

University of Nevada, Reno

**Evaluating the Feasibility and Acceptability of Written Exposure Therapy  
Delivered Via Telehealth for the Treatment of Post-Traumatic Stress Disorder**

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requirements for the degree of Doctor of Philosophy in  
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## Abstract

Evaluating evidence-based treatments for PTSD and their appropriateness for telehealth delivery is crucial for providing access to quality care during the COVID-19 pandemic. Brief treatments, that require fewer resources, less clinical training and supervision, and are more efficient for clinicians and clients remain largely untested for alternative modes of treatment delivery. WET, a brief written intervention for the treatment of PTSD, has demonstrated success in the treatment of a variety of traumatized populations. However, there is a dearth of literature regarding the provision of WET via telehealth. In order to address this gap in the literature, an exploratory study of WET delivered via telehealth was conducted to examine the preliminary efficacy, feasibility, and participant acceptability of the intervention. Fifteen participants were enrolled in the intervention, with ten participants completing treatment as intended, and five participants experiencing clinically significant improvements in PTSD symptoms. Our data suggests that the intervention was viewed as acceptable by participants and moderately feasible to implement, albeit with a number of considerations for refinement in areas of treatment recruitment, retention, data collection. Qualitative data highlighted common issues experienced with the written and telehealth aspects of the intervention that can be used to refine this intervention for future research. We argue that future research in this area is warranted given the potential for reducing accessibility barriers to clinical service delivery for trauma-exposed populations.

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## **Chapter 1: Introduction**

Post-Traumatic Stress Disorder (PTSD) is a trauma and stressor-related disorder that manifests shortly after exposure to a traumatic event (American Psychological Association [APA], 2013). While most people are resilient in the wake of a traumatic event, a substantial number of people go on to develop PTSD (Benjet et al., 2016; Koenen et al., 2017). Unfortunately, PTSD is a debilitating disorder (Kessler et al., 2014), associated with high rates of comorbidity that leads to impairment in several important domains including health, social, and occupational functioning (Angelakis & Nixon, 2015; Campbell et al., 2007; Galatzer-Levy et al., 2013; Rojas et al., 2013; Spinhoven et al., 2014; Tripp et al., 2019).

### **Evidence-based Treatments for PTSD**

Two dominant psychological theories explain the development and maintenance of PTSD: emotional processing theory (EPT; Foa & Kozak, 1986) and fear inhibition learning (Craske et al., 2008; Craske et al., 2014). EPT describes the development and maintenance of pathological fear, which ultimately gives rise to psychopathology such as PTSD (Foa & Kozak, 1986; Foa & Rothbaum, 1998), while fear inhibition learning emphasizes different aspects of learning and memory as central factors underlying change in exposure-based therapies (Craske et al., 2008).

Given the serious impairment associated with PTSD, research has focused on the development and evaluation of treatments for PTSD. Exposure-based therapies are well-documented to be efficacious treatments for PTSD. One treatment, Prolonged Exposure Therapy (PE; Foa et al., 2007; Karlin et al., 2010; Powers et al., 2010; Regehr et al., 2013) is a nine-to-fifteen-week individual treatment, that is traditionally delivered in

person, and that involves psychoeducation, exposure, breathing retraining, and homework practice assignments. PE is currently listed on the APA's list of "strongly recommended" treatments for PTSD (Division 12 of the APA, 2016). Researchers have also adapted PE to a written (and briefer) form: Written Exposure Therapy (WET). This second treatment, WET, is a five-session, individual treatment, that is traditionally delivered in-person, and that consists of psychoeducation and exposure (Sloan & Marx, 2017). WET is also considered to be an evidence-based treatment for PTSD (Sloan & Marx, 2017).

### **Limitations of Exposure-based Treatments**

Exposure therapies are not accessible or effective for everyone. A minority of individuals do not respond to this treatment and continue to experience symptoms, many individuals drop out prematurely, and some individuals fail to engage in treatment at all due to a host of barriers (Gutner, 2016; Imel et al., 2013; Tripp et al., 2019). Empirical investigations have demonstrated several barriers that impact the success of exposure therapies, including client factors (i.e., low socioeconomic status, low educational levels, living in rural areas, and stigma; Sloan et al., 2011), logistical factors (i.e., cost, transportation, and work interference with treatment; Najavitz, 2015), and clinician or clinical site factors (i.e., inadequate training or supervision, concerns regarding safety and efficacy, unavailability of staff and appointments, and problems regarding treatment length, resources and cost; Foa et al., 2013; Sloan et al., 2011)

### **Advancements in Treatment: Written Exposure Therapy**

Written Exposure Therapy (WET) was developed specifically to address existing barriers and criticisms of exposure-based treatments for PTSD. This treatment ameliorates several difficulties observed in dissemination and implementation efforts of

PE (i.e., low engagement, high attrition, barriers to implementation) by capitalizing on the efficacious components of existing exposure-based treatments (e.g., exposure and cognitive processing/restructuring) while bolstering the efficiency of treatment delivery and increasing patient satisfaction (Sloan & Marx, 2019). Indeed, pilot and efficacy studies have indicated that WET produces long-term reductions in PTSD symptomology, fewer treatment dropouts, and high rates of patient satisfaction with the treatment (Sloan et al., 2013; Sloan et al., 2012). Although WET appears to be an excellent alternative to existing exposure-based treatments, the COVID-19 pandemic has presented new challenges to accessibility that have impacted the delivery of this treatment and require additional research efforts to address.

### **Advancements in Treatment: Telehealth**

The provision of services via home-based telehealth (HBT) (i.e., behavioral health services delivered via telephone or video teleconferencing software at the provider and the client's home; Moring et al., 2020) is one promising solution to overcoming existing and now amplified barriers to care. Since HBT can occur in any location where the patient has 1) access to the internet and 2) a confidential space for the session, HBT reduces many of the barriers of in-person services as it increases accessibility by moving these services online (Acierno et al., 2016). Existing studies have also shown that HBT delivered exposure-based services are non-inferior to in-person delivered exposure-based services and is an effective modality by which to deliver services to harder to reach populations (Wells et al., 2020).

### **COVID-19 and the State of Evidence-based Treatment**

According to Moring et al. (2020), “the adoption of home-based telehealth care, is perhaps, the most substantial adaptation of mental health services during this crisis... telehealth has become ‘a vital and necessary tool’ in the wake of physical distancing guidelines”. While existing studies have shown that HBT delivered exposure-based services are non-inferior to in-person delivered exposure-based services, there is a dearth of literature regarding the provision of WET via HBT. A close examination of WET studies revealed no methodologies that included telehealth as a mode of delivery and Sloan and Marx (2018) have argued that WET does not easily lend itself to telehealth, despite no available published research, stating, “we have not had good success in trying to implement the treatment in this manner [via telehealth]. Specifically, we have found that people drop out of the treatment at fairly high rates and are reluctant to engage in the narrative writing when outside of the clinic.” Finally, only one study has been identified that delivered a related brief written exposure-based intervention via telehealth (i.e., Possemato et al., 2018 conducted a study evaluating a 1-session written emotional disclosure [WED] intervention via telehealth). Thus, the extent to WET can be delivered to people who cannot access traditional in-person treatment due to COVID-19 restrictions remains unknown.

### **Rationale and Current Study**

Although PE and WET have strong empirical support as a treatment for PTSD, they each suffer from pitfalls (i.e., low engagement and high drop-out rates for PE; limitations for populations that cannot access traditional in-person sessions for WET). Given the COVID-19 pandemic, investigations of alternative modes of treatment delivery are necessary and vital. Thus, the current study aims to capitalize on the benefits of both

treatments and address their limitations in terms of accessibility by delivering the WET protocol via telehealth.

### **Methodology**

The primary aims of the current study were to assess the feasibility and acceptability of a brief PTSD treatment, (e.g., WET), developed to increase engagement and access to PTSD treatment options for individuals that are socially disadvantaged, delivered via telehealth. There were five main objectives to be answered by the current study:

Objective 1: Determine the feasibility and suitability of recruitment.

Objective 2: Determine the feasibility and suitability of eligibility criteria.

Objective 3: Determine the feasibility and suitability of the data collection procedures.

Objective 4: Determine the acceptability of the intervention.

Objective 5: Determine if the intervention shows promise of success with the intended population.

### **Study Design and Procedures**

The current study was a pretest-posttest design feasibility study. Participants were recruited through the THRIVE Center and La Clínica V.I.V.A. clinics both of which serve clients that experience barriers due to social disadvantage. Interested community members were screened for eligibility during an initial intake. Based on sample sizes of similar studies, our goal was to recruit 16 participants. Participants completed measures related to psychopathology, emotional responding, satisfaction and acceptability during pretest, intervention, and posttest time periods. Analyses of data included descriptive

statistics, qualitative thematic coding, correlations, and t-tests to answer the primary research objectives.

## Chapter 2: Literature Review

### Post-Traumatic Stress Disorder (PTSD)

Post-Traumatic Stress Disorder (PTSD) is a trauma and stressor-related disorder that manifests shortly after exposure to a traumatic event (American Psychological Association [APA], 2013). In order for a person to meet criteria for PTSD, they must experience a Criterion A traumatic event, fulfill the minimum symptom requirements (i.e., Criteria B-E), have experienced symptomology for at least one month, endorse clinically significant distress or impairment across important domains of functioning, and their symptomology should not be better explained by the effects of a substance or another medical condition (APA, 2013).

According to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed., DSM-5; APA, 2013), a Criterion A event can include exposure to a traumatic event via 1) direct exposure, 2) witnessing death or serious injury, 3) learning about a traumatic event that occurred to a close family member or friend, or 4) repeated or extreme exposure to traumatic details: APA, 2013). Then, after exposure, the person displays a number of symptoms that cause distress or impairment in social, occupational, or other areas of functioning. *Intrusive symptoms*, classified under Criterion B, can include experiences of memories, dreams, nightmares, flashbacks about the traumatic event, distress and/or physiological reactions to internal or external trauma reminders (APA, 2013). A person must endorse at least one symptom to fulfill Criterion B. *Avoidant symptoms*, classified under Criterion C, can include the person avoiding memories, thoughts or feelings, and/or avoiding external trauma reminders that may invoke distressing memories, thoughts, or feelings about the trauma (APA, 2013). A person can endorse one or both symptoms to

fulfill Criterion C. *Negative alterations in cognitions or mood*, classified under Criterion D, can include an inability to remember some aspects of the traumatic event, negative beliefs or expectations about oneself, the world, or others, distorted cognitions about the event, negative emotional states and an inability to experience positive emotions, diminished interest in activities, and/or feelings of detachment from others (APA, 2013). A person must endorse at least two symptoms to fulfill Criterion D. *Alterations in arousal and reactivity*, classified under Criterion E, can include irritable behavior and angry outbursts, reckless or self-destructive behavior, hypervigilance, exaggerated startle response, problems with concentration, and/or sleep disturbances (APA, 2013). A person must endorse at least two symptoms to fulfill Criterion E. The DSM-5 also allows for further specification if a person displays dissociative, depersonalization, or derealization symptoms or if there is delayed expression of symptoms.

### **Epidemiology of PTSD**

Trauma exposure is common across the globe and while most people are resilient in the wake of a traumatic event, a substantial number of people go on to develop PTSD (Benjet et al., 2016; Koenen et al., 2017). A review of World Mental Health (WMH) surveys (Koenen et al., 2017) demonstrated prevalence rates vary widely across countries, albeit high income countries were reported to have higher lifetime, 12-month, and 30-day prevalence rates of PTSD (e.g., 6.9%; 3.6%; 1.9% respectively) than middle income (e.g., 3.9%; 1.6%; 0.7% respectively) or low-income countries (e.g., 3.0%; 1.5%; 0.6% respectively). In the United States, the lifetime prevalence rate of PTSD among trauma exposed individuals was reported to be 8.3%, the 12-month prevalence rate was 4.3%, and the 30-day prevalence rate was 2.1% (Koenen et al., 2017). This is significant

because a lifetime prevalence rate of 8.3% demonstrates that the proportion of individuals in the United States that develop PTSD is quite high (i.e., the prevalence rate equates to approximately 3.8 million individuals impacted by PTSD; United States Census Bureau, 2019) and the 12-month prevalence rate of 4.3% demonstrates that approximately half of all lifetime cases of PTSD are persistent cases of PTSD in the United States.

### ***Populations impacted by PTSD***

Criterion A allows for a wide range of events to be classified as traumatic. As such, the types of individuals who can be diagnosed with PTSD is quite large. To date, research that has examined PTSD among different populations (i.e., in terms of reviews of prevalence rates, development, maintenance, and treatment of PTSD) has included military members (LeardMann et al., 2008; Kuester et al., 2017; Magruder & Yeager, 2009; Middleton & Craig, 2012; Ramsawh et al., 2014), first responders (Bromet et al., 2016; Haugen et al., 2012; Komarovskaya et al., 2014), victims of crime or violence (e.g., including childhood abuse or neglect, interpersonal violence, sexual violence, and workplace violence; Alisic et al., 2015; Arroy et al., 2017; Elklit & Christiansen, 2010; Furuta et al., 2016; Lanctot & Guay, 2014; McTavish et al., 2019), those involved in motor vehicle collisions (Beck & Coffey, 2007; Sloan et al., 2012), individuals with traumatic injury or those diagnosed with a serious, chronic, or life-threatening illness (Hesdorffer et al., 2009; Molina et al., 2018; Schwartzman et al., 2016), victims of natural disasters (Beaglehole et al., 2018; Rataj et al., 2016; Tang et al., 2017) victims of terrorism (Lowell et al., 2018), refugee or immigrant populations (Betancourt et al., 2017; Chu et al., 2013), and forensic populations (Baranyi et al., 2017; Guston et al., 2019; Wolff et al., 2014).

Researchers have also explored sociodemographic factors as they relate to PTSD. Existing studies have indicated that the highest risk for the development of PTSD is associated with several sociodemographic factors, many of which are related to social disadvantage (Koenen et al., 2017). For instance, Brewin et al. (2000) reported that those that are younger, less educated, more impoverished, and that have a smaller social support network are at an increased risk to develop and receive a diagnosis of PTSD. Other studies have reported female gender, ethnic minority status, a history of prior mental health problems, being unemployed, being unmarried, and increased life stress after exposure to the trauma to be important predictors in the development of PTSD (Kessler et al., 2014; Koenen et al., 2017; Robert et al., 2011; Tolin & Foa, 2006). Finally, a substantial body of literature has demonstrated that following sexual assault or interpersonal violence, women are at an elevated risk for developing PTSD (Brown et al., 2015).

### **Sequelae of PTSD**

Despite impacting a minority of the population, PTSD is a debilitating disorder (Kessler et al., 2014), associated with high rates of comorbidity including co-occurring substance use disorders, depressive disorders, and anxiety disorders (Angelakis & Nixon, 2015; Campbell et al., 2007; Galatzer-Levy et al., 2013; Rojas et al., 2013; Spinhoven et al., 2014; Tripp et al., 2019). PTSD leads to impairment in several domains including health, social, and occupational functioning. Studies have reported high rates of health problems, including chronic illness and pain, cardiovascular disease, and diabetes (Gilsanz et al., 2017; Lucev et al., 2017; Sareen et al., 2007; Sumner et al., 2016) and suicidal or self-injurious behaviors (Rojas et al., 2013) among those diagnosed with

PTSD. Additionally, Sherbourne and colleagues (2010) found that those diagnosed with PTSD more poorly evaluated their mobility, self-care, ability to engage in usual activities, and level of pain and discomfort, which indicated a low perceived quality of life (i.e., those diagnosed with PTSD scored more poorly on four out of five functioning and disability measures than individuals diagnosed with other anxiety disorders in this study; Sherbourne et al., 2010).

### **Evidence-based Treatments for PTSD**

#### ***Prolonged Exposure Therapy***

Given the serious impairment associated with PTSD, a substantial area of research has focused on the development and evaluation of treatments for PTSD. One treatment, Prolonged Exposure therapy (PE), has received considerable attention since its inception (Foa et al., 2007). PE is well-documented to be an efficacious treatment for PTSD (Karlin et al., 2010; Powers et al., 2010; Regehr et al., 2013) and it is currently listed on the APA's list of "strongly recommended" effective treatments for PTSD (Division 12 of the APA, 2016). PE is provided in weekly individual sessions (i.e., the original protocol [*Treating Rape Trauma*; Foa & Rothbaum] advised nine to twelve 90-minute sessions, the subsequent protocol [*Prolonged Exposure for PTSD*; Foa et al., 2007] protocol advised ten to fifteen 90-minute sessions) and involves psychoeducation about common reactions to trauma, exposure to trauma reminders (i.e., to memories, feelings, and situations through in vivo and imaginal exposures), and breathing retraining (Foa et al., 2007). Imaginal exposures are conducted in session and recordings of the exposure sessions are assigned as homework. An in vivo fear hierarchy is created in session and in vivo exposures from the hierarchy are assigned as homework. Client progress is

monitored biweekly throughout treatment via self-report measures of PTSD and depression (Foa et al., 2007).

### **Written Exposure Therapy (WET)**

A second treatment, Written Exposure Therapy (WET), is also considered to be an evidence-based treatment for PTSD (Sloan & Marx, 2017). WET is a five session individually administered treatment (Sloan & Marx, 2017). While the first session is approximately one hour, the remaining four sessions last approximately 40 minutes. Session one begins with a rationale for treatment and psychoeducation about common reactions to trauma. All WET sessions include exposure to the trauma memory via written exposures and discussion about the experience of engaging in the narrative writing process (Sloan & Marx, 2017). Each week in session the therapist 1) checks in with the client about their experiences and symptoms since last session, 2) reads the exposure instructions verbatim from the WET manual, 3) obtains a starting Subjective Unit of Distress Scale (SUDS) rating, 4) allows the client 30 minutes to engage in the written exposure, 5) obtains an ending SUDS rating, 6) discusses the client's experience of writing the trauma narrative, and 7) reads the concluding instructions verbatim from the WET manual (Sloan & Marx, 2017). After each exposure session, the therapist is instructed to read the client's narrative in an effort to evaluate the length, level of detail, conformity to session instructions, and any instances of avoidance, as well as to provide feedback to the client in the subsequent session (Sloan & Marx, 2017). While the first two written exposure sessions are used to generate descriptions of the trauma (i.e., adding as much sensory detail as possible, including thoughts, feelings, and so forth), the latter writing sessions are used to describe the impact of the trauma (i.e., how the event has

changed their life, their view of their life, how they relate to others, and so forth). Client progress is monitored throughout treatment via SUDS ratings (Sloan & Marx, 2017).

### **Mechanisms of Change in Treatment**

Two dominant psychological theories that explain the development and maintenance of PTSD (and subsequently explain the mechanisms of change in exposure-based treatments) exist: emotional processing theory (EPT; Foa & Kozak, 1986) and fear inhibition learning (Craske et al., 2008; Craske et al., 2014).

#### ***Foundational framework for Emotional Processing Theory (EPT)***

The theoretical basis for PTSD and its treatment is built upon the framework of two instrumental theories: Mowrer's two-factor theory (1960) and Lang's bioinformation theory of fear (1977;1979). Mowrer's theory describes the acquisition and maintenance of fear, whereas Lang's theory describes the representation of fear in memory. Both theories were reported to be incomplete (Foa & Kozak, 1986); EPT is hypothesized to account specifically for the pathological fear characteristic of PTSD.

**Mowrer's Two-Factor Theory.** According to Mowrer (1960), learning occurs via 1) classical conditioning and 2) operant conditioning. Fear is acquired via classical conditioning (Mowrer, 1960). This occurs when a neutral stimulus (i.e., the conditioned stimulus [CS]), paired with an aversive stimulus (i.e., the unconditioned stimulus [UCS]), elicits a conditioned response (e.g., fear) (Mowrer, 1960). Imagine a scenario in which a person goes on a hike in the woods. During this hike, sitting by a waterfall, the person encounters a bear, feels their heart race, begins to run away, and has thoughts such as "I am going to die" and "this is terrible." In this scenario, the nearby waterfall (CS), because it was paired with the sight of the bear (UCS) could later come to elicit fear (CR). This

process, and related processes of generalization, explain how a myriad of stimuli present during a trauma, including seemingly neutral stimuli, can evoke fear in those with PTSD (Foa & Rothbaum, 1998).

Fear is maintained via operant conditioning (Mowrer, 1960). The guiding principle is that behaviors are more or less likely to occur as a function of their consequences; more specifically during fear, *negative reinforcement* is found to be a powerful reinforcer of avoidant behavior in relation to trauma reminders (Figley, 2012; Foa & Rothbaum, 1998). This is because avoidant behaviors are followed by the removal of aversive stimuli (Figley, 2012). Unfortunately, avoidance only serves to maintain fear because it disrupts a person's ability to recognize that the CS is no longer followed by the UCS (Foa & Rothbaum, 1998). In our earlier example, if the person continued to avoid hiking in wooded areas that contained waterfalls, they would never realize that the waterfall was not going to increase their chance of a bear sighting and that waterfalls are objectively safe. Thus, for those diagnosed with PTSD, Mowrer's two-factor theory (1960) provides the basis for successful treatment to be rooted in behavioral learning processes (e.g., where a decrease in fear and anxiety [CRs] through extinction will only occur when confronted with the CS in the absence of the UCS).

**Lang's Bioinformation Theory of Emotional Imagery.** According to Lang (1977;1979), fear is represented in memory as structures that are comprised of stimulus elements (e.g., information about the feared stimulus), response elements (e.g., information about verbal, physiological, and behavioral responses), and meaning elements. For instance, using our earlier example of the hike in the woods, one fear structure could include "bear" as a stimulus element, heart racing and feet running away

as response elements, and “I am going to die” or “this is terrible” as meaning elements. Then, in the future when a person contacts something in the environment that matches one element of the fear structure (e.g., a bear), the entire structure is activated (Rauch & Foa, 2006). This activation of the entire fear network is considered adaptive in that it can help a person to avoid or escape danger (Lang, 1977, 1979; Rauch & Foa, 2006). Thus, according to Lang’s theory, normal fear occurs when a real threat is perceived in the environment and disappears when the threat is eliminated.

### ***Emotional Processing Theory (EPT)***

However, researchers noticed that only some individuals recovered from a traumatic experience, whereas other individuals continued to experience fear and relived the trauma over and over again (Foa & Rothbaum, 1998). This fear appeared to be pathological as it was 1) disruptively intense, 2) included unrealistic elements, and 3) generated distorted associations and responses between neutral stimuli and escape or avoidance reactions (Foa & Rothbaum, 1998, p. 74). Thus, EPT was developed as a way to describe the development and maintenance of pathological fear, which ultimately gives rise to psychopathologies such as PTSD (Foa & Kozak, 1986; Foa & Rothbaum, 1998).

According to EPT, normal emotional processing is impeded and pathological fear is developed when the traumatic experience violates existing knowledge about the person and their world (e.g., the world is viewed as dangerous and the person is viewed as incompetent), when the trauma memory is formed with a high number of stimulus-danger associations (e.g., several stimuli are erroneously associated with the meaning of danger and fear; many meaning elements contain distorted interpretation, including that anxiety will persist until the person can escape or that the fear itself can cause serious

psychological or physical harm [e.g., beliefs that the person could go crazy or die], or that the consequences of engaging with the fear would be too aversive; Foa & Kozak, 1986), and when post-trauma experiences are interpreted as negative (e.g., interpretations of the sequelae of PTSD after the trauma as dangerous or as evidence of incompetence; Foa & Rothbaum, 1998). Thus, EPT places significant value in the role of pre-trauma schemas about the self and the world, the trauma memory, and post-trauma experiences in the development of pathological fear structures and the maintenance of psychopathology (Foa & Rothbaum, 1998). Furthermore, pathological fear structures are reported to be highly resistant to modification (Foa & Kozak, 1986; Foa & Rothbaum, 1998).

EPT plays a vital role in providing the foundation by which behavioral therapies can modify pathological fear structures. Foa & Kozak (1986) proposed that modification of a fear structure could only occur if 1) the fear structure was activated and 2) information incompatible with aspects of the fear structure is presented. In EPT, the presentation of incompatible yet more reality-based information is hypothesized to replace or compete with pathological elements of the fear structure (Foa & Kozak, 1986; Foa et al., 1996). Thus, during treatment, modification of a fear structure is hypothesized to occur during emotional engagement with trauma-related fear (e.g., activation of the fear structure associated with the trauma memory) and habituation through repeated exposures to trauma reminders (e.g., using in vivo and imaginal exposures). Corrective learning through modification of the fear structure is hypothesized to occur from both within session habituation (e.g., disassociation of stimuli from fear response elements through repeated exposure to physiological and verbal aspects of the trauma reminders in session) and between session habituation (e.g., changes in meaning, probability of harm,

and lessened negativity of the stimuli as a long-term result of within session habituation: Craske et al., 2008; Foa & Kozak, 1986).

### ***Fear Inhibition Learning***

In contrast, fear inhibition learning emphasizes different aspects of learning and memory as central factors underlying change in exposure-based therapies (Craske et al., 2008). Craske and colleagues (2008; 2014) posited that fear elevations and reductions throughout exposure therapy, as put forth by EPT (e.g., the importance of the initial fear activation, within session habituation, and between session habituation as indices of fear learning), are poor indicators of fear learning, are generally unsupported by empirical evidence, and contradict existing memory and extinction research (See Craske et al., 2008, for a review). Instead, Craske et al. (2008; 2014) argued that inhibitory learning better accounts for the changes observed across exposure therapies.

Inhibitory learning involves new learning, where the original CS-US association is left intact and a new secondary association about the CS-US develops (Bouton, 1993). This new learning allows the CS to have two meanings: the original excitatory meaning and the new inhibitory meaning (Craske et al., 2008). In our hiking example, the waterfall (CS) would possess two meanings: danger (CS-UCS; the excitatory meaning), and safety (CS-noUCS; the inhibitory meaning). In inhibitory learning, although fear subsides given multiple presentations of the CS (e.g., waterfall) in the absence of the UCS (e.g., bear), the strength and stability of the fear response is dependent on context and time (Bouton, 1993; Craske et al., 2008). For instance, research has shown the original CS-UCS association can be recovered when testing of the fear response occurs during an exposure in a new context (i.e., renewal). As such, renewal, reinstatement, and spontaneous

recovery of the original fear response are possible and accounted for and provide evidence for the vulnerability of inhibitory learning to context or time (Craske et al., 2008). Inhibitory learning hypothesizes that the toleration of fear, not reduction of fear, should be the primary goal of exposure therapy (Craske et al., 2008). Craske and colleagues argued that a focus on reduction of fear is counter to the literature on emotion regulation and the association with psychopathology (e.g., reliance on suppression or avoidance and the onset of anxiety disorders), whereas toleration of fear is commensurate with current emotion regulation and experimental pharmacological studies (Craske et al., 2008). In exposure-based treatments, inhibitory learning is hypothesized to occur through the repeated imaginal and in vivo exposures, and it's retrieval is dependent on the context and time in which the memories are recalled (Craske et al., 2014).

### **Limitations of Evidence-Based Treatments**

Although PTSD is debilitating and the field has theoretically strong accounts for how fear operates and how exposure therapy can elicit change, the reality is that exposure therapy is not accessible nor effective for everyone. Indeed, many people do not seek treatment for PTSD (Koenen et al., 2017). Of the individuals that do, a substantial minority drop out from treatment prematurely (i.e., within the first four sessions: Gutner, 2016; Imel et al., 2013; Keefe et al., 2017; Tripp et al., 2019). Estimates of drop-out rates in exposure-based treatments range greatly across studies: from 36% to 68% (Imel et al., 2013; Kehle-Forbes et al., 2016; Smith et al., 2019). Research has consistently shown that treatment attrition occurs prior to the individual receiving an adequate dose of treatment (Gutner et al., 2016). For instance, in one study, approximately 16% of individuals who were offered services failed to initiate treatment as evidenced by dropping out of

treatment prior to the first session (Kehle-Forbes et al., 2016) Additionally 38.5% of participants receiving treatment dropped out of treatment early, with the mean number of sessions attended prior to drop out being 4.47 sessions. In Kehle-Forbes and colleagues' study, over 50% of participants failed to receive an adequate dose of therapy. This is problematic given that successful treatment for PTSD requires sustained engagement; the PET manual suggests 10-15 sessions for treatment completion and maximum benefit (Foa et al., 2007).

Interestingly, research has shown that some individuals, who complete a full course of treatment, recover slowly and/or continue to experience PTSD symptoms post-treatment (e.g., treatment non-responders) (Larsen et al., 2016; Resick et al., 2012). Resick and colleagues (2012) reported that approximately 14.3% of participants in their study who received PE continued to meet criteria for PTSD at long-term follow-up. These results are similar to an earlier study by Resick, Nishith, Weaver, Astin, and Feuer (2002), where 20% of participants were determined to be treatment non-responders.

Empirical investigations of evidence-based treatments (EBTs) for PTSD have demonstrated several barriers to treatment that impact treatment success (e.g., in relation to low engagement, attrition, and non-responsiveness to treatment). Client factors, including low socioeconomic status, low educational levels, and living in rural areas are reported to be disadvantageous (Sloan et al., 2011) as they are reported to introduce stigma towards mental health and logistical barriers, such as cost, transportation, and work interference with treatment (Najavitz, 2015). Additionally, client perceptions may impact treatment success (Benuto & Bennett, 2019). Indeed, researchers have reported that PTSD treatment, and in particular imaginal exposures, can be experienced as

burdensome and aversive to clients, which negatively impacts their engagement with the treatment and contributes to treatment drop out (Imel et al., 2013; Najavitz, 2015). Finally, clinician factors are reported to be a barrier to treatment (Najavitz, 2015) and researchers have revealed that despite the demonstrated effectiveness of EBTs, the adoption of these treatments in clinical practice is not universal (Karlin, 2010; Foa et al., 2013). One hypothesis regarding the disuse of EBTs, is that these treatments require substantial training and supervision and that aspects of treatment sites (i.e., availability of staff and appointments, treatment length, resources and cost) can impede adoption and result in unsuccessful implementation (Foa et al., 2013; Sloan et al., 2011). Indeed, exposure based EBTs are generally delivered for 6-15 sessions, last between 50 to 90 minutes per session, and require training and supervision (Sloan & Marx, 2019, See Kazdin, 2010, for a review of the national dissemination and implementation efforts of PE by the Veteran's Administration). Another hypothesis is that clinicians have concerns regarding EBT's safety and efficacy and opt out of implementing the treatment (e.g., that the treatment poses a risk to clients, that their symptoms will get worse and they will drop out; Najavitz, 2015; Zayfert et al., 2005). Thus, although there are EBTs for PTSD, several barriers to treatment exist and impact treatment success.

### **Advancements in Treatment: Written Exposure Therapy**

Developed in response to several criticisms of existing EBTs, Written Exposure Therapy (WET), was hypothesized to bolster the efficiency of treatment delivery and increase patient satisfaction (Sloan & Marx, 2019). During the development of WET, the efficacious components of existing treatments (e.g., exposure and cognitive processing/restructuring) recommended by both the Department of Veterans Affairs and

Department of Defense and the American Psychological Association (Sloan & Marx, 2017) and the extensive evidence base for different psychological outcomes associated with Written Emotion Disclosure (WED; Pennebaker, 1997) (for a review see Frattaroli, 2006) were considered. Additionally, the difficulties observed in dissemination and implementation efforts (e.g., low engagement, high attrition, barriers to implementation) were acknowledged.

Stemming from the foundation of Pennebaker and Beall's (1986) written disclosure procedure and other narrative writing techniques (for a review see Frattaroli, 2006), Sloan and Marx conducted a series of studies to adapt, examine, and refine written exposure as a treatment for individuals diagnosed with PTSD (Sloan & Marx, 2017). Their studies demonstrated that written exposure had an impact on PTSD symptomology and that it produced changes in fewer sessions than originally hypothesized was necessary given extinction learning (Sloan & Marx, 2004). Their studies (Epstein et al., 2005; Sloan & Epstein, 2005; Sloan et al., 2005; Sloan et al., 2011; Sloan et al., 2008) also underscored the importance of writing about the same traumatic event across treatment sessions, having instructions that emphasized emotional expression and encouraged a distance perspective, and incorporating psychoeducation and treatment rationale components into treatment.

### ***Efficacy studies of WET***

The empirical basis for WET as an efficacious treatment for PTSD is nascent, but strong. Pilot studies have examined the WET protocol with motor vehicle accident survivors (Sloan et al., 2012) and veterans with PTSD (Sloan et al., 2013). Results from these pilot studies have indicated that WET produces long-term reductions in PTSD

symptomology, few treatment dropouts, and high rates of patient satisfaction with the treatment (Sloan et al., 2013; Sloan et al., 2012). Across these studies, treatment gains in improvement in PTSD symptoms maintained at 24 to 30-week follow-ups, fewer than 10% of participants dropped out of treatment, and participant satisfaction, as measured by the Treatment Expectancy Questionnaire (TEQ) and Client Satisfaction Questionnaire (CSQ-8), indicated WET to be rated as very credible and to be perceived as highly tolerable (Sloan et al., 2012; Sloan et al., 2013).

Additionally, there is one study that has compared WET with a first-line treatment for PTSD, cognitive processing therapy (CPT), in a randomized controlled trial (Sloan et al., 2016; Sloan, et al., 2018). Results revealed WET to be as effective as CPT in reducing PTSD symptomology (Sloan et al., 2018). Furthermore, there was no difference in the percentage of participants that met criteria for PTSD at any assessment time point between WET or CPT conditions (Sloan et al., 2018). Finally, there was no difference in participant satisfaction between the WET or CPT conditions (Sloan et al., 2018). Thus, efficacy studies have determined WET, a considerably shorter treatment, to be noninferior to existing treatments for PTSD and to be an efficacious and efficient way to treat PTSD. Although WET appears to be an excellent alternative to existing exposure-based treatments, the Coronavirus disease 2019 (COVID-19) pandemic has changed the operations of many behavioral health services and has negatively impacted the availability and accessibility of traditional in-person behavioral health service delivery (Moring et al., 2020).

### **Advancements in Treatment: Telehealth**

The provision of services via home-based telehealth (HBT) (i.e., behavioral health services delivered via telephone or video teleconferencing software at the provider and the client's home; Moring et al., 2020) is one promising solution to overcoming existing barriers to care that are now amplified due to COVID-19. Since HBT can occur in any location where the patient has 1) access to the internet and 2) a confidential space for the session, HBT reduces many of the barriers of in-person services as it increases accessibility by moving these services online (Acierno et al., 2016).

Existing studies have also shown that telehealth delivered exposure-based services are non-inferior to in-person delivered exposure-based services. In a randomized controlled trial of PE delivered via home-based telehealth as compared to in-person delivery of the intervention, Acierno and colleagues (2016) found HBT to be “as good” to in person treatment in terms of reduction of PCL-5 scores and these clinically significant improvements were observed to be maintained at post-treatment, 3 months, and 6-month follow-up. These results were further supported by a randomized clinical trial of PE. Indeed, Morland et al. (2019) reported that the clinical effectiveness of P was not affected by treatment modality. Finally, in a broader overview of existing studies conducted to make considerations during COVID-19, Wells, and colleagues (2020) argued that telehealth services can be used to effectively deliver evidence-based interventions to patients. Thus, there is evidence that HBT of some evidence-based trauma-focused services is non-inferior to in-person delivered services and is an effective modality by which to deliver services to harder to reach populations.

### **COVID-19 and the State of Evidence-based Treatment**

According to Moring et al. (2020), “the adoption of home-based telehealth care, is perhaps, the most substantial adaptation of mental health services during this crisis... telehealth has become ‘a vital and necessary tool’ in the wake of physical distancing guidelines”. COVID-19 has challenged traditional in-person behavioral health service delivery and providers have had to quickly adapt their services to meet the needs of their clients, ensure continuity of care, and maintain client safety (Moring et al., 2020; Sansom-Daly et al., 2020). The offering of remote services online has quickly become a dominant mode of delivery (Payne et al., 2020) and researchers have argued that telehealth services can now be leveraged for use with patients who might not have otherwise enrolled in in-person services (Boykin et al., 2019).

While existing studies have shown that some HBT delivered exposure-based services are non-inferior to in-person delivered exposure-based services, there is a dearth of literature regarding the provision of WET via HBT. A close examination of WET studies revealed no methodologies that included telehealth as a mode of delivery. Additionally, Sloan and Marx (2018) have argued that WET does not easily lend itself to telehealth, despite no available published research, stating, “we have not had good success in trying to implement the treatment in this manner [via telehealth]. Specifically, we have found that people drop out of the treatment at fairly high rates and are reluctant to engage in the narrative writing when outside of the clinic”.

Finally, an extensive review of the literature identified one completed study and one study in-progress that has examined HBT delivered exposure-based written interventions. First, Possemato and colleagues (2018) evaluated the delivery of Written Emotional Disclosure (WED), a written intervention that consists of three 20-minute

writing sessions, among 31 combat veterans diagnosed with PTSD. Although results suggested that approximately half of the participants experienced decreases in PTSD that were maintained at the three-month follow-up, these differences were not statistically different from the control group. Importantly, Possemato et al. (2018) made two suggestions for future intervention research that are directly addressed by the existing WET protocol: to increase the number of writing sessions to five sessions and to encourage the therapist to provide feedback about the writing sessions to promote cognitive and emotional processing and remind participants of session instructions. Second, McClean and colleagues (2020) published an article describing their data collection for a randomized controlled trial that will be comparing the efficacy and efficiency of WET versus imaginal exposure for PTSD among 300 veterans. While their data collection is currently underway, their study methodology included several modifications that deviate from the original WET protocol: the intervention is between 4 and 8 sessions online two times a week as opposed to 5 sessions one time a week, they utilize a peer support specialist instead of a mental health professional, and the peer support specialist is automated and accessed via chat boxes as opposed to a live mental health professional accessed in face to face interactions. Thus, the extent to which WET can be delivered to people who cannot access traditional in-person treatment due to COVID-19 restrictions remains unknown. This represents a substantial concern given that individuals at the highest risk for the development of PTSD (i.e., younger, less educated, more impoverished and of ethnic minority status; Brewin, 2000; Kessler et al., 2014; Koenen et al., 2017; Roberts et al., 2011; Tolin & Foa, 2006) also have a reduced ability to access traditional in-person services due to social disadvantage.

## **Rationale and Current Study**

Although PE and WET have strong empirical support as a treatment for PTSD, they each suffer from pitfalls (i.e., low engagement and high drop-out rates for PE; limitations for populations that cannot access traditional in-person sessions for WET; lack of evidence base regarding HBT delivery). Due to the COVID-19 pandemic, investigations of alternative modes of treatment delivery are necessary and vital. WET has predominantly been delivered in an in-person format, but the COVID-19 pandemic has disrupted and shifted the mode of delivery of services to telehealth, a mode of delivery largely unexplored with brief exposure-based interventions. Thus, the current study aims to deliver the WET protocol via HBT. This would effectively capitalize on the benefits WET (i.e., a shorter and less arduous intervention), while adapting to the challenges associated with COVID-19 by delivering services in a modality that is well-documented to reduce barriers to care. This would be an interesting future direction for PTSD treatment research because the evidence-base for the provision of exposure-based therapies via telehealth is strong but using the WET protocol could bolster treatment outcomes in several ways. First, due to the brevity of the intervention (i.e., 5 sessions) and the lack of homework assignments, the proposed intervention could increase treatment engagement, reduce burden and avoidance, and limit treatment drop-out. Next, the delivery of services remotely online could alleviate problems for clients who previously could not access or afford to attend in-person sessions due to practical or logistical barriers. It may also be that aversion and stigma of services could be reduced for clients who previously viewed treatment-seeking in-person to be uncomfortable, unsafe, or unacceptable. Therefore, the proposed intervention, delivering the WET

protocol via telehealth, is a potentially viable option for individuals diagnosed with PTSD who may experience barriers in accessing or engaging with existing PTSD treatment.

### Chapter 3: Methodology

The primary aims of the study were to assess the feasibility and acceptability of the WET protocol delivered via telehealth. More specifically, the study aimed to examine the recruitment capability and resulting sample characteristics of the intervention, evaluate the data collection procedures and outcome measures, and evaluate the acceptability of the intervention. The results of this study can then be used in the future to inform the design of a larger study of WET delivered via telehealth to assess efficacy and effectiveness. The study had five primary research objectives guided by Orsmond and Cohn's (2015) objectives and guiding questions for feasibility studies:

Objective 1: Determine the feasibility and suitability of recruitment.

- 1a. What are the recruitment rates?
- 1b. How long did it take to recruit the specified number of participants into the study?
- 1c. What are the refusal rates for participation?

Objective 2: Determine the feasibility and suitability of eligibility criteria.

- 2a. What are the obstacles to recruitment?
- 2b. What are the reasons for ineligibility?

Objective 3: Determine the feasibility and suitability of data collection.

- 3a. Do participants respond with missing or unusable data?
- 3b. Do the participants have the capacity to complete the data collection procedures (without accommodations)?
- 3c. Does the overall data collection plan involve a reasonable amount of time or does it create a burden for the participants?

Objective 4: Determine the acceptability of the intervention.

- 4a. What is the participant and clinician perception of the therapeutic alliance?
- 4b. To what extent is the intervention acceptable and appealing to participants?
- 4c. How satisfied are participants with the intervention?
- 4d. What are the retention rates as the participants move through the study and intervention?

Objective 5: Determine if the intervention shows promise of being successful with the intended population.

5a. Does examination of data suggest that the intervention is likely to be successful?

5b. Are the changes of the outcome variable(s) in the expected direction?

5c. Do participants provide qualitative feedback that the intervention was helpful or that it will be successful?

### **Study Design**

The current study design was a pretest-posttest feasibility study. Feasibility studies are the initial phase of intervention development (Gitlin, 2013; Orsmond & Cohn, 2015) and they focus narrowly on process-oriented variables to answer, “can it work”? (Orsmond & Cohn, 2015). In the feasibility phase, pre-post study designs are useful; they help define and refine the intervention in terms of dose, intensity, and treatment elements (Gitlin, 2013). The quasi-experimental one-group pretest-posttest design is a valuable design at the pre-experimental stage (Dimitrov & Rumrill, 2003) and although more susceptible to threats of internal validity (e.g., including history, maturation, selection, testing effects, and regression towards the mean: Dimitrov & Rumrill, 2003; Cherulnik, 2001), is a desirable design for examining feasibility and acceptability rather than for examining outcome (Orsmond & Cohn, 2015). See table 1 for the study design notation.

**Table 1**

*Study methodology*

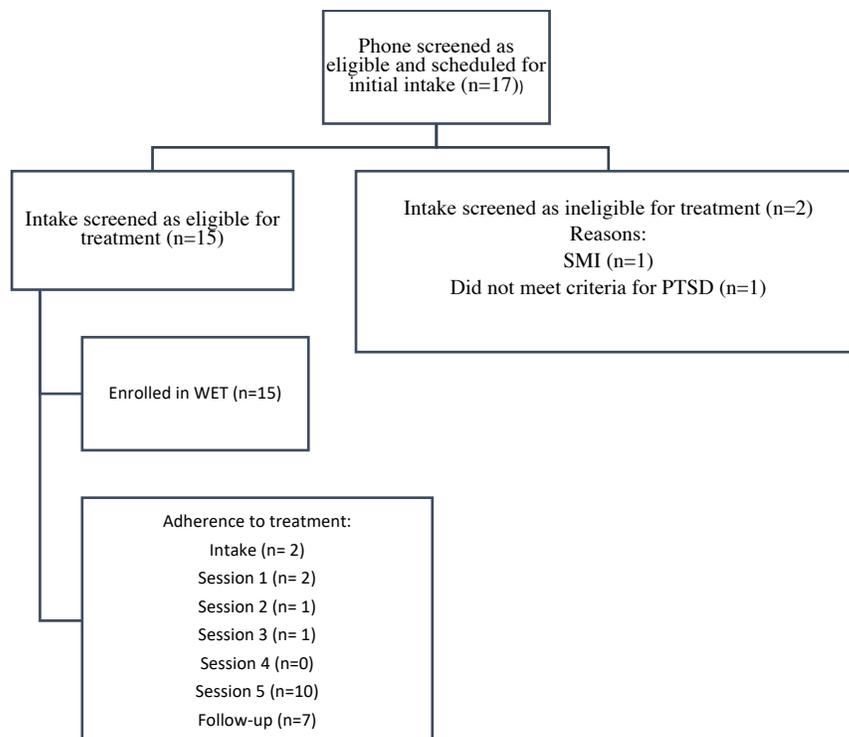
quasi-experimental one-group pretest-posttest design	O <sub>1</sub> X O <sub>2</sub>
---------------------------------------------------------	---------------------------------

\*O<sub>1</sub>= observation 1(pre-test); X= Intervention; O<sub>2</sub>= observation 2 (Posttest)

### **Participants**

Fifteen participants were recruited into the study from August 2020 to March 2021 through the DICE Center at the University of Nevada, Reno. Inclusion criteria were

that the participant: 1) be over 18 years of age, and 2) screen positive for PTSD symptoms as measured by the PCL-5. Exclusion criteria were that the participant was 1) under 18 years of age, 2) actively suicidal or homicidal, or 3) qualified for a Serious Mental Illness (SMI) diagnosis. Participants were compensated \$10 for completion of the study. See Figure 1 for a recruitment flowchart.



*Figure 1: Study Recruitment Flowchart*

Participants ranged in age from 18 to 59 ( $M = 39.52$ ,  $SD = 13.57$ ), were primarily female (73.3%), Latinx (93.3%), had limited English-language proficiency (60%), were U.S. citizens (60%), and had a high school education or less (80% had a high school education or less). All participants enrolled in the study were diagnosed with PTSD ( $n = 15$ ). Comorbid diagnoses were present among four participants with two participants having two co-morbid conditions (e.g., major depressive disorder [ $n = 2$ ], generalized anxiety disorder [ $n = 2$ ], social anxiety [ $n = 1$ ]). Over 40% of the sample endorsed

exposure to more than one traumatic event. While all fifteen participants experienced interpersonal violence, the type of exposure to interpersonal trauma was varied and included physical assault (n = 2), sexual assault (n = 5), armed robbery (n = 2), exposure to extreme human suffering of a family member (n = 2), stalking (n = 1), and violence in the context of an intimate partner relationship, such as emotional, sexual, physical, and psychological abuse (n = 7). In addition, one participant endorsed that they also experienced a transportation accident aside from interpersonal violence. Full participant characteristics can be found in Table 2.

**Table 2**  
*Participant Characteristics*

	Total Sample		Treatment Completer		Drop-out	
	N (N = 15)	%	n (n = 10)	%	n (n = 5)	%
<b>Sex</b>						
Male	4	26.7%	2	20.0%	2	40.0%
Female	11	73.3%	8	80.0%	3	60.0%
<b>Age</b>						
18-25	5	33.3%	3	30.0%	2	40.0%
26-35	1	6.7%	1	10.0%	0	0.0%
36-45	1	6.7%	0	10.0%	1	20.0%
46-60	8	53.3%	6	60.0%	2	40.0%
<b>Ethnicity</b>						
White	1	6.7%	0	0.0%	1	20.0%
Latinx	14	93.3%	10	100%	4	80.0%
<b>Income</b>						
\$0 - \$10,000	6	40.0%	5	50.0%	1	20.0%
\$10,500 - \$30,000	6	40.0%	3	30.0%	3	60.0%
\$30,5000 - \$50,000	3	20.0%	2	20.0%	1	20.0%
<b>Education</b>						
Elementary school	2	13.3%	2	20.0%	0	0.0%
Middle school	2	13.3%	2	20.0%	0	0.0%
High school	8	53.3%	5	50.0%	3	60.0%
Some college	1	6.7%	0	0.0%	1	20.0%
College degree	2	13.3%	1	10.0%	1	20.0%

<b>LEP*</b>						
Yes	9	60.0%	6	60.0%	3	60.0%
No	6	40.0%	4	40.0%	2	40.0%
<b>Immigrant</b>						
Undocumented	6	40.0%	5	50.0%	1	20.0%
Citizen	9	60.0%	5	50.0%	4	80.0%
<b>Sexual Orientation</b>						
Heterosexual	14	93.3%	9	90.0%	5	100%
LGBTQ	1	6.7%	1	10.0%	0	0.0%
<b>Comorbidity</b>						
One diagnosis (PTSD)	11	73.3%	7	70.0%	4	80.0%
Two diagnoses	2	13.3%	2	20.0%	0	0.0%
Three diagnoses	2	13.3%	1	10.0%	1	20.0%
<b>Trauma Exposure</b>						
One traumatic event	9	60.0%	6	60.0%	3	60.0%
Two traumatic events	4	26.7%	2	20.0%	2	40.0%
Three traumatic events	2	13.3%	2	20.0%	0	0.0%

*Note. Limited English Language Proficient (LEP).*

### ***Procedure: Screening and Recruitment***

Participants were invited to participate in the study and were scheduled for an appointment with a clinician when they called the DICE Center at the University of Nevada, Reno and were determined to have a trauma history and some post-trauma symptoms. All appointments were scheduled to occur online via telehealth utilizing Zoom videoconferencing software and all assessment measures were hosted and completed online via Qualtrics. During the initial appointment, participants were screened by a clinician to determine if they met eligibility criteria. This screening included obtaining a comprehensive psychosocial history, including a detailed trauma history (i.e., experience of a Criterion A event) and having the participant complete

symptomology measures. If the participant was screened into the study, they were asked to digitally sign the informed consent for the study and were scheduled to begin treatment within one week of their initial appointment.

A number of assessment measures were given during the study and measures varied depending on the phase of the study (see Table 3 for a schedule of assessment measures). For the initial telehealth appointment (pre-treatment), participants filled out measures related to determining a PTSD diagnosis. Then, for the next five consecutive weeks, participants completed the five sessions of the intervention by following the WET protocol and filled out measures to obtain subjective ratings of their emotional responding during the exposure (i.e., emotional valence and physiological arousal). Finally, one week from the delivery of the final treatment session, participants completed post-treatment assessment measures, including a measure to determine residual PTSD symptomology, indices of satisfaction, and a semi-structured interview to gauge their acceptability of the treatment.

**Table 3**  
*Schedule of assessment measures*

Measure*	Pre-tx	Every Tx session	Post-tx
PCL-5	x		x
SAM		x	
TEQ	x		
CSQ-8			x
WAI-SF's			x
Acceptability interview			x

Note. Post-traumatic stress disorder checklist for DSM-5 (PCL-5); Self-Assessment Manikin (SAM); Treatment Expectancy Questionnaire (TEQ); Client Satisfaction Questionnaire (CSQ-8); Working Alliance Short Form-Client version/Therapist version.

## Measures

### ***Demographic Questions***

Information was collected prior to treatment regarding the participant's age, ethnicity, education, sexual orientation, income, immigration status, and English language proficiency.

### ***Psychopathology***

**The PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013).** The PCL-5 measures the presence of PTSD symptomology by asking participants to rate how much they have been bothered by each of the 20 DSM-5 symptoms of PTSD in the last month. Higher scores indicate higher severity of PTSD symptoms. The PCL-5 has demonstrated sound psychometric properties. Evaluations indicated strong internal consistency ( $\alpha = .94$ ), test-retest reliability ( $r = .82$ ), and convergent ( $r_s = .74$  to  $.85$ ) and discriminant validity ( $r_s = .31$  to  $.60$ ; Blevins et al., 2015).

### ***Emotional responding***

**The Self-Assessment Manikin (SAM; Bradley & Lang, 1994).** The SAM is a pictorial measure used to obtain participants' ratings of emotional valence and arousal in response to each session using a 5-point Likert-type scale. The SAM is a valid indicator of emotional responding (Lang et al., 1993).

### ***Acceptability and satisfaction***

**The Treatment Expectancy Questionnaire (TEQ; Borkovec & Nau, 1972).** The TEQ is a 6-item measure that obtains participant ratings of expectancy for improvement and credibility of the treatment on a 9-point Likert style scale. Ratings range from "1" indicating no expectancy or credibility, to "9" indicating very strong expectancy or credibility. The "set 1" questions, or the first four questions, are aimed at determining

treatment credibility. The “set 2” questions, or last two questions of the measure, are aimed at determining treatment expectancies. Evaluations of the psychometrics properties of the TEQ indicated high internal consistency (i.e.,  $\alpha$  between 0.84 and 0.85) and good test-retest reliability (i.e., between .75 and .82 for each factor) (Devilley & Borkovec, 2000).

**The Client Satisfaction Questionnaire (CSQ-8; Larsen et al., 1979).** The CSQ-8 is an 8-item measure used to examine satisfaction with the treatment. Participants rate their satisfaction with the treatment on 4-point Likert style scales, and higher scores indicate higher levels of satisfaction. Psychometric properties of the CSQ-8 indicate high internal consistency (i.e.,  $\alpha$  between 0.92 and 0.93) (Attkisson, & Zwick, 1982; Larsen et al., 1979).

**The Working Alliance Inventory-Short Form (WAI-SF; Hatcher & Gillapsy, 2004).** The WAI-SF is a 12-item self-report measure of the therapeutic alliance to be completed by both the client and the therapist. The WAI-SF contains 3 subscales (e.g., goals, tasks, and bond) and ratings indicate agreement between the therapist and client in relation to the tasks and goals of treatment and the quality of the relationship across treatment.

#### ***Post-test acceptability interview***

The post-test acceptability interview is a six-question semi-structured interview aimed to determine participant acceptability of the treatment protocol. Questions were generated based on those asked within existing acceptability studies of various PTSD treatments (Ashwick et al., 2019; Kehle-Forbes et al., 2014). Participants were asked the following questions:

1. What were some of the positives of the treatment?
2. What were some of the negatives of the treatment?
3. What are your thoughts about the telehealth aspect of the treatment?
4. What are your thoughts about the written aspect of treatment?
5. Did you experience any barriers to telehealth treatment? That is, did anything prevent you from accessing, engaging, or otherwise completing treatment as intended?
6. Would you refer your family or friends to receive this telehealth treatment if they had experienced a trauma? Why or why not?

Exploratory prompts were used throughout (e.g., “can you tell me more about that?”) and several probing questions were utilized to reframe the questions in a different way. For example, for question one, the following questions were utilized as probing questions to reframe the question: What, if anything, did you like about the treatment? What, if anything, did you think was helpful about the treatment? What, if any positive changes did you see in yourself as a result of the treatment?

### **Data Analysis Plan**

To investigate the five objectives of the proposed intervention, mixed methods were used to analyze the data. Quantitative data analyses were performed utilizing the Statistical Package for Social Sciences (SPSS) version 20. Assumptions of normality and homogeneity of variance were confirmed via a visual inspection of boxplots and the results of Shapiro-Wilk and Levene’s tests. Descriptive statistics (i.e., frequencies, means, and standard deviations) were performed for all relevant demographic variables and outcome variables. An independent samples t-test was employed to examine any

differences in pre-treatment scores on the PCL-5 between participants who completed the treatment and participants who dropped out of treatment. Then, a paired samples t-test was employed to examine differences from pre-treatment to post-treatment on the PCL-5 and to describe any statistically significant change in symptomology due to the intervention. Finally, Pearson's correlations were conducted to examine any relationship between treatment expectancy scores and PCL-5 post-treatment scores, and a paired samples t-test was employed to examine differences between participant and client ratings in relation to the quality of the relationship across treatment.

Qualitative data analyses were performed utilizing Saldana's (2013; 2015) qualitative thematic analyses. Two independent raters analyzed the qualitative interview data of participant's ratings of acceptability of and satisfaction with the treatment. First cycle and second cycle coding methods were employed. First cycle methods (i.e., initial coding) allowed the raters to read the interview transcripts line-by-line and generate descriptive "first-impression" codes that summarized the primary topic areas discussed. Second cycle methods (pattern coding and focused coding) identified repetitive concepts across participant responses and refined and refigured the "gist" codes to summarize the "essence" of the datum.

## Chapter 4: Results

### **Feasibility**

The first three objectives of the current study involved determining the feasibility and suitability of key aspects of treatment delivery, including factors related to recruitment and retention. This involved an examination of recruitment and refusal rates, eligibility and ineligibility reasoning, retention throughout the treatment process, and any reported problems or modifications required to successfully collect data as intended for the treatment protocol.

### ***Recruitment***

Overall, fifteen participants met eligibility criteria and were enrolled in the study. Participants were recruited between August 2020 to March 2021, with the majority of participants recruited in the first five months (i.e., 14 out of 15 participants were recruited by December 2020). Although recruitment occurred at a slower rate than was originally anticipated, the COVID-19 pandemic is hypothesized to be one potential barrier to recruitment efforts. Importantly, the eligibility criteria appeared to be appropriate as only two individuals were deemed ineligible for the study during the recruitment period due to serious mental illness ( $n = 1$ ) or failure to endorse significant post-trauma symptoms ( $n = 1$ ). Additionally, all potential participants that screened eligible for the study over the phone and were scheduled for an initial intake agreed to participate in the study (i.e., zero participants refused participation).

### ***Clinic Procedure***

Standard clinic procedures dictated that all potential clients calling the DICE Center were screened for psychiatric symptoms and then assigned to a clinician to

conduct a comprehensive intake to establish diagnoses and develop a treatment plan. Only clients with an established PTSD diagnosis were referred to treatment via WET and were included in the current study. All providers (N = 5) were pre-doctoral clinicians with between two and seven years of supervised clinical experience. Clinicians were supervised by the Director of the Dice Center and attended weekly Zoom supervision meetings which included opportunities to review video-taped sessions of the treatment and discuss challenges or barriers to treatment success, including adherence to treatment protocol.

### ***Retention***

Five participants (33.3%) left treatment prior to the completion of the treatment protocol and ten participants (66.7%) completed treatment (i.e., one individual completed treatment early by attending three sessions and achieving symptom reduction). Of the participants that left the study, three participants dropped out due to scheduling or availability difficulties and two were referred to different care (i.e., Cognitive Processing Therapy, Prolonged Exposure Therapy) within our clinic due to concerns regarding their need for a higher level of care. Additionally, the number of sessions attended by treatment non-completers ranged from zero to two sessions (M = 0.80, SD = 0.84); the number of treatment sessions that treatment non-completers missed, either due to cancellation or rescheduling, ranged from zero to two sessions (M = 1.20; SD = 0.84). Conversely, the number of treatment sessions missed by treatment completers ranged from zero to four sessions (M = 1.20; SD = 1.14).

### ***Data Collection Efforts***

Overall, the data collection efforts employed within the current study were successful; data that is considered “missing” occurred consistent with the participant’s treatment status and would be expected to be missing. For example, participants who dropped out of treatment prior to completion of the protocol are missing post-treatment symptom severity scores. Additionally, all data was entered into Qualtrics with little to no difficulty (i.e., few entry errors or reported problems with uploading or saving content) and there were no remarks from clinicians that the data collection efforts extended the length of therapy sessions or generated any other burden during the session. Finally, the only accommodation that was reported to be used to help participants complete data collection included reading the items on measures out loud.

### **Acceptability**

The fourth objective of the study involved determining participant acceptability of the intervention. Acceptability was measured in several ways including treatment expectancy, treatment satisfaction, perception of the working alliance, and via semi-structured interview to determine positive and negative aspects of the treatment, including any barriers to attend or participate in treatment.

### ***Treatment Expectancy***

The Treatment Expectancy Questionnaire (TEQ) was completed by participants prior to the start of treatment to determine 1) their perceived credibility of the intervention (i.e., how much they *think* the intervention is logical) and 2) their expectancy of improvements due to the intervention (i.e., how much they *actually feel* that the intervention will improve their condition). Means and standard deviations can be found in Table 4 and suggested that participant’s credibility scores were relatively similar to their

expectancy scores, albeit expectancy scores were slightly higher. Participants endorsed that they *think* the treatment is highly credible and that they logically believed they could achieve an improvement in their symptoms. In a similar vein, participants endorsed that they *actually felt* that the treatment is credible and expected to achieve an improvement in their symptoms.

**Table 4**

*Treatment Expectancy Questionnaire (TEQ) Descriptive Statistics*

	n	M	SD
TEQ credibility score	13	7.26	0.99
TEQ expectancy score	13	7.46	1.20

Note. TEQ credibility and expectancy scores are calculated on a 9-point Likert-style scale. Credibility scores range from 0 “not at all logical” to 9 “very logical”. Expectancy scores range from 0 “not at all” to 9 “very much”.

**Satisfaction**

Participant acceptability of the intervention was also examined via a satisfaction index. The Client Satisfaction Questionnaire (CSQ-8) was completed by participants at the end of their treatment to determine their level of satisfaction with the care they received. Total scores ranged from 24 to 32 with an average score of 29.00 (SD = 2.67). See Table 6 for item-level descriptive statistics; scores are based on a 4 point-Likert style scale, with higher scores indicating more satisfaction. The average scores indicated that participants endorsed a high level of satisfaction with the treatment, including that they endorsed the services they received as high quality, helpful, and recommendable to family and friends.

**Table 5**

*Client Satisfaction Questionnaire (CSQ-8) Descriptive Statistics*

	n	M	SD
1. How would you rate the quality of service you received?	8	3.63	0.51

2. Did you get the kind of service you wanted?	8	3.50	0.53
3. To what extent has our program met your needs?	8	3.50	0.53
4. If a friend were in need of similar help, would you recommend our program to him/her?	8	3.89	0.35
5. How satisfied are you with the amount of help you received?	8	3.63	0.74
6. Have the services you received helped you to deal more effectively with your problems?	8	3.63	0.50
7. In an overall, general sense, how satisfied are you with the service you received?	8	3.89	0.33
8. If you were to seek help again, would you come back to our program?	8	3.75	0.46

*Note.* Total scores range from 0 to 32, with higher scores indicating higher levels of satisfaction. Individual items are rated on a 4-point scale, from 0 to 4, with higher scores indicating higher levels of satisfaction.

### ***Alliance***

Finally, participant acceptability of the intervention was examined via a therapeutic alliance inventory. The means and standard deviations of the total scale score of the Working Alliance Inventory-Short Form-Client Version (see Table 7), demonstrated that both participants ( $M = 41.89$ ) and clinicians ( $M = 37.81$ ) endorsed a strong working alliance between the dyad during the intervention. An examination of the means for the three domain subscales of the client and therapist version of this measure indicated that participants endorsed they had strong bonds with their clinician, were working towards agreed upon and important goals in therapy and were confident that the therapeutic tasks were helpful for resolving their problems.

**Table 6**

*Working Alliance Inventory Short Form (WAI-SF) Descriptive Statistics*

	Participant Ratings			Clinician Ratings		
	n	M	SD	n	M	SD
WAI-SF: Total	8	41.13	5.39	10	37.82	9.47
WAI-SF: Bond	8	17.75	2.92	10	16.90	3.63
WAI-SF: Goal	8	17.13	1.80	10	15.50	3.49

WAIS-SF: Task	8	18.13	2.47	10	16.20	2.66
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Note. Scores on each WAI-SF domain range from 5 to 20, total scores range from 15 to 60, with higher scores indicating better therapeutic alliance. The sample sizes between the participant and clinician categories are dissimilar because two questionnaires were completed by clinicians of participants who refused to participate in the post-treatment assessment session.

## **Preliminary Efficacy**

### ***Quantitative Data***

Although power calculations for sample size and evaluation of outcomes for clinical significance are rarely conducted for initial phase feasibility studies, sub-objectives for the fifth objective of the current study involved determining if expected changes in symptomology were occurring as a result of enrollment in the treatment.

An independent samples t-test was conducted to determine if there were differences in pre-treatment PTSD severity between participants that completed treatment and participants that did not complete. The data was examined and met all assumptions (i.e., there were no outliers as assessed by visual inspection of boxplots, scores on the pre-treatment PCL-5 for each level of treatment status [completer or non-completer] were normally distributed as assessed by Shapiro-Wilk's test [ $p > .05$ ], and there was homogeneity of variances for pre-treatment PCL-5 scores for treatment completers and non-completers as assessed by Levene's test for equality of variances [ $p = .10$ ]). Participants included ten treatment completers and five treatment non-completers; results revealed that pre-treatment PTSD symptoms were more severe for treatment non-completers ( $51.40 \pm 10.52$ ) than treatment completers ( $40.90 \pm 6.29$ ). Mean pre-treatment PTSD symptom severity was 10.50 points higher for treatment non-completers (95% CI,

1.22 to 19.78) than for treatment completers, a statistically significant difference,  $t(13) = 2.444$ ,  $p = .03$ .

Next, a paired samples t-test was conducted to examine changes in PTSD symptom severity from pre-treatment to post-treatment. Among treatment completers, there was a mean reduction of 16.20 points on the PCL-5, a statistically significant difference in symptom severity from pre- to post- treatment (95% CI, 7.29, 25.11,  $t [9] = 4.11$ ,  $p < .01$ ,  $d = 1.30$ , 95% CI, 0.43, 2.14). Means and standard deviations for treatment completers can be found in Table 9.

**Table 7**  
*Pre- and Post- Treatment Scores for Treatment Completers*

	Pre-Treatment Scores				Post-Treatment Scores			
	n	M	SD	Range	n	M	SD	Range
PCL-5	10	40.90	6.29	33-52	10	25.80	15.24	6-53

To further explore clinical significance, change in functioning from pre-treatment to post-treatment was examined by calculating clinically significant change (CSC) and the percentage of participants that had subclinical symptoms of PTSD, as well as identifying participants that achieved high-end state functioning (HESF) at the completion of treatment. CSC was calculated in accordance with Jacobson and Traux (1992); in their formula,  $M_1$  refers to the mean of a normal population and  $M_2$  is the mean of the pretest scores. Psychometric data on the PCL-5 was obtained from a trauma exposed community sample ( $M = 15.42$ ,  $SD = 14.72$ ; Blevins et al., 2015) and used as  $M_1$  in the formula. The CSC cutoff score was determined as follows:

$$CSC \text{ Cutoff} = \frac{M_1 + M_2}{2} \quad PCL - 5 = \frac{15.42 + 43.50}{2} = 29.46$$

Five treatment completers (55.55%) experienced clinically significant change according to calculated cutoff criteria. Identification of treatment response and HESF was informed by the procedure used in Farchione and colleagues (2012) (i.e., albeit their study examined treatment response and HESF regarding anxiety as opposed to PTSD) and calculated via the following specific criteria: 1) endorsed subclinical symptoms of PTSD post-treatment; and 2) achieved a 30% or greater improvement on the PCL-5 post-treatment. Five treatment completers were identified to have subclinical PTSD symptoms (i.e., scores of 33 or lower as per the PCL-5; scores 33 or higher are a cutoff for a provisional diagnosis of PTSD) at the conclusion of treatment indicating treatment response. Finally, a 30% reduction rate of initial PCL-5 scores were calculated for treatment completers ( $M = 12.36$ ;  $SD = 1.95$ ). Five participants experienced at least a 30% reduction in scores on the PCL-5 and two participants still met diagnostic criteria for PTSD at the completion of treatment. It is worth noting that the two participants that completed treatment and still met criteria for PTSD actually achieved slightly worse post-treatment scores on the PCL-5 than their pre-treatment scores but declined additional treatment when they completed WET.

Finally, to determine if habituation or inhibitory learning was occurring related to aspects of the trauma memory (i.e., a decrease in negative emotionality and physiological arousal), participant's subjective reports of emotional valence and arousal during the written exposure were analyzed. Means and standard deviations can be found in Table 10. Results revealed that participant's subjective experience of emotional valence increased from session one to session five (i.e., from an average of 2.10, between "unsatisfied" and "neutral", to an average of 3.67, between "neutral" and "pleased"),

whereas their subjective experience of physiological arousal decreased from session one to session five (i.e., from an average of 3.80, between “neutral” and “wide-awake” to 2.89, to between “neutral” and “dull”). A paired samples t-test was conducted to further examine changes in valence and arousal scores from pre-treatment to post-treatment. The data met all assumptions (i.e., there were no outliers as assessed by visual inspection of boxplots, scores on the SAM were normally distributed as assessed by Shapiro-Wilk's test [ $p > .05$ ]). There was a statistically significant difference between session one and session five in terms of self-reported emotional valence on the SAM (95% CI, -2.23, -0.88,  $t [8] = -3.04$ ,  $p < .001$ ,  $d = 1.07$ , 95% CI, 0.18, 1.81), with participants experiencing a one and a half category positive change in emotional valence (e.g., a change from “unsatisfied” to between “neutral” and “pleased”).

**Table 8**  
*Self-Assessment Manikin (SAM) Valence and Arousal Scores*

	N	M	SD
Valence Session 1	13	2.38	1.19
Valence Session 2	11	2.55	1.29
Valence Session 3	10	3.00	1.15
Valence Session 4	9	3.44	0.88
Valence Session 5	9	3.67	1.00
Arousal Session 1	13	3.85	1.46
Arousal Session 2	11	4.09	1.38
Arousal Session 3	10	3.30	1.06
Arousal Session 4	9	3.33	1.58
Arousal Session 5	9	2.89	1.76

### ***Qualitative Data***

The fifth objective of the study was to determine if the intervention was described by participants as helpful or successful in alleviating their symptoms, which included an examination of participant responses to six semi-structured questions during the post-treatment interview. Eight participants completed the post-treatment semi-structured

interview. Interviews were conducted by a neutral interviewer (i.e., a person not involved in the participants treatment) to ensure that the participant could be open and honest in their responses regarding the treatment. The first two questions were aimed at obtaining broad information regarding the “positive” and “negative” aspects of the therapeutic process; the last four questions were aimed at obtaining information specific to intervention, including the telehealth and written aspects of the treatment.

**Positive and Negative Aspects of Treatment.** Overall, participants reported several broad positive and negative opinions of the services they were provided (See Table 11 for an overview of the thematic analysis). Participants shared that they found the opportunity to discuss the trauma with a mental health professional, as opposed to a friend or family member, as a key positive aspect of the treatment. Participants described that the treatment process allowed them to have a dedicated time and space, where they could “get to the root” of the trauma, and could release any feelings of fear, anxiety, worry, or sadness associated with their trauma memory. In a similar vein, participants reflected that they were able to move beyond the distress of the trauma memory by approaching their emotions as opposed to avoiding them and learning practical skills to control their pain and any associated PTSD symptoms. Several participants described the relationship with their clinician to be of paramount importance to their progress in treatment and described key traits of the clinician that supported their therapeutic growth: patience, active listening, validation, guidance, and professionalism.

Conversely, participants shared that they found the necessity to “face their fear” as stressful and difficult and the primary negative aspect of the treatment. Indeed, several participants described managing reluctance and avoidance during the treatment to be

particularly difficult. Some participants shared that they didn't want to remember "ugly" details of their trauma and found themselves worrying before they started treatment and considering cancelling sessions after they started treatment. One participant described that although the treatment was helpful in many ways, it ultimately didn't change the fact that they experienced the trauma and that they had to live with the consequences of that event. Finally, one participant reported that they felt limited by the singular focus of the treatment. They reported that they experienced multiple traumas and didn't feel that processing only one trauma would lead to post-traumatic growth required to heal from their cumulative trauma exposure.

**Table 9**  
*General Qualitative Results (n=8)*

<b>Positive Aspects of Treatment</b>	<b>%</b>	<b>n</b>
Sharing the trauma with a mental health professional		
- <i>releasing associated distress (i.e., fear, anxiety, worry, tears)</i>	62.5	5
- <i>neutral outlet to re-experience the trauma</i>	25.0	2
- <i>repetition helped with processing trauma experience</i>	25.0	2
- <i>dedicated space and time to heal</i>	25.0	2
- <i>"getting to the root" of the trauma</i>	12.5	1
Moving beyond the distress of the memory		
- <i>recognize, release, and accept emotions rather than avoid</i>	100.0	8
- <i>can "control" the pain/symptoms</i>	25.0	2
- <i>learned practical skills for coping</i>	25.0	2
- <i>reduced other feelings, including suicidality</i>	12.5	1
Desirable qualities of the therapist:		
- <i>has patience</i>	25.0	2
- <i>listens</i>	50.0	4
- <i>high degree of professionalism</i>	12.5	1
- <i>provides validation and normalizes experiences</i>	62.5	5
- <i>provides instructions and feedback</i>	25.0	2
<b>Negative Aspects of Treatment</b>		
Fearing facing the trauma		
- <i>reluctance to start treatment/ leave comfort zone</i>	50.0	4
- <i>remembering trauma details</i>	62.5	5

- <i>felt tension, nervousness, anxiety, or stress during sessions</i>	87.5	7
Strengthened avoidance		
- <i>desire to cancel sessions</i>	25.0	2
- <i>desire to suppress emotions</i>	25.0	2
Doesn't change that the trauma happened	12.5	1
Felt limited by writing about one trauma	12.5	1
Initially felt "worse" after session	12.5	1

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**Perspective of Telehealth Delivery of Services.** Participants reported several specific opinions of receiving trauma-focused services via telehealth (See Table 12 for an overview of the thematic analysis). In particular, participants voiced preferences for service delivery mode, described their level of comfort with technology, and reported details regarding any technological concerns that came up during their treatment.

Interestingly, despite 100% of participants endorsing that telehealth services were similar to services delivered in-person, and over half of the participants endorsing comfort with technology, more than 50% of the participants reported that they would still prefer to receive in-person services if they were offered in the future. Additionally, there were a moderate number of technological problems that participants reported they encountered during treatment, such as problems with cell phone service or wi-fi, that led to poor audio or video quality and negatively impacted their sessions.

**Perspective of the Written Intervention.** Participants reported several specific opinions of participating in the brief written intervention for PTSD (See Table 12 for an overview of the thematic analysis). A common theme about the treatment was that writing was a "process" that became easier and less stressful over time. Indeed, 50% of participants reported that writing about their trauma was initially very stressful but became easier over time and was helpful for them. Participants described that writing

about their trauma forced them to approach their fear, which while stressful, ultimately aided in remembering suppressed or previously forgotten details and allowed them to process their emotions. Despite that participants were told by therapists during written exposure that their grammar, spelling, or handwriting was not important, several participants shared concerns regarding the quality of their writing. Other concerns included managing anxious pressure due to the 30-minute time limit and worrying about taking breaks (i.e., due to hand cramps or moments of intense emotions).

**Table 10**

*Qualitative Results Specific to Treatment Components (n=8)*

<b>Perspectives on Telehealth Delivery</b>	<b>%</b>	<b>n</b>
Increased accessibility to services		
- reduced barriers (i.e., anxiety in waiting room, driving to clinic)	25.0	2
Treatment acceptability		
- was similar to in-person services	100.0	8
- would prefer in-person services	50.0	4
- would prefer telehealth services	25.0	2
Comfort with technology	50.0	4
Technological problems during service delivery		
- problems with cell phone service	25.0	2
- had issues with passwords and logins	12.5	1
- poor wi-fi connection/ poor audio and video quality	25.0	2
- did not experience any problems	62.5	5
Safety during COVID-19	12.5	1
<b>Perspectives on Written Intervention</b>		
Writing was a “process”		
- initially difficult, but easier with time	75.0	6
- “forced” approaching memories	12.5	1
- aided in processing and releasing emotions	50.0	4
- allowed for self-evaluation	12.5	1
- aided in memory	37.5	3
- found writing stressful, but helpful	50.0	4
- can go back to narratives after sessions	12.5	1
Concerns during written exposure		
- worries about grammar and spelling	50.0	4

- <i>worries about handwriting</i>	25.0	2
- <i>felt pressure from time limit</i>	12.5	1
- <i>writing traumatic details required taking breaks</i>	12.5	1
- <i>hand cramps</i>	12.5	1
- <i>difficulties in self-expression: "am I doing this right?"</i>	37.5	3

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## Chapter 5: Discussion

Evaluating evidence-based treatments for PTSD and their appropriateness for telehealth delivery is crucial for providing access to quality care during the COVID-19 pandemic. In-person clinical service delivery has been negatively impacted and existing barriers to care have been amplified due to COVID-19 (Moring et al., 2020). However, brief treatments, that require fewer resources, less clinical training and supervision, and are more efficient for clinicians and clients (Sloan et al., 2018), remain untested for alternative modes of treatment delivery. WET is one such intervention; WET is an effective brief written intervention for the treatment of PTSD, but no studies to date have reported examining WET delivered via telehealth.

The WET protocol was developed in response to criticisms and barriers of existing evidence-based treatments. The success of WET is hypothesized to be due to the inclusion of integral psychoeducation and exposure components of existing exposure-based treatments offered within a truncated protocol package that reduces burden and increases client satisfaction (i.e., reduced number of sessions and exposures, reduced time spent in sessions and exposures, and no homework outside of the session) (Sloan & Marx, 2019). WET allows the client to activate pathological fear structures, provide corrective information, and increase tolerance of fear associated with trauma memories, during each writing session. Given that these different aspects of learning and memory are central factors underlying change in this treatment (Craske et al., 2008; Foa & Kozak, 1986) researchers have argued that efforts to increase engagement with the treatment are needed (Sloan & Marx, 2019). One way to increase engagement is to improve the feasibility and acceptability of WET.

This aim of this study was to evaluate the feasibility and acceptability of WET as delivered via telehealth. Specifically, our objectives were to determine if our recruitment methods were appropriate and if telehealth delivery was feasible to implement and if the treatment was viewed as acceptable to clients. Additionally, we were interested in establishing preliminary treatment response rates and comparing these to existing treatment literature.

### **Recruitment Strategy**

During the initial months of recruitment, we conducted in-person presentations and emailed brochures about our clinic services to a variety of community agencies. We advertised our services to various state offices (i.e., Child and Family Services, District Attorney's office, Department of Health and Human Services, Washoe County Human Services Clinical Services Division), police department victim services units, hospital emergency departments, substance use rehabilitation facilities, domestic violence shelters, court programs (i.e., family law mediation, alternative sentencing programs), child protective services, attorneys, public bulletin boards at Starbucks locations, and counseling, veterans outreach, and student services through the University of Nevada, Reno. We anticipated that our recruitment strategy would generate a broad range of referrals, yet our recruitment strategy did not yield the diverse sample we expected.

### ***Unique Sample Characteristics***

We recruited a primarily Latinx sample who endorsed histories of interpersonal violence (IPV). While it was not our objective to specifically investigate IPV or to focus on a specific cultural group, our treatment site may have lent itself to recruit a specific trauma type and ethnic group. Our site includes two clinics that are specialized in the

treatment of IPV. Additionally, one of the two clinics is dedicated to providing culturally and linguistically sensitive treatment for Latinx community members. Both clinics have been in operation for the last five years and are well-networked in the community, with common referrals often stemming from agencies within these areas of specialization. Thus, although we reached out to a broader range of potential referral sources, many sources did not generate referrals during the recruitment period, and the majority of our sample paralleled our clinic areas of specialization.

It is also noteworthy that the COVID-19 pandemic, which changed the operations of many community agencies, may have obstructed our recruitment efforts. It is possible that changes in hours of operation and availability of staff and services impacted potential referrals. During the recruitment period, our clinic reached out to a number of new community agencies (i.e., veterans services, attorneys, school districts) in which we did not have any prior working relationships. Perhaps these agencies were incapable of building or sustaining new partnerships for referrals during COVID-19, whereas agencies that we had longer-standing partnerships with continued to refer community members to us regardless of COVID-19.

Research has shown that clinical service utilization and research during COVID-19 has been negatively impacted by a number of factors, including people not feeling comfortable with or experiencing challenges with telehealth services, and people facing barriers related to privacy and confidentiality, expressing concerns about safety, or having general difficulty reaching or becoming established with providers (Costa et al., 2021; Sevelius et al., 2020). Given the nature of our recruitment strategy, potential participants needed to connect to and be active with community agencies in order to learn

about (and in some cases utilize) our services. Concerns about safety may have impacted people's decisions to stay connected to these community agencies. Alternatively, community agencies may have become inaccessible due to state mandates and people may have had difficulty reaching or becoming established with their services. As such, future studies may decide to refine the recruitment strategy and investigate whether any changes in strategy leads to more fruitful referrals. In particular, future studies may try to advertise within community locations that provide essential services (i.e., grocery stores, gas stations, pharmacies) as opposed to locations specialized for traumatized populations and may explicitly advertise on written materials the ways in which help will be provided to set up and access telehealth platforms to reduce barriers to access.

### **Sample Generalizability**

Our recruitment sample differed from existing research on WET in terms of the majority representation of participants with a history of IPV- related PTSD and in the inclusion of Latinx individuals. Existing WET research includes participants with a broader range of trauma exposure. Although participants with histories of IPV are included in five WET studies (Sloan et al., 2006; Sloan et al., 2007; Sloan et al., 2008; Sloan et al., 2011; Sloan et al., 2018), they comprise minor percentages of overall samples, with the majority of participants endorsing exposure to motor vehicle accidents, illness or injury, or combat-related trauma. To the best of our knowledge, our study includes the largest number of Latinx individuals treated for PTSD with WET. Indeed, 14 out of 15 of our participants identified as Latinx and endorsed a number of cultural variables that are known peritraumatic risk factors for PTSD, including low socioeconomic status, low educational attainment, undocumented immigration status, and

limited English language proficiency. It is possible that these same sample characteristics impacted their ability to engage in treatment, including their literacy and writing skills. It is well documented that Latinx individuals are significantly impacted by trauma and PTSD (Alcántara et al., 2013; Roberts et al., 2011), and that cultural variables, such as language or immigration status, can play a complicating role in the treatment of PTSD (Benuto & Bennett, 2019; Pittman, 2014), yet there are no studies of WET with culturally and linguistically diverse samples. Indeed, Latinx individuals are underrepresented in WET studies, with inclusion rates ranging from zero to six Latinx participants (i.e.,  $n = 6$  in Sloan et al., 2012) and descriptions of cultural variables, such as immigration status or English language proficiency, are largely missing from reported participant characteristics. Finally, although two clinical case studies exist, both of which specifically describe the treatment of a Latinx individual via WET for PTSD symptoms (Austern et al., 2017; Benuto & Bennett, 2019), generalizability of their results due to the singular sample size is limited.

Given the unique sample characteristics of the current study, including our small sample size and the relative homogeneity of our participant demographic characteristics (i.e., including high proportions of female, Latinx, immigrant, low educational attainment, and limited English language proficient individuals), and specific focus on IPV trauma exposure, it is unknown to what extent our results are generalizable to the larger population of Latinx individuals being treated for PTSD with the WET protocol. Thus, although our study adds to the WET literature, our participant experiences may not be representative of the trauma exposed Latinx population as a whole. As such, it will be important for future WET studies to include a representative number of Latinx

individuals and to report on important cultural variables, such as language proficiency and immigration status, to more effectively determine the generalizability of results, the predictors of treatment success, and identify for who WET works best.

### **Treatment Feasibility: WET Via Telehealth**

While WET was originally developed to address barriers and criticisms of other existing exposure-based treatments for PTSD (i.e., high rates of treatment attrition, treatment non-response, and logistical barriers that impacted treatment success) (Sloan & Marx, 2019), we evaluated WET via telehealth in an effort to increase access to quality treatment during the COVID-19 pandemic. Our expectations were that WET delivered via telehealth would address all of the same difficulties as WET delivered in-person, but that there would be an even greater decrease in reported logistical barriers. We modified two aspects of the original WET protocol to meet the new demands of online treatment delivery and our results revealed that WET delivered via telehealth was well received by participants (i.e., as evidenced by self-report acceptability indices), but somewhat infeasible to implement without making refinements to ameliorate challenges to treatment engagement and retention. It is worth noting that the examination of treatment effects was exploratory given our small sample size.

### ***Treatment Modifications***

We made two modifications to the procedure of the written exposure, informed by considerations in the WET manual (Sloan & Marx, 2019), to address barriers introduced by the telehealth delivery. The first modification was to define the context of the narrative writing, by asking clinicians to leave clients alone to write for the exposure while muting their microphones and blacking out their video screens to limit distractions.

The second modification was to develop a method for transferring the narratives from participant to clinician at the end of the session, by having clients hold their narrative up to the camera and clinicians taking a “screenshot” picture of the narrative to read after session. We had anticipated some difficulty with transferring the written narratives from participant to clinician, but we expected difficulties such as potentially struggling to read a participant’s handwriting. More pressing was the poor quality of the images capturing the hard copy of the narrative and conversations regarding privacy if the participants chose to keep their trauma narratives as opposed to discarding or destroying them. Indeed, some images of the narratives appeared blurry or discolored, while others needed to be taken several times before an acceptable image was captured. While no participants made complaints about the process of transferring the written narratives from themselves to the clinician, it is more likely that dissatisfaction with the process would be voiced by clinicians, as the implications of having a poor-quality image of the narrative would be more serious for the clinician. Implications could include not being able to read the narrative, identify and address instances of avoidance, or provide feedback on treatment adherence, all of which could impact future treatment sessions for the participant. Given that clinicians were not interviewed in this study, it is not possible to examine the extent to which poor image quality may have impacted treatment outcomes. Thus, future research should 1) develop a procedure for obtaining the participant’s trauma narrative that reduces barriers (i.e., reduces poor image quality and ensures client privacy) and 2) obtain both clinician and participant perspectives on treatment procedures to gain a more nuanced understanding of treatment feasibility. Given innovations in communication

methods (i.e., voice dictation software), researchers may consider creative technological options to produce and obtain trauma narratives.

### ***Treatment Acceptability***

Notwithstanding these challenges to feasibility, our participants endorsed high levels of treatment acceptability as evidenced by ratings of treatment expectancy, satisfaction, and the working alliance.

**Treatment Credibility and Expectancy.** Therapy credibility is correlated to and can predict actual therapy outcome (Deville & Borkovec, 2000), but therapy credibility is often elevated simultaneously with measures of treatment expectancy, a finding not consistent with our study results. Importantly, Devilly and Borkovec (2000) described that participants might struggle to differentiate between the way they *think* about the treatment (i.e., credibility) as opposed to the way they *feel* (i.e., expectancy), which could contribute to disparate findings. Indeed, in our study, several participants required help completing the assessment measures and were read the items out loud. In a similar vein, more than half of our participants were limited English language proficient. Thus, it is unknown to what extent our participants were able to distinguish between credibility and expectancy items, which might have contributed to our disparate findings. It is worth noting that in one prior WET study (Sloan et al., 2012) the Treatment Expectancy Questionnaire score was reported as a mean total score, as opposed to two separate scores (i.e., credibility and expectancy), which may address the difficulties described by Devilly and Borkovec (2000), albeit Sloan et al. (2012)'s methodology for calculating this score was not described and cutoff criteria for interpretation was not provided. Thus, future research with WET should identify a simple and reliable tool that can be used to measure

treatment expectancy given its importance in contributing to therapy outcome.

Additionally, if there are multiple ways that the assessment tool can be interpreted, it will be helpful for researchers to clearly describe their methodology to aid in study replication or comparisons.

**Treatment Satisfaction.** Our participants reported high levels of satisfaction with the treatment they received (i.e., scores ranging from 28 to 32) and indicated that they would “highly recommend” the treatment to friends or family members. These findings parallel existing WET research that has demonstrated participants endorse high levels of treatment satisfaction, with scores ranging from 28 to 30 on the Client Satisfaction Questionnaire-8 (Sloan et al., 2012; Sloan et al., 2013; Sloan et al., 2018), and extends these results to include satisfaction with WET as delivered via telehealth.

**Working Alliance.** Although both participants and clinicians reported positive perceptions of their working alliance, there were small discrepancies in the perception of the bond, tasks, and goals, where participants endorsed stronger alliances with clinicians than clinicians did. Although these results were not statistically significant, they are clinically meaningful. The therapeutic alliance can have a significant impact on treatment outcomes and other investigations of the therapeutic alliance during telehealth delivered treatments (Knaevelsrud, 2006) have demonstrated that stable and positive relationships can be developed between participants and clinicians despite telehealth service delivery. It is possible that several aspects of WET as delivered via telehealth contributed to our findings. Perhaps the brevity of the treatment protocol, the standardization of the session-by-session content, the procedural modification to turn off the camera and “leave the room” while the participant was completing the written exposure, or the

videoconferencing aspect of the treatment reduced emotional closeness and contributed to participants endorsing lower scores of their therapeutic bond than clinicians.

Interestingly, each of these same components may have contributed to participant's higher levels of agreement on the importance of the tasks and goals of therapy. For instance, each session is standardized, with specific instructions and time demands that clearly delineate the tasks to be completed and goals to be achieved by both members of the dyad. It is possible that the rigid structure and formatting of the treatment allowed for a more objective view of the required tasks and an easier connection to how those tasks related to achieving set therapeutic goals. Although, given that this study is the first to examine WET delivered via telehealth, it will be important for future studies to continue to investigate the impact of telehealth treatment delivery on domains related to the therapeutic alliance.

**Acceptability Interviews.** Taken together, the results on treatment expectancy, satisfaction, and the working alliance extend evidence that WET is viewed as an acceptable treatment to be delivered via telehealth. This hypothesis is further supported by nuanced information gleaned from our qualitative findings. All of our participants shared that they believed telehealth services were similar to services delivered in-person, with over half of our sample reporting that they would prefer telehealth services to in-person services if given an option. Additionally, participants reported few experiences of technological problems, with over half of the sample reporting no technological problems, and several participants reporting high levels of comfort with technology necessary for engaging in treatment, such as the internet and videoconferencing software (i.e., Zoom). It is notable that our study is the only available WET study conducted via

telehealth and the only study that includes qualitative data regarding participant perspectives of WET. Thus, although our results add an important client-driven perspective to existing research with the WET protocol, future research should aim to obtain additional qualitative information from participants to gain a better understanding of what factors affect treatment acceptability, particularly regarding telehealth delivery of services.

### **Preliminary Efficacy**

Feasibility and acceptability studies are generally focused on examining process-oriented variables to refine an intervention in terms of dose, intensity, and treatment elements as opposed to examining treatment effects. Although, in this study, it was also our intention to engage in an exploratory examination of treatment effects so that our results could be used to inform the design of larger study of WET delivered via telehealth to assess efficacy and effectiveness. Thus, even though our sample size was small, and our study is underpowered, these exploratory results can be used to determine preliminary efficacy prior to engaging in future research.

### ***Treatment Response***

Our participants experienced reductions in PTSD symptomology and self-reported emotional valence and arousal that suggested moderate treatment response to WET delivered via telehealth. Of participants that completed treatment ( $n = 10$ ), approximately half (55.5%) no longer met criteria for PTSD at the end of treatment and achieved high end state functioning (i.e., reporting more than a 30% reduction in symptomology). These results are consistent with other WET studies that have demonstrated clinically meaningful reductions in PTSD symptomology post-treatment (Sloan et al., 2005; Sloan

et al., 2007; Sloan et al., 2011; Sloan et al., 2012; Sloan et al., 2013; Wisco et al., 2016), albeit our treatment response rate was smaller than found within existing studies. WET efficacy and effectiveness studies have demonstrated that WET significantly reduces PTSD symptoms, with a number of studies showing that both clinically significant and long-lasting reductions in PTSD are possible (Sloan et al., 2005; Sloan et al., 2012; Sloan et al., 2013). Additionally, treatment response rates at the end of treatment range from approximately 57% (Sloan et al., 2013) to 95% (Sloan et al., 2012) and our results parallel the findings observed in the Sloan et al. (2013) study, the WET study with the smallest sample.

### ***Treatment Attrition***

The treatment attrition rate for our study was high (33.3%) and inconsistent with rates reported in other WET studies. Across WET research, attrition rates are much lower and range from 6.3% (Sloan et al., 2018) to 9% (Sloan et al., 2012). Although, our attrition rates were similar to studies of other exposure-based interventions (i.e., PE) that are delivered via telehealth, including Gros and colleagues (2017)'s study that reported a 33% attrition rate for participants that enrolled in PE delivered via telehealth and studies of PTSD more broadly (i.e., between 36% to 68; Imel et al., 2013; Kehle-Forbes et al., 2016; Smith et al., 2019). In the WET manual, Sloan and Marx (2019) made a statement that they piloted WET for telehealth but encountered two major problems and dropped it as a condition in their initial RCT of WET (Sloan et al., 2012): at least a 50% drop out rate prior to the first treatment session and low engagement due to distractibility during written sessions. Furthermore, it is worth noting that two out of five participants that dropped out of our treatment were transferred to a more aggressive PTSD treatment and

thus were referred to a higher level of care within our clinic as opposed to quitting the treatment.

### *Mechanisms of Change*

We utilized the Self-Assessment Manikin (SAM), a self-report measure of emotional valence and physiological arousal, to examine the underlying mechanisms of change associated with exposure. Across other WET studies, this measure has been used to provide evidence of activation of the fear network (i.e., emotional engagement) and habituation (i.e., arousal), two hypothesized mechanisms of change of exposure-based treatments. Our results highlighted that while both negative emotional valence and physiological arousal decreased across sessions, only emotional valence changed in a statistically significant way. In particular, participants reported that their experience of writing about their trauma changed from displeasure to neutrality, while their physiological arousal remained relatively high across treatment sessions. This appears to be consistent with newer possible mechanisms proposed by Craske et al. (2008), who has argued that exposure-based treatments work through fear tolerance (i.e., repeated exposure to trauma memories that allow the feared stimuli to possess both “danger” and “safety” meanings, where the fear reactivity becomes dependent on context and time [such as higher fear in the presence of actual threat and lower fear in the presence of the memory]) as opposed to fear habituation (i.e., repeated exposure to trauma memories that replaces pathological elements of the fear structure by disassociating stimuli from fear response elements and thus lessening the negativity of the stimuli). Indeed, in this way, emotional valence would be expected to change from negative emotionality to more positive emotionality across sessions, as this is evidence that the memory of the traumatic

experience is perceived as objectively “safe” and therefore more tolerable. Interestingly, SAM results are inconsistent across WET studies: some studies have shown significant changes in both emotional valence and arousal across treatment (Sloan et al., 2006; Sloan et al., 2007; Sloan et al., 2012), others only arousal (Wisco et al., 2016), and others only emotional valence (Sloan et al., 2005). Thus, while our results were similar to Sloan et al. (2005) and appear to demonstrate fear tolerance consistent with Craske et al. (2008)’s theory, our study is underpowered, and our results should be interpreted cautiously. It is worth noting that there are contemporary neurobiological theories of PTSD (Brewin, 2001) that build upon earlier cognitive theories of PTSD and describe the effects of stress on trauma memory processes, including encoding, storage and retrieval, and reconsolidation. These theories make specific goals for treatment to focus on constructing a consistent and fully formed (i.e., not fragmented) autobiographical representation of the trauma memory and may lend themselves to utilization of more sophisticated psychophysiological methods in future research (i.e., fMRI, heart rate variability, galvanic skin conductance).

### ***Treatment Implications***

The COVID-19 pandemic is unprecedented and has generated challenges to behavioral health service delivery for which telehealth has become an increasingly important and utilized option. Our results provide preliminary evidence that WET delivered via telehealth can produce reductions in PTSD, but highlights some concerns regarding the dose-response relationship, the “one size fits all” (Cloitre, 2015) approach to trauma treatment, and the potential impact of participant characteristics and barriers of telehealth delivery on treatment outcomes. Given that our overarching goals were to

determine if WET delivered via telehealth would work and if it would ameliorate barriers experienced by those receiving other exposure-based PTSD treatments, our evidence is an important contribution to the literature.

**Stepped-Care.** The fact that WET's efficacy ranged from participants failing to engage with the treatment and dropping out, to participants minimally responding, to participants fully responding and no longer meeting criteria for PTSD, provide some support for the hypothesis that WET might function most effectively as a first line treatment within a stepped-care approach (Sloan et al., 2013). In this stepped-care approach, people could initially access the brief and low burden treatment and be incrementally "stepped up" to higher levels of care if response to treatment is poor. Indeed, in our study, five participants benefitted from starting treatment with a brief and low burden intervention, two participants were identified as treatment non-responders early in the treatment and were able to be transferred to a higher level of care, and two participants were offered to "step-up" to a more intensive treatment after completion of WET due to residual PTSD symptoms. Although, this stepped-care hypothesis does not address the high drop-out rate that was observed to occur early in our study.

**Avoidance.** We noted that our participants with the most severe PTSD symptomology dropped out of treatment, whereas participants with more moderate PTSD symptomology remained engaged in treatment. Additionally, participants that dropped out of treatment did so within the first two sessions. Taken together, these results provide some evidence that avoidance, a hallmark symptom of PTSD, could have impacted treatment response. This hypothesis is further supported by our data on rescheduled treatment sessions. For participants that dropped out of treatment, an average of two

sessions were rescheduled after completing the intake session, but prior to initiating treatment, potentially indicating an aversion to starting the treatment protocol. For other participants that started the treatment but eventually dropped out, an average of two sessions were rescheduled intermittently, potentially indicating an aversion to the weekly sessions.

**Treatment Unacceptability.** In addition to avoidance, these patterns of rescheduling and drop-out may have indicated poor acceptability of the treatment. For instance, in our study, drop-out occurred between the initial intake session, where the participant was informed about the nature of the treatment, and the second treatment session, where the participant would have been expected to write about the trauma in its entirety. Investigations of drop-out from other exposure-based interventions, such as PE, are stated to occur in the first six sessions (Imel et al., 2013). Interestingly, early session content of WET is similar to later session content of PE. WET begins session one with psychoeducation and written exposure (Sloan & Marx, 2019), whereas PE begins the first few sessions with psychoeducation and breathing retraining and exposure occurs in later sessions (Foa & Kozak, 1986). Thus, the pattern of rescheduling and drop-out observed in our study and other studies involving PE may more broadly signify poor acceptability towards engaging in trauma-focused work at all, a concern discussed by other researchers (Cloitre, 2015) regarding trauma-focused treatments for PTSD.

*Increasing Acceptability.* If the hypotheses about avoidance or treatment unacceptability are true, there are therapeutic techniques, such as Motivational Interviewing (Miller & Rollnick, 2012), that could be utilized to reduce some aversion to the treatment sessions and enhance participant buy in and willingness to approach rather

than avoid the treatment. Indeed, Motivational Interviewing techniques may be beneficial in helping those engaged in the treatment perceive the treatment tasks as a choice as opposed to being forced upon them, which may reduce resistance and foster engagement.

**Diverse Population Needs.** Finally, another possibility is that our results suggest the “one size fits all” approach to trauma treatment does not adequately address the diversity of needs across different patient populations. Perhaps participant characteristics (i.e., specific PTSD symptomology, trauma exposure, ethnicity, educational level) contributed to our attenuated outcomes from existing WET research. Our sample were participants with IPV-related PTSD, which differs from the Sloan et al. (2012) study (i.e., the study with the highest treatment response rate), where eligible participants were being treated for PTSD resulting from a discrete traumatic event (i.e., a motor vehicle accident). While IPV can include discrete events, such as the experience of a physical argument, it can also encompass a broader relational pattern (i.e., an on-going pattern of intimidation, coercion, control, manipulation, or harm; Bornstein, 2006), which can lead to prolonged or complex trauma exposure (Bailey et al., 2019). Indeed, seven out of fifteen participants endorsed exposure to intimate partner violence, one reported stalking, and two reported repeated exposure to extreme suffering of a family member, all-encompassing broader chronic exposure to trauma. Our participants repeatedly wrote about a singular traumatic event, but it is possible that other contextual factors related to IPV (i.e., concerns about safety, poor emotion regulation or other coping skills) impacted their ability to effectively engage with the treatment. Additionally, given the heterogeneity of symptoms that can be endorsed for a person to meet criteria for PTSD, it

is possible that there are specific PTSD symptoms that lend themselves to a quicker or easier recovery using WET.

Furthermore, 93% of our sample were Latinx, with over half of the participants endorsing limited English language proficiency and more than two thirds endorsing a high school education or less. Although participants were told that the quality of their writing was not important, a substantial number of participants cited concerns with different aspects of their narratives, including their grammar, spelling, sentence structure, or handwriting. Additionally, it was common for assessment measures to be read out loud to participants during the intervention, which may indicate lower levels of literacy. Although participants did not explicitly state that they could not engage with the intervention when they were interviewed about their experience with the intervention, it is unknown to what extent participants had difficulty reading or understanding the instructions and writing their inner experience during the exposures. It is possible that relying on writing as opposed to other available methods communication (i.e., technological advances in voice-to-text software), limited the success of this treatment with our sample. Thus, it is possible that characteristics related to our sample somewhat influenced their ability to engage and interact with the intervention.

**Telehealth Barriers.** These hypotheses are further complicated by the telehealth treatment delivery of the intervention. Telehealth is often described to have a distinct advantage of increasing accessibility of clinical services for hard-to-reach populations because it brings the services to the person as opposed to asking the person to come to the services (Payne et al., 2020; Wells et al., 2020). Yet, it appears that telehealth may inadvertently transfer barriers from the clinic setting to the home setting and may

generate new barriers that do not exist in the clinic setting at all. Acierno and colleagues (2016) reported that home-based telehealth can overcome existing barriers to care by moving services online, but Payne and colleagues (2020) highlighted that inequalities may exist for some families that do not have access to an appropriate environment to use telehealth services. In our study, it is unknown how many participants were receiving treatment from a location in which they felt unsafe, unsupported, or unconfident about their therapy space. Although clinicians were instructed to ensure that participants had access to a private and confidential space, the need to assess for an appropriate environment in general may have had some treatment implications. It is possible that socioeconomic factors played a role in our participants treatment experience (i.e., such as residing in a small space with multiple occupants where finding a separate room for sessions may not have been possible, having access to a phone as opposed to a laptop or desktop for sessions, conducting sessions from a bed or vehicle, or experiencing distraction due to childcare responsibilities). Additionally, Wells and colleagues (2020) described special privacy and technological considerations for sessions and homework materials when treating a client in their home. In our study, due to the COVID-19 pandemic, there were new burdens (e.g., homeschooling, afterschool childcare, and work) in the home environment, that when combined with socioeconomic factors and technological issues, may have contributed to differences in our treatment outcomes. Indeed, participant interviews described difficulties with childcare, internet connection, and privacy for sessions (i.e., at least one participant was residing in a shelter and needed to coordinate shelter resources to have a private space for session, at least one participant reported use of headphones for privacy, and one participant attended sessions with their

infant child). Thus, the need to determine the safety and appropriateness of participant's environments may be warranted. Problem-solving barriers to treatment may be particularly important given concerns of new barriers in the home environment due to COVID-19.

### **Limitations and Future Directions**

There were several limitations to our study, mainly the small sample size resulting in the study being underpowered and the generalizability of our qualitative and quantitative results given the homogeneity of our sample in terms of trauma exposure and demographic characteristics. Given that the study does not have a control group, determinations of causality are limited and remain a future research direction. Additionally, due to the changing nature of the COVID-19 pandemic, there is significant potential for historical threats to internal validity. Thus, there is a need to determine whether outcomes for WET delivered via telehealth resulted from the intervention components or were due to our sample characteristics or historical factors.

Future research may address these limitations by examining for whom WET delivered via telehealth may be most beneficial. Moderator analyses, adding a control group, qualitative interviews with participants and clinicians, detailed data collection regarding attrition, a priori determinations of expected treatment effects (i.e., may include calculating clinically significant change from comparison studies), and utilization of measures that do not rely on self-report to investigate mechanisms of action are some potential directions for further inquiry. Efforts to address study limitations and refine treatment components to ameliorate reported problems will improve the intervention prior to conducting a larger scale study.

## Conclusion

Given the deleterious symptoms that can arise after trauma exposure, telehealth delivered treatments that target accessibility barriers represent a promising alternative to traditional treatment options. This feasibility and acceptability study was conducted with the aim of improving access to PTSD treatment for people that have been exposed to trauma and cannot access in-person services due to COVID-19, by using a brief and low burden evidence-based intervention delivered via telehealth. The results of this study suggest that WET delivered via telehealth is viewed by participants as acceptable, but that it is not feasible to implement via telehealth without modifications. Treatment outcomes suggested that those that completed treatment moderately responded to the intervention in regard to experiencing reductions in PTSD symptoms. Our findings highlighted specific problems with retention and attrition, engagement with mechanisms of action, and technological issues that should be investigated and refined in future feasibility research prior to conducting a larger scale RCT study. Research in this area is warranted given the potential for reducing accessibility barriers to clinical service delivery for harder-to-reach populations.

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