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Compassion-Based Therapy for Trauma-Related Shame and Posttraumatic Stress: Initial Evaluation Using a Multiple Baseline Design

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Accumulating research suggests that shame can strongly contribute to the development and maintenance of post-traumatic stress disorder (PTSD). Interventions that promote self-compassion have shown promise for reducing shame related to various clinical problems, but this approach has not been systematically evaluated for traumatized individuals. The aim of this study was to develop a brief compassion-based therapy and assess its efficacy for reducing trauma-related shame and PTSD symptoms. Using a multiple baseline experimental design, the intervention was evaluated in a community sample of trauma-exposed adults ($N = 10$) with elevated trauma-related shame and PTSD symptoms. Participants completed weekly assessments during a 2-, 4-, or 6-week baseline phase and a 6-week treatment phase, and at 2 and 4 weeks after the intervention. By the end of treatment, 9 of 10 participants demonstrated reliable decreases in PTSD symptom severity,

while 8 of 10 participants showed reliable reductions in shame. These improvements were maintained at 2- and 4-week follow-up. The intervention was also associated with improvements in self-compassion and self-blame. Participants reported high levels of satisfaction with the intervention. Results suggest that the intervention may be useful as either a stand-alone treatment or as a supplement to other treatments.

THERE IS GROWING RECOGNITION that shame can strongly contribute to the development and maintenance of PTSD, yet little is known about effective interventions for reducing shame in this context (Candea & Szentagotai, 2013; La Bash & Papa, 2014). Shame refers to the affective experience of feeling intrinsically defective, socially undesirable, and inadequate (Lewis, 1971). It is associated with global negative self-evaluations (i.e., "I am a bad person"), withdrawal, and poor health outcomes (Dickerson, Gruenewald, & Kemeny, 2004). After trauma, shame is commonplace; for instance, individuals who have experienced childhood physical abuse report higher levels of shame than nonabused individuals (Keene & Epps, 2016). Shame is especially prevalent among people with PTSD; in a study of 1,522 adults with histories of interpersonal trauma, 62% of those with assault-related PTSD reported experiencing trauma-related shame, and shame was a stronger predictor of PTSD than fear (Badour, Resnick, & Kilpatrick, 2015). Accordingly, the revised PTSD criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*; American Psychiatric Association [APA], 2013) no longer require "intense fear, helplessness, or horror" at the time of the traumatic event (Criterion A2 of *DSM-IV-TR*; APA, 2000) and now recognize common posttraumatic changes in cognitions and mood, including negative self-evaluation, distorted self-blame, and shame. Across a variety of populations and types of trauma, shame has been found to persist over time and to consistently predict greater PTSD symptom severity (reviewed in La Bash & Papa, 2014). For example, in a longitudinal study of sexually abused adolescents, higher abuse-related shame at the time of the abuse discovery was associated with persistent shame and increased PTSD symptoms 6 years later (Feiring & Taska, 2005).

For individuals with PTSD and elevated shame, treatments that focus on reducing shame may aid recovery. According to cognitive theory, PTSD develops from and is maintained by the perception of ongoing threat (Ehlers & Clark, 2000). While fear gives rise to perceived external threats (e.g., "the world is unsafe"), shame can fuel a sense of internal threat (e.g., seeing oneself as damaged, inadequate, incapable). Initially, shame may temporarily act as an adaptive response to interpersonal trauma, akin to submissive behavior in animals that preserves group membership and decreases the likelihood of continued aggression from others (Dickerson et al., 2004). However, trauma survivors frequently continue to attack themselves with self-criticism and blame themselves for the trauma long after the external threat has ceased (Lee, Scragg, & Turner, 2001). Lee et al. (2001) theorize that new, maladaptive shame schemas may then replace a previously positive self-identity, or alternatively, pretrauma shame schemas (e.g., "I'm weak") may be activated and exacerbated. The resultant shame may further maintain PTSD symptoms by motivating avoidant behaviors, such as isolating. PTSD that is maintained by fear and perceived external threat may be more responsive to exposure therapy, whereas PTSD maintained by shame may respond less well to such treatments and warrant an alternative approach (Lee et al., 2001). Neglecting to address shame may interfere with the efficacy of PTSD treatment (e.g., Pitman et al., 1991). Conversely, decreases in shame prospectively predict reductions in PTSD symptoms, suggesting that treatments that target shame may alleviate shame-based PTSD (Feiring & Taska, 2005; Øktedalen, Hoffart, & Langkaas, 2015).

Only a small handful of studies have evaluated the efficacy of interventions for reducing shame in any disorder (Gilbert & Procter, 2006; Luoma, Kohlenberg, Hayes, & Fletcher, 2012; Rizvi & Linehan, 2005). These studies have provided encouraging evidence that relatively brief interventions can reduce shame; for instance, in an addictions treatment program, a 6-hour mindfulness- and acceptance-based intervention produced small pre- to posttreatment reductions in shame (within-subjects Cohen's d = .26) that grew by the 4-month follow-up (within-subjects Cohen's d = .66; Luoma et al., 2012). However, there is no consensus on the most effective ways to directly target and reduce shame (Candea & Szentagotai, 2013).

One promising approach for alleviating shame in PTSD may be to build self-compassion. Compassion involves being mindfully aware of suffering, seeing the shared humanity of the person experiencing suffering, and responding with kindness, warmth, and goodwill *because* of their suffering (Neff, 2003). For individuals with PTSD and high

shame, cultivating self-compassion may address pervasive feelings of unworthiness and insufficiency, while countering the tendencies to withdraw and self-criticize. Rather than relying primarily on higher-level reason and logic to challenge distorted cognitions about oneself, self-compassion may activate the attachment and caregiving emotion-regulation system, creating a felt sense of safeness and caring (Gilbert & Procter, 2006). Among trauma-exposed individuals, greater self-compassion has been found to be associated with less avoidance and lower PTSD severity (Kearney et al., 2013; Thompson & Waltz, 2008). In prospective studies, self-compassion predicted PTSD severity up to 12 months later, after controlling for degree of trauma exposure and baseline PTSD severity (e.g., Hiraoka et al., 2015).

Various interventions have recently been developed to explicitly increase self-compassion. Collectively referred to here as compassion-based therapy, these interventions vary in terms of format, duration, and specific techniques. The two most prominent compassion-based interventions include Compassion Focused Therapy (CFT; Gilbert & Procter, 2006) and Mindful Self-Compassion (MSC; Neff & Germer, 2013). There is considerable overlap in the specific exercises used by CFT and MSC, which both include formal practices (e.g., guided loving-kindness meditation) and informal practices during daily life (e.g., compassionate self-talk). Both also include some basic mindfulness training, since present-centered, nonjudgmental awareness—especially of one's own suffering—is often considered a prerequisite for self-compassion (Neff & Germer, 2013). While MSC arose from a mindfulness tradition, CFT is rooted in evolutionary biology, neuroscience, and developmental and social psychology. MSC was developed as an 8-week, group-based, resource- and resilience-building intervention for both clinical and nonclinical populations. CFT was developed as an individual or group therapy for clinical populations with chronic, complex mental health difficulties related to high shame and self-criticism.

Recent studies suggest that compassion-based therapy is effective for increasing self-compassion. In an uncontrolled study with a small clinical sample, a 12-week CFT intervention led to increases in self-compassion, as well as reductions in shame (Gilbert & Procter, 2006). In a randomized controlled trial with a nonclinical sample, 8 weeks of MSC led to increased self-compassion ($d = 1.67$) and decreased depression, anxiety, and avoidance, compared to a waitlist control group (Neff & Germer, 2013). In addition, two studies have evaluated the efficacy of compassion-based therapies specifically for PTSD. In one study, participants (mostly civilian accident survivors) were randomized to receive either cognitive behavioral therapy (CBT) or CBT + CFT (Beaumont, Galpin, & Jenkins, 2012). Both therapies produced reductions in PTSD symptoms, and CBT + CFT produced larger increases in self-compassion. The relevance of trauma-related shame for study participants was unclear, since shame was not assessed and impersonal trauma (e.g., accidents) tends to be less strongly linked to shame than interpersonal trauma (e.g., sexual or physical assault; La Bash & Papa, 2014). In another recent study, all participants practiced 12 weeks of *loving-kindness meditation*, a single compassion-based therapy technique that aims to increase kindness and compassion for self and others (Kearney et al., 2013). This intervention was found to be safe and acceptable to participants and produced large increases in self-compassion (*within-subjects* $d = .80$ at posttreatment, $d = .92$ at 3-month follow-up) and decreases in PTSD symptom severity (*within-subjects* $d = -.75$ at post-treatment, $d = -.89$ at 3-month follow-up), with changes in self-compassion mediating changes in PTSD symptom severity. Although these findings are promising, since most of these studies did not include a no-treatment control group, it remains unknown whether symptoms may have improved with the passage of time. In addition, it remains unclear whether compassion-based therapy may reduce shame among individuals with PTSD, since no studies to date have evaluated the impact of compassion interventions on both trauma-related shame and PTSD.

In the present study, the primary aim was to develop a brief compassion-based therapy and evaluate its acceptability, tolerability, and efficacy for reducing shame and PTSD symptoms. The intervention was designed to increase self-compassion, integrating research on PTSD with theory and techniques from compassion-based therapies. Exercises from MSC and CFT—including a CFT protocol for PTSD (Lee & James, 2013)—were adapted into an individual, 6-session intervention. Multiple baseline, a type of single-case experimental design, was used as a time- and cost-effective method for evaluating efficacy while controlling for the passage of time and repeated assessments (Barlow, Nock, & Hersen, 2009). Participants completed weekly assessments throughout a baseline phase and treatment phase, and at 2- and 4-weeks post-intervention. It was hypothesized that PTSD and shame symptoms would remain stable or increase during the baseline phase, decrease only after the treatment was initiated, and remain low during follow-up. Increases in self-compassion were expected to occur during the treatment phase and to correlate with reductions in PTSD and shame. Since

shame is closely related to self-blame (Feiring, Taska, & Chen, 2002), self-blame was also assessed and expected to decrease during treatment.

Method

PARTICIPANTS

Participants consisted of 10 individuals with elevated trauma-related shame and PTSD symptoms. Inclusion criteria were: (a) a least 18 years of age; (b) exposure to a traumatic event, as defined by *DSM-5* PTSD Criterion A, at least 1 month prior to the screening; (c) elevated PTSD symptoms (PTSD Checklist [PCL-5] score $\geq$ 27, per Weathers [2013] and National Center for PTSD [2014]); (d) elevated shame related to the traumatic event and/or its sequelae (Internalized Shame Scale [ISS] past-month score > 40, per Cook [2001]; estimated ISS score before the trauma $\leq$ 40 and at least 10 points lower than past-month ISS); and (e) if taking psychotropic medications, stabilized dose for at least 8 weeks. Exclusion criteria were: (a) elevated current risk requiring a higher level of care, including current suicidal ideation and intent, psychosis, bipolar disorder, or current or recent (within 3 months) history of substance use disorder (not including caffeine, nicotine, or cannabis use disorder); or (b) concurrent psychotherapy for trauma-related problems. Participant characteristics are presented in Table 1.

STUDY DESIGN

To evaluate the efficacy of the intervention for reducing shame and PTSD symptoms, a randomized, nonconcurrent, multiple baseline across participants design was used (Barlow et al., 2009; Kazdin, 2011). Participants were randomized to a 2-, 4-, or 6-week baseline assessment phase. During the subsequent treatment phase, all participants received six weekly, 60–90 minute individual sessions of compassion-based therapy. Participants completed weekly self-report questionnaires throughout the baseline and treatment phases. During follow-up, participants completed the weekly assessment battery 2 and 4 weeks after the final treatment session. Randomizing participants to baseline periods of varying lengths enables assessment of whether symptom changes occur when and only when the intervention is applied. This design allows causal inferences to be made and controls for many threats to internal validity, including the passage of time and repeated assessments. Since each participant acts as their own control, fewer participants are needed to demonstrate change as a result of the intervention. The frequent assessments also provide information on whether symptom changes are stable and coincide with the introduction of specific treatment components.

PROCEDURES

Participants were recruited from the community via advertisements posted on community bulletin boards and online research study listings. Interested individuals completed online screening questionnaires. Those who appeared to be eligible were invited for an in-person assessment, where the investigator obtained informed consent, administered self-report questionnaires, and conducted a semistructured 30-minute interview to assess the relationship between the traumatic event and the onset or worsening of shame. To further ensure that the shame reported was linked to a traumatic event, participants were asked to complete the ISS first in reference to the past month, and then in reference to the period before the traumatic event. These procedures were used because we sought to

Table 1
Participant Characteristics

	Age	Gender	Ethnicity	Marital Status	Education	Employment Status	Index Trauma	Time since trauma	Total PTEs
P1	23	female	EA	N	B	S	Sexual assault	5 yrs	5
P2	31	female	PR	M	B	S	Sexual assault	14 yrs	>5
P3	20	female	EA	N	SC	S; PT	Sexual assault	3 yrs	2
P4	21	female	EA-ME	N	SC	S	Repeated sexual assault	1.5 yrs	>5
P5	19	female	I	N	SC	S	Sexual assault	2 yrs	4
P6	20	female	EA	N	SC	S	Repeated sexual assault	4 yrs	4
P7	20	non-binary	EA	N	SC	S; PT	Sexual assault	4 mos	3
P8	32	male	EA	M	B	FT	Cycling accident	2 mos	3
P9	19	female	EA	N	SC	S	Parent suicide	5 yrs	1
P10	18	female	EA	N	SC	S	Repeated sexual assault	2 yrs	>5

Note. P = Participant; EA = European-American, ME = Middle-Eastern, I = Indian; PR = Puerto-Rican; N = never married; M = married; B = Bachelor's, SC = some college; S = undergraduate/graduate student; PT = employed part-time; FT = employed full-time; PTE = lifetime number of potentially traumatic events.

evaluate the effect of the intervention on trauma-related shame, not lifelong shame potentially attributable to other causes. No diagnostic assessment or intervention was conducted during the in-person assessment. Individuals who did not meet inclusion/exclusion criteria were provided with a list of alternative treatment referrals.

All self-report questionnaires in this study were completed online using Qualtrics, a confidential Internet-based survey program. All in-person assessments and treatment sessions were conducted at the Center for Anxiety and Related Disorders at Boston University by the lead investigator of this study (TMA), who was a master's-level clinician in an APA-approved doctoral program in Clinical Psychology at the time of the study. Participants received a small monetary compensation at the end of their participation in the study. All procedures were approved by the Boston University Institutional Review Board.

Participant flow is presented in Figure 1. One advantage of a multiple baseline design is that the baseline phase can be used to exclude participants who spontaneously recover on their own over time, analogous to a placebo run-in for studies evaluating drug efficacy. Participants were required to show stable or worsening symptomatology during baseline, defined in this study as no more than a 10-point decrease on either the PCL-5 or ISS between the last two baseline observations, and scores on both measures that remained above the inclusion criteria cutoffs. Since multiple baseline participants act as their own controls, noncompleters did not have sufficient data to be included in the final analyses, leaving a sample of 10 treatment completers.

Noncompleters did not differ discernibly from completers in terms of demographics, time since trauma, type of trauma, initial symptom severity, or symptom severity during baseline.

INTERVENTION

The intervention focused on practicing self-compassion in response to PTSD symptoms and other posttraumatic sequelae, including shame and self-blame regarding the causes and consequences of the traumatic event. A manual was developed to guide each treatment session. Each session included didactic psychoeducation on a treatment concept (e.g., conceptualization of PTSD, self-compassion) followed by an in-session experiential exercise (e.g., loving kindness meditation), which participants were asked to also practice on their own between sessions. The first half of the intervention (Sessions 1–3) focused on building general mindfulness and self-compassion skills for everyday difficulties that were not trauma-related. Session 1 focused on PTSD psychoeducation and mindfulness. The concept of self-compassion was then explicitly introduced in Session 2, and self-compassion exercises were practiced in Sessions 2–3. The second half of the intervention (Sessions 4–6) focused on directly applying the self-compassion skills from Sessions 2–3 to the index trauma. Additional details on the content of each session are provided online (Supplementary Table S1). All treatment sessions were audio-recorded for supervision and adherence ratings. Independent raters were Bachelor's-level research assistants who were trained to recognize the various treatment components. They evaluated one randomly selected recording from each participant (10 recordings total, or 17% of the total recordings) for therapist adherence to the intervention manual, using a checklist of predetermined content for each session. Adherence ratings ranged from 90%–100% (mean = 98.33%, mode = 100%).
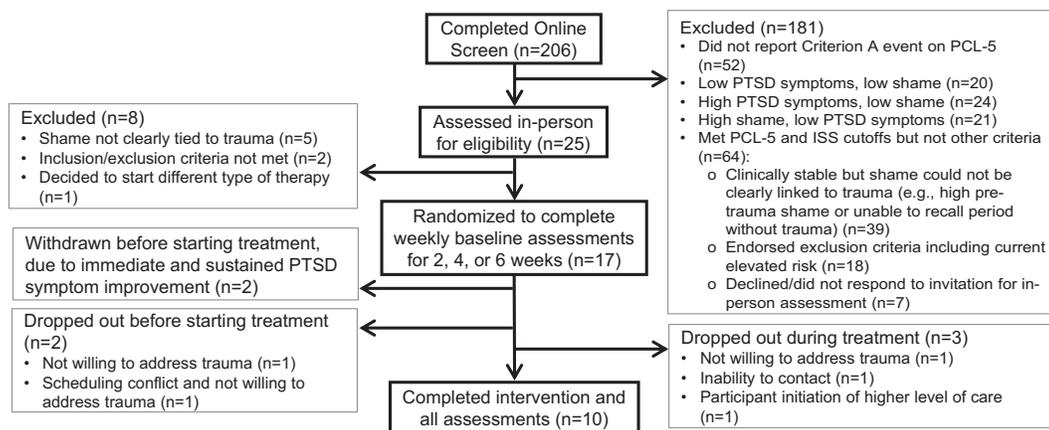

FIGURE 1 Participant flow. PCL-5 = PTSD Checklist for *DSM-5*; ISS = Internalized Shame Scale.

MEASURES

Inclusion and exclusion criteria were assessed with measures administered via the initial online screening questionnaire and in-person assessment. On the online screening questionnaire, current substance use disorders were assessed with the Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) and Drug Abuse Screening Test (DAST-10; Skinner, 1982). Bipolar disorder and psychosis were screened with the Mood Disorders Questionnaire (MDQ; Hirschfeld, 2002) and the 5-item psychotic symptoms screen from the Psychiatric Diagnosis Screening Questionnaire (PDSQ; Zimmerman & Mattia, 2001). To assess for exposure to potentially traumatic events, the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000) was used. Exposure to at least one traumatic event, as defined by PTSD Criterion A in *DSM-5*, was then confirmed during the in-person assessment interview. At the in-person assessment, the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) was used to assist in screening for current suicidal ideation. Participants also completed a brief demographics questionnaire.

PTSD symptom severity was assessed with the PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013), a widely-used measure based on the *DSM-5* criteria for PTSD. Participants' responses were indexed to the traumatic event that they identified as resulting in the most shame, self-blame, and self-criticism. The PCL-5 has demonstrated strong psychometric properties and high quality of efficiency for predicting PTSD diagnosis (Bovin et al., 2015). The PCL-5 can be scored to provide a provisional diagnosis of probable-PTSD, based on "moderate" or higher endorsements of the required number of symptoms within each symptom cluster, following *DSM-5* criteria (Weathers et al., 2013). Total scores range from 0 to 80. Shame was measured with the 24-item shame subscale of the Internalized Shame Scale (ISS), which has demonstrated good psychometric properties (Cook, 2001). Respondents rate frequency of various shame experiences (e.g., "I feel like I am never quite good enough"). Total scores range from 0 to 96. Previous studies reported a mean ISS score of 30 (SD = 15) for a nonclinical population (Cook, 2001) and a mean score of 58.6 (SD = 19.5) for a sample of veterans with PTSD (Wong & Cook, 1992). The PCL-5 and ISS were anchored to the "past month" on the online screen and in-person assessment, and to the "past week" for the weekly assessment battery during baseline, treatment, and follow-up. The following self-report questionnaires were also administered as part of the weekly assessment battery and were anchored to the "past week." Self-compassion was measured with the 26-item Self-Compassion Scale (SCS; Neff, 2003). Total SCS score is the mean of six subscales and ranges from 1 to 5, with higher scores indicating greater self-compassion (Neff, n.d.). Previous studies reported a mean of 3.04 (SD = .63) in a nonclinical sample (Neff, 2003) and a mean of 2.28 (SD = .70) in a PTSD sample (Kearney et al., 2013).[1] Self-blame was assessed with the 6-item self-blame subscale of the Posttraumatic Cognitions Inventory (PTCI-sb; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). Respondents rate the extent to which they agree or disagree with six statements (e.g., "The event happened because of the way I acted"; 1 = *totally disagree*, 4 = *neutral*, and 7 = *totally agree*). The subscale score is the mean of the six items; scores range from 1 to 7. Treatment credibility was assessed with the Credibility/Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000). The score is the mean of three items asking participants to rate how logical the therapy seemed, how successful it was in treating their symptoms, and their confidence in recommending the therapy to a friend (1 = *not at all*, 5 = *somewhat*, and 9 = *very*).

After each session, the study therapist rated the participant's homework compliance and quality, using a 0 to 6 scale (Leung & Heimberg, 1996). At posttest, participants completed a Protocol Evaluation Survey to evaluate the intervention and provide qualitative feedback.

DATA ANALYSIS

Data analyses were conducted according to established guidelines for single-case experimental designs (Barlow et al., 2009; Kazdin, 2011). For single-case designs, including multiple baseline, visual inspection is the primary method used to describe the data and make inferences about the reliability of changes. It entails visually examining the graphed data within-subjects and between-subjects to evaluate the magnitude and rate of change (i.e., slope) across phases. The overall pattern can also be evaluated by examining whether the data overlap across phases (e.g., whether scores during the treatment phase overlap with the range of scores observed during the baseline phase). Visual inspection is often considered a more

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[1] The published means provided by Neff (2003) and Kearney et al. (2013) used the original SCS scoring method of summing the six SCS subscale scores. However, the current study averages the six SCS subscale scores instead, in accordance with the latest advice from the instrument's author (Neff, n.d.). We have converted the published norms to match the scale of the new method.

conservative approach than using statistical tests because visual inspection relies on very potent and consistent effects that are readily seen (Kazdin, 2011). In this study, PCL-5, ISS, SCS, and PTCI-sb data were plotted graphically for each participant. The level and slope of outcome variables during the treatment phase were compared against the baseline phase data, both within- and between-subjects. Symptom change was also evaluated relative to specific treatment components.

To supplement visual inspection, 95% confidence intervals (CIs) were calculated for each participant's change scores to evaluate the reliability of the change. First, for each participant, change scores on each outcome measure were calculated to assess change from first baseline to pretreatment (last baseline), change from pre- to posttreatment, and change from pretreatment to 4-week follow-up. Then, for each outcome measure, a standard error of the difference (S_{diff}) was calculated, which represents the average change in score that would be expected on that measure by chance variation alone, between two measurement occasions. S_{diff} was calculated following the method developed by Jacobson and Truax (1991) for calculating reliable change and using SDs and reliability coefficients from previously published psychometrics studies (see online supplementary material for additional details). The S_{diff} for each measure was then multiplied by 1.96 to create a 95% CI around each participant's change score. This CI provides the range of plausible values for each change score within a 95% confidence level; additionally, when the CI does not include zero, the observed change can be considered a reliable change (i.e., the change is statistically non-zero at $p < .05$, indicating that there is a statistically significant change). Correlations between change scores were also performed to test whether reductions in shame and PTSD symptoms were related to changes in self-compassion.

An overall, standardized mean difference effect size for each outcome variable was also calculated, using a d-statistic specifically developed for single-case designs (Shadish, Hedges, & Pustejovsky, 2014). The resulting d-statistic takes into account autocorrelation, between- and within-case variance, and corrects for small sample bias using Hedges' g. It is in the same metric as the d-statistic used for between-subjects designs and can be pooled with those statistics in meta-analyses. The d-statistic was calculated using the SPSS macro available on the developer's website (Shadish, 2015), and the calculated variance was used to compute 95% CIs for each outcome variable: $d \pm 1.96$ X sqrt(Var). The effect size was considered statistically significant at $p < .05$ if the 95% CI did

not include zero. Of note, Shadish et al.'s d-statistic is most accurate when the outcome variable is relatively stationary within phases (i.e., lacking a time trend), as it is calculated from the average within-subject difference between mean baseline phase scores and mean treatment phase scores. This d-statistic may be an underestimate when there is a genuine slope of change during the treatment phase.

To determine acceptability and tolerability of the intervention, retention rates, data from the CEQ, posttest satisfaction ratings, and qualitative feedback were also examined.

Results

Figure 2 graphically displays PTSD symptom severity (PCL-5) and shame (ISS) scores during baseline (B), treatment (T), and follow-up (FU) for all 10 participants (P1-P10).

Table 2 presents three change scores for each participant: baseline change (B1 to last baseline before treatment), pre-post change (last baseline to T6), and pre-FU change (last baseline to F2).

PTSD SYMPTOM SEVERITY

At the initial in-person assessment, all 10 participants met the criteria for probable-PTSD on the PCL-5, with scores suggesting moderate to severe PTSD symptom severity ($M = 47.90$, $SD = 9.05$, range 36 to 61). Visual inspection of baseline data in Figure 2 indicates that PTSD severity scores were stable or increasing during baseline for all participants except for P7. P7's score markedly decreased at B2 and remained relatively low yet still above the inclusion criteria cutoff for the remainder of the baseline period. During the treatment phase, PTSD symptom severity decreased for 9 of 10 participants (Figure 2); all of these decreases were reliable (Table 2) and fell below the inclusion criteria cutoff. By posttreatment (T6), all participants had PCL-5 scores that did not overlap with their baseline scores, except for P7 and P5 (Figure 2). P5's score at T6 overlapped with her baseline scores, due to a transient decrease at B1 relative to her in-person assessment score (not graphed), but her baseline scores had an increasing slope, whereas her treatment scores had a steep decreasing slope. P7's pre-post change was not reliable, and P7's treatment scores overlapped entirely with baseline scores. At follow-up, all participants maintained or extended their gains; all participants demonstrated reliable pre-FU decreases on the PCL-5, and no F2 scores overlapped with baseline scores. Nine of 10 participants had F2 scores that fell below the inclusion criteria cutoff. Across all participants, the mean pre-post change was -27.30 ($SD = 14.96$, range 0 to -52), and the mean pre-FU
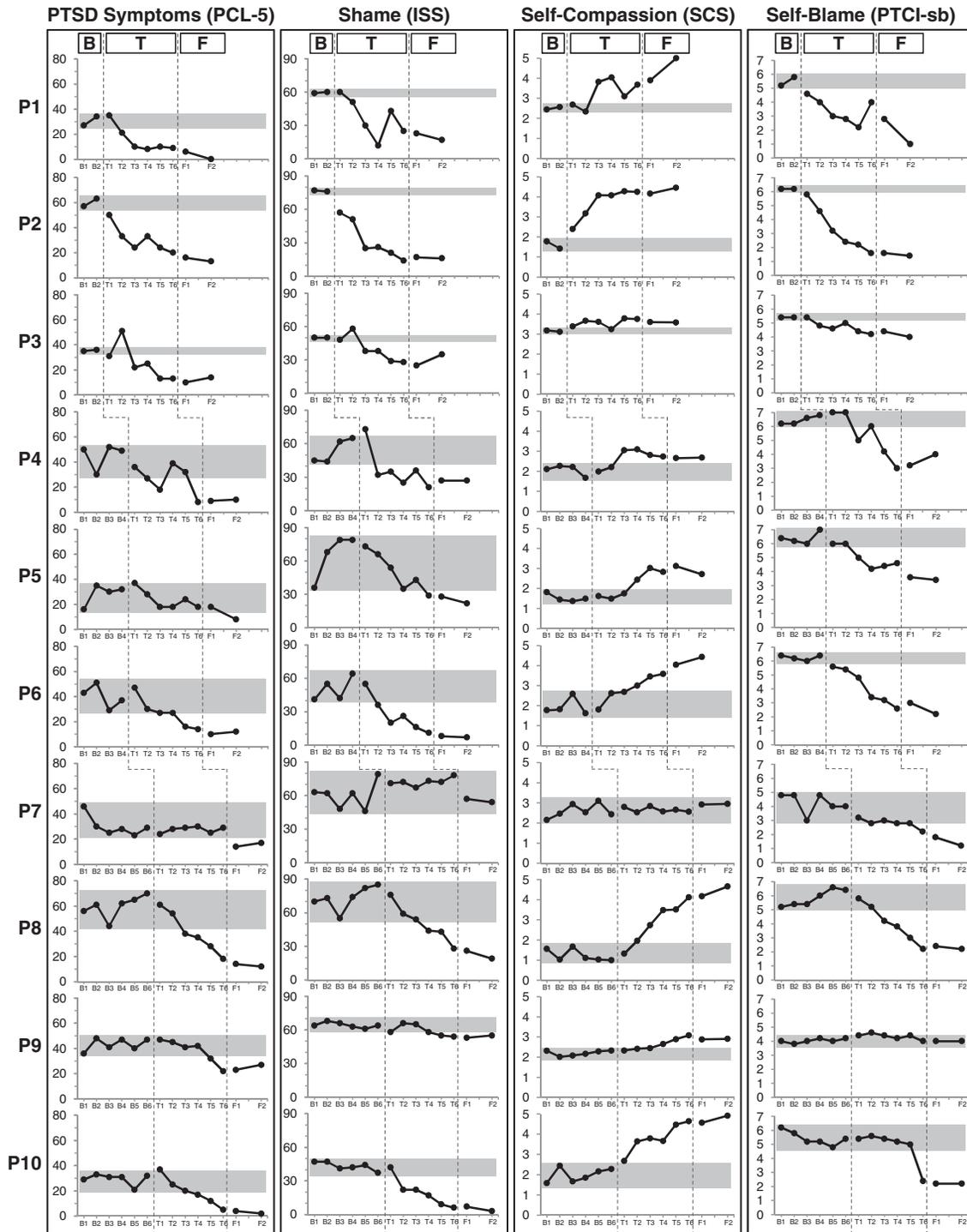
FIGURE 2 Individual outcomes throughout baseline (B), after each treatment session (T), and during follow-up (F). Each row represents data for one participant. Shaded regions on each graph indicate the range of baseline scores. P = Participant; PCL-5 = PTSD Checklist for *DSM-5*; ISS = Internalized Shame Scale; SCS = Self-Compassion Scale; PTCI-sb = Posttraumatic Cognitions Inventory Self-Blame subscale.

change was -31.40 (*SD* = 14.18, range -12 to -58). At posttest and 4-week follow-up, all 10 participants no longer met criteria for probable-PTSD on the PCL-5.

SHAME SEVERITY

On the ISS, all participants demonstrated stable or worsening shame at baseline (Figure 2; Table 2). At baseline, mean ISS scores were similar to previously

Table 2
Change Scores with 95% CIs for PTSD Severity, Shame, Self-Compassion, and Self-Blame

	PCL-5 $95\%CI = CS \pm 11.73$	ISS $95\%CI = CS \pm 11.00$	SCS $95\%CI = CS \pm .49$	PTCI-sb $95\%CI = CS \pm 1.80$
P1				
BL	7 [-4.73, 18.73]	1 [-10, 12]	0.13 [-0.37, 0.62]	0.6 [-1.2, 2.4]
Pre-Post	-25 [-36.73, -13.27]*	-35 [-46, -24]*	1.12 [0.63, 1.61]*	-1.8 [-3.6, 0]
Pre-FU	-34 [-45.73, -22.27]*	-43 [-54, -32]*	2.43 [1.94, 2.92]*	-4.8 [-6.6, -3]*
P2				
BL	6 [-5.73, 17.73]	-1 [-12, 10]	-0.35 [-0.84, 0.14]	0 [-1.8, 1.8]
Pre-Post	-43 [-54.73, -31.27]*	-62 [-73, -51]*	2.83 [2.34, 3.32]*	-4.6 [-6.4, -2.8]*
Pre-FU	-50 [-61.73, -38.27]*	-60 [-71, -49]*	3.03 [2.54, 3.52]*	-4.8 [-6.6, -3]*
P3				
BL	1 [-10.73, 12.73]	0 [-11, 11]	-0.07 [-0.56, 0.42]	0 [-1.8, 1.8]
Pre-Post	-23 [-34.73, -11.27]*	-22 [-33, -11]*	0.63 [0.14, 1.12]*	-1.2 [-3, 0.6]
Pre-FU	-22 [-33.73, -10.27]*	-15 [-26, -4]*	0.47 [-0.02, 0.96]	-1.4 [-3.2, 0.4]
P4				
BL	-1 [-12.73, 10.73]	20 [9, 31]^	-0.43 [-0.92, 0.06]	0.6 [-1.2, 2.4]
Pre-Post	-41 [-52.73, -29.27]*	-44 [-55, -33]*	1.07 [0.58, 1.56]*	-3.8 [-5.6, -2]*
Pre-FU	-39 [-50.73, -27.27]*	-38 [-49, -27]*	1.02 [0.53, 1.51]*	-2.8 [-4.6, -1]*
P5				
BL	16 [4.27, 27.73]^	43 [32, 54]^	-0.32 [-0.82, 0.17]	0.6 [-1.2, 2.4]
Pre-Post	-14 [-25.73, -2.27]*	-50 [-61, -39]*	1.33 [0.84, 1.82]*	-2.4 [-4.2, -0.6]*
Pre-FU	-24 [-35.73, -12.27]*	-57 [-68, -46]*	1.23 [0.74, 1.72]*	-3.6 [-5.4, -1.8]*
P6				
BL	-6 [-17.73, 5.73]	23 [12, 34]^	-0.15 [-0.64, 0.34]	0 [-1.8, 1.8]
Pre-Post	-23 [-34.73, -11.27]*	-53 [-64, -42]*	1.97 [1.48, 2.46]*	-3.8 [-5.6, -2]*
Pre-FU	-25 [-36.73, -13.27]*	-57 [-68, -46]*	2.81 [2.32, 3.3]*	-4.2 [-6, -2.4]*
P7				
BL	-17 [-28.73, -5.27]*	16 [5, 27]^	0.28 [-0.21, 0.77]	-0.8 [-2.6, 1]
Pre-Post	0 [-11.73, 11.73]	-1 [-12, 10]	0.13 [-0.36, 0.62]	-1.8 [-3.6, 0]
Pre-FU	-12 [-23.73, -0.27]*	-25 [-36, -14]*	0.52 [0.03, 1.01]*	-2.8 [-4.6, -1]*
P8				
BL	14 [2.27, 25.73]^	15 [4, 26]^	-0.56 [-1.05, -0.07]^	1.2 [-0.6, 3]
Pre-Post	-52 [-63.73, -40.27]*	-57 [-68, -46]*	3.13 [2.64, 3.62]*	-4.2 [-6, -2.4]*
Pre-FU	-58 [-69.73, -46.27]*	-66 [-77, -55]*	3.66 [3.17, 4.15]*	-4.2 [-6, -2.4]*
P9				
BL	11 [-0.73, 22.73]	0 [-11, 11]	0.02 [-0.47, 0.51]	0.2 [-1.6, 2]
Pre-Post	-25 [-36.73, -13.27]*	-10 [-21, 1]	0.75 [0.26, 1.24]*	-0.2 [-2, 1.6]
Pre-FU	-20 [-31.73, -8.27]*	-9 [-20, 2]	0.57 [0.08, 1.06]*	-0.2 [-2, 1.6]
P10				
BL	3 [-8.73, 14.73]	-10 [-21, 1]	0.7 [0.21, 1.19]*	-0.8 [-2.6, 1]
Pre-Post	-27 [-38.73, -15.27]*	-31 [-42, -20]*	2.36 [1.87, 2.85]*	-3 [-4.8, -1.2]*
Pre-FU	-30 [-41.73, -18.27]*	-34 [-45, -23]*	2.63 [2.14, 3.12]*	-3.2 [-5, -1.4]*

Note. Each cell displays a change score [lower limit of change, upper limit of change]. Negative change scores indicate decreases on a given measure, positive change scores indicate increases. Listed at the top of each column is the 1.96 X S_{diff} value used for each measure to calculate the 95% CIs around each change score. CI = Confidence interval; CS = change score; BL = change from first baseline score to last baseline score; Pre-Post = change from last baseline score to post-test (after Session 6); Pre-FU = change from last baseline to 4-wk follow-up. P = Participant; PCL-5 = PTSD Checklist for *DSM-5*; ISS = Internalized Shame Scale; SCS = Self-Compassion Scale; PTCI-sb = Posttraumatic Cognitions Inventory Self-Blame subscale. * indicates improvement $p < .05$. ^ indicates worsening $p < .05$.

published clinical means for a PTSD sample (Wong & Cook, 1992). After the intervention began, 8 of 10 participants showed reliable pre- to posttreatment decreases in shame that did not overlap with baseline scores (Figure 2; Table 2). By posttreatment (T6), mean ISS scores were comparable to previously published nonclinical means (see Table 3; Cook, 2001). Two participants did not show reliable pre-post decreases: P9 did show decreases, although not large enough to be reliable; and P7 showed a reliable pre-FU decrease, but this decrease overlapped completely with earlier baseline scores and was therefore not considered evidence of treatment response. At follow-up, all decreases in shame were

Table 3
Mean Summary Scores and Effect Sizes with 95% CIs

Outcome	Baseline Phase M(SD)[a]	Treatment Phase M(SD)[a]	d_{tx} [95% CI]	T6 M(SD)[b]	Follow-Up Phase M(SD)[a]	d_{fu} [95% CI]	F2 M(SD)[b]
PCL-5	40.20 (11.92)	27.33 (7.33)	**1.10** [0.54, 1.66]	15.60 (7.26)	11.95 (6.31)	**2.26** [1.33, 3.19]	11.50 (7.58)
ISS	59.65 (10.59)	42.52 (15.67)	**1.03** [0.47, 1.60]	29.40 (21.56)	26.30 (16.97)	**2.12** [1.27, 2.97]	25.50 (17.77)
SCS	2.08 (0.57)	3.02 (0.54)	**1.46** [0.82, 2.10]	3.52 (0.70)	3.72 (0.80)	**2.26** [1.22, 3.30]	3.83 (0.96)
PTCI-sb	5.57 (0.86)	4.20 (0.83)	**1.31** [0.66, 1.96]	3.08 (1.04)	2.73 (1.02)	**2.61** [1.45, 3.77]	2.56 (1.20)

Note. [a] mean (and standard deviation) of all scores within the respective phase (baseline, treatment, and follow-up); scores were first averaged across all time points within each phase for each participant, and then averaged across participants.
[b] mean (and standard deviation) across participants at the indicated time point (T6 = post-treatment after Session 6; F2 = 4-week follow-up).
d_{tx} = baseline vs treatment effect size; d_{fu} = baseline vs follow-up effect size; effect sizes (d_{tx} and d_{fu}) reflect the standardized difference between Phase Ms; 95% CI = 95% confidence interval.
PCL-5 = PTSD Checklist for *DSM-5*; ISS = Internalized Shame Scale; SCS = Self-Compassion Scale; PTCI-sb = Posttraumatic Cognitions Inventory Self-Blame subscale.

maintained or extended. Across all participants, the mean pre-post change was -36.50 (*SD* = 20.51, range -1 to -62). The mean pre-FU change was -40.40 (*SD* = 19.76, range -9 to -66).

SELF-COMPASSION

Self-compassion scores on the SCS were stable or worsening at baseline for all participants, except for P10 who demonstrated a small but reliable increase in self-compassion at baseline (Figure 2; Table 2). P10 reported that the baseline questionnaires had increased her awareness of her self-criticism, which motivated her to be kinder towards herself. During the treatment phase, all participants except P7 showed reliable increases in self-compassion, with T6 scores that did not overlap with baseline scores. P10 demonstrated a larger and steeper increase in self-compassion during treatment, relative to the increase seen at baseline. At follow-up, all self-compassion gains were maintained except for P3 whose score decreased slightly. By F2, P7's score had reliably increased but overlapped completely with baseline scores and therefore was not considered an indication of treatment response. Mean pre-post change was 1.53 (*SD* = .99, range .13 to 3.13), and mean pre-FU change was 1.84 (*SD* = 1.20, range .47 to 3.66).

SELF-BLAME

Visual inspection suggests that self-blame scores on the PTCI-sb followed a similar pattern to PCL-5 and ISS scores; stable baselines were followed by reductions in self-blame for nine participants (Figure 2). Six participants showed reliable pre-post reductions in self-blame (Table 2). By F2, all participants except P9 had self-blame scores that did not overlap with baseline scores, and eight of these reductions were reliable. Mean pre-post change was -2.68 (*SD* = 1.44,

range -.20 to -4.60) and mean pre-FU change was -3.20 (*SD* = 1.48, range -.20 to -4.80).

EFFECT SIZES

Standardized mean differences (*d* with 95% CIs) were calculated to estimate the overall magnitude of the intervention effect across participants. Table 3 presents the means and standard deviations for all outcome variables across each study phase, as well as the *d-statistic* comparing treatment vs baseline and follow-up vs baseline. These effect sizes suggest that across participants, the self-compassion intervention was associated with large decreases in PTSD symptom severity, shame, and self-blame, and a large increase in self-compassion. As described in the Method section, the baseline vs treatment effect size may represent an underestimate, since it uses the average of all treatment sessions and does not account for the slope during the treatment phase. The baseline vs follow-up effect size may therefore be a more accurate representation of the final treatment effect (Shadish et al., 2014).

PATTERNS OF SYMPTOM CHANGE

Several patterns of symptom change during the treatment phase are apparent in Figure 2. Six participants (P1, P4, P5, P6, P8, P10) experienced small increases or relative stability on the PCL-5 and/or the ISS at T1, followed by sharp reductions (i.e., a steeper negative slope) beginning at T2, after the concept of self-compassion is introduced in Session 2. Four participants (P1, P2, P4, P5) showed the greatest PCL-5 and ISS reductions during the first three treatment sessions in which general mindfulness and self-compassion skills are applied to everyday, nontrauma difficulties. At T4 and T5, after participants began applying self-compassion

skills to the trauma memory, five participants' scores on the PCL-5 and/or ISS plateaued or transiently increased (P1, P2, P4, P5, P6) before decreasing again at a slightly slower rate. P3 showed a similar, striking increase on the PCL-5 and ISS at T2, after she reported that she had written the self-compassionate letter in relation to her trauma, despite explicit instructions to complete this assignment only for nontrauma difficulties.

Greater pre-post increases in self-compassion correlated with greater pre-post reductions in PTSD symptom severity ($r = -.74, p < .05$), shame ($r = -.80, p < .01$), and self-blame ($r = -.78, p < .01$). The same pattern was observed for pre-FU changes, with greater improvements on the SCS correlating with larger decreases in PTSD symptom severity ($r = -.76, p < .05$), shame ($r = -.79, p < .01$), and self-blame ($r = -.78, p < .01$). Therapist ratings of participants' homework quality were positively correlated with greater pre-post reductions in PTSD symptom severity ($r = -.70, p < .05$). Homework completion was high (average compliance rating = 4.90 out of 6, $SD = .63$; average homework quality rating = 4.11 out of 6, $SD = 1.00$). No other significant correlations were observed between homework compliance/quality and changes in other outcomes.

SATISFACTION WITH TREATMENT

After completing the intervention, participants provided feedback on the intervention. Scores on the credibility subscale of the CEQ indicate that participants found the intervention highly credible ($M = 7.3$ out of 9, $SD = 1.16$). Most participants found that 6 weeks of treatment was "somewhat too little" (60%) or "far too little" (10%), while 20% found it to be "just the right amount" and 10% found it "somewhat too much." Participants rated the treatment as "somewhat interesting" (40%) to "extremely interesting" (60%). Most participants (90%) found the treatment "just the right level," while one participant (10%) found it "far too basic." Participant ratings of the perceived helpfulness of individual treatment components was high; on average, all treatment components were deemed at least moderately helpful (mean rating across treatment components = 3.76 out of 5, $SD = .34$, range 3.22 to 4.30).

QUALITY OF LIFE

At post-test, participants rated the extent to which the treatment positively impacted their quality of life, with 20% responding "moderately," 60% "quite a bit," and 20% "extremely." Participants also provided qualitative feedback on some of the changes they had noticed as a result of the intervention. Some common themes from these qualitative data: greater capacity to sit with discomfort (P1, P4, P6); greater resilience and reduced avoidance when facing difficulties (P2, P4, P5, P10); improved relationships, including feeling more connected to others and engaging in more social activities (P1, P2, P3, P5, P6, P8, P10); increased assertiveness and openness with others (P1, P2, P5, P6); improvements in self-care (P1, P6, P7, P8); and greater comfort with and enjoyment of sexual intimacy (P2, P4, P6).

Discussion

In this study, we used a multiple baseline design to evaluate a 6-week self-compassion intervention developed for reducing trauma-related shame and PTSD symptoms. Weekly pretreatment assessments across a 2-, 4-, or 6-week baseline period indicated that PTSD symptoms and shame remained stable or increased, irrespective of baseline duration. After the intervention began, 9 of 10 participants demonstrated marked, reliable reductions in PTSD symptoms, and 8 participants showed reliable decreases in shame, relative to their scores at baseline. For most participants, self-compassion increased and self-blame decreased. These increases in self-compassion suggest that it is feasible for trauma survivors with low baseline levels of self-compassion to increase in self-compassion over a relatively brief period. Treatment gains were maintained or extended at 4-week follow-up. The stable or worsening baselines, rapid decrease in symptoms only after the intervention was introduced, and the magnitude of the changes suggest that the intervention effect is not likely due to repeated assessments, self-monitoring, the passage of time, chance fluctuations, regression to the mean, or spontaneous recovery. Standardized effect sizes comparing baseline versus follow-up across all participants indicated large improvements in PTSD symptoms, shame, self-compassion, and self-blame. Participants also reported high levels of satisfaction with the intervention. Of participants who started the intervention, 77% completed it, a retention rate that is comparable to that of existing empirically supported treatments for PTSD (Hembree et al., 2003).

This study's idiographic design enabled a preliminary examination of individual factors that may contribute to treatment response and nonresponse. Overall, marked reductions in shame and PTSD symptoms were observed across participants who varied in terms of number of lifetime traumatic events and length of time since trauma (ranging from 2 months to 14 years). However, 2 of 10 participants had a mixed response to the intervention. One participant (P9) showed reliable, marked

pre-post treatment decreases in PTSD symptoms but not in shame. It is possible that the intervention is not as effective for the type of trauma experienced by P9: learning about her parent's suicide, which was accompanied by chronic, complex feelings of loss and emptiness. Since only one other participant (P8) reported an index trauma other than sexual assault, the utility of the intervention for different trauma types is unclear. Another participant (P7) did not demonstrate clear improvements in shame and self-compassion, but by follow-up showed delayed yet reliable decreases in PTSD symptoms and self-blame. P7's lack of clear increase in self-compassion may explain the lack of change in shame. Also, at post-test, P7 reported increased general life stress even as trauma-related distress decreased, and expressed a preference for more general therapy instead of trauma-focused treatment. Additional research is needed to evaluate the self-compassion intervention for addressing comorbidities.

The patterns of symptom change observed in this study suggest differential effects of specific treatment components. Most participants experienced minimal change in PTSD symptoms and shame after receiving psychoeducation and mindfulness instruction in Session 1, followed by a much steeper rate of improvement after Session 2, when self-compassion is introduced. In addition, from pre- to posttreatment and pretreatment to FU, greater increases in self-compassion were correlated with greater decreases in shame and PTSD. These patterns are consistent with the possibility that self-compassion may be mediating changes in shame and PTSD. However, caution should be used in interpreting these exploratory findings, since the study design did not permit direct comparison of different treatment components. Future studies comparing treatment components and evaluating mediation are needed to better understand the relationships between self-compassion, shame, and PTSD.

Another notable pattern was that for many participants, the majority of symptom change occurred in the first three sessions. Some participants also demonstrated temporary increases in shame and PTSD symptoms after Session 4, when the focus shifts from general self-compassion skills to applying those skills directly to the trauma. While these increases were transient, the rate of improvement decreased slightly for some participants even after their scores began to decrease again. This pattern suggests that building self-compassion for everyday difficulties may be effective for reducing PTSD symptoms and trauma-related shame, even without deliberately recalling

the trauma memory. It is generally thought that activating the trauma memory is necessary for practicing a new, more adaptive response (Brewin et al., 2010). However, there is evidence that nontrauma-focused therapies have similar efficacy to trauma-focused approaches and may be more tolerable (reviewed in Steenkamp, Litz, Hoge, & Marmar, 2015). Future studies should evaluate the differential efficacy and retention rates associated with practicing self-compassion more generally versus explicitly applying self-compassion skills to the trauma.

Strengths of this study include the multiple baseline design that controlled for threats to internal validity, the brief nature of the intervention, and the large effect sizes across participants who had experienced multiple traumatic events with varying lengths of time since trauma. The effect sizes for PTSD symptoms, shame,[2] and self-compassion were comparable to or larger than those reported in other treatment studies (e.g., Luoma et al., 2012; Neff & Germer, 2013; Watts et al., 2013). By deliberately targeting the affective experience of shame, the intervention addresses a common posttraumatic reaction that can contribute to the development and maintenance of PTSD. Current empirically supported treatments for PTSD use either exposure to produce extinction of maladaptive fear responses, and/or cognitive therapy to logically challenge maladaptive cognitive appraisals of the trauma. Both of these approaches have been shown to be effective for overgeneralization of fear and overaccommodated beliefs about danger. However, compassion-based therapy may be a useful alternative or adjunct for PTSD that is maintained not by fear but by shame. Instead of relying on higher-level reasoning and logic, compassion-based therapy focuses on creating a felt sense of kindness, warmth, and understanding towards oneself for having experienced the trauma or struggling to recover from it. Responding to the trauma memory with self-compassion may create a new, sensory-based experience of feeling comforted, soothed, and supported that competes with former sensory-based memories of feeling ashamed, isolated, and abandoned (Brewin et al., 2010). Learning to respond to the trauma memory with self-compassion may also reduce the internal threat (i.e., view of oneself as incapable, deserving of maltreatment) that is fueled by shame and harsh self-criticism, and that ultimately maintains PTSD

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[2] For shame, direct comparability of effect sizes is limited, since the only known published effect sizes for shame from a treatment study (Luoma et al., 2012) are scaled using a different metric (Shadish et al., 2014).

(Ehlers & Clark, 2000). Another strength of the intervention was its relatively brief duration, which appeared sufficient for increasing self-compassion, despite many participants' reports that self-compassion initially felt unfamiliar and difficult.

There are a number of limitations to this study. First, without an active control condition, it is not possible to distinguish the observed intervention effect from any nonspecific effects of therapy. Also, since a single therapist administered all of the treatment sessions and assessments, it is not possible to rule out the influence of therapist-specific effects, demand characteristics, or observer effects. In addition, while treatment adherence in this study was evaluated by independent raters who were trained to recognize the presence or absence of specific treatment components, they did not have the expertise to rate treatment quality. Relying solely on self-report measures was another study limitation. Future studies should evaluate the intervention against an active control condition, include independent ratings of treatment quality and therapist rapport and competency, and use clinician-administered diagnostic assessments by an independent assessor.

The study is also limited in its ability to generalize the findings from a small sample to diverse populations and trauma types; 8 of 10 participants had experienced sexual trauma, and most were well-educated, relatively young, and high-functioning. Additionally, a large number of individuals were excluded from participating after the initial online screen, despite reporting elevated PTSD and shame symptoms. This group included individuals with elevated risk and those whose shame could not be clearly linked to the trauma using our procedure for assessing trauma-related shame. This procedure was designed to exclude individuals who reported high pretrauma shame potentially due to non-trauma causes. However, it also excluded many individuals who likely had trauma-related shame but could not recall a period in their lives without trauma (i.e., those with histories of early childhood trauma). Future studies should instead assess for trauma-related shame using a shame measure explicitly linked to the trauma (e.g., the recently developed Trauma Related Shame Inventory; Øktedalen, Hagtvet, Hoffart, Langkaas, & Smucker, 2014). Moreover, an important future direction would be to evaluate the intervention for more diverse samples and trauma types, especially for individuals with chronic shame stemming from early childhood trauma and for populations with elevated risk. Additional research is also needed to evaluate

compassion-based interventions transdiagnostically on shame, independent of its causes.

Finally, another study limitation is the relatively high number of enrolled participants who discontinued their participation during baseline or after starting treatment. Several of these participants cited their lack of readiness to address the trauma as their principal reason for discontinuing. Since avoidance is a core symptom of PTSD and shame also predicts increased avoidance (Feiring & Taska, 2005), future research on strategies for combating avoidance may be especially relevant for those with shame-based PTSD.

In summary, the results from this study provide preliminary evidence that compassion-based therapy is associated with reductions in trauma-related shame and PTSD symptoms. The brief nature of this treatment and the rapid improvements observed in this study suggest that the intervention may be promising as either a stand-alone treatment or as an adjunct to other treatments. Study results and feedback from participants will be used to guide future work that refines the intervention, explores mechanisms of change, compares the intervention against other treatments, and evaluates treatment efficacy on a larger scale and for more diverse populations.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

Appendix A. Supplementary Data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.beth.2016.11.012.

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