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Brief treatment for PTSD: A non-inferiority trial

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Abstract

Prior studies have identified several psychosocial treatment approaches as effective for posttraumatic stress disorder (PTSD). Unfortunately, a substantial minority of individuals who receive these treatments drop out prematurely. Moreover, a considerable number of individuals in need of PTSD treatment do not present for treatment due to time constraints and other barriers to care. Thus, there is a need to develop alternative evidence-based PTSD treatments that have lower treatment dropout rates and address current barriers to receiving care. One recently developed PTSD treatment that has demonstrated efficacy and potentially meets these criteria is Written Exposure Therapy (WET), a 5-session treatment protocol that promotes recovery through writing about the trauma event as well as one's thoughts and feelings about it without any assigned homework. In an ongoing randomized controlled trial (RCT) we are investigating whether WET is equally efficacious as Cognitive Processing Therapy (CPT), a treatment that typically requires more therapist training and more therapy sessions. The study sample consists of 126 adults diagnosed with PTSD who are randomly assigned to either WET ($n = 63$) or CPT ($n = 63$). Participants are assessed prior to treatment and 6-, 12-, 24-, 36-, and 60-weeks after the first treatment session. The primary outcome measure is PTSD symptom severity assessed with the Clinician Administered PTSD Scale for DSM-5. Given the prevalence of PTSD and the aforementioned limitations of currently available first-line PTSD treatments, the identification of a brief, efficacious treatment that is associated with reduced patient dropout would represent a significant public health development.

Keywords

Clinical trial; Posttraumatic stress disorder; Cognitive behavioral therapy

1. Introduction

Substantial progress has been made in identifying effective treatments for PTSD, with Cognitive Processing Therapy (CPT; [15]) and Prolonged Exposure (PE; [11]) having the strongest empirical support [9,22]. Although these treatments have undoubtedly demonstrated success in treating PTSD among many of those with the disorder, research has

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also shown that approximately one-third of those who begin these treatments dropout prematurely [21]. Additionally, many mental healthcare providers are not inclined to use these treatment approaches, even after being trained, due to time constraints and other implementation barriers [5,10,47]. On the patient side, a considerable number of individuals in need of PTSD treatment do not seek it, due to their own time constraints and other barriers to care (e.g., [20]). Thus, there is a pressing need to identify alternative PTSD treatments that are more efficient for providers and clients alike, and that promote greater treatment attendance and engagement than currently available evidence-based treatments.

One potential alternative treatment is Written Exposure Therapy (WET), which involves repeatedly confronting a trauma memory through writing over the course of five, 30-min sessions. Direct face-to-face contact between therapist and client is significantly reduced in WET, as the writing instructions are read loud by the therapist who then leaves the client alone to write for 30 min. The therapist returns to the room after 30 min to briefly check in with the patient (see detailed information about the treatment in Methods section). Research indicates that WET is an efficacious treatment for PTSD with large within- and between-group effect sizes that are comparable with PE and CPT [34,37]. However, WET has not been directly compared with either of these first-line treatments.

This is the primary aim of an ongoing study, namely to examine whether WET is equally efficacious (i.e., non-inferior) to CPT in the treatment of adults diagnosed with PTSD. Based upon previously obtained effect sizes obtained for WET [34,37], we expect that WET will be non-inferior to CPT and that observed treatment gains will be maintained at follow-up. The second aim of the study is to examine treatment differences in dropout rates. We anticipate that WET will have a significantly fewer treatment dropouts relative to CPT, based on prior findings [21,37]. The study is funded by the National Institute of Mental Health (R01 MH095737).

2. Materials and methods

2.1. Participants

Participants are 126 adult (i.e., 18 and older) men and women diagnosed with PTSD. Rather than restricting participation to individuals with a particular trauma type (e.g., interpersonal violence), we are including individuals with varied trauma histories, provided that they meet DSM-5 PTSD diagnosis [2]. The inclusion of participants with heterogeneous trauma histories increases the generalizability of our findings. Based on past recruitment experience in the same geographic region [37], we anticipate recruiting a diverse sample, 60% of which are women and 50% of which are White.

2.1.1. Inclusion/Exclusion criteria—Inclusion criteria include: 1) a current diagnosis of PTSD [2], and 2) if taking psychotropic medication, then the dose must be stable for at least 4 weeks prior to study entry. Exclusion criteria are: 1) a current diagnosis of substance dependence (substance abuse not an exclusion), 2) current psychotic disorder, 3) current unstable bipolar disorder, 4) current participation in another psychosocial therapy for PTSD, 4) significant cognitive impairment, and 5) current suicidal risk. Please refer to Table 1 for the list of inclusion and exclusion criteria and rationale.

2.2. Study design

We designed the study as a non-inferiority randomized controlled trial. This design permits us to examine whether WET is non-inferior (i.e., equally efficacious) to a first-line PTSD treatment with more treatment sessions (i.e., a greater treatment dose). Participants ($N=126$) are randomly assigned to either WET ($n=63$) or to CPT (CPT, $n=63$). Recruitment is occurring over the course of four years. Because of the differences in treatment dosage, diagnostic assessments are scheduled to occur at pre-treatment, as well as 6-, 12-, 24-, 36-, and 60-weeks following the first treatment session. Thus, assessments occur at the same time point for all participants regardless of treatment assignment; structuring the assessments in this fashion, thus, controls for any possible effects of time since treatment on study outcomes. Participants are compensated \$50 for each assessment session. The entire study requires five years to complete. See Fig. 1 for the planned participant flow.

2.2.1. Ethical oversight—The study protocol has been approved by the Investigational Review Boards (IRB) at the VA Boston Healthcare System and Boston University. Clinical trial registration was completed at [ClinicalTrials.gov](https://clinicaltrials.gov) (NCT01800773). A Certificate of Confidentiality was obtained from the National Institutes of Health.

2.3. Study procedures

2.3.1. Recruitment and screening—Participants are recruited using a variety of strategies. Flyers are posted at local community centers describing the study, directing interested individuals to contact study staff for additional information. Recruitment also takes place through referrals from local primary care clinics, mental health clinics, and domestic violence service agencies. The source of referral is tracked for each participant who enrolls in the study.

Individuals who contact study staff to express interest are first provided with a detailed description of the study, including the required time commitment. If the individual is interested in participating, a phone screen is conducted. During the phone screen, study staff briefly assess for all inclusion/exclusion criteria (see Table 1). To assess for the presence of PTSD, study staff ask the individual whether or not she or he has experienced a traumatic event, and if so, if they have experienced any of the core symptoms of PTSD in the past two weeks. The individual is also asked about current substance use, symptoms of bipolar disorder, and symptoms of psychosis. Study staff then ascertain if the individual is currently enrolled in psychosocial treatment and taking psychotropic medications.

Individuals who appear eligible based on the phone screen are scheduled for an initial assessment. During this meeting, once the participant provides informed consent, a study staff member administers the standardized clinical interviews and then the participant completes a battery of self-report measures (see Section 2.5). Appropriate referrals are provided to individuals who are ineligible to enroll. Based on our prior collective recruitment experiences, we expect to enroll 70% of the participants who complete the initial assessment.

2.4. Randomization

We use the sealed envelope program to generate randomization to condition. Envelopes are opened for each participant after completion of the initial assessment to determine eligibility and after the individual confirms that they want to be randomized to one of the two treatment conditions. The project coordinator then informs the participant of their treatment assignment and then they are contacted by the assigned study therapist to schedule the first treatment session.

2.5. Assessment instruments and procedures

Assessments are conducted by independent evaluators (IEs) who are unaware of assigned treatment condition. IEs are master- or doctoral-level psychologists who receive training and certification for this study under the direction of an IE trainer (BPM). Monthly inter-rater reliability checks for the assessments are undertaken by IEs who did not conduct the assessment. The ratings are used to calculate kappa coefficients and to facilitate supervision, during which potential disagreements are discussed and instruction is provided to enhance inter-rater reliability. Twenty-percent of the assessments are randomly selected for reliability checks. See Table 2 for a schedule of assessment instruments.

2.5.1. Primary outcome measures—The Clinician Administered PTSD Scale for DSM-5 (CAPS-5; [43]). The CAPS-5 is a structured diagnostic interview and the gold standard for assessing the DSM-5 symptoms of PTSD [2]. The scale also assesses social and occupational functioning, dissociation symptoms, and the validity of symptom reports. The CAPS-5 uses a single 5-point ordinal rating scale to measure symptom severity. Symptom severity ratings combine information about symptom frequency and intensity obtained by the interviewer. Although the CAPS-5 is a new measure, initial psychometric properties indicate high criterion and construct validity and high agreement with a self-report measure of PTSD [30]. The non-inferiority margin for the previous version of the CAPS is 10 points [31]. Because the CAPS-5 is relatively new, there are no available data at this time for determining its non-inferiority margin. These data are expected to be available by time study recruitment is completed.

Because a PTSD diagnosis requires the presence of a traumatic life event, such events are determined at the initial assessment using the Life Events Checklist for DSM-5 (LEC-5; [44]). The LEC-5 includes the same list of 16 different potentially traumatic life events from the original LEC that are commonly associated with PTSD symptoms and is designed to facilitate PTSD diagnosis [44]. To be consistent with the DSM-5 PTSD criteria, The LEC-5 includes one additional item that asks about exposure to occupation-related trauma (“for example, paramedic, police, military, or other first responder”). There is also space for specifying other potentially traumatic stressors that do not fit into any of the other 16 event categories. For each potentially traumatic event, respondents rate their experience of that event on a 6-point nominal scale (1 = happened to me, 2 = witnessed it, 3 = learned about it, 4 = part of my job, 5 = not sure, and 6 = doesn't apply). There are no publications on the psychometric properties of the LEC-5, but the measure is nearly identical to the original LEC, and that version had high internal consistency and test-retest reliability [44]. The

traumatic event identified at the initial assessment is recorded and used for all subsequent administrations of the CAPS-5.

2.5.2. Assessment of psychiatric comorbidity—The Structured Clinical Interview for DSM-IV (SCID; [41]) is administered during the initial assessment session to assess for psychiatric comorbidity. The SCID is a clinician-administered interview with each symptom coded as present, not present, or probable, based on structured questions that map onto the DSM-IV [1] criteria. With the exception of the PTSD module, assessors administer the entire SCID for Axis I disorders. In addition to assessing exclusion criteria, this measure provides additional information on participant characteristics. The SCID for DSM-5 [2] was not available at the start of recruitment for the current study, thus the version for DMS-IV is being used.

2.5.3. Treatment process measures—Several treatment process measures are included in the study to be examined in an exploratory fashion. These measures will be used to generate hypotheses about the impact of therapeutic processes on outcome.

The Treatment Expectancy Questionnaire (TEQ) is a widely-used measure of treatment credibility [4]. This measure is administered at the conclusion of the first treatment session (after the treatment rationale and specific procedures are explained). The TEQ asks the individual to rate on a 10-point scale how logical the treatment seems, the participant's confidence in undergoing the treatment and recommending it to others, and their expectations for the treatment's success. We anticipate treatment expectancy to be high for both treatment conditions but expectancy ratings may moderate treatment outcome in general.

The Client Satisfaction Questionnaire [23], a measure of participant satisfaction with treatment, is administered at the last treatment session. This 8-item measure assesses satisfaction with treatment and has demonstrated concurrent validity. We expect client satisfaction ratings to be high for both conditions but treatment satisfaction ratings may moderate treatment outcome for both treatments.

The Working Alliance Inventory – short form (WAI-SF; [18]), is a 12-item self-report measure of therapeutic alliance. The WAI-SF consists of three subscales: Goals, which reflects the agreement between therapist and patient on overall goals of treatment; Tasks, which reflects the agreement on the appropriate tasks on which to focus (to achieve goals); and Bond, the quality of the affective relationship between the therapist and the patient. Both the therapist (therapist version) and the participant (client version) complete the WAI-SF at the conclusion of treatment. In the event that a participant drops out of treatment prematurely, the WAI-SF is completed at the time of dropout. Although WET is a much shorter treatment, we expect client and therapist alliance ratings to be equally high for WET and CPT. Alliance ratings will be investigated as a potential moderator of treatment outcome.

The Wechsler Test of Adult Reading (WTAR; [46]) is a brief reading test used to estimate intellectual functioning. Respondents are asked to read 50 words aloud. The total number of

words pronounced correctly is summed to a total score. A standard score is then calculated and used to estimate verbal IQ (VIQ), performance IQ (PIQ), and full scale IQ (FSIQ). The WTAR was co-normed using the Wechsler Adult Intelligence Scale, third edition (WAIS-III) and the Wechsler Memory Scale, third edition (WMS-III). The WTAR estimated FSIQ has been strongly correlated with WAIS-III FSIQ scores among a variety of samples [46]. The WTAR is included in the current study to investigate whether VIQ moderates treatment outcome for either treatment condition.

2.6. Treatment conditions

2.6.1. Written Exposure Therapy (WET)—The WET protocol was developed over the course of a systematic series of studies investigating the use of expressive writing for the treatment of PTSD [35,37–40]. WET consists of five weekly treatment sessions, with the first session lasting one hour and each subsequent session lasting approximately 40 min. In the first session, the therapist educates the participant about common reactions to trauma and provides the rationale for WET as a treatment for PTSD. The participant is then given general instructions for completing the trauma narratives, specific instructions for completing the first session, and then completes the first (30 min) writing session. Participants are instructed to write about the same trauma during each session. This event is the same event identified as the index trauma during the baseline assessment session. The importance of delving into their deepest emotions surrounding the traumatic event is emphasized, as well as the importance of providing detailed information about the event. All WET sessions begin with the therapist reading the specific writing instructions for that session and then leaving the instructions with the participant, while the 30 min writing session is completed alone. After 30 min has elapsed, the therapist re-enters the room and asks the participant to stop writing. The therapist then checks in with the participant regarding how the writing session went. The discussion of the participant's reaction to the writing session is kept brief (i.e., less than 10 min).

Writing instructions begin with a focus on describing the details of the trauma and emotions and thoughts that occurred during the traumatic event and then change over the 5 sessions to focus more on the meaning of the trauma event (e.g., what the event has meant to the person, how it has changed the way they view his or her life). No between session homework assignments are included in the WET protocol. Following each session, the therapist reads the written narrative to make sure the participant followed the writing instructions. At the start of subsequent writing sessions, the therapist provides feedback to the participant regarding how well they followed the instructions. For example, the therapist might inform the participant that he followed directions in terms of providing details about the trauma exposure but should provide more information about the types of cognitions he had during the exposure during the next writing session.

The assumed mechanism of action for WET is exposure [37]. Evidence for this mechanism comes from several prior studies, which showed that, over the course of writing about a traumatic experience, individuals initially experience an activation of their fear response, which subsequently extinguishes with repeated writing (exposures). Moreover, these studies showed that this initial activation of fear and subsequent fear extinction is associated with

PTSD symptom reduction [35,38,48]. Although exposure is assumed to be the primary mechanism of action of WET, there may be other explanations of how WET reduces symptoms, including cognitive restructuring [37]. More work is needed to further explore each of these proposed mechanisms of WET [36].

2.6.2. Cognitive Processing Therapy (CPT)—CPT consists of 12, 60 min weekly sessions that primarily focuses on challenging and changing distorted beliefs and self-blame regarding the traumatic event through Socratic questioning [29]. In addition, several writing assignments are included in the treatment. Specifically, after the first session, participants are asked to write an essay about why they think the index event occurred and how the traumatic event has impacted their lives. The impact statement is again assigned at session 11 and compared with the one written at the beginning of treatment to see how it changed. Between sessions 3 and 5, participants are instructed to write two, detailed accounts of the trauma event as homework assignments, to read it every day and to bring in these written accounts to be read out loud to the therapist during the next session. The rest of the therapy consists of sequential cognitive therapy practice assignments to teach the client to examine and modify their thoughts about their traumatic events and the consequences.

These written accounts differ from the narrative writing in WET in several ways. First and foremost, they are conducted outside the therapy session, as homework assignment. Second, the specific instructions given in CPT and WET for the writing exercises are very different, with more specific instructions provided in WET. Third, whereas CPT only requires two written accounts, WET requires five. Finally, the CPT protocol requires that the client reads their narratives back to the therapist; in the WET protocol, the client is never asked to read his or her written account to the therapist.

The primary proposed underlying mechanism of CPT is cognitive restructuring [6]. However, there has been some suggestion that exposure may also be an underlying mechanism given the inclusion of the trauma narratives [33]. Nonetheless, there is limited investigation of the underlying mechanisms of CPT.

Because there is more than one evidence-based treatment for PTSD (e.g., [22]), there were several options for the comparison condition to include in this study. CPT was selected because of its use of writing about the trauma during the treatment and because at the start of the current study the developer of CPT (PAR) was located at the same site as the lead investigator of this study (DMS), which facilitated study collaboration.

2.6.3. Training, supervision, and adherence of study therapists—All study therapists hold either a masters or doctoral degree in psychology and have at least one year experience in treating PTSD patients. Therapists are counterbalanced across the two treatment conditions for several reasons. First, we have no reason to suspect that study therapists will have particular enthusiasm for either treatment, as therapists were not involved in the development of this project. Second, the interaction with the therapist is minimal in WET given that therapists are not in the room for the majority of the sessions. Thus, the risk of mixing elements across treatments is very low. Third, although we anticipate that therapists will be equivalent with respect to skill level in both cognitive and

exposure-based therapies, counterbalancing of therapists ensures that any potential differences in therapists are removed.

Given the nature of the two treatment conditions in this study, the amount of training and supervision required for each treatment differs substantially. For CPT, a two-day workshop is completed by all therapists. For WET, a one-hour training session is required. Following completion of the initial training, therapists receive supervision or case consultation from one of the authors who has extensive experience with the respective treatment protocol (first author for supervision of WET and CPT (supervisor of record) and third author for consultation regarding CPT). For WET, supervision consists of weekly meetings for the first two participants treated and then on an as needed basis thereafter. Case consultation for CPT consists of 1 h weekly group telephone meetings. All treatment sessions are audio-recorded and available for supervision or consultation.

Treatment fidelity is assessed by two individuals who are otherwise unaffiliated with the study. These two individuals were selected based on their familiarity with either the WET or the CPT protocol. For each treatment condition, 20% of the treatment sessions are randomly selected, reviewed, and rated, using the adherence and competence forms developed for each of the treatment conditions.

2.7. Safety protocol

To optimize participant safety, we do not include participants with high suicidal risk or substantial cognitive impairment. Suicidal risk is determined with the administration of the Mini International Neuropsychiatric Interview (MINI; [24,32]) suicide module. Individuals are excluded from enrolling in the trial if they score 17 or higher (i.e., high risk) on the MINI at the initial assessment.

The Mini-Mental State Examination, 2nd edition, Brief Version (MMSE-2:BV; [13]) is used as a brief screen for cognitive impairment. The MMSE is a clinician-administered measure consisting of registration, orientation, and recall tasks. Age- and education-based *t*-scores are calculated from the measure raw score. Performance on the MMSE-2 in combination with clinical judgment is used to assess cognitive impairment.

To monitor suicide risk during the treatment, the BDI-II [3] is administered at each treatment session. The MINI suicidal module is administered if a participant endorses suicidal ideation at any level in response to item 9 on the BDI-II (suicidal thoughts or wishes). The MINI suicide module also is administered to each participant during each follow-up assessment session for continued monitoring of suicidal risk.

The PTSD Checklist for DSM-5 (PCL-5; [45]) is administered at the beginning of every treatment session to monitor potential worsening of symptoms. Worsening of symptoms is defined by an increase from the initial assessment of at least 10 points that is sustained for at least three consecutive treatment sessions [12]. The PCL-5 is completed in reference to the identified criterion A event established at the baseline assessment. If substantial worsening of symptoms occurs, the therapist talks with the participant about the possible reasons for symptom increase and whether study withdrawal, with appropriate referrals, is appropriate.

Lastly, adverse events are assessed at each assessment visit by inquiring whether any major change in mental or physical health has occurred since the participant's previous visit and whether any hospitalizations have occurred since last visit. All adverse events are reported within 48 business hours to the local IRB as well as to the Data Monitoring Committee that meets on a quarterly basis to monitor safety of participants enrolled in the study.

2.8. Strategies to minimize attrition

Several procedures are used to minimize study attrition. First, the project coordinator conducts the initial assessment to determine eligibility in order to form rapport with the participant, should they enroll in the study. Next, the project coordinator regularly checks in with the participant between scheduled assessment sessions to make sure any change in contact information (e.g., phone numbers, home address) is appropriately documented. Next, at the completion of each assessment session, the participant is provided with an appointment card that indicates the tentative date and time of the next scheduled assessment appointment. These appointments are important in the event that project staff is unable to contact the participant to schedule the next assessment session (e.g., in the event that the participant moves). Finally, 1 month prior to a scheduled assessment session, a letter is sent to the participant reminding them of their upcoming appointment and requesting that they contact the project coordinator if they need to reschedule their appointment. The project coordinator also calls the participant to confirm their appointment approximately 2 weeks before the scheduled assessment appointment, as well as the day before the scheduled session.

During the treatment phase, the study therapist follows up by phone with participants who canceled or did not attend a scheduled session. For participants who do not contact the therapist for more than 1 week or who cancel several consecutive treatment sessions, the project coordinator assumes the responsibility of contacting the participant to inquire about the reason for the lack of attendance. Every effort is made to bring the participant back to the treatment sessions. These collective strategies have been very effective in resulting in high retention rate in prior treatment studies (e.g., [37]).

2.9. Data analytic strategy

2.9.1. General—The equivalence of the treatment conditions will be assessed according to key baseline variables (demographics and psychological variables) using *t*-tests, nonparametric equivalence, or Chi-square tests, depending on the type (continuous or dichotomous) and distribution (normal or non-normal) of the data. Any variables that differ among groups will be used as covariates in the final analyses.

2.9.2. Non-inferiority analysis—To test the hypothesis that WET is non-inferior to CPT, analyses will be conducted using the intent to treat (ITT) sample. The ITT sample will consist of participants who are randomized and complete at least one treatment session.

The second aim of the study is to examine whether treatment dropout rates are significantly lower in the WET condition relative to CPT. Treatment dropout is defined as dropping out of treatment before completion of the protocol. However, because we are interested in dropout

related to tolerability of the treatment, participants will not be included as a dropout if they report that they dropped out of treatment before completion because they felt they achieved treatment gain (e.g., participant dropped out at session 10 of CPT because they felt they achieved treatment benefits and no additional sessions were deemed necessary). To test the hypothesis that WET will have significantly fewer treatment dropouts we will conduct both survival and logistic regression analyses. The regression model can incorporate predictors (covariate main effects) of dropout, model the timing of attrition, and explore interactions to supplement the survival analysis.

2.9.3. Power analysis to determine sample size—A power analysis was conducted with the focus being the primary study aim to test non-inferiority based on the CAPS PTSD symptom severity. Following the practice of Schnurr et al. [31]) and Monson (described in [16]), an outcome difference of 10 points or more on the CAPS total severity score was chosen as the “non-inferiority margin.” Differences smaller than 10 points would be considered clinically insignificant, so non-inferiority will be declared if the upper bound of the 95% one-sided confidence limit of the difference between group means is less than 10. Schnurr et al. reported the standard deviation of the CAPS to be 20, so this represents a standardized mean difference in Cohen [8]) of $d = 0.50$, a conventional medium effect.

Sample size was determined using the appropriate module for non-inferiority tests in the NCSS/PASS power software [19]. Specifications were a 10 point non-inferiority margin, a standard deviation of 20 [31], a true difference between treatment groups of zero, one-sided non-inferiority test at $p = 0.05$, desired power = 0.80 and equal allocation to the two treatment groups. With these specifications, PASS indicated that $N = 50$ per group is required. This number was increased twice, first by 15% to account for unavoidable loss to follow-up, and then by an additional 10% to deal with the as yet unknown psychometric properties of the CAPS-5. This is the basis for proposed recruitment of 126 participants. The sample size is consistent with other previously conducted PTSD non-inferiority trials (e.g., [25,26]).

3. Discussion

WET is a viable alternative treatment that would address the time constraint barrier currently cited by both patients and mental health providers [5,10,47]. If our findings provide empirical support for a brief, easily implemented PTSD treatment with similar outcomes as CPT, but with significantly fewer dropouts, then our study may have profound implications for the many millions of worldwide trauma survivors in need of treatment for their resulting PTSD, but who are either unwilling or unable to receive it. Also, our study is unique among the prior non-inferiority PTSD treatment trials. Specifically, prior non-inferiority trials only have examined whether the same treatment protocol (e.g., CPT) is equally efficacious when delivered in person versus remote video conferencing [25,26]. Very few non-inferiority PTSD studies have examined whether two treatments with very different doses are non-inferior. One recent study did compare whether 60 min of PE was equally efficacious as the standard 90 min session [27], although the total number of sessions was the same. Although WET is expected to be as efficacious as CPT, findings may instead show that that WET is inferior to CPT. If this finding is observed, the degree to which WET is inferior will need to

be considered, given the differences between the two treatments in terms of dose. Indeed, a cost effectiveness analysis may be informative regardless of whether or not WET produces similar outcomes as CPT. A cost effectiveness analysis would take into account the amount of time required for each treatment for both participants and therapists. For instance, the number of treatment sessions differs for the two treatment conditions but there is also homework included in CPT but not for WET. For study therapist, time would include training and supervision for each treatment condition, along with time in session and time needed to prepare for each session.

In addition to considering non-inferiority and cost effectiveness, differences in treatment dropout will also be investigated. Based on prior findings (e.g., [17,37]), we expect to find significantly lower treatment dropout rates in the WET condition relative to CPT. PTSD treatment dropout remains a substantial problem for trauma-focused treatments, such as CPT and PE [17,21], with approximately one-third of participants dropping out of treatment prematurely. Recent findings indicate that the longer duration of treatment associated with PE and CPT is not the cause for the premature dropout because the majority of individuals dropout early in the course of trauma-focused treatment (e.g., [17]). Consequently, it is unclear why dropout rates would be substantially lower in WET. One possibility is that the exposure work is solely conducted within the treatment sessions rather than assigned to be conducted outside of sessions. It's also possible that having exposure begin in the first treatment session might be advantageous in terms of eliminating anticipatory anxiety about future exposure-related work. Lastly, participants may feel a greater sense of control over the trauma exposures, given that they are left alone to complete the trauma writing and not asked to read the narrative out loud to the therapist when they are finished. As such, they may feel less shame or be less concerned about the reactions or judgments of others (e.g., the therapist) to their experiences and/or reactions to it. The current study will not be able to determine the reason for dropout differences between treatments, but rather whether such differences occur. Future studies will need to address this important topic.

In addition to investigating treatment outcomes, we will examine whether there are treatment process differences between the two conditions. Based on prior findings, we anticipate that the two treatments will not differ in terms of treatment expectancy and client satisfaction ratings, as well as therapeutic bond. Treatment expectancy and client satisfaction ratings for WET have been very high (e.g., [37]). Moreover, despite the minimal contact time with therapists, both therapists and patients report high levels of therapeutic bond.

It should be noted that PE and CPT protocols were designed based on the number of treatment sessions (and duration of session) assumed to be necessary. However, recent research investigating PE indicates that a 60-min PE session is as efficacious as a 90-min PE session [42], and a brief version of PE (i.e., 4, 30-min sessions) delivered in a primary care setting has also been found to be efficacious [7]. Moreover, recent evidence indicates that a variable length CPT protocol may provide the most flexibility given that the majority of patients did not require a full 12 sessions of CPT to achieve good end state [14]. Continued investigation of the minimum dose needed to achieve clinically meaningful treatment reductions is important to advance our knowledge of treatments and provide the most

efficient treatment approaches. Moreover, the increased focus on underlying mechanisms of effective PTSD treatments will further enhance treatment efficacy and effectiveness.

Although the WET protocol appears to be easily disseminated, efficacy studies to date have only included study therapists who have at least a master's level degree in clinical psychology. This type of design feature is appropriate given the current state of empirical support for WET. However, future work should examine the extent to which WET can be administered successfully by clinicians with different levels of training or experience. Additional information regarding the factors that may influence WET outcomes would be gained through these and other implementation studies. It would also be important for WET efficacy and effectiveness studies to be conducted by investigators other than those who developed the treatment in order to show that WET can result in similar outcomes with other investigators.

In summary, the findings of the non-inferiority trial described here have the potential to substantially advance both our understanding and practice of evidence-based PTSD treatments. The notion that efficacious PTSD treatment can be obtained with just a handful of sessions is perhaps surprising to some. However, there is a growing line of work challenging our assumptions regarding what is necessary and sufficient for the successful treatment of PTSD.

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Fig. 1.
Planned participant flow.

Table 1

Inclusion and exclusion criteria and rationale.

Inclusion criteria	Rationale
Current PTSD diagnosis	Population under study
Stable medication dose for at least 4 weeks	Treatment confound
Exclusion criteria	Rationale
Current substance dependence diagnosis	Human subjects concern
Current psychotic disorder	Human subjects concern
Current unstable bipolar disorder	Human subjects concern
Currently in psychosocial treatment for PTSD	Treatment confound
Significant cognitive impairment	Human subjects concern
Suicidal risk	Human subjects concern

Table 2

Schedule of assessment measures.

Measure	Pre-Tx	1st session	Every Tx session	Last session	6-week	12-week	24-week	36-week	60-week
CAPS-5	X				X	X	X	X	X
SCID	X				X	X	X	X	X
MINI – suicide module	X				X	X	X	X	X
WTAR	X								
MMSE	X								
TLEQ	X								
PCL-5	X		X		X	X	X	X	X
BDI-II	X		X		X	X	X	X	X
TEQ		X							
CSQ									
WAI-SF									

Note. BDI-II = Beck Depression Inventory, 2nd edition; CAPS-5 = Clinician Administered PTSD Scale for DSM-5; TEQ = Credibility Expectancy Questionnaire; CSQ = Client Satisfaction Questionnaire; MINI = Mini International Neuropsychiatric Interview, suicidal risk module; MMSE = Mini Mental Status Exam; PCL-5 = PTSD Checklist for DSM-5; SCID = Structured Clinical Interview for DSM-IV; TLEQ = Traumatic Life Events Questionnaire; WAI-SF = Working Alliance Inventory, short-form; WTAR = Wechsler Test of Adult Reading.