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A Randomized Trial of Brief Couple Therapy for PTSD and Relationship Satisfaction

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Objective: This three-arm randomized trial tested a brief version of cognitive-behavioral conjoint therapy (bCBCT) delivered in two modalities compared to couples' psychoeducation in a sample of U.S. veterans with posttraumatic stress disorder (PTSD) and their intimate partners. ***Method:*** Couples were randomized to receive (a) in-person, office-based bCBCT (OB-bCBCT), (b) bCBCT delivered via home-based telehealth (HB-bCBCT), or (c) an in-person psychoeducation comparison condition (PTSD family education [OB-PFE]). Primary outcomes were clinician-assessed PTSD severity (Clinician Administered PTSD Scale), self-reported psychosocial functioning (Brief Inventory of Psychosocial Functioning), and relationship satisfaction (Couples Satisfaction Index) at posttreatment and through 6-month follow-up. ***Results:*** PTSD symptoms significantly decreased by posttreatment with all three treatments, but compared to PFE, PTSD symptoms declined significantly more for veterans in OB-bCBCT (between-group $d = 0.59$ [0.17, 1.01]) and HB-bCBCT (between-group $d = 0.76$ [0.33, 1.19]) treatments. There were no significant differences between OB-bCBCT and HB-bCBCT. Psychosocial functioning and relationship satisfaction showed significant small to moderate improvements, with no differences between treatments. All changes were maintained through 6-month follow-up. ***Conclusions:*** A briefer, more scalable version of CBCT showed sustained effectiveness relative to an active control for improving PTSD symptoms when delivered in-person or via telehealth. Both

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The datasets analyzed during the present study are not publicly available. Study materials are available from the principal investigator on reasonable request. This study's design and hypotheses were preregistered; see trial registration: NCT02720016.

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bCBCT and couples' psychoeducation improved psychosocial and relational outcomes. These results could have a major impact on PTSD treatment delivery within large systems of care where access to brief, evidence-based PTSD treatments incorporating family members are needed.

What is the public health significance of this article?
Cognitive behavioral conjoint therapy effectively reduces PTSD symptoms in veterans when delivered either in-person or through telehealth. This treatment is also effective in improving psychosocial functioning and marital satisfaction, again via either delivery modality.

Keywords: videoconferencing, veterans, couple therapy, PTSD randomized controlled trial, couples

Posttraumatic stress disorder (PTSD) is a disabling psychiatric condition frequently observed in current and former military personnel, particularly among veterans of combat operations and those who have experienced military sexual trauma (MST; Judkins et al., 2020). Untreated PTSD is associated with a host of negative consequences, including mental health problems (Elhai et al., 2011), unemployment (Smith et al., 2005), and suicidality (Bullman et al., 2019; Jakupcak et al., 2009). Impact is not limited to those with PTSD; rather, the entire family, and intimate partners in particular, are often affected (Taft et al., 2011). Symptom expression such as anger, withdrawal, and avoidance can produce negative effects on both members of the couple, including poor relationship adjustment, parenting problems, intrafamilial violence, and relationship instability (Campbell & Renshaw, 2018; Monson et al., 2021; Taft et al., 2011). Increased stress and diminished social support due to these family problems are, in turn, associated with poorer PTSD treatment outcomes for patients (Fontana & Rosenheck, 2010; Monson et al., 2005). Further, partners of those with PTSD evidence higher rates of their own psychosocial concerns, such as somatic symptoms, anxiety, insomnia, depression, and low self-esteem (Gorman et al., 2011; Mansfield et al., 2010).

Recent research suggests treating PTSD at the level of the couple can improve both PTSD symptoms and relationship functioning simultaneously, thus interrupting the cyclical nature of PTSD and interpersonal problems and enhancing treatment impacts (Monson et al., 2021). Cognitive-behavioral conjoint therapy for PTSD (CBCT; Monson & Fredman, 2012) is a 15-session manualized treatment for couples in which one partner has PTSD, designed to concurrently reduce PTSD symptoms and enhance relationship functioning. Clinical trials of CBCT support its efficacy in reducing PTSD symptom severity and improving relationship functioning in veteran and community samples (see Liebman et al., 2020 for a review).

Although research on CBCT strongly supports its efficacy, data from the Veteran Health Administration's (VHA) national roll out of CBCT suggest significant challenges with retaining couples for a 15-session CBCT protocol among trainees (S. Glynn, personal communication, March 13, 2017). A recently published study on the benefits accruing from CBCT offered in a U.S. Department of Veterans' Affairs (VA) outpatient clinic reported a 48% attrition rate (Pukay-Martin et al., 2021). These data on high dropout rates for the 15-session protocol in the VHA, combined with preliminary evidence of the efficacy of the first two phases of the three-phase traditional CBCT protocol (Monson & Fredman, 2012), provided rationale for modifying the original 15-session protocol to a briefer eight-session protocol (bCBCT) and conducting a trial on the clinical efficacy in the VA system. The modified intervention included Sessions 1–7 from the original protocol and an additional Session 8 that reviews gains, consolidates skills learned, and identifies plans for potential challenges in the future.[1] Although preliminary data were promising on the first two phases of the three-phase CBCT protocol, more research on the efficacy of bCBCT is needed.

Given the challenges couples face accessing in-person treatment, it is important to develop and examine virtual couple-based interventions (Doss et al., 2017; Doss & Hatch, 2022). Obstacles to accessing and engaging in family services include limited options and finances for childcare, transportation, and dual work scheduling. Agency-level barriers, such as shortage of specialty couple and PTSD treatment providers, also create challenges. The couples for whom in-person treatment is unworkable are often those with the lowest amount of social and financial support, which is compounded when both members of the dyad must attend appointments. Obstacles to treatment may be further exacerbated by PTSD symptomology (e.g., avoidance), fear of stigmatization, and lack of knowledge about PTSD and its treatment (Hoge et al., 2004; Seal et al., 2010; Vogt, 2011).

Thus, it is important to evaluate novel strategies to increase access to and scalability of effective couple-based mental health treatments, including developing brief treatments that are easy to access through video telehealth or other remote modalities. The COVID-19 pandemic has further emphasized the importance of providing virtual care effectively, safely, and broadly. Evidence-based PTSD treatment delivered via video telehealth has been shown to be safe, effective, and cost-efficient (Morland, Wells, et al., 2020). However, no studies have yet evaluated the efficacy of a couple-based PTSD treatment delivered remotely, and to our knowledge there have been no empirical comparisons of any couple therapy delivered via telehealth versus in-person.

The current randomized controlled trial (RCT) had the primary aim of evaluating the clinical efficacy (i.e., reducing PTSD symptoms, reducing functional impairment, and improving relationship satisfaction) of bCBCT delivered in an office-based setting (OB) or via home-based telehealth (HB). Both conditions were compared to an eight-session office-based PTSD family education (OB-PFE; Sautter et al., 2014). PFE has been used as an active comparator in past PTSD couple's trials (Sautter et al., 2014) and involves providing psychoeducation and does not include skills training or other therapeutic interventions (Sautter et al., 2014). PFE was selected as an active comparator because it has the same conjoint

[1] The resulting manual is available from the first author.

frame and effectively reduces PTSD symptoms and improves relationship functioning for couples (Sautter et al., 2014).

We hypothesized that both OB-bCBCT and HB-bCBCT would be superior to OB-PFE in efficacy for PTSD symptoms, functional impairment, and relationship satisfaction. Although this study was not designed as a noninferiority trial, consistent with prior studies on individual telehealth treatment with PTSD where no differences were found on modality of care (Acierno et al., 2016, 2017; Morland, Mackintosh, et al., 2020), we did not predict any differences between HB and OB modalities on any outcome. We also compared process outcomes (i.e., therapeutic alliance, treatment satisfaction, and dropout rates) between the three treatment arms. We hypothesized that patient satisfaction rates and working alliance would be higher in the bCBCT arms compared to the OB-PFE comparator, and that dropout rates would be lower in HB-bCBCT compared to the office-based treatment conditions given its greater accessibility.

Method

The study protocol was approved by the Institutional Review Board of the University of California, San Diego, and this study's design and hypotheses were preregistered; see Trial Registration: NCT02720016. The study methods have been published (Morland et al., 2019).

Participants

Participating couples (N = 137 dyads) at a U.S. Department of Veterans' Affairs (VA)-based clinical site were randomly assigned to one of three treatment arms (OB-bCBCT, HB-bCBCT, or OB-PFE) and were assessed at five time points: pretreatment, midtreatment, posttreatment, 3 months posttreatment, and 6 months posttreatment (see Figure 1). To be included, couples had to include a veteran (age 18 or older) with a current PTSD diagnosis according to the *Diagnostic and Statistical Manual of Mental Disorders*, fifth edition (DSM-5; American Psychiatric Association, 2013) as assessed by the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5; Weathers et al., 2018). Their intimate partner (age 18 or older, any gender and any sexual orientation) had to be willing to participate in the intervention. If on psychiatric medication, the veteran had to be on a stable regimen for at least 2 months. Each member of the couple had to be willing to: (a) be randomized to any condition, (b) have assessment and treatment sessions audio-recorded, and (c) not receive other individual or group psychotherapy for PTSD or conjoint psychotherapy during the treatment portion of the study per self-report and baseline chart review. Exclusion criteria in either member of the couple included: (a) current substance use disorder (past 3 months) as evidenced by a score of 20 or more, indicating high-risk dependence, on the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993) and/or a score of three or more, indicating moderate degree of problems related to drug abuse, on the Drug Abuse Screening Test (DAST; Skinner, 1982); (b) current uncontrolled psychotic symptoms as measured by the prime screen-revised (PS-R; Kobayashi et al., 2008); (c) imminent suicidality or homicidality; (d) any severe cognitive impairment; (e) probable PTSD in the intimate partner (i.e., ≥33 on the PTSD Checklist-5); or (f) any severe physical or sexual relationship aggression in the past year. Past relationship aggression was assessed by the revised Conflict Tactics Scale (CTS-2-S; Straus & Douglas, 2004) and two items assessing current and past fear of and/or intimidation by their partner. Participants who did not meet study criteria were offered referrals to alternative services.

Procedure

Couples were recruited from the San Diego VA Medical Center from November 2015 to September 2020. Following informed consent, couples completed an assessment battery to determine eligibility. Eligible couples were then randomly assigned to one of three treatment arms by an independent, off-site statistician. Of the 137 couples in the intent-to-treat (ITT) sample, 97 (70.8%) attended at least seven of the eight treatment sessions and were considered to have completed a meaningful dose of treatment. Study therapists included masters or doctoral-level clinicians trained as psychologists or marriage and family therapists. All therapists saw couples from all three study conditions.

Of note, five couples randomized to office-based conditions participated in treatment during the COVID-19 pandemic shutdown beginning in March 2020, which necessitated home-based telehealth treatment despite being randomized to an office-based condition. Three couples randomized to OB-PFE completed one, five, and six of their treatment sessions remotely, and two couples randomized to OB-bCBCT received two and eight sessions remotely; all of these couples completed all treatment sessions.

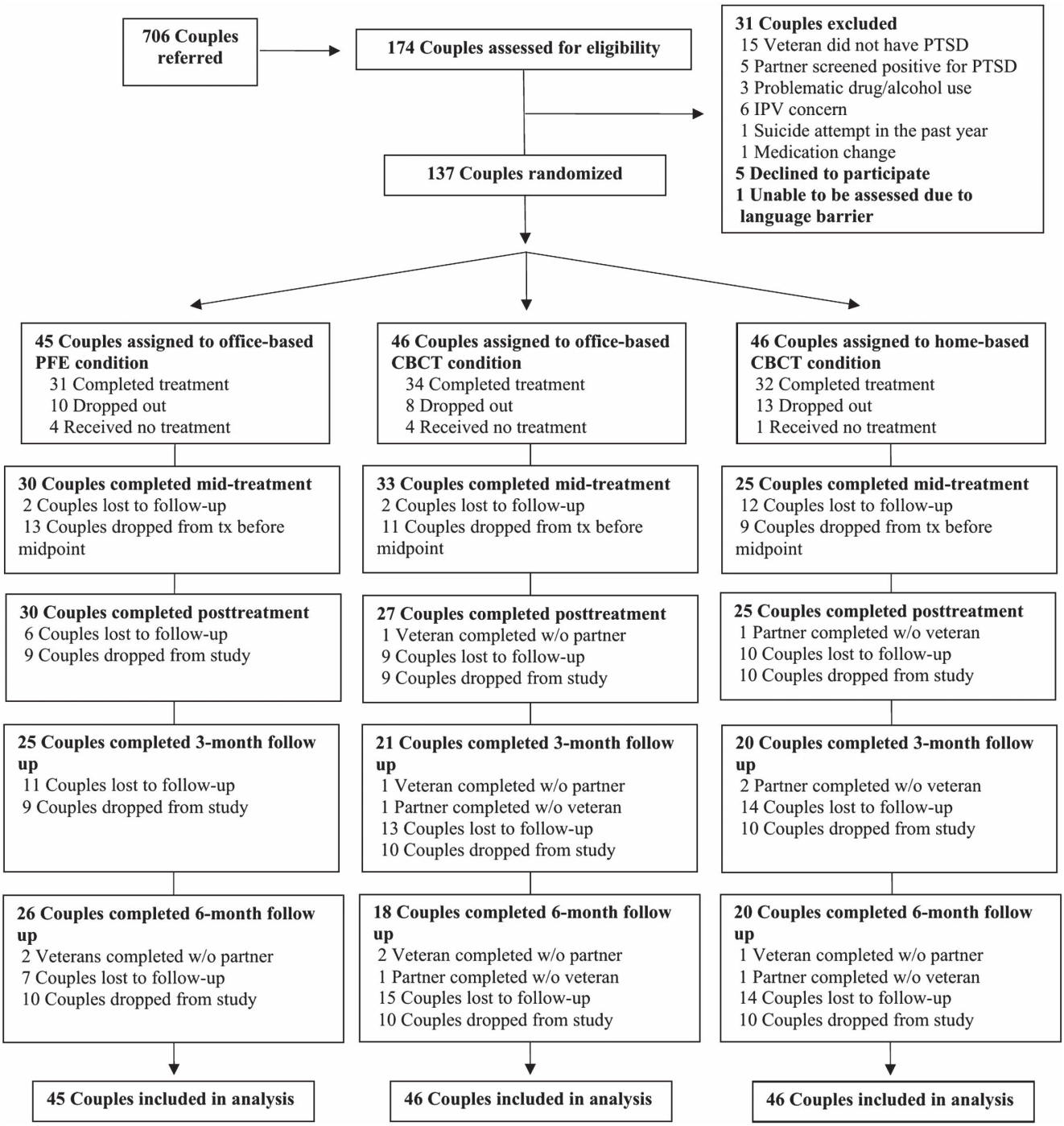
Brief CBCT (Office-Based and Home-Based)

The original CBCT manualized protocol consists of 15, 75-min sessions organized into three phases that build upon one another and include both in- and out-of-session exercises to increase skill acquisition (Monson & Fredman, 2012). The current brief version of CBCT includes Phases 1 and 2 (Sessions 1–7) from the original 15 session manual and a new eighth session focused on the final session of the original protocol. Phase 1 (Sessions 1–2) offers psychoeducation regarding PTSD and relationships, including strategies to identify early warning signs of anger and implementation of conflict management strategies. Phase 2 (Sessions 3–7) builds on the foundation of education and safety and provides couples with communication skills that aid in increasing emotional intimacy and relational satisfaction. Phase 2 also includes a dyadic cognitive challenging strategy targeting trauma-related thoughts. Finally, this phase targets PTSD-related avoidance behaviors by assigning "approach activities" for the couple to complete together. The dyadic communication skills facilitate PTSD-related discussions during and after approach activities, reduce emotional numbing by encouraging expression of thoughts and feelings, and enhance the couple's ability to problem-solve how they will decrease the role of PTSD in their relationship. The final session involves review of gains, consolidation of skills, and an opportunity to plan for future challenges. A structured training procedure and adherence/competence rating form was developed based on the updated eight-session protocol.

OB-PFE (Office-Based)

PFE is a manualized PTSD-focused psychoeducation intervention for couples consisting of eight, 75-min sessions adapted from the support and family education (SAFE) program (Sherman, 2003) and the behavioral family therapy (BFT) program (Mueser & Glynn, 1995; Sautter et al., 2015). Similar to other VA program involving

Figure 1
Participant Flow



Note. PTSD = posttraumatic stress disorder; PFE = PTSD family education condition; CBCT = cognitive-behavioral conjoint therapy; IPV = Intimate Partner Violence.

family members (Fischer et al., 2013), PFE involves educating family members about PTSD and other comorbid conditions using didactics, discussion, and written materials. Topics of discussion included psychoeducation about the symptoms of PTSD, risk and resiliency factors, co-occurring disorders (e.g., depression substance use), PTSD's effect on health and relationships, complex PTSD, stigma, and PTSD treatments. Couples assigned to PFE were encouraged to read and discuss the educational material between sessions. Skills training is not included in PFE; clinicians providing PFE in this study were specifically trained to avoid skills training

and other therapeutic interventions beyond psychoeducation. A structured training protocol and a rating form were developed to assess PFE fidelity and competence (Sautter et al., 2014).

Treatment Delivery

OB-bCBCT and OB-PFE were delivered in a traditional office-based setting at the VA. HB-bCBCT was delivered by a therapist located in a VA office, with the couple connecting via their personal computer or tablet from a private and quiet location of choice (e.g., their home). Couples with computers that were not video-capable or in a public area were provided with an internet-connected tablet.

In all three conditions, participants received a complete set of therapy-related materials during the initial baseline assessment. Participants completed weekly session assessments to track changes in PTSD symptoms and relationship satisfaction and to assess safety prior to meeting with their therapist. In the office-based conditions, participants completed paper-and-pencil versions of the weekly measures, whereas home-based participants self-reported answers verbally to study staff via a phone call. All treatment sessions were audio-recorded for fidelity assessments and clinical supervision. In the event of a therapeutic crisis between sessions (e.g., safety concern, infidelity, potential breakup, or other unforeseen event), the therapist and couple could collaboratively decide to complete an As Soon As Possible ("ASAP") session to focus on managing the emergent situation (limited to no more than two ASAP sessions during the 8-session intervention). Approximately 23 couples had an ASAP session. Of these 23 couples, 21 had 1 ASAP session and 2 couples had 2 ASAP sessions. These sessions did not replace a manualized session and were not evaluated for fidelity.

Treatment and Assessment Fidelity and Reliability Monitoring

Ongoing close supervision and weekly consultation with treatment experts were provided to maximize therapist fidelity to treatment protocols. Treatment therapists in this study included one masters- and six doctoral-level female clinicians trained to fidelity in both bCBCT and PFE. To evaluate fidelity, 20% of available participant ID sessions were randomly selected for review by CBCT and PFE experts. In addition, 10% of the recordings selected for treatment fidelity monitoring were randomly selected for double rating to determine interrater reliability (intraclass correlations) for treatment fidelity. Therapists were adherent to the treatment manuals across all three treatment conditions, as measured by the average number of required elements delivered during each session randomly selected for review (HB-bCBCT = 94%; OB-bCBCT = 93%; OB-PFE = 93%). Interrater reliability between the first and second treatment fidelity raters was excellent (intra-class correlation = .96).

Assessment reliability was also measured for PTSD diagnostic assessments on the CAPS-5 (Weathers et al., 2018). Experts in the diagnosis and assessment of PTSD using the CAPS-5 served as study assessors and reliability raters. CAPS assessors included master-level assessors trained and supervised by a doctoral-level clinician. Fifteen percent of participants were randomly selected for assessment reliability. The fidelity raters listened to CAPS recordings from all assessment time points for each participant selected for review. Interrater reliability between the initial study assessors and the expert assessors for CAPS rating was excellent (ICC = .94).

Measures

The CAPS-5 (Weathers et al., 2018) is a diagnostic interview used to assess PTSD and was administered at baseline, post, and three and six months posttreatment (not at midtreatment). Trained assessors evaluate the severity of four PTSD-related symptom clusters: reexperiencing, avoidance, negative alterations in cognition and mood, and alterations in arousal and reactivity. The interview includes 20 items about PTSD symptoms that the assessor rates on a 5-point Likert scale, 0 = *absent* and 4 = *extreme/incapacitating*. Total PTSD severity scores are determined by summing scores on all 20 items and can range from 0 to 80, with higher scores indicating greater severity. Based on both a sample-specific reliable change criterion calculated to be 11.88 (Jacobson and Truax, 1991) and recent guidance from Marx et al. (2022), "treatment responder" status was defined as a decrease of 12 or more points on the CAPS-5 severity score. "Loss of diagnosis" was then defined as both being a treatment responder plus no longer meeting diagnostic criteria for PTSD based on the CAPS-5, and "remission" was defined as loss of diagnosis plus a posttreatment CAPS-5 severity score less than 12 points (Schnurr et al., 2022). The CAPS-5 has good reliability and validity (Weathers et al., 2018), and had adequate internal consistency in this sample ($\alpha = .79$).

The Brief Inventory of Psychosocial Functioning (B-IPF; Marx et al., 2020) measures functioning impairment across seven domains of intimate relationships, family and parenting, friendships, work, socializing, education, and self-care over the past 30 days. This seven-item scale is reliable and validated for use in veteran populations (Marx et al., 2020). Total scores, ranging from 0 to 100, are calculated as the sum score divided by the total possible score multiplied by 100, with higher scores indicating greater impairment in functioning. In this sample, internal consistency was adequate ($\alpha = .75$).

The Couples Satisfaction Index (CSI; Funk & Rogge, 2007) is a 32-item self-report scale that evaluates relationship satisfaction. The first item assesses the general amount of happiness in an intimate relationship on a 7-point scale from 0 (*extremely unhappy*) to 6 (*perfect*), and all other items on the CSI use a 6-point scale from 0 to 5 with varying response options. Total scores, ranging from 0 to 161, are calculated by summing all items, with higher scores indicating greater relationship satisfaction. Scores below 104.5 indicate a clinical level of relationship distress. Internal consistencies in this sample were $\alpha = .98$ for veterans and $\alpha = .97$ for partners.

The relationship between the client and the therapist was evaluated using the Working Alliance Inventory—Short Form (WAI-S; Horvath & Greenberg, 1989). This 12-item self-report scale was completed by both clients and treatment providers at Session 8. Items are rated on a 7-point Likert scale, 1 = *never* and 7 = *always*. The WAI-S has high validity and reliability. Internal consistencies in this sample were $\alpha = .84$ for veterans and $\alpha = .80$ for partners.

The Client Satisfaction Questionnaire (CSQ-8; Larsen et al., 1979) assessed patient satisfaction with treatment. This eight-item self-report questionnaire measures general satisfaction with care. Items are rated on 4-point scales that vary for each question. Example questions include "To what extent has our service met your needs?" and "In an overall sense, how satisfied are you with the service you have received?" A ninth item asks for any open-ended feedback that participants may have about treatment. Total scores are calculated by averaging answers for the first eight items, with higher scores indicating greater satisfaction with the program. Internal consistencies in this sample were $\alpha = .92$ for veterans and $\alpha = .87$ for partners.

Data Analysis

Preliminary data analysis included testing for baseline differences in outcome and demographic variables between the three treatment arms using linear models. Rates of participants missing data on one or more of the four outcome variables were 4% at baseline and 58% at the 6-month follow-up, with no significant differences in rates of missingness at the 6-month follow-up across arms, OB-bCBCT = 65%, HB-bCBCT = 57%, PFE = 51%; $\chi^2(2, N=137) = 1.89$, $p = .388$. All analyses include the full eligible intent-to-treat sample ($N = 137$ couples). To address missing data, multiple imputation (MI) was completed using fully Bayesian model-based imputation procedures in Blimp 2.0 software (Enders et al., 2018, 2020; Keller & Enders, 2019). Auxiliary variables predicting missingness and outcome variable values were included in the imputation model, and veteran and partner data were included in the same imputation model to account for interdependence within couples. We used a large number of imputed datasets (50) to stabilize the imputed values in the analysis stage, which is important for estimating treatment differences with longitudinal data (Lu, 2017). All analyses were pooled across the 50 imputed datasets using the *mitml* package in R (Grund et al., 2021) and built-in imputation pooling functions in SPSS 27 (IBM Corp., 2020).

Consistent with the preregistered analyses for the clinical trial, three sets of models were conducted: OB-bCBCT compared to OB-PFE, HB-bCBCT compared to OB-PFE, and OB-bCBCT compared to HB-bCBCT. We used piecewise (also known as spline) mixed-effects regression models estimated in the R package *lme4* (Bates et al., 2015; R Core Team, 2020), with one slope estimated from baseline to posttreatment, representing change during the treatment period, and a separate slope estimated from posttreatment to 6 months, representing maintenance of gains during the follow-up period. Models included two variables coding time (one during treatment and one during follow-up, centered at posttreatment), a variable coding treatment condition, and interactions between time and treatment condition, along with random intercepts. The interactions between time and treatment conditions (i.e., differences in slopes) were the main parameters of interest to test our hypotheses. We tested quadratic effects of time for all slopes (except CAPS-5 during the treatment period, for which we only had two data points), but none were statistically significant, so they were not retained in final models. Models for PTSD symptoms and functional impairment included data from the veteran patient only. Models for couples' satisfaction included both partners nested within couples to account for interdependence between partners, and also included variables coding study role (i.e., identified veteran patient or intimate partner) and interactions between role and all other effects. Between-group effect sizes were calculated based on regression coefficients for the treatment period slope, $d_b = (b \times \text{Time})/\text{pooled } SD$. Within-group effect sizes (d_w) were calculated as standardized mean differences using pooled *SD*s from baseline to posttreatment and from baseline to 6 months, adjusting for the within-person correlations between time points. Following tests of main hypotheses, we conducted two sensitivity tests exploring the impact of controlling for (a) baseline covariates and (b) assessments or treatment sessions potentially impacted by the COVID-19 pandemic. Finally, process variables (i.e., working alliance and client satisfaction) were examined using single-level regression models comparing the relevant treatment arms. The datasets analyzed during the present study are not publicly available. Study data and materials are available from the principal investigator on reasonable request.

Results

Baseline Comparisons

At the time of study enrollment, 25% of the veteran participants reported to being in nontrauma focused individual therapy and 45% reported to taking psychotropic medication. Less than 5% of the veterans reported to being in group therapy or substance abuse treatment. Table 1 shows sample demographic characteristics and baseline study variables, with differences between treatment arms noted. Despite randomization, average relationship length was shorter for the OB-bCBCT condition than the HB-bCBCT condition, $t(90) = 2.281$, $p = .025$, and the OB-PFE condition, $t(88) = -2.655$, $p = .009$. Baseline levels of partner-reported relationship satisfaction were also lower for HB-bCBCT than for OB-PFE, $t(88) = -2.234$, $p = .028$, although partner relationship satisfaction in the OB-bCBCT condition was not significantly different from either other condition ($t < 1.05$, $p > .29$). Notably, average partner relationship satisfaction for the OB-PFE and OB-bCBCT conditions were in in the satisfied range, while the HB-bCBCT condition was in

Table 1
Sample Demographics, Baseline Outcomes, and Process Variables by Treatment Arm

Demographic or Study variable	OB-bCBCT	HB-bCBCT	PFE
N couples	46	46	45
Demographics			
% married	68.5%	77.2%	80.0%
Relationship length (years)	9.0 (7.0)[a]	13.6 (11.8)[b]	15.3 (14.4)[b]
Age (years)	39.3 (12.5)	42.4 (12.4)	43.9 (15.2)
Veteran gender (% male)	73.9%	87.0%	82.2%
% Same-gender couples	8.6%	8.6%	4.4%
% Hispanic/Latinx	36.3%	34.1%	33.3%
% African American/ Black	26.2%	14.9%	14.3%
% White	53.6%	57.5%	63.1%
Outcome variables at baseline			
CAPS-5	37.2 (9.95)	38.5 (9.35)	36.9 (9.14)
B-IPF	41.6 (21.8)	42.0 (21.5)	39.8 (19.3)
CSI—Veterans	102.9 (38.7)	106.3 (33.4)	110.9 (29.7)
CSI—Partners	106.8 (33.2)	99.7 (29.4)[a]	112.8 (30.7)[b]
Process variables			
WAI—Veterans	73.02 (15.20)	72.45 (14.00)	74.4 (15.36)
WAI—Partners	74.74 (10.65)	71.75 (11.03)	76.93 (9.84)
CSQ—Veterans	3.41 (1.13)	3.50 (1.11)	3.27 (1.21)
CSQ—Partners	3.44 (0.78)	3.28 (0.90)	3.57 (0.78)

Note. Values in cells are percentages or means with standard deviations in parentheses. Different superscripts within a row indicate different means at $p < .10$; CBCT = cognitive-behavioral conjoint therapy; OB-bCBCT = office-based brief CBCT condition; HB-bCBCT = home-based brief CBCT condition; PTSD = posttraumatic stress disorder; PFE = PTSD family education condition; DSM-5 = *Diagnostic and Statistical Manual of Mental Disorders*, fifth edition; CAPS-5 = Clinician-Administered PTSD Scale for DSM-5; B-IPF = Brief Interpersonal Functioning scale; CSI = Couples Satisfaction Index; WAI = Working Alliance Inventory; CSQ = Client Satisfaction Questionnaire.

the clinically distressed range; 38% of partners' relationship satisfaction scores were in the clinically distressed range in the OB-PFE condition, compared to 50% in OB-bCBCT and 52% in HB-bCBCT. No other significant baseline differences were found (all $p > .10$).

PTSD Symptoms

Table 2 shows results from mixed-effects models for PTSD symptoms and functional impairment, and Figure 2 depicts imputed means over time for all outcome variables. PTSD symptoms significantly decreased during the treatment period for all participants. Within-group effect sizes were large from baseline to posttreatment for HB-bCBCT, $d_w = 1.05$, 95% CI [0.61, 1.49], corresponding to an average decrease of 11.4 points on the CAPS-5, and OB-bCBCT conditions, $d_w = 1.12$ [0.68, 1.56], 13.1-point average decrease, as well as from baseline to 6-month follow-up, $d_w = 1.09$ [0.65, 1.53] and 1.08 [0.64, 1.52], respectively. Effect sizes for PFE were in the medium range, $d_w = 0.48$ [0.06, 0.90] by posttreatment, corresponding to a 5.2-point average decrease on CAPS-5, and 0.72 [0.29, 1.15] by 6-month follow-up. Compared to the OB-PFE control group, PTSD symptoms declined significantly more for veterans in the OB-bCBCT, $d_b = 0.59$ [0.17, 1.01], and HB-bCBCT, $d_b = 0.76$ [0.33, 1.19], treatment arms, supporting our hypothesis. There were no significant differences between the OB-bCBCT and HB-bCBCT groups. There were no significant changes in PTSD symptoms during the follow-up period for any of the three treatment arms, and there were no differences between treatment arms in degree of maintenance of treatment gains.

Figure 3 depicts proportions of treatment responders, loss of diagnosis, and remission for the three arms by posttreatment. Compared to OB-PFE, both bCBCT groups showed more than double the proportions of treatment response (44%–61% vs. 13%, zs > 3.18, $p < .001$) and loss of diagnosis (24%–26% vs. 9%; zs > 1.93, ps $< .027$). The CBCT groups also showed higher rates of remission, though not statistically significantly different due to low remission rates overall (OB-bCBCT 5% and HB-bCBCT 6% vs. PFE 2%; $z = 0.57$, $p = .28$ and $z = 1.00$, $p = .16$, respectively).

Functional Impairment

Veterans' functional disability significantly improved for all treatment groups during the treatment period, with an average improvement of 15.6 points on the IPF, and showed no significant change during the follow-up period (see Table 2 and Figure 2). There were no differences in slopes of IPF scores between any treatment arms during treatment or follow-up, counter to our first hypothesis. Within-group effect sizes were medium to large: for OB-bCBCT, $d_w = 0.65$ [0.23, 1.07] from baseline to posttreatment and 0.64 [0.22, 1.06] to 6 months; for HB-bCBCT, $d_w = 0.70$ [0.28, 1.12] and 0.53 [0.11, 0.95], respectively; and for OB-PFE, $d_w = 0.65$ [0.23, 1.07] and 0.47 [0.05, 0.89], respectively.

Couple Satisfaction

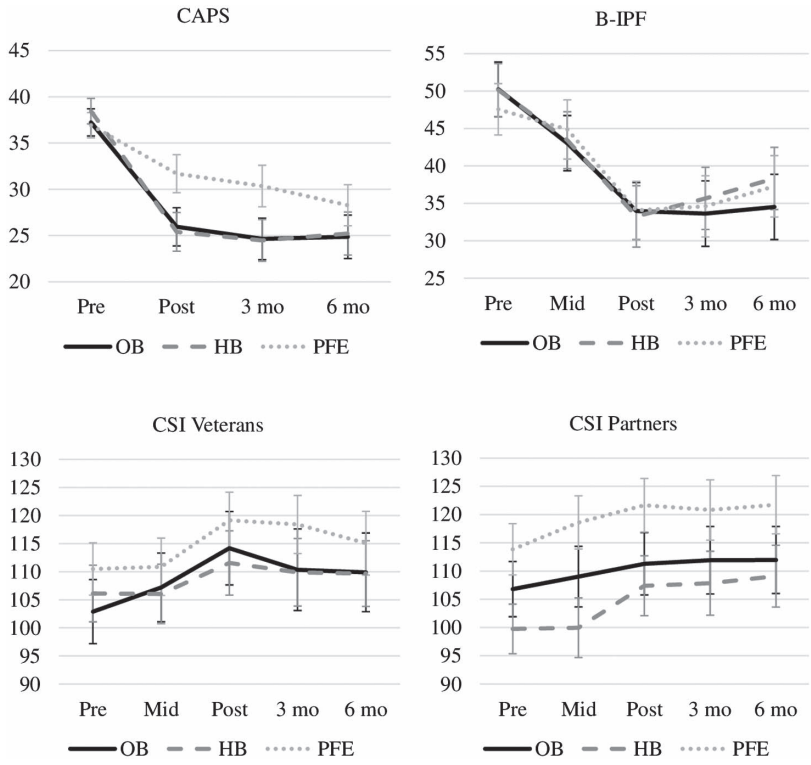
As shown in Table 3 and Figure 2, participants' ratings of relationship satisfaction significantly increased for all groups during treatment, with an average gain of 7.6 points on the CSI; there were no significant changes during follow-up for any condition.

Table 2
Results From Mixed-Effects Models for PTSD and Functioning Outcomes

	CAPS-5			B-IPF		
Parameter	*b*	*SE*	*p*	*B*	*SE*	*p*
OB-bCBCT vs. PFE						
Intercept (grand mean)	28.725	1.399	<.001	34.479	2.745	<.001
Treatment slope	−4.181	0.638	<.001	−7.666	1.325	<.001
Follow-up slope	−0.373	0.251	.144	0.163	0.474	.732
Condition at post	−6.127	2.840	.034	−0.850	5.245	.872
Condition on treatment slope	−3.216	1.300	.016	−1.213	2.518	.631
Condition on follow-up slope	0.398	0.521	.458	−0.262	0.888	.768
HB-bCBCT vs. PFE						
Intercept (grand mean)	28.436	1.462	<.001	34.306	2.800	<.001
Treatment slope	−4.633	0.681	<.001	−7.792	1.380	<.001
Follow-up slope	−0.296	0.251	.243	0.523	0.483	.284
Condition at post	−6.698	2.825	.020	−1.192	5.276	.822
Condition on treatment slope	−4.110	1.308	.002	−1.461	2.495	.560
Condition on follow-up slope	0.540	0.522	.305	0.450	0.881	.611
OB-bCBCT vs. HB-bCBCT						
Intercept (grand mean)	25.410	1.495	<.001	33.888	2.773	<.001
Treatment slope	−6.219	0.715	<.001	−8.390	1.365	<.001
Follow-up slope	−0.105	0.285	.716	0.389	0.477	.418
Condition at post	−0.571	2.736	.835	−0.342	5.231	.948
Condition on treatment slope	−0.894	1.296	.492	−0.248	2.536	.922
Condition on follow-up slope	0.151	0.555	.787	0.712	0.890	.426

Note. Condition denotes differences between the two treatment conditions, either at posttreatment or on the treatment period or follow-up period slopes. PTSD = posttraumatic stress disorder; DSM-5 = *Diagnostic and Statistical Manual of Mental Disorders*, fifth edition; CAPS-5 = Clinician-Administered PTSD Scale for DSM-5; B-IPF = Brief Interpersonal Functioning scale; CBCT = cognitive-behavioral conjoint therapy; OB-bCBCT = office-based brief CBCT condition; HB-bCBCT = home-based brief CBCT condition; PFE = PTSD family education condition.

Figure 2
Imputed Means Over Time for Main Outcomes



Note. PTSD = posttraumatic stress disorder; DSM-5 = *Diagnostic and Statistical Manual of Mental Disorders*, fifth edition; CAPS = Clinician-Administered PTSD Scale for DSM-5; B-IPF = Brief Interpersonal Functioning scale; CSI = Couples Satisfaction Index; CBCT = cognitive-behavioral conjoint therapy; OB = office-based brief CBCT condition; HB = home-based brief CBCT condition; PFE = PTSD family education condition. Data points are means and bars are standard errors of the mean, pooled across 50 imputed datasets.

Within-group effect sizes were small: for OB-bCBCT, $d_w = 0.38$ [−0.03, 0.79] from baseline to posttreatment and 0.23 [−0.18, 0.64] to 6 months; for HB-bCBCT, $d_w = 0.19$ [−0.22, 0.60] and 0.12 [−0.28, 0.53], respectively; and for OB-PFE, $d_w = 0.38$ [−0.03, 0.80] and 0.18 [−0.23, 0.59], respectively. There were no significant differences between any of the three treatment arms on slopes during treatment or follow-up, counter to our first hypothesis. Finally, none of the interactions with role were significant, suggesting that change in couple satisfaction was not statistically different for veterans and their intimate partners.

Sensitivity Analyses

Following these tests of the main hypotheses, two sensitivity analyses were conducted. First, we controlled for the two variables that were different between the treatment arms at baseline: relationship length and partner relationship satisfaction. Including these variables did not change the results. Second, we examined the impact of COVID-19 on the study in two ways: we first controlled for a variable coding assessment dates falling during the COVID-19 lockdown period, and subsequently we removed the five couples who received off-protocol telehealth treatment. Neither of these analyses changed the results.[2]

Treatment and Process Variables

Overall, 70.8% of enrolled couples completed a full treatment dose (seven out of eight sessions). There were no significant differences between treatment completers and noncompleters in terms of demographic characteristics or baseline outcome scores. There were also no significant differences in treatment completion rates between OB-bCBCT (74%), HB-bCBCT (70%), and OB-PFE (69%) conditions ($t < .65$, $p > .4$). Table 1 shows working alliance and client satisfaction scores for veterans and partners. There were no significant differences between treatment arms in the process variables for veterans ($p > .2$). For partners, those in the OB-PFE condition reported significantly higher working alliance ($b = -5.18$, $p = .014$) and client satisfaction ($b = -0.29$, $p = .045$) compared to those in the HB-bCBCT condition; OB-bCBCT was not significantly different from either of the other arms ($p > .18$).

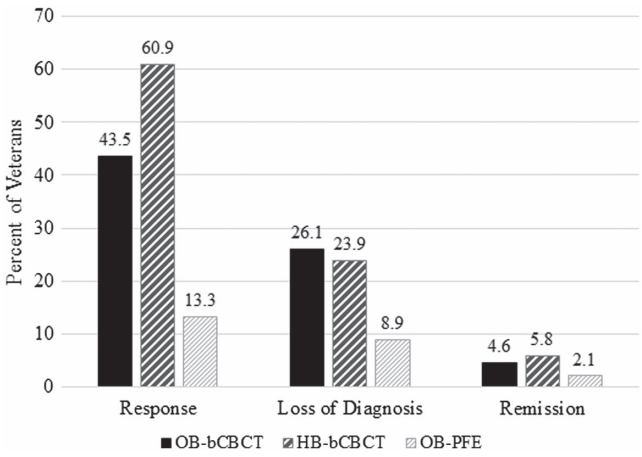
Discussion

This RCT examined the efficacy of an eight-session abbreviated version of CBCT delivered in-office (OB) or through a home-based

[2] Full results from sensitivity analyses are available from the first author.

Figure 3

Rates of PTSD Symptom Response, Loss of Diagnosis, and Remission at Post



Note. PTSD = posttraumatic stress disorder; CBCT = cognitive-behavioral conjoint therapy; OB-bCBCT = office-based brief CBCT condition; HB-bCBCT = home-based brief CBCT condition; OB-PFE = PTSD family education condition.

(HB) telehealth modality, compared against an office-based, psychoeducation-focused active comparison condition (OB-PFE). This is the first study to systematically examine any couple therapy delivered virtually compared to in-person. It is also the largest published effectiveness study on couple therapy for PTSD, and the only study to evaluate a couple-based PTSD intervention delivered using a telehealth modality. This study includes a briefer, more scalable version of CBCT and a brief PFE protocol. The trial also includes a diverse sample, including both male and female veterans and same-gender couples, and features assessment of functioning as one of the primary outcomes.

Our findings indicate bCBCT delivered in either office-based or home-based telehealth formats is more effective in treating PTSD than PFE, and that gains from bCBCT are large in size and maintained through 6-month follow-up. Compared to PFE, more than twice as many participants in bCBCT had at least a 12-point CAPS treatment response, no longer met PTSD diagnostic criteria, and were considered in remission by posttreatment. These improvements are comparable to other evidence-based, individual PTSD treatments with veteran samples where treatment pre–post effect sizes were .99 and .71 for PE and CPT, respectively (Schnurr et al., 2022). Importantly, both bCBCT and PFE produced improvements in functional impairment and relationship satisfaction, though counter to our hypotheses, bCBCT was not statistically superior to PFE on these outcomes. Completion rates in the present study (70%) were on par with prior smaller trials of the 15-session CBCT protocol (Liebman et al., 2020) but much higher than a recently published CBCT study in a VA PTSD clinic where completion rates where 52% (Pukay-Martin et al., 2021) and individual PTSD treatment in the VA where completion rates were reported in a recent large trial to be approximately 44% for PE and 53% for CPT (Schnurr et al., 2022). Unexpectedly, both completion and treatment process metrics were similar across the three treatment arms, with the exception of partners' treatment satisfaction and working alliance, which were significantly higher in OB-PFE than in HB-bCBCT. Because the significant difference in treatment satisfaction and alliance variables applied to only this single comparison between conditions, it is unclear whether the difference is attributable to the intervention, the modality, both, or something else altogether (e.g., baseline differences, simple chance).

Our findings support the efficacy of an abbreviated version of CBCT (bCBCT) for improving PTSD symptoms. The bCBCT protocol did not include an explicit discussion of historical, trauma-specific appraisals, but instead focused primarily on psychoeducation about PTSD and relationship functioning, instruction in behavioral conflict management and communication skills, and dyadic cognitive interventions that focused on present and future maladaptive PTSD- and relationship-related beliefs. A key component of bCBCT is also the assignment of couple-level in vivo approach homework that serves to reduce PTSD-related avoidance and partner symptom accommodation and increase relationship

Table 3

Results From Mixed-Effects Models for Couples Satisfaction Index (CSI)

Parameter	OB-bCBCT vs. PFE			HB-bCBCT vs. PFE			OB-bCBCT vs. HB-bCBCT		
	b	*SE*	*p*	*B*	*SE*	*P*	*b*	*SE*	*p*
Intercept (grand mean)	116.145	3.273	<.001	114.152	3.047	<.001	110.377	3.463	<.001
Treatment slope	4.021	1.074	<.001	3.728	1.081	.001	3.557	1.200	.004
Follow-up slope	−0.257	0.389	.510	−0.038	0.380	.920	−0.055	0.428	.899
Condition at post	−7.679	6.605	.246	−11.621	6.241	.064	−3.942	6.704	.557
Condition on treatment	−0.352	2.172	.872	−0.931	2.296	.686	−0.579	2.256	.798
Condition on follow-up	-0.028	0.743	.970	0.405	0.771	.601	0.433	0.809	.594
Role at post	0.613	3.981	.878	−0.572	3.720	.878	−3.132	4.324	.470
Role on treatment	−2.035	1.952	.299	0.129	1.913	.946	−0.964	2.106	.648
Role on follow-up	0.588	0.678	.387	0.525	0.671	.435	0.709	0.723	.328
Role × Condition at post	−5.204	7.724	.501	−7.547	7.543	.318	−2.343	8.078	.772
Role × Condition on treatment slope	−2.162	3.689	.558	2.119	3.794	.577	4.282	3.895	.273
Role × Condition on follow-up slope	0.371	1.265	.769	0.247	1.271	.846	−0.125	1.344	.926

Note. Role distinguishes identified veteran patient (0) or their intimate partner (1), grand-mean centered. Condition denotes differences between the two treatment conditions, either at posttreatment or on the treatment period or follow-up period slopes. CBCT = cognitive-behavioral conjoint therapy; OB-bCBCT = office-based brief CBCT condition; HB-bCBCT = home-based brief CBCT condition; PTSD = posttraumatic stress disorder; PFE = PTSD family education condition.

engagement and satisfaction (e.g., going on a date in a public restaurant). These active, PTSD-focused skills may help explain bCBCT's superiority relative to the psychoeducation-focused OB-PFE intervention in terms of PTSD outcomes. The findings from the present study are similar to those reported in an uncontrolled pilot study of an abbreviated, intensive, multi-couple group version of CBCT for PTSD (AIM-CBCT for PTSD; Fredman et al., 2020). Fredman et al. (2020) delivered content similar to the bCBCT protocol during a weekend retreat and found a large within-group effect-size at 3-month follow-up ($d = 0.98$), similar in magnitude to the HB-bCBCT ($d = 1.09$) and OB-bCBCT ($d = 1.08$) within-group effect sizes at the 6-month follow-up here. Taken together, this new line of research suggests that the abbreviated protocol should be studied more rigorously across diverse populations and directly compared against the full 15-session version of CBCT. The bCBCT protocol used in the present study could be implemented more broadly, including in Department of Defense and VA systems of care where treatment retention can be a challenge.

This study also examined treatment-related changes in relationship satisfaction among couples. Relationship satisfaction improved for veterans and partners across all treatment conditions, though consistent with other CBCT trials (Liebman et al., 2020), the magnitudes of change were generally small ($d_w = 0.12$–0.38). In this vein, it is important to note that we did not specifically recruit couples with clinical levels of distress, and this change in relationship satisfaction represents enhancement in an otherwise relatively satisfied sample. More than half (55%) of the sample entered the study in the satisfied range based on the CSI, which may have attenuated this study's ability to detect more clinical change. The findings for OB-PFE were contrary to hypotheses regarding relationship satisfaction, insofar as OB-PFE performed better than anticipated. Dyadic PTSD psychoeducation may have provided couples a framework where both partners could see how PTSD symptoms impact relationships, allowing couples to better understand each other's experiences. In addition, partner willingness to engage in any intervention together may have fostered relationship satisfaction improvements. Further, because the IPF captures broad psychosocial functioning, this nonspecific improvement in relationship functioning may have, in turn, produced improvements in psychosocial functioning that were similar irrespective of the treatment condition.

A strength of this study is the use of an active comparison condition, PFE. Indeed, OB-PFE was an effective treatment for reducing symptoms, improving functioning, and enhancing relationship satisfaction. Although OB-PFE was less effective than bCBCT at reducing PTSD symptoms, it may nonetheless be an appropriate option for couples who prefer an educational rather than active therapeutic intervention. Research suggests that intimate partners' cognitive attributions about their partners' PTSD symptoms may play a key role in whether and how PTSD impacts relationship functioning (Renshaw et al., 2011, 2014), suggesting that educating intimate partners about PTSD may target an important treatment mechanism. Additionally, the clinician training demands to effectively deliver OB-PFE (an educational program) are lower than those required to competently deliver bCBCT (a therapeutic intervention), suggesting OB-PFE may be a good initial offering in settings where trained PTSD and/or couple therapists are less available.

Outcomes from this trial suggest couple-based treatments can be effective when delivered remotely, which can overcome numerous logistical barriers for couples (Doss et al., 2017). This study's findings on treatment delivery modality could have a major impact on the way couple-based services are delivered. Until this point, no research has systematically compared couple-based in-person and virtual care. This may be due to beliefs about potential challenges, such as less ability to redirect couples being seen virtually when working with more volatile couples, technical difficulties, difficulty reading body language, and less personal connection (Wrape & McGinn, 2019). However, we found no indication that OB-bCBCT was preferable or superior to HB-bCBCT, although it is important to note that this study was not powered to detect noninferiority and the lack of significant differences between office-based and home-based telehealth bCBCT does not necessarily indicate that HB-bCBCT is noninferior. One further caveat is that our sample had relatively high relationship satisfaction, and clinicians treating couples via telehealth may be particularly concerned about the presence of significant distress and conflict. Future research should address whether initial distress level moderates the effectiveness of remotely delivered care for couples. Additionally, in this sample, intimate partners of veteran patients did seem to prefer office-based PFE to home-based bCBCT, though given the lack of differences relative to office-based bCBCT, this difference is hard to interpret. It may be that some partners preferred either the psychoeducation focus and/or the in-person setting, though future study is needed to disentangle these explanations. Veterans, on the other hand, were equally satisfied with all treatment conditions. Given VA's position as an industry leader in video telehealth, it may be the case that veterans are more familiar with telehealth than their nonveteran partners and thus find it more acceptable.

There are several study limitations. First, study exclusion criteria (e.g., recent aggression) may have excluded couples with more severe pathology, although our exclusion criteria are similar to contraindications for couple therapies in clinical practice. Further, all measures except for the CAPS-5 were self-reported measures, introducing potential bias in reporting. And although this study demonstrated that bCBCT was effective both when delivered in-office and when provided over telehealth with similar effect sizes, this study was not powered as a noninferiority trial, and thus we cannot assume there are no differences in effectiveness of OB-bCBCT and HB-bCBCT simply because we failed to detect them. Future noninferiority trials are needed to test this assertion. Importantly, this research study provided administrative support for telehealth procedures, including providing internet-connected tablets to participants when necessary, providing technical support to couples prior to scheduled sessions, and providing regular reminders and outreach to discourage dropout. Although this level of support for telehealth care, including providing tablets to patients, is available in many VA clinical settings, these findings may not generalize to other care settings with less support for video telehealth. Finally, although participants were excluded if they were engaging in trauma focused or conjoint therapy at baseline and participants were asked to report any trauma-focused or couple therapy they initiated during the study, this was not systematically assessed or tracked at the follow-up, so we cannot rule out the possibility that some participants received other concurrent treatment during the assessment period.

Overall, this study demonstrated that bCBCT is an effective treatment for PTSD whether delivered in-person or via telehealth. It also supports PFE as a strategy for improving relationship satisfaction for couples struggling with PTSD. Future studies should examine predictors of treatment response to each of these interventions. This information can help clinicians to identify which couples (or individuals in couples) are most likely to benefit from these interventions, and who is likely to require additional or alternative treatments. To enhance the relational impacts of dyadic interventions, it may be beneficial to investigate supplemental treatments, including novel pharmacotherapies such as 3,4-methylenedioxymethamphetamine (MDMA; e.g., Monson et al., 2020) or oxytocin (e.g., Flanagan et al., 2019), which may enhance intimate bonding and strengthen the effects of treatment interventions. Finally, we recommend that future studies recruit a larger and more diverse sample of couples (e.g., nonveterans, varying levels of relationship distress) to determine the efficacy of these couple-focused interventions in other populations. Such research will help address PTSD and the relational issues so commonly experienced by those who suffer and their loved ones.

Data Transparency

Manuscripts have been previously published from the current baseline dataset, though none of the prior manuscripts have included any longitudinal or outcome data from this large clinical trial. The current manuscript is the first paper to include longitudinal treatment outcome data as the primary focus.

Manuscript (MS) 1 (accepted) focuses on baseline variables adverse childhood experiences (ACES), depression, and relationship satisfaction; MS 2 (published) focuses on baseline gender, PTSD, and relationship functioning variables; MS 3 (published) focuses on baseline suicide; MS 4 (published) focuses on baseline suicide, anger, and PTSD; MS 5 (published) focused on baseline suicide and sexual functioning data. MS 7 (soon to be revised and resubmitted) focuses on baseline variables of trauma history and relationship functioning and accommodation in couples with a lesbian, gay, or bisexual partner; MS 8 (under review) focuses on baseline PTSD and insomnia; MS 9 (under review) focuses on baseline attachment and relationship satisfaction; and MS 10 (under review) focused on baseline PTSD reporting discrepancies between intimate partners.

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