comparability of these two groups, results demonstrated that symptoms of PTSD decreased significantly and similarly in the two groups. This was true for total symptoms as well as the four clusters. This was also true for participants in the REBT-Informed Group regardless of previous attendance in the PTSD Recovery Group. These findings are particularly notable as the REBT-Informed Group, designed to target comorbidities, was just as successful at decreasing PTSD symptoms as a group developed to reduce PTSD symptoms and did so in half the number of sessions. Results supported our hypothesis and suggest the clinical utility of this brief treatment option for Veterans with PTSD and presenting concerns surrounding depression and anxiety symptoms.

While findings between groups were generally similar, some differences are worth noting. Greater effect sizes were seen in the REBT-Informed Group for Re-experiencing symptoms. It may be that a reduction in irrational beliefs

and depression impact a Veteran's ability to manage nightmares or intrusive thoughts; future research may examine this. Greater effect sizes were seen in the PTSD Recovery Group for Avoidance and Hyperarousal symptoms, which aligns with the intentional use of exposure and relaxation components in the group to address these symptoms. Follow-up analyses examining differences in improvement as a function of prior group attendance suggest potential benefits of an REBT-Informed Group for Veterans who do not show improvement following PTSD Recovery Group.

### **Impairment of sample and comparisons to other treatments**

The current study sample represents a clinical population with high levels of symptoms. Importantly, Veterans in the REBT-Informed Group began with moderately severe depression scores (Kroenke et al., 2001), moderate anxiety scores (Spitzer et al., 2006), and high irrational beliefs (Malouff & Schutte, 1986; Warren & Zgourides, 1989), showing the importance of consideration of comorbidity even in a PTSD-focused clinic. On average, both groups showed statistically significant decreases in PCL-5 scores, as well as "clinically meaningful improvement" in PTSD symptoms (by the standard of one-half [0.5] of a standard deviation improvement [Norman, Sloan, & Wyrwich, 2003]) or nearly meeting this criterion (by the standard of 5- and 10-point decreases [Wortmann et al., 2016]).

However, despite significant improvement, PCL-5 scores remained above the suggested clinical cutoff score, depression and anxiety scores remained moderate, and irrational belief scores remained relatively high at treatment completion. The finding that clinically significant symptoms remained at treatment completion for both groups is consistent in the EBT literature and has received attention regarding the need for addressing quality of life, persistent symptoms, and treatment resistance (Murphy & Smith, 2018). We also note briefly that a small number of participants who engaged in the PTSD Recovery Group for the second time demonstrated *more* PTSD symptoms than when they started. While conclusions are tempered given the small number, this highlights that some individuals continue to struggle despite increased treatment. Future research may examine factors impacting lack of improvement, refractory symptoms, or benefits of adjunctive treatment options or transition into an EBT for such patients.

Comparisons of the results of this study with previous studies place them within the mid-range of successful treatments for PTSD in group modalities (e.g., Dunn et al., 2007; Schumm et al., 2015). Moreover, the dropout rate in the current study is consistent with the average dropout rate found in group PTSD treatments (26.5%; Sloan et al., 2013). In sum, although the REBT-Informed

Group may not demonstrate improvements in dropout rate, it is unique to existing treatments for several reasons. It offers an alternative for Veterans unwilling to engage in individual trauma-focused treatment (Fala et al., 2016), presents a brief format to increase accessibility and feasibility (Bryant et al., 2003), and by focusing on depression, anxiety, and anger, may reduce PTSD diagnosis-related stigma (Barr et al., 2019; Mittal et al., 2013). Importantly, the group introduces a cognitive model and targets irrational beliefs, which could provide a basic understanding and increase cognitive flexibility in preparation for future trauma-related treatment (e.g., CPT; Resick et al., 2017). Indeed, preparation in understanding the relationship between thoughts and emotions at the beginning of CPT treatment (which directly incorporates traditional REBT approaches as part of the treatment; Ellis, 1962, 1992; Resick et al., 2017) may help Veterans to quickly address their trauma through CPT.

### **Limitations and future directions**

Despite the unique aspects of the study, some limitations are noted. First, a primary limitation is the lack of randomization and a true control group, as the initial goal of this work was program evaluation. Thus, although we utilized a post hoc artificial control group to compare findings, this remains a study of the effectiveness rather than the efficacy of an REBT-Informed Group. Further, treatment self-selection may have impacted study findings. Future randomized controlled investigations are needed to determine if current findings can be replicated and to more stringently compare results to alternative treatment approaches. Second, the IBS was implemented later in the study and is thus based on a smaller sub-sample than the full REBT-Informed Group sample, limiting power to detect effects. Work examining this measure in more detail can better evaluate changing irrational beliefs as a hypothesized mechanism of treatment effects. Further, only the PCL-5 was administered in the treatment-as-usual group; thus, group comparisons could be conducted using just this singular measure. It is unknown how the groups would compare on measures of depression or general anxiety and future research examining this would be useful. Third, no data were available for "dropout" for PTSD Recovery Group, preventing a comparison of "non-completion" rates.

Fourth, as symptoms of hyperarousal and those of generalized anxiety are often similar, it was not clear the extent to which the GAD-7 was measuring "pure" anxiety rather than "PTSD-related" hyperarousal. There were notable correlations between GAD-7 and Hyperarousal symptoms, Re-experiencing, and Negative Cognitions/Emotional Numbing. Future research may better examine anxiety



among Veterans with PTSD with a different instrument. Fifth, diagnoses of PTSD were based on clinician interview and self-report measure and not a structured clinical interview such as the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5; Weathers et al., 2018). Additionally, there were no structured methods utilized by treatment planning providers to diagnose comorbid conditions (e.g., Major Depressive Disorder, Generalized Anxiety Disorder) and thus inform group assignment in a reliable way. Future work may explicitly diagnose comorbid conditions and randomly assign Veterans to group condition. Sixth, there was no long-term follow-up of Veterans in this study to determine maintenance effects and further treatment outcomes, which would be useful in future work. Finally, all sessions of the REBT-Informed Group were run by the first author. While a manual for dissemination is being prepared, generalizability to other providers and treatment adherence effects are unknown.

## Conclusion

Psychiatric comorbidity and treatment barriers are not commonly addressed in PTSD treatment. Results in this sample of post-9/11 military Veterans demonstrated that despite a brief (five-session) treatment duration and a general focus on decreasing depression and anxiety, the REBT-Informed Group demonstrated reductions in PTSD symptoms that were comparable to a PTSD treatment as usual, with comparable effect sizes to other group treatments for Veterans with combat-related PTSD in the literature (e.g., Dunn et al., 2007; Sloan et al., 2013). Reductions in depression and anxiety were also present. These results highlight the practical benefits of a treatment that may increase feasibility and accessibility in busy treatment clinics. Future directions include research comparing the REBT-Informed Group and PTSD Recovery Group (or another treatment) with a sample larger than that of this study and with more controlled criteria for group assignment; development of a manual for potential dissemination of the REBT-Informed Group; research to determine the relevance of certain demographic variables and a reduction in irrational beliefs as moderators or mechanisms of change in PTSD, depression, or anxiety; and follow-up measurement. This study demonstrated that the REBT-Informed Group for PTSD comorbid with depression or anxiety symptoms in post-9/11 Veterans – a therapy that may be uniquely suited to a military or Veteran population, but potentially generalizable to civilians as well – can significantly reduce symptoms and may be beneficial to expand to other civilian, military, or VA medical centers.

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