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Efficacy of Integrated Exposure Therapy vs Integrated Coping Skills Therapy for Comorbid Posttraumatic Stress Disorder and Alcohol Use Disorder
A Randomized Clinical Trial

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IMPORTANCE Co-occurrence of posttraumatic stress disorder (PTSD) and alcohol use disorder (AUD) is common and associated with psychiatric and functional problems. Understanding whether exposure therapy is tolerable and efficacious for treating PTSD and AUD is critical to ensure that best practice treatments are available.

OBJECTIVE To compare the efficacy of integrated (ie, targeting both PTSD and alcohol use) prolonged exposure (I-PE) therapy with present-centered integrated coping skills (I-CS) therapy, a more commonly available treatment, in reducing PTSD symptoms and alcohol use.

DESIGN, SETTING, AND PARTICIPANTS This prospective randomized clinical trial with masked assessments considered 186 veterans seeking Veterans Affairs mental health services. A total of 119 veterans with PTSD and AUD were randomized. Data were collected from February 1, 2013, to May 31, 2017, before treatment, after treatment, and at 3- and 6-month follow-ups. Intention-to-treat analyses were performed.

INTERVENTIONS Veterans underwent I-PE (Concurrent Treatment of PTSD and Substance Use Disorder Using Prolonged Exposure) or I-CS (Seeking Safety) therapy.

MAIN OUTCOMES AND MEASURES A priori planned outcomes were PTSD symptoms (Clinician Administered PTSD Scale for *DSM-5*) and percentage of heavy drinking days (Timeline Follow-Back) before treatment, after treatment, and at 3- and 6-month follow-ups.

RESULTS A total of 119 veterans (mean [SD] age, 41.6 [12.6] years; 107 [89.9%] male) were randomized. Linear mixture models found that PTSD symptoms decreased in both conditions, with a significantly greater decrease for I-PE treatment compared with I-CS treatment (treatment × time interaction, −2.83; $F_{3,233.1}$ = 4.92; Cohen d = 0.41; P = .002). The percentage of heavy drinking days improved in both conditions but was not statistically different between I-PE and I-CS treatment (treatment × time interaction, 1.8%; $F_{3,209.9}$ = 0.18; Cohen d = 0.04; P = .91).

CONCLUSIONS AND RELEVANCE The I-PE arm had a greater reduction in PTSD symptoms than the I-CS arm and comparable drinking decreases. The study provides evidence that exposure therapy is more efficacious in treating PTSD than a more commonly available integrated treatment without exposure for comorbid PTSD and AUD.

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Supplemental content

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Posttraumatic stress disorder (PTSD) frequently co-occurs with alcohol use disorders (AUDs) in the general population[1] and among veterans.[2] Individuals with PTSD and AUD exhibit briefer abstinence periods, greater risk of suicidality and homelessness, and more medical, legal, and psychosocial problems than individuals with either disorder alone.[3-7]

Trauma-focused exposure psychotherapies, such as prolonged exposure therapy,[8] are the first line of treatment of PTSD based on numerous studies and clinical practice guidelines.[9-17] Several studies[18-21] have found that, for patients with PTSD and AUD or PTSD comorbid with alcohol and/or other substance use disorders (A/SUDs), exposure therapy is more efficacious in reducing PTSD symptoms than A/SUD-only treatment. However, individuals with PTSD and AUD are often not offered exposure therapy because of concerns that exposure to trauma memories may lead to increased drinking and crises.[22] Furthermore, treatment attendance is sometimes lower with exposure therapy than in A/SUD-only treatment.[18] Psychotherapy for PTSD and AUD that focuses on improving coping skills is well accepted and highly disseminated.[23] Such therapy posits that establishing safety through better coping is the first priority for patients with PTSD and A/SUD and that eliciting trauma memories too early in treatment may be harmful.[24] Although session attendance is comparable to A/SUD-only treatment, questions remain about whether coping skills therapy is more efficacious than A/SUD-only care.[18] To date, no randomized clinical trials (RCTs) have directly compared the efficacy and tolerability of 2 active integrated PTSD and AUD interventions, specifically, exposure and coping skills therapies. In addition, many studies of PTSD and AUD treatment have been limited by narrow inclusion and exclusion criteria and methodologic problems, such as low recruitment, leading to risk of bias and low power to detect differences among treatments.[18] Understanding which interventions are the most efficacious and tolerable for treating PTSD and AUD and, in particular, whether exposure therapy is tolerable and more efficacious than coping skills therapy even when AUD is present is critical to improving outcomes and ensuring best practice treatments are available to patients with comorbid conditions.

The current trial was designed to address these critical gaps. The objective was to compare integrated prolonged exposure (I-PE) therapy, using the Concurrent Treatment for PTSD and Substance Use Disorder Using Prolonged Exposure (COPE)[25] protocol, with the most widely used[18] integrated coping skills (I-CS) therapy, Seeking Safety (SS).[26] We hypothesized that I-PE treatment would produce greater reductions in PTSD symptoms after treatment and at follow-ups and that both arms would have reductions in the percentage of heavy drinking days (PHDD) after treatment but that the I-PE therapy arm would have a significantly lower PHDD at 3- and 6-month follow-ups. The PHDD variable was selected as the primary alcohol use outcome because many participants chose harm reduction rather than abstinence as their treatment goal. In addition to the primary outcomes of PTSD symptoms and PHDD, we examined the percentage of days abstinent (PDA) from al-

cohol and PTSD remission at each time point. Discontinuations attributable to serious adverse events and treatment satisfaction were examined as markers of tolerability and satisfaction.

Key Points

Question Is integrated prolonged exposure therapy tolerable and more efficacious than present-centered integrated coping skills therapy for reducing posttraumatic stress disorder symptoms and alcohol use in patients with comorbid posttraumatic stress disorder and alcohol use disorder?

Findings In this randomized clinical trial of 119 patients, exposure therapy reduced posttraumatic stress disorder symptoms significantly more than coping skills therapy after treatment and at 3- and 6-month follow-ups. Participants in both treatment arms had reductions in heavy drinking days over time.

Meaning Integrated prolonged exposure therapy was well tolerated and had greater efficacy for reducing posttraumatic stress disorder symptoms than present-centered integrated coping skills therapy.

Methods

Design

The study was an RCT of 2 active treatments, I-PE and I-CS therapy, for PTSD and AUD. Participants gave written informed consent before enrollment by the study coordinator (E.B.). Independent evaluators were masked to treatment assignment for study duration. Details of methods are published elsewhere.[27] The study was approved by the VA San Diego Research Review Board. The trial protocol can be found in Supplement 1.

Participants

Demographic characteristics are given in **Table 1**. Participants were 119 adult veterans (107 male) seeking treatment at a large urban veterans affairs (VA) facility. Patients who potentially had PTSD and AUD based on medical record review were referred to the study by mental health practitioners. Patients also responded to flyers posted around the VA facility. Eligible participants had current full or subthreshold PTSD (up to 1 symptom missing)[28] and current AUD with at least 20 days of heavy alcohol use in the past 90 days not in a restricted environment and wanted to reduce or abstain from alcohol use. Exclusion criteria were acute suicidality, unmanaged psychosis or mania, and intravenous drug use. Participants were asked not to engage in other PTSD psychotherapy during study treatment. Participation in other mental health treatment (medications and psychotherapy) was tracked.

Procedures

Recruitment took place from February 1, 2013, to May 31, 2017. After a telephone screen, participants were scheduled to provide written informed consent and complete baseline assessments. The Clinician Administered PTSD Scale for *DSM-5*

Table 1. Demographic Characteristics of the Intention-to-Treat Sample[a]

Characteristics	Total (N = 119)	I-PE Treatment (n = 63)	I-CS Treatment (n = 56)	P Value
Age, mean (SD), y	41.6 (12.6)	43.2 (13.5)	39.7 (11.3)	.13
Sex				
Men	107 (89.9)	56 (88.9)	51 (91.1)	.69
Women	12 (10.1)	7 (11.1)	5 (8.9)	
Marital status				
Not married	87 (73.1)	45 (71.4)	42 (75.0)	.54
Married	32 (26.9)	18 (28.6)	14 (25.0)	
Educational level				
High school graduate or GED	11 (9.2)	6 (9.5)	5 (8.9)	.62
Some college	65 (54.6)	33 (52.4)	32 (57.1)	
College graduate	36 (30.2)	21 (33.3)	15 (26.8)	
Ethnicity				
Hispanic	35 (29.4)	18 (28.6)	17 (30.4)	.70
Non-Hispanic	83 (69.7)	44 (69.8)	39 (69.6)	
Race				
White	78 (65.5)	41 (65.1)	37 (66.1)	.44
Black	16 (13.4)	8 (12.7)	8 (14.3)	
Asian	6 (5.0)	3 (4.8)	3 (5.4)	
Other	18 (15.1)	11 (17.5)	7 (12.5)	
Subthreshold PTSD	5 (4.2)	2 (3.2)	3 (5.4)	.82
Lifetime trauma exposure, mean (SD), No. of events	8.3 (2.7)	8.5 (2.6)	7.9 (2.8)	.20
Event type				
Combat trauma	100 (84.0)	51 (81.0)	49 (87.5)	.33
Sexual trauma	28 (23.5)	15 (23.8)	13 (23.2)	.94
Physical assault	98 (82.4)	53 (84.1)	45 (80.4)	.74
Disaster exposure	83 (69.7)	43 (68.2)	40 (71.4)	.71
Serious incident	60 (50.4)	30 (47.6)	30 (53.6)	.52
Life-threatening illness or injury	34 (28.6)	19 (30.2)	15 (26.8)	.73
Taking psychotropic medication[b]	78 (65.5)	49 (77.8)	29 (51.8)	.003
Baseline assessment scores, mean (SD)[b]				
Interviewer-rated PTSD severity, CAPS-5 score, mean (SD)[c]	42.7 (9.5)	43.2 (8.8)	42.0 (10.3)	.55
Substance use, TLFB score, mean (SD)[c]				
Days drinking alcohol in past 90 d, %	67.2 (22.9)	65.7 (24.5)	68.8 (21.1)	.45
Days of heavy drinking in past 90 d, %[d]	51.5 (26.1)	52.5 (25.6)	50.4 (26.9)	.66
Days of drug use in past 90 d, %	16.6 (30.9)	16.4 (31.2)	16.8 (30.9)	.94
No. of total sessions attended, mean (SD)	9.8 (4.9)	8.4 (4.6)	11.4 (4.8)	.001
Mean No. of weeks in treatment	13.61 (6.46)	12.21 (6.46)	15.19 (6.40)	.02
Treatment satisfaction, CSQ-8 score, mean (SD)[c]	29.1 (2.7)	28.9 (2.7)	29.4 (2.8)	.40

Abbreviations: CAPS-5, Clinician Administered PTSD Scale for *DSM-5*; CSQ-8, Client Satisfaction Questionnaire 8; GED, General Educational Development; I-CS, integrated coping skills; I-PE, integrated prolonged exposure; PTSD, posttraumatic stress disorder; TLFB, Timeline Follow-Back.

[a] Data are presented as number (percentage) unless otherwise indicated.

[b] For descriptions of score ranges, see the Methods section of the text.

[c] Scoring details are given in the Measures subsection of the Methods section.

[d] Heavy drinking was defined as at least 5 drinks per day for men and 4 drinks per day for women.

(CAPS-5),[29] the Structured Clinical Interview for *DSM-IV-TR* (SCID-IV) Module E,[30] and the Timeline Follow-Back[31] confirmed study criteria for PTSD, AUD, and alcohol use, respectively. Participants then met with a study practitioner (M.H., B.C.D., U.S.M., P.J.C., T.M, and others) to learn more about both therapies and ask any remaining questions about the treatment process. Balanced block randomization (variable blocks of 8-12 individuals) with masked allocation was stratified by sex. A statistician not otherwise involved in the study used SAS Institute's[32] random number generator for randomization. Participants were informed of their treatment condition at their first therapy session. Participants engaged in 12 to 16 sessions

of psychotherapy and then completed measures after treatment and at 3- and 6-month posttreatment follow-ups. Compensation was $20 at baseline, $30 after treatment, and $50 per follow-up.

Masked independent evaluators completed training and achieved at least 90% agreement on CAPS-5 item scores before conducting assessments. Interrater reliability, conducted on 11% of randomly selected CAPS-5 assessments, was excellent (κ = 0.94 for diagnosis; intraclass correlation coefficient, 0.99; 95% CI, 0.98-0.99).[29,33] Study therapists were 13 licensed psychologists, postdoctoral fellows, clinical psychology interns, and doctoral students. Most participants were seen

by therapists who administered both treatments (to control for therapist effects). The exception was doctoral students, who were only able to see [1] to 3 participants during their training rotation (a parallel set of analyses were conducted that excluded 11 participants treated by doctoral students to ensure robustness of the findings). Therapists received training in study protocols through didactics, videos, and practice sessions with a supervisor before treating a participant. The first time that therapists administered each intervention, all sessions were rated for fidelity. Henceforth, all sessions were recorded and 10% were rated. Therapists received weekly individual and group supervision.

Measures

The CAPS-5 (score range, 0-80, with 0 indicating no PTSD symptoms and 80 indicating extreme ratings across all symptoms), a 30-item structured interview[29] considered to be the criterion standard for PTSD, was the primary measure of PTSD symptoms and diagnosis. Diagnosis was determined using the rule of a severity score of 2 or higher, which follows *DSM-5* PTSD criteria. A CAPS-5 diagnosis using this rule displayed strong interrater reliability ($\kappa = 0.78$), and severity scores had strong internal consistency ($\alpha = .88$) in the development sample.[29] Internal consistency in the current sample was strong ($\alpha = .83$). At each time point, PTSD remission was defined as a total score less than 12 because it is not possible to have a diagnosis of PTSD with a score less than 12. This optimally conservative cutoff was recommended by CAPS developers (P. P. Schnurr, PhD, and B. P. Marx, PhD, written communication, April 2018).

Frequency and quantity of alcohol use were assessed using the Timeline Follow-Back, a calendar-assisted structured clinical interview[31] that displays good psychometric properties.[34] The PHDD was calculated by dividing the number of days in which 5 or more drinks for men or 4 or more drinks for women were consumed by the total number of days in the reference period. Toxicology screens were completed during a randomly selected week each month, and Breathalyzer tests were administered if there was indication that a participant came to an appointment after consuming alcohol.

The Modified Interview of Antiretroviral Medication Use[35] was used to assess past week adherence to psychotropic medications. The Client Satisfaction Questionnaire (score range, 8-32, with 8 indicating extremely poor satisfaction and 32 indicating extremely high satisfaction), a widely used measure of psychotherapy satisfaction,[36] was administered every other therapy session. The mean across-treatment sessions were computed to ascertain satisfaction.

Treatments

The I-PE and I-CS treatments were delivered in 90-minute individual sessions. Therapy was 12 sessions, with the option of completing up to 16 sessions if the participant and therapist agreed that treatment goals were not yet met. Participants were encouraged to attend therapy 1 to 2 times per week on consecutive weeks but allowed up to 6 months to finish treatment.

COPE[25] is an integrated PTSD and SUD treatment that augments prolonged exposure with cognitive behavioral relapse prevention skills for SUD in each session. COPE includes in vivo exposures to trauma reminders (starting in session 3) and repeated imaginal exposures to the trauma memory (starting in session 4). The COPE manual includes 12 sessions. For participants who completed 13 to 16 sessions, up to 4 SUD skills were repeated (S. E. Back, PhD, oral communication, November 2012).

The SS treatment[26] is a present-focused, PTSD and SUD integrated therapy that teaches cognitive behavioral and interpersonal techniques and case management. It consists of 24 modules. Each module includes safe coping skills. Trauma is discussed in the context of how it is currently affecting the patient's life. For this study, session topics were predetermined for sessions 1 through 12 based on previous research.[37] Participants completing 13 to 16 sessions selected from the remaining topics.
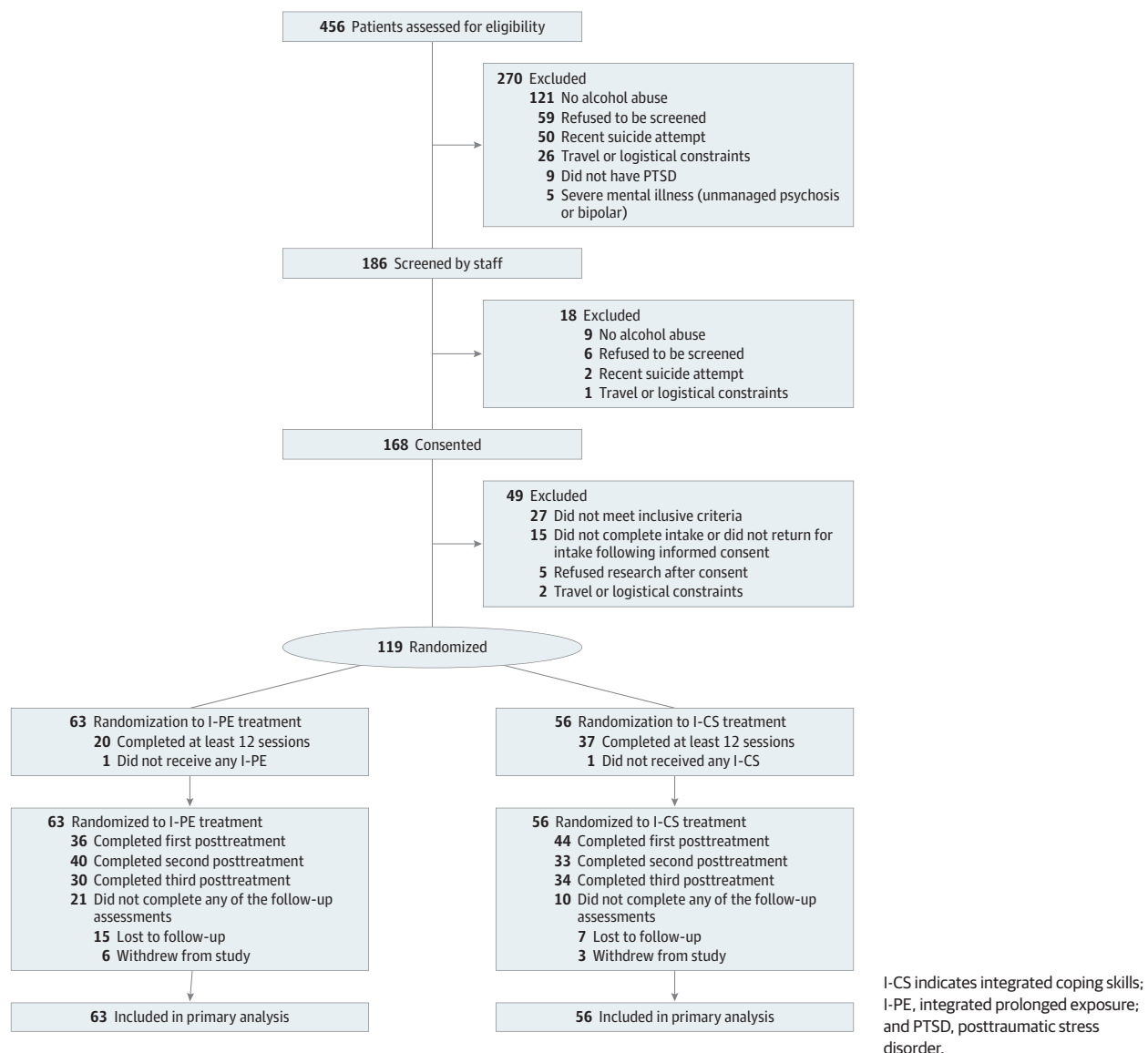
Forty-seven I-PE and 59 I-CS therapy session recordings were rated for fidelity. A score of 2 or higher (range, 0-4, with 0 indicating no fidelity and 4 indicating excellent fidelity) on the COPE fidelity scale indicated adequate adherence and competence with I-PE therapy.[11,20] Strong adherence (mean [SD], 3.18 [0.48]) and competency were maintained (mean [SD], 3.65 [0.42]). The SS adherence scale,[38] a 4-point scale (range, 0-3, with 0 indicating not done or harmful and 3 indicating done thoroughly or extremely helpful), was used for I-CS therapy. Strong adherence (mean [SD], 2.45 [0.27]) and competency (mean [SD], 2.59 [0.26]) were maintained.

Statistical Analysis

Sample size was determined to ensure adequate statistical power to detect between-group differences in PTSD and alcohol use after treatment. We anticipated a large between-group effect size for PTSD based on findings of studies evaluating I-PE and I-CS treatment for PTSD[18]; thus, the sample size was based on alcohol use. We estimated the between-group standardized effect for alcohol use to be 0.58 based on an earlier trial conducted by our team.[39] Ninety-six participants (48 in each condition) were needed to have 80% power with a 2-tailed test with α at .05 to detect this estimated effect size using intention to treat. The final sample size of 119 exceeded the target by 24%.

Linear mixed models were used to analyze the continuous outcomes (CAPS, PHDD, and PDA) using SPSS, version 21 (SPSS).[40] These models allow for an intention-to-treat analysis in which all available data from randomized participants are included to estimate unbiased variable estimates under the missing at random assumption. Treatment condition, time, and their interaction were treated as fixed effects, and the intercept was specified as a random effect to account for the repeated observations within participants. Analyses were conducted using an identity covariance matrix for the random effects and an autoregressive covariance for the repeated effect of time. Between-group effect sizes were computed according to Cohen *d* using estimated data from these procedures. Rates of PTSD remission (CAPS score <12) were compared for participants for whom data were available at each time point using χ^2 tests. A 1-sided $P < .05$ was considered to be statistically significant.

Figure 1. Consort Flow Diagram

I-CS indicates integrated coping skills; I-PE, integrated prolonged exposure; and PTSD, posttraumatic stress disorder.

Results

A total of 119 veterans (mean [SD] age, 41.6 [12.6] years; 107 [89.9%] male) were randomized. **Figure 1** shows the flow of the patients through the study. The I-PE and I-CS arms did not significantly differ on background variables or on baseline measures of the primary outcomes (Table 1). The I-PE arm had higher rates than the I-CS arm of taking psychotropic medication (77.8% vs 51.8%; t_{117} = 3.07; P = .003). Number of sessions completed was higher in the I-CS arm than the I-PE arm (11.4 vs 8.4; t_{117} = 3.47; P = .001). Session attendance was comparable between the 2 treatments through session 5, but the proportion attending I-PE treatment was lower than the proportion attending I-CS treatment at subsequent sessions.

The estimated marginal means from the mixed models for outcomes over time are given in **Table 2**. The CAPS scores decreased in both arms, with a significantly greater decrease in CAPS scores for the I-PE arm compared with the I-CS arm (treatment × time interaction, −2.83; $F_{3,233.1}$ = 4.92; Cohen d = 0.41; P = .002) (**Figure 2**). The PHDD decreased in both arms, but these changes were not statistically different between arms (treatment × time interaction, 1.8%; $F_{3,209.9}$ = 0.18; Cohen d = 0.04; P = .91). The PDA had the same pattern of results as the PHDD.

The I-PE arm had significantly higher rates of PTSD remission than the I-CS arm after treatment (8 of 36 [22.2%] vs 3 of 44 [6.8%]; χ^2 = 3.96; P = .047) and 3-month follow-up (10 of 40 [25%] vs 2 of 33 [6.1%]; χ^2 = 4.72; P = .03); there was a marginal group difference in favor of I-PE treatment at 6-month follow-up (10 of 30 [33.3%] vs 5 of 34 [14.7%]; χ^2 = 3.08; P = .08) (**Figure 3**).

No participants were discharged from the study because of serious adverse events. Satisfaction in I-PE (mean [SD], 28.9 [2.7])

Table 2. Continuous Outcomes at All Time Points

Outcome and Time Point	Marginal Mean From Linear Mixed Models (95% CI)	
	I-PE Treatment	I-CS Treatment
PTSD severity (CAPS)[a]		
Baseline	43.2 (40.0-46.4)	42.1 (38.7-45.5)
After treatment	25.8 (22.1-29.6)	32.9 (29.3-36.6)
3-mo Follow-up	26.4 (22.6-30.3)	31.0 (27.0-35.1)
6-mo Follow-up	22.5 (18.2-26.8)	29.8 (25.6-33.9)
Heavy drinking days, %[b]		
Baseline	52.5 (46.5-58.6)	50.4 (44.1-56.7)
After treatment	21.0 (13.4-28.6)	17.4 (10.4-24.5)
3-mo Follow-up	14.2 (6.9-21.4)	15.0 (7.1-22.8)
6-mo Follow-up	20.2 (11.9-28.5)	19.9 (12.1-27.6)
Days abstinent, %[c]		
Baseline	34.3 (27.1-41.6)	31.2 (23.5-38.8)
After treatment	67.5 (58.9-76.1)	63.1 (54.9-71.4)
3-mo Follow-up	65.6 (57.0-74.2)	68.4 (59.3-77.4)
6-mo Follow-up	66.2 (56.5-75.9)	64.0 (54.8-73.3)

Abbreviations: CAPS, Clinician Administered PTSD Scale for *DSM-5*; I-CS, integrated coping skills; I-PE, integrated prolonged exposure; PTSD, posttraumatic stress disorder.

[a] Slope = −4.03 (95% CI, −5.38 to −2.68); group × time interaction = −2.83 (95% CI, −4.75 to −0.91).

[b] Slope = −10.49 (95% CI, −13.54 to −7.44).

[c] Slope = 10.80 (95% CI, 7.66 to 13.95).

Figure 2. Posttraumatic Stress Disorder Symptom Severity Estimated Means by Treatment Condition at Each Time Point
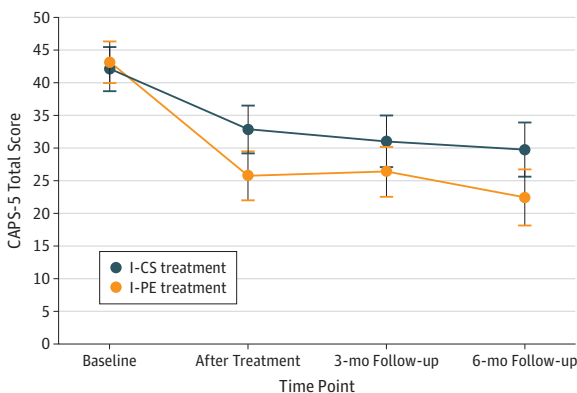
Error bars indicate 95% CIs. CAPS-5 indicates Clinician Administered PTSD Scale for *DSM-5*. I-CS indicates integrated coping skills; I-PE, integrated prolonged exposure.

and I-CS (mean [SD], 29.4 [2.8]) treatment was high and did not differ between arms. A parallel set of analyses that excluded the 11 participants seen by doctoral students found no meaningful differences from the estimates using the full sample.

Discussion

The aim of this study was to compare the relative efficacy of 2 promising psychotherapies for PTSD and AUD. The 2 treat-

Figure 3. Exploratory Completer Analysis of Rates of Posttraumatic Stress Disorder (PTSD) Remission by Treatment Condition at Each Time Point
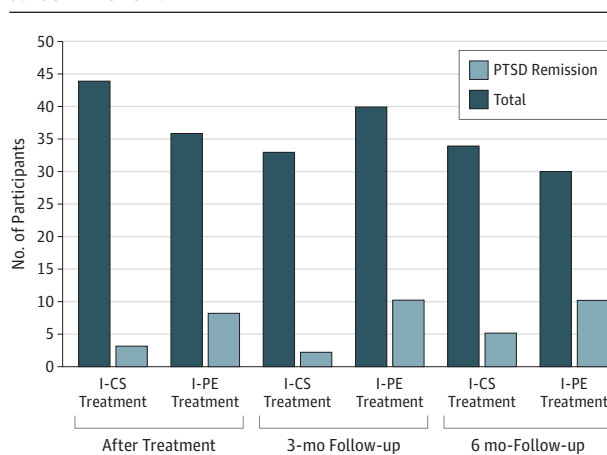
PTSD remission was defined as a Clinician Administered PTSD Scale for *DSM-5* score less than 12. I-CS indicates integrated coping skills; I-PE, integrated prolonged exposure.

ments are based on vastly different models. Whereas I-PE treatment posits that exposure to trauma-related memories and emotions is critical, I-CS treatment posits that patients with PTSD and AUD may not be ready for exposure and that a focus on better coping is key to recovery. As hypothesized, participants in both conditions had significant reductions in PTSD symptoms with greater reductions in the I-PE arm over time. The PTSD remission rates were greater for the I-PE arm than the I-CS arm.

Contrary to our hypotheses, no statistically significant differences were found between conditions in alcohol use at follow-ups. This hypothesis was based on research suggesting that as PTSD resolves, individuals are more successful in reducing drinking.[37,41-46] Our last follow-up was 6 months after treatment. It is possible that the effect we hypothesized would be seen further downstream. However, PTSD symptoms improved in both conditions, and participants in both conditions received cognitive behavioral interventions for AUD. Although I-PE and I-CS treatments differ greatly in how PTSD is treated, the cognitive behavioral AUD components may have been too similar for one condition to outperform the other.

Key implications of this novel direct comparison of 2 active integrated PTSD and AUD treatments are that patients with PTSD and AUD can tolerate and benefit from exposure therapy and, regarding PTSD, exposure therapy is more efficacious than therapy without exposure. This information is critical because having an AUD continues to be a barrier to receiving exposure therapy because of therapist perceptions of patients' fragility (ie, beliefs that patients will not be able to handle trauma-related memories and may have an increase in alcohol use).[47] Participants were not required to be abstinent and were not excluded for having additional SUDs (except intravenous drug use), and the mean number of trauma types experienced was more than 7, further reinforcing that patients with complicated, comorbid conditions can tolerate and benefit from exposure therapy.

Although I-PE treatment produced greater PTSD symptom reduction and remission rates, both treatments produced decreases in PTSD symptoms, reductions in alcohol use, and high treatment satisfaction. These findings raise questions regarding which treatment should be offered to whom and when. Findings of this study and a meta-analysis[18] that found I-PE treatment to be more efficacious than AUD-only treatment suggest that I-PE treatment should be offered when possible. The I-CS treatment may be useful when exposure therapy is refused by a patient or is not available. The I-CS treatment may be less costly to implement in that it can be delivered in groups, in 45- to 60-minute sessions,[26] and by trained peers.[48] However, in the present study, therapists were doctoral psychology trainees and psychologists and sessions were individual and 90 minutes long. Results may not generalize to delivery using a group format or shorter sessions. Given the better PTSD outcomes with fewer sessions attended, I-PE treatment may ultimately be more cost effective. Future research is needed to investigate the cost effectiveness of I-PE treatment compared with I-CS treatment.

It is not clear whether some participants in the I-PE arm attended fewer sessions because they found I-PE treatment to be too difficult, if they completed treatment more quickly because they felt better, or for other reasons. Prolonged exposure is generally conducted in approximately 12 sessions.[8] The mechanism of exposure (processing trauma-related distress, overcoming avoidance of trauma reminders, and challenging beliefs that one cannot handle trauma memories and reminders through exposure) may work more quickly and effectively than learning to cope better with current life difficulties. Future research is needed to understand why participants had better PTSD outcomes with I-PE treatment even though they attended significantly fewer sessions, and who is most likely to benefit from each treatment under which conditions.

To our knowledge, there has been little research on treating comorbid PTSD and A/SUD with trauma-focused treatments other than exposure. Preliminary studies suggest that cognitive processing therapy[49] and eye movement desensitization and reprocessing[50] are promising. Randomized clinical trials with these psychotherapies would further expand treatment options for PTSD and A/SUD.

Strengths and Limitations

This study has several strengths. It is the first RCT of which we are aware to compare 2 active PTSD and AUD psychotherapies. Many previous treatment studies of PTSD and AUD have had underrecruitment and limitations associated with risk of bias.[18] The study used a rigorous methodologic design and was powered to evaluate hypotheses. The study had minimal exclusion criteria, allowing for evaluation of a clinically complex, real-world comorbid population.

A limitation is that delivery of I-CS treatment in this study was different from how the SS treatment is typically delivered (in group or shorter individual sessions).[18,26] We chose to deliver 90-minute individual sessions to match for dose (COPE uses 90-minute individual sessions) rather than have participants in the I-PE arm receive 30 to 45 minutes more of therapy per session. The trade-off of this choice is that findings regarding I-CS treatment may not generalize to other, more standard delivery formats. In general, group treatments for PTSD have lower effect sizes than individual treatments[51-53]; thus, current findings may not generalize to I-CS treatment delivered in group format. Other limitations of the study included a mostly male veteran sample, potentially limiting generalizability. Attrition was high (73.9% completed at least 1 posttreatment assessment), although comparable with other RCTs of I-PE treatment (eg, 48%-79% completing at least 1 posttreatment assessment).[19,20,54] Consistent with other studies of PTSD and AUD,[18] the exposure therapy condition had fewer sessions attended and higher study dropout.

Conclusions

This study provides evidence that exposure therapy is more efficacious in treating PTSD among individuals with PTSD and AUD than a more commonly available integrated treatment without exposure. Exposure therapy did not worsen drinking outcomes, and both I-PE and I-CS treatment reduced heavy drinking.

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