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Efficacy of Group Treatment for Posttraumatic Stress Disorder Symptoms: A Meta-Analysis

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This study conducted a meta-analysis of published randomized clinical group trials for adult survivors of trauma to examine the efficacy of the group format. Effect sizes for posttraumatic stress disorder (PTSD) severity outcome were examined. Sixteen studies were included, with a total of 1686 participants. Results of a random effects model meta-analysis indicated that group treatments are associated with significant pre- to posttreatment reduction in PTSD symptom severity (within treatment $d = .71$, 95% CI [.51, .91]), and result in superior treatment effects relative to a wait list comparison condition ($d = .56$, 95% CI [.31, .82]). However, no significant findings were obtained for group interventions relative to active treatment comparison conditions ($d = .09$, 95% CI [−.03, .22]). Moderator analyses also indicated that gender and type of trauma moderated treatment effects for PTSD outcome, with smaller effect sizes associated with males relative to females and combined gender samples, and smaller effect sizes for combat and child sexual assault trauma samples relative to mixed-trauma sample studies. Taken together, group treatment for trauma symptoms is better than no treatment but not better relative to comparison conditions that control for nonspecific benefits of therapy. Additional work is needed to identify effective group treatments for PTSD, especially for patients with repeated or chronic traumatization.

Keywords: group treatment, PTSD, trauma, meta-analysis

Posttraumatic stress disorder (PTSD) is a chronic and debilitating disorder with a lifetime prevalence rate of up to 25% (Hidalgo & Davidson, 2000). Given the prevalence of PTSD and the debilitating nature of this disorder, identifying effective treatments is a high priority. Although the group treatment format is commonly used in health care settings for the treatment of PTSD (e.g., Foy et al., 2000), group therapy currently is not recognized as a first-line treatment by the Departments of Veterans Affairs/Deparment of Defense (VA/DoD) Practice Guideline for PTSD (2010) in the United States or by other PTSD treatment guidelines from around the world (see Forbes et al., 2010).

Foy and colleagues (2000) reviewed the literature on group therapy clinical trials for adult trauma survivors. These investigators identified 20 published studies of group therapy clinical trials for adult trauma survivors, with the majority of studies focused on female survivors of sexual abuse. Foy et al. (2000) concluded that, regardless of theoretical orientation, the available empirical data indicated that group treatment for adult trauma survivors was generally associated with a favorable outcome. However, Foy and colleagues (2000) noted that methodological shortcomings, including a lack of within-study participant randomization and a lack of active treatment comparison groups, limited the scientific conclusions that could be drawn. A more recent review conducted by Shea, McDevitt-Murphy, Ready, and Schnurr (2009) reached similar conclusions.

Although the Foy et al. and Shea et al. (2009) reviews suggested that group treatments for PTSD may have some merit, neither of them performed a meta-analysis of the research findings. Moreover, several randomized clinical trials (RCT) of group treatment for PTSD have been published since Shea et al. (2009) published their review. Given the public health significance of PTSD, and the frequency with which group treatments are used with trauma survivors, a meta-analysis of this literature area is needed.

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The purpose of this study was to conduct a meta-analysis of the efficacy of group treatments for adult survivors of trauma with PTSD symptoms. A meta-analysis provides the average effect size of the previous findings as well as an indication of the heterogeneity of findings across studies, with significant heterogeneity indicating that moderators are affecting the average effect size (Lipsey & Wilson, 2001). We limited our review to studies of adult trauma survivors because the majority of the work in this area has focused on this patient population. Given the small number of controlled studies conducted in this area, we did not require that a study only examine participants meeting diagnostic criteria for PTSD for inclusion in the meta-analysis. We focused our review on studies that included a PTSD-related outcome measure.

Method

We referred to the *Meta-Analysis Reporting Standards* (American Psychological Association Publications and Communications Board Working Group on Journal Article Reporting Standards, 2008) as a guide in conducting the meta-analysis and reporting the methods and results of the meta-analysis.

Literature Search

A comprehensive literature review was conducted by searching databases and cross-referencing results with relevant review articles (see Figure 1). A total of 1,715 possible sources were identified by entering the following search parameters in the PsycINFO, Social Sciences Citation Index (SSCI), MedLine, and Published International Literature on Traumatic Stress (PILOTS) search engines through July 26, 2011. Various permutations of the words *group*, *treatment*, *intervention*, *therapy*, and *psychotherapy* were entered as search criteria, simultaneously with various permutations of the following trauma-related words: *trauma, posttraumatic stress disorder, PTSD, childhood sexual abuse*, *rape*, *sexual assault*, *physical assault/abuse, combat*, *veteran*, *motor vehicle accident*, *domestic violence/abuse, violence, natural disaster*, *hurricane*, *tornado*, *earthquake*, and *fire*. In the PsycINFO database, the query searched the presence of search terms in abstracts and English-language journal articles. In the PILOTS database, results were filtered to present only English-language journal articles. In the SSCI database, results were filtered to present only English-language articles in the following subject areas: psychiatry, health care sciences and services, clinical psychology, multidisciplinary psychology, substance abuse, psychology, interdisciplinary social sciences, applied psychology, social work, and behavioral sciences. When appropriate articles were identified, the reference sections of those articles were examined for additional relevant articles. Book chapters on group treatments for PTSD were also examined (e.g., Foy et al., 2000; Shea et al., 2009), but no additional articles were identified. Articles generated by the literature search were then assessed to determine their eligibility for inclusion in the meta-analysis.

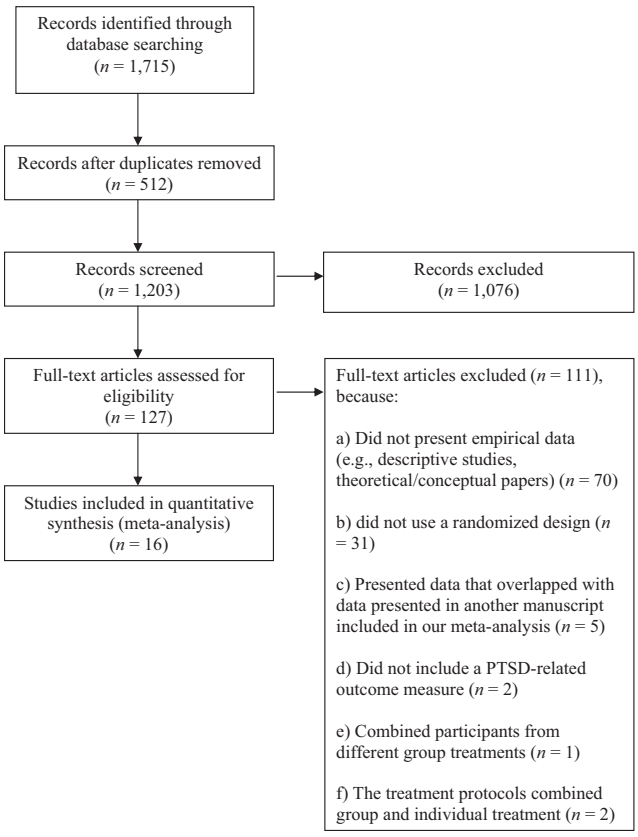

Figure 1. Flow diagram of literature search process.

Inclusion and Exclusion Criteria

Published studies had to meet the following inclusion criteria: (a) the study examined a group treatment for either PTSD or trauma survivors, (b) the treatment protocol involved only group treatment, (c) participants were age 18 or older, (d) the study included a PTSD-related symptom outcome measure, (e) the study consisted of an outpatient sample, (f) the article was written in English, (g) the study used a between-condition randomized controlled design, (h) sufficient information was included to calculate an effect size, and (i) the article presented original data that were not reported in full or in part in another published study.

Figure 1 presents a flow diagram of the literature search process. Based on titles and abstracts, our literature search identified 127 studies that were eligible for further consideration. Of the 127 studies identified, 16 met inclusion criteria for the meta-analysis.

Coding Procedure

A coding form was created to systematically extract relevant information from each article. This information included (a) report information (full bibliographic reference), (b) participant information (e.g., mean age, type of trauma experienced, enrollment and retention *N*s for each condition, (c) methodological information (e.g., independent assessors, treatment adherence checks, type of analyses conducted), (d) treatment information (e.g., orientation approach of the target intervention, type of comparison condition), and (e) effect size information for the primary PTSD-related outcome measure. Two of the authors (DMS and JGB) independently coded each study included in the meta-analysis and had an agreement rate of 97%. Coding discrepancies were resolved via discussion.

Calculating and Evaluating Effect Sizes

Cohen's *d* was used as the measure of between-groups effect size (Cohen, 1988). Cohen's *d* represents the standardized mean difference between the treatment and control groups (Hedges, 1981) and can be interpreted using the following conventions—a small effect size, $d = .2$; a medium effect size, $d = .5$; and a large effect size, $d = .8$. Each *d* was transformed using Hedge's correction for small sample size. Each *d* was also weighted inversely to its conditional variance (Shadish & Haddock, 1994), and then all of the *d*s were averaged to calculate the mean weighted effect size across all of the studies. When treatments are conducted in group form, dependencies among observations can occur that violate the independence of observations assumption of most statistical tests. We therefore used a correction formula to adjust the reported effect sizes to account for the group component of variance when studies had not corrected for this effect in their analyses (see Baldwin, Murray, & Shadish, 2005, for a detailed discussion), which was the case in all but three studies. Group sizes of seven and intraclass correlations of .10 were assumed when this information was not reported within manuscripts.

We also calculated within-group effect sizes. The standardized mean gain (ES_{sg}) was used as the measure of within-group effect size. Each ES_{sg} was weighted inversely to its conditional variance (Shadish & Haddock, 1994), and then all of the ES_{sg}s were averaged to calculate the mean weighted effect size across all studies. The computation of these weights requires the correlation between the pre- and posttest scores represented in each effect size. When possible, these correlations were obtained from the studies themselves. If the correlation was not reported, it was estimated from the test–retest reliability coefficients reported for the outcome measure. In the event that we were unable to obtain the correlation data from the aforementioned method, we used a conservative estimate of $r = .50$ (D. B. Wilson, personal communication, December 30, 2010). The standardized mean gain effect size can be interpreted following the same conventions provided by Cohen (1988). The SPSS macros developed by Lipsey and Wilson (2001) were used to calculate and evaluate the aforementioned effect sizes and to generate 95% confidence intervals for the effect sizes. All analyses were conducted using random effects methods. Random effects methods were chosen because the inclusion of parameters to model both within- and between-study sampling variability leads to more conservative estimations of the significance of effect sizes. Random effects methods also permit broader inferences by considering the observed studies to be a sample of a larger population of studies (Hedges & Vevea, 1998).

Following the guidelines provided by Lipsey and Wilson (2001), separate meta-analyses were conducted on between-groups and within-group effect sizes, because the form and meaning of each effect size statistic is unique. When studies contained more than one PTSD-related outcome measure, a primary PTSD symptom outcome measure was identified and used to calculate the effect size for each study. When available, semistructured diagnostic interview data (e.g., total score from the Clinician-Administered PTSD Scale) were used for the outcome measure. If a study compared more than one treatment condition with a control condition, we determined the target intervention via coding. When studies included more than one comparison condition (e.g., wait list and supportive therapy group), we selected the treatment comparison condition over the wait-list condition. Some studies included multiple assessments following treatment completion. When this occurred, the assessment that took place closest to the end of treatment was selected, which most often was a posttreatment assessment. We selected this outcome assessment period because it was most consistent across studies. Full-scale data were used when studies reported both full-scale and subscale data. If only multiple subscales were used as the outcome measure (e.g., the Intrusion and Avoidance subscales of the Impact of Events Scale; IES), we calculated the effect size for each subscale and then calculated the mean effect size for the study. We used intention-to-treat (ITT) data for the studies that provided these data; completer data were used otherwise. When *M* or *SD* were not reported, effect sizes were calculated from other data provided (e.g., *t*, χ^2).

Moderator Analyses

The homogeneity of the effect sizes was examined to determine if the characteristics of individual studies moderated the observed effect sizes. A significant homogeneity test suggests that there is significant variance among effect sizes and that moderator variables should be examined (Hedges & Olkin, 1985). Hedges's (1982) analog to the analysis of variance was conducted to examine moderator variables. Lipsey and Wilson's (2001) SPSS macro was used to examine potential moderator variables. For both between- and within-group effect-size analyses, we examined the following potential moderator variables: (a) type of outcome measure (i.e., semistructured interview vs. self-report), (b) gender (i.e., female vs. male vs. mixed), (c) analysis type (i.e., intent to treat vs. completer), (d) use of independent assessor (i.e., yes vs. no), and (e) type of trauma (i.e., combat vs. childhood sexual abuse [CSA] vs. mixed/other trauma). For between-groups effect-size analyses, we also examined type of comparison condition (i.e., active treatment comparison condition vs. wait-list comparison condition) as a potential moderator variable. We did not examine type of comparison condition as a moderator of within-group effect-size analyses, as these analyses focused solely on the active treatment group in each study.

Results

Between-Groups Effect-Size Analyses

Tables 1 and 2 present study characteristics, and Table 3 presents effect sizes, for each study and the mean between-group effect sizes and 95% confidence intervals for each comparison. The between-group effect sizes are presented for all studies that compared an active treatment with a comparison condition. The between-group effect sizes (*d*) ranged from −.09 to 1.31. Across all treatments, the average between-group effect size of $d = .24$ (95% CI [.09, .39]) was significant ($p < .05$), suggesting that group treatments for PTSD produced a small effect in PTSD symptom reduction relative to comparison conditions.

To assess the homogeneity of the effect sizes, we used the *Q* statistic. A significant *Q* indicates heterogeneity across studies, deserving further exploration. For between-group effects, *Q* was not significant ($Q = 22.81$, $df = 1$, $p = .09$). Although the *Q*

Table 1
Summary of Study Characteristics

Study	Treatment description	PTSD diagnosis	Comparison	Sample	Female (%)
Beck et al. (2009)	2-hr, 14-session CBT group; combination of cognitive restructuring, exposure-based treatment	Yes	MCC	MVA	82
Bradley & Follingstad (2003)	2.5-hr, 18-session CBT group; combination of DBT and narrative exposure	No	WL	CSA	100
Classen et al. (2011)	1.5-hr, 24-session trauma-focused CBT	No	PCG	CSA	100
Dunn et al. (2009)	1.5-hr, 14-session CBT group developed on the self-control model of depression	Yes	Psychoed	Combat	0
Falsetti et al. (2008)	12-week exposure-based treatment focused on comorbid PTSD and panic attacks	Yes	WL	Mixed	100
Harris et al. (2011)	8-week, 2-hr session of trauma focused spiritually integrated treatment	No	WL	Mixed	11
Hien et al. (2009)	1.5-hour, 12-session CBT group: seeking safety which focuses on treatment for combined PTSD and substance abuse	No	Psychoed	Mixed	100
Hinton et al. (2011)	Culturally-adapted CBT for Latino women with PTSD	Yes	AMR	Mixed	100
Hollifield et al. (2007)*	12-session CBT group that includes cognitive restructuring, behavioral activation, and in vivo exposures	Yes	Acupuncture	Mixed	68
Krupnick et al. (2008)	2-hr, 16-session interpersonal group treatment	Yes	WL	Interpersonal	100
Morland et al. (2010)	Anger management treatment via teleconferencing	Yes	Anger management via in person	Combat	0
Rogers et al. (1999)	1- to 1.5-hr session of EMDR	Yes	Exposure-based group	Combat	0
Schnurr et al. (2003)	2-hr, 30-session CBT, plus 5 booster sessions	Yes	PCG	Combat	0
Sikkema et al. (2007)*	15-session CBT focused on HIV and trauma coping skills	No	Support group	CSA	53
Zlotnick et al. (1997)	15-session CBT focused on affect management	Yes	WL	CSA	100
Zlotnick et al. (2009)	1.5-hr, 18- to 24-session CBT group: seeking safety which focuses on treatment for combined PTSD and substance abuse	No	TAU	Mixed	100

Note. AMR = applied muscle relaxation; CBT = Cognitive-Behavioral Therapy; CA = Childhood Abuse; CSA = Childhood Sexual Abuse; DBT = dialectical behavioral therapy; EMDR = eye movement desensitization and reprocessing; MVA = Motor Vehicle Accident; MCC = minimal contact condition; PCG = present centered supportive group; Psychoed = psychoeducation; TAU = treatment as usual; WL = Waitlist.
* Included more than two conditions, with the third condition being wait list. For purpose of this meta-analysis, we examined the treatment comparison condition.

statistic suggested homogeneity of effect sizes, the statistic can be underpowered for small samples; consequently, we decided to evaluate the potential moderators. Results indicated that the type of comparison condition moderated the between-treatment effect on PTSD symptom severity. The average effect size for studies that compared group treatments with wait list comparisons (k = 6) was greater (d = .56, 95% CI [.31, .82]) than for studies that compared group treatments with active treatment comparisons (k = 10, d = .09, 95% CI [−.03, .22]). Type of trauma also moderated the between-treatment effects on PTSD, such that studies that included individuals with CSA reported smaller effects (k = 4, d = .13, 95% CI [−.13, .39]) than studies that included mixed/other trauma type samples (k = 8, d = .40, 95% CI [.15, .65]). The effects reported in studies that included combat trauma samples (k = 4, d = .19, 95% CI [−.14, .52]) were not significantly different from either the CSA trauma or mixed/other trauma sample studies.

Within-Group Effect-Size Analyses

Table 3 presents the mean within-group effect sizes and 95% confidence intervals for each comparison. The within-group effect sizes are presented for all studies that reported pretreatment and posttreatment data for an active treatment. The pre- versus post-treatment effect sizes (ES_{sg}) ranged from .09 to 2.16. Across all treatments, the mean within-group effect size was significant, ES_{sg} = .71 (95% CI [.51, .91], $p < .001$), suggesting that group treatments for PTSD, when pre- and posttreatment data were compared, produced a small to very large effect. For within-group effects, Q was significant (Q = 449.34, df = 13, $p < .001$); thus, moderator analyses were conducted.

Results demonstrated that gender moderated the within-treatment effects of group treatments on PTSD symptom severity. The within-treatment effect size for studies that consisted of females (k = 8, ES_{sg} = .89, 95% CI [.64, 1.13]) or studies that included a mixed-gender sample (k = 4, ES_{sg} = .77, 95% CI [.47, 1.06]) were larger than for studies that consisted of males (k = 4, ES_{sg} = .32, 95% CI [.04, .61]). Results also demonstrated that the type of trauma experienced also moderated the within-treatment effects of group treatments on PTSD symptom severity. The within-treatment effect sizes for studies with individuals that experienced combat trauma (k = 4, ES_{sg} = .35, 95% CI [−.08, .77]) or CSA (k = 4, ES_{sg} = .55, 95% CI [.20, .91]) were less than for studies with mixed/other (i.e., MVA) trauma experiences (k = 8,

Table 2
Summary of Study Methodological Characteristics

Study	Treatment (*n*)	Comparison (*n*)	Analysis	Treatment dropout rates		Outcome measure
				Treatment	Comparison	
Beck et al. (2009)	26	18	AD	27%	11%	CAPS
Bradley & Follingstad (2003)	24	25	Comp	46%	28%	TSI – IE & DA
Classen et al. (2011)*	55	56	AD/ITT	29%	17%	PCL-S
Dunn et al. (2007)	55	56	Comp/ITT	38%	21%	CAPS
Falsetti et al. (2008)	29	31	Comp/ITT	52%	26%	CAPS
Harris et al. (2011)	26	28	Comp	6%	0%	PCL
Hien et al. (2009)	176	177	MA/ITT	41%**	46%**	CAPS
Hinton et al. (2011)	12	12	ITT	0%	0%	PCL
Hollifield et al. (2007)*	28	29	Comp/ITT	25%	34%	PSS-SR
Krupnick et al. (2008)	32	16	ITT	47%**	56%	CAPS
Morland et al. (2010)	61	64	Comp/ITT	10%	11%	PCL-M
Rogers et al. (1999)	6	6	ITT	0%	0%	IES
Schnurr et al. (2003)	180	180	AD/ITT	34%	25%	CAPS
Sikkema et al. (2007)*	96	101	ITT	15%**	13%**	IES
Zlotnick et al. (1997)	16	17	Comp	29%	25%	DTS
Zlotnick et al. (2009)	27	22	Comp	22%	0%	CAPS

Note. AD = adequate dose, defined as attending at least 75% of sessions; CAPS = Clinical-Administered PTSD Scale; Comp = Completer analysis; DTS, IE & DA = Davidson Trauma Scale Intrusive Experiences, Defensive Avoidance; IES = Impact of Events Scale; ITT = Intention to Treat; LOCF = last observation carried forward; MA = minimal attendance, defined as attending at least 50% of the sessions; PCL-M = Posttraumatic Stress Disorder Checklist – Military version; PCL-S = Posttraumatic Stress Disorder Checklist – Specific version; PSS = Posttraumatic Stress Symptom Scale; PSS-SR = Posttraumatic Stress Symptom Scale – Self-Report; TSC-33 = Trauma Symptom Checklist – 33-item version; TSI = Trauma Symptom Inventory.
* Included more than two conditions. ** Treatment dropout not reported; for Hien et al. and Krupnick et al., dropout rate represents the percentage of participants who attended fewer than 50% of sessions, and for Sikkema et al., dropout rate represents the percentage of participants who did not receive any treatment or who were lost to follow-up (i.e., wait list).

ES_{sg} = .96, 95% CI [.68, 1.24]). No other variables significantly moderated the within-treatment effect.

File-Drawer Problem/Fail-Safe *N* Calculation

In order to assess for publication bias, we calculated Rosenthal's (1979) fail-safe *N*, which represents an estimation of the number of nonsignificant, unpublished, or missing studies needed to reduce the cumulated effect across studies to the point of nonsignificance. Although this statistic was developed for use with Rosenthal's (1979) method of cumulating z-values across studies, Orwin (1983) adapted this approach to the standardized mean difference effect size, such that it determines the number of studies with an effect size of zero needed to reduce the mean effect size to a specified or criterion level. The specified or criterion level was arbitrarily set at .01, which represents a nearly null effect size. We computed fail-safe *N*s for the two main types of analyses conducted (i.e., between-groups and within-group analyses). For between- and within-group effects on PTSD, the fail-safe *N*s were 370 and 976, respectively. Notably, these fail-safe *N*s far exceed the number of studies included in the current meta-analyses as well as the value required by Rosenthal (1994) to suggest the presence of publication bias.

Discussion

The findings of this meta-analysis indicate that group treatment for PTSD is better than no treatment. However, when compared with a comparison condition intended to control for nonspecific therapy effects (e.g., supportive counseling), group treatment results in comparable benefits. It is also important to note that the within- and between-groups effect sizes observed in this study are substantially smaller than what is typically reported for individual treatment for PTSD (i.e., usually greater than 1.0; Cahill, Rothbaum, Resick, & Folette, 2009). However, there have been no published studies directly comparing group and individual treatment for PTSD.

Gender and the type of trauma sample also appear to be important moderators of group treatment for PTSD. Specifically, studies with CSA trauma samples had a significantly smaller between-group effect size than studies that included a mixed-trauma sample. In addition, both CSA and combat trauma samples had significantly smaller within-group effect sizes than the mixed-trauma sample studies. CSA and combat trauma events are characterized by chronic or repeated trauma events rather than a discrete trauma experience (e.g., motor vehicle accident, natural disaster). Thus, the moderator findings indicate that group treatment may be less efficacious for trauma samples that are characterized by repeated traumatization and/or more chronic PTSD. It is also possible that longer treatment duration is needed for individuals with greater PTSD chronicity. However, the study by Schnurr et al. (2003) used 30 weekly treatment sessions and five booster sessions, and did not find group differences between trauma-focused treatment and present-centered group treatment.

The findings obtained in this meta-analysis should be interpreted with caution for several reasons. First, the generalizability of the findings is limited. The majority of studies included in this meta-analysis examined women trauma survivors, and many of these studies focused on CSA or interpersonal violence trauma samples. As noted by a recent review of the PTSD treatment literature (Institute of Medicine, 2007), there is a general dearth of

Table 3
Mean Effect Sizes and 95% Confidence Intervals for Moderator Analyses

	PTSD			
	Within-group effect size (*ESsg*)		Between-group effect size (*d*)	
Study	Mean	95% CI	Mean	95% CI
Overall	.71	.51: .91	.24	.09: .39
Wait-list comparison	—	—	.56	.31: .82
Beck et al. (2009)	1.26	.97: 1.54	.69	−.01: 1.39
Bradley & Follingstad (2003)	.78	.59: .98	.37	−.35: 1.09
Falsetti et al. (2008)	—	—	.31	−.39: 1.01
Harris et al. (2011)	.20	.06: .34	.58	.02: 1.13
Krupnick et al. (2008)	1.13	.89: 1.38	.91	−.01: 1.83
Zlotnick et al. (1997)	.58	.37: .79	.68	−.02: 1.38
Active treatment comparison	—	—	.09	−.03: .22
Classen et al. (2011)	—	—	.14	−.24: .51
Dunn et al. (2007)	.09	.02: .16	.17	−.23: .56
Hien et al. (2009)	1.10	1.00: 1.20	.03	−.23: .30
Hinton et al. (2011)	2.16	1.52: 2.80	1.31	.42: 2.19
Hollifield et al. (2007)	1.12	.84: 1.40	.55	−.07: 1.16
Morland et al. (2010)	.31	.16: .47	−.09	−.46: .28
Rogers et al. (1999)	.70	.24: 1.15	.93	−.26: 2.12
Schnurr et al. (2003)	.30	.25: .34	.14	−.14: .36
Sikkema et al. (2007)	.36	.26: .47	.02	−.28: .32
Zlotnick et al. (2009)	.57	.43: .72	.04	−.55: .64

Note. No within-group effect sizes are presented for the moderator analysis that focused on the type of comparison group because, conceptually, the type of comparison group should not affect the within-group effects of the active treatment group. CI = Confidence Interval; PTSD = posttraumatic stress disorder.

PTSD treatment research focused on veteran and military populations. Given the frequency of use of the group format within the Department of Veterans Affairs (Rosen et al., 2004), it would be important to further investigate the efficacy of the group format for treating combat-related PTSD. Although most of the studies included in this meta-analysis focused on women, the studies are heterogeneous in the terms of the types of target treatment and the outcome measures used, which also limits generalizability. Second, many of the studies had small sample sizes, and thus the total *N* for the analysis was relatively small. Third, we focused our analyses on posttreatment assessments, due to the variability of when assessments were conducted in the included studies and that all studies included a posttreatment assessment. However, it is possible that further treatment gains may be observed at later periods as patients develop skills in using the techniques learned in treatment. On the other hand, it is possible that any benefits gained in treatment are quickly lost over time. The inclusion of follow-up assessments that occur at least several months after treatment is important for addressing the durability of benefits gained in group treatment.

Lastly, we know very little about how group treatment for PTSD might be beneficial in ways other than PTSD symptom severity. A number of the studies included treatment satisfaction measures (Beck, Coffey, Foy, Keane, & Blanchard, 2009; Dunn et al., 2007; Hollifield, Sinclair-Lian, Warner, & Hammerschlag, 2007; Morland et al., 2010; Rogers et al., 1999; Zlotnick, Johnson, Najavits, 2009) and found that participants reported high satisfaction with the group treatment and perceived benefit from the treatment. This finding raises the possibility that patients are benefiting in ways that may not be captured by the outcome measures included in these clinical trials. For instance, a commonly assumed advantage of group treatment for PTSD is increased social contact. However, investigators do not typically examine whether group treatment for PTSD increases social functioning. Another commonly assumed advantage of group treatment is cost effectiveness, yet we have no data addressing the cost effectiveness of group treatment for PTSD relative to individual treatment.

Although PTSD symptom severity was the focus of this meta-analysis, another important factor to consider is treatment dropout rate. Treatment dropout rates for the studies included in this meta-analysis were comparable to rates reported for individual treatment for PTSD, with a mean treatment dropout rate of 26.5% (range 0–52%) for the 16 studies.

Despite suggestions by Foy and colleagues (2000) nearly 10 years ago, emphasizing the importance of advancing the methodological sophistication of PTSD group treatment clinical trials, work in this area continues to be hampered by methodological shortcomings. Although this meta-analysis focused on RCTs, the majority of work in this area tends to be non-RCT designs. In addition, the most methodologically rigorous clinical trial design compares the target treatment to an active treatment comparison condition. Only 10 of the 16 studies examined in this meta-analysis used an active treatment comparison condition. The use of a wait-list comparison condition is generally regarded as acceptable when establishing preliminary efficacy of a treatment protocol (e.g., Schnurr, 2007). Once initial efficacy data are obtained, the next investigative step is to examine the treatment protocol in comparison with another active treatment (e.g., supportive counseling, present-centered therapy). The inclusion of a nonspecific therapy comparison condition addresses whether treatment effi-

cacy is associated with nonspecific therapy effects or related to the specific ingredients of the treatment. The comparison condition moderator effect obtained in this meta-analysis does suggest that group treatment for PTSD, which includes cognitive–behavioral, interpersonal, and other approaches, does not have unique benefits beyond the general benefits of group therapy. This finding may underscore the need to identify additional approaches to group treatment for PTSD.

Another important methodological issue is whether an ITT or completer analysis approach is used. A strength of the studies reviewed in this meta-analysis is that almost all of the studies used an ITT analysis approach. Nonetheless, a number of the studies used the last observation carried forward (LOCF) approach. As recommended by others (e.g., Institute of Medicine, 2007), LOCF should not be used when dropout rates are greater than 10%, which is almost always the case in treatment studies.

In general, clinical trials are complex to design, difficult to execute, and very costly to conduct. The cost and complexity of conducting clinical trials is increased for group clinical trials, owing to the need for much larger patient samples, greater burden of clinical management, and other methodological features. In addition, large sample sizes are needed in order to detect between-groups differences in studies that include a treatment comparison condition. Such large sample sizes typically necessitate the need for a multisite clinical trial, which results in additional complexity and cost. These features most likely account for the study of group treatment for PTSD lagging behind research in individual treatment for PTSD.

Taken together, findings of this meta-analysis indicate that group treatment for PTSD is efficacious. Nevertheless, due to the collective methodological limitations of the research that has been conducted to date, we know very little regarding what group treatments work best for different trauma populations and how group treatment compares with individual treatment. It is important to advance our knowledge of group treatment for PTSD by conducting systematic research that builds on prior work, employs more rigorous clinical trial methodology (e.g., use of semistructured interviews, use of treatment comparison condition), and includes large sample sizes. Although methodologically sophisticated group clinical trials are costly and complex to conduct, it is imperative that this work be pursued, given the high prevalence of PTSD and the large-scale use of group treatments within care settings where many PTSD patients are found.

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