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Emotion Dysregulation Predicts Dropout from Prolonged Exposure Treatment among Female Veterans with Military Sexual Trauma-Related Posttraumatic Stress Disorder

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Abstract

Background: Military sexual trauma (MST) is notably prevalent among military personnel and can result in mental and physical health problems, including posttraumatic stress disorder (PTSD). Although there are several evidence-based treatments for MST-related PTSD, including Prolonged Exposure therapy (PE), it is unclear what factors are associated with premature termination (i.e., dropout) from this treatment. Given the popularity of PE as an evidence-based treatment for PTSD, the examination of variables that influence dropout from PE among women veterans with MST is warranted. Identification of these specific factors may assist clinicians in addressing the unique symptom profiles and potential barriers to treatment access for individual MST survivors.

Methods: The current study presents secondary data analyses from an ongoing randomized clinical trial that compared the effectiveness of PE delivered in person to delivery via telemedicine for women veterans with MST-related PTSD ($n = 136$).

Results: A total of 50% of participants dropped out from the study ($n = 68$). Difficulties with emotion regulation at baseline were associated with treatment dropout (odds ratio = 1.03, $p < .01$), while baseline PTSD and demographic factors were not.

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Conflict of Interest

The authors have no conflicts to declare.

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Conclusions: Findings from the current study indicate that emotion regulation skills deficits contribute to PE dropout and may be an appropriate target to address in future clinical trials for PTSD.

Keywords

Treatment dropout; Treatment engagement; PTSD; military sexual trauma; emotion regulation

Introduction

Military sexual trauma (MST) is defined as sexual assault or repeated, threatening sexual harassment experienced while in the military (Veterans Affairs, 2019). Although both women and men are victims of MST, a greater proportion of the victims are women. A total of 38.4% of women military personnel and veterans experience MST (for a recent review, see Wilson, 2018). MST is associated with increased risk of mental health problems including substance use, depression, and most notably post-traumatic stress disorder (PTSD; Kimerling et al., 2007; Suris & Lind, 2008). Furthermore, women veterans with MST are twice as likely to present with PTSD compared to those without such histories (Klingensmith, Tsai, Mota, Southwick, & Pietrzak, 2014). Other data indicate a link between MST and prior victimization experiences, childhood adversities, other comorbid psychiatric symptoms and disorders, severe difficulties with social/role functioning, and decreased distress tolerance (Luterek et al., 2011; Turchik & Wilson, 2010).

Prolonged Exposure (PE) is a front-line treatment for PTSD in both civilian and veteran samples (VA/Department of Defense, 2017) and is widely available in Veterans Affairs Medical Centers (VAMCs) across the nation. It has a substantial evidence base and can be delivered both in person and remotely via telemedicine (Acierno et al., 2017). Despite its prominence and national recognition as a well-established, evidence-based treatment for PTSD, a number of individuals with MST-related PTSD symptoms do not initiate PE treatment or other evidence-based psychotherapies for PTSD (Calhoun et al., 2018; Zinzow et al., 2015). Additionally, once enrolled in care, dropout from PE specialty care is common, with rates averaging from 24–40% in treatment outcome studies (Gros et al., 2011; Gutner et al., 2016; Hembree, Rauch, & Foa, 2003; Hernandez-Tejada et al., 2014; Jeffreys et al., 2014; Mott et al., 2014; Rauch et al., 2012; van Minnen et al., 2002). Treatment attrition is even higher in general VA clinic samples. Specifically, in a study of 265,566 veterans, Maguen et al. (2019) found that the dropout rate of MST positive patients from PE was approximately 60%, which was just slightly lower than that of veterans with other forms of trauma.

PE includes emotional processing of the traumatic event as a central aspect, and a key requirement of patients is the ability and willingness to tolerate and regulate emotions as they re-experience the traumatic event as part of therapy, both within sessions and during out-of-session assignments. Thus, PE involves direct confrontation of traumatic memories and stimuli. However, prior research (Landes, Garovoy, & Burkman, 2013; van Minnen, Hendriks, & Olff, 2010) indicates treatment that encourages early and premature confrontation with trauma-related memories and cognitions may increase the likelihood of

treatment discontinuation. Thus, emotion regulation may play a key role in the decision to drop out from PE among MST survivors because a past history of MST is associated with difficulties in this area (Luterek, Bittinger, Simpson, 2011).

Difficulties with Emotion Regulation

Emotion regulation is broadly defined as self-regulatory function related to emotional self-awareness and understanding, acceptance, and tolerance of negative emotion; use of goal-directed behavior and management of impulsive behavior; and consideration of social context in the selection of emotion regulation strategies (Gratz & Roemer, 2004). Given this broad definition, there is a consistent association between difficulties in emotion regulation and PTSD symptoms in general (Cloitre, Miranda, Stovall-McClough, & Han, 2005; Ehring & Quack, 2010; Tull, Barrett, McMillan, & Roemer, 2007), and studies demonstrate that veterans who have experienced MST report more difficulties in emotion regulation than those who have not experienced MST (Luterek, Bittinger, & Simpson, 2011; Allard et al., 2011).

Both pre-military experiences and characteristics of MST-related assaults within the context of the military may contribute to reported emotion regulation difficulties among veterans with MST. For example, MST is associated with prior adult and childhood victimization experiences as well as other childhood adversities (Luterek et al., 2011; Turchik & Wilson, 2010), which in turn place an individual at increased risk for developing maladaptive strategies for managing their emotions. Within the context of the military, unit cohesion is required for completion of unit missions (Greene, Buckman, Dandeker, & Greenberg, 2010) and could encourage emotional suppression. For example, after experiencing MST, a service member would likely need to suppress his or her post-MST emotional experience (especially if the MST was perpetrated by a unit member) to successfully complete mission related duties (Suris, 2007; Scott et al., 2014). Therefore, military-specific values such as unit cohesion may encourage emotional suppression following MST, an ultimately ineffective emotion regulation strategy that would contribute to the manifestation and maintenance of PTSD. It is also possible that difficulties with emotion regulation prior to entering the military (e.g., PTSD from childhood exposure to potentially traumatic events; Marusak, Martin, Etkin, & Thomason, 2015) could impact one's ability to successfully re-integrate into a military unit after experiencing MST. Therefore, the interaction between emotion regulation difficulties and the experience of MST is complex, and the military environment may deter the recovery of MST survivors while on active duty.

Difficulties with emotion regulation likely exacerbate the symptoms of PTSD by impeding the natural recovery process, and vice versa, PTSD symptoms likely exacerbate difficulties with emotion regulation. No matter the directionality, difficulties with emotion regulation are likely to interfere with PTSD treatment compliance and effectiveness. Consistent with this, multiple theoretical models of PTSD etiology and maintenance identify ineffective emotion regulation as a key factor for the disorder (Rauch & Foa, 2006). For example, experiential and emotional avoidance of both internal and external trauma-related cues is often exhibited in individuals with PTSD. While this strategy limits short-term distress and emotional reactivity, anxiety and fear-based avoidance of trauma-related stimuli is negatively

reinforced. Therefore, avoidance of emotional processing via suppression limits opportunities for an individual to extinguish fear responding to trauma-related stimuli (Rauch & Foa, 2006).

PE includes exposure-based techniques to allow emotional processing of the traumatic event. However, individuals who experience difficulties in emotion regulation may not be able to tolerate the distress and negative emotions that arise from the initial application of exposure-based emotional processing techniques (see Brown et al., 2018). Without confidence in their ability to manage emotions, patients with emotion regulation difficulties may be at significant risk to drop out of treatment prematurely. It is also likely that this effect will be amplified for survivors of MST, as treatment is offered in a setting (i.e., Veterans Affairs Medical Centers) influenced by the same military organizational principles that provided context for their experience of trauma. To date, only one study has examined the association between emotional regulation skills and PTSD treatment drop-out (Belleau et al., 2017). This clinical trial used a modified version of PE for individuals with PTSD and a comorbid substance use disorder, and the study authors did not find a relationship between emotion regulation and dropout. Given the high rates of emotion regulation difficulties among women with MST-related PTSD, the theoretical rationale of PE, and the lack of sufficient data on the topic, more work along this theme is warranted. If difficulties with emotion regulation are identified as a predictor of treatment dropout, emotion regulation skills training (e.g., Linehan, 2014) provided concurrently with PE could significantly improve treatment retention and outcomes in this vulnerable veteran demographic group.

Current Study

The current study examined factors associated with treatment dropout among women veterans with MST-related PTSD enrolled in PE both in person or via telemedicine as part of an ongoing randomized clinical trial. We hypothesized that greater levels of difficulty with emotion regulation and higher PTSD symptoms at baseline would be associated with a greater likelihood of treatment dropout compared to those with lower levels of difficulty at baseline. It was also hypothesized that individuals in the telemedicine condition would be less likely to drop out relative to those in the in-person condition secondary to a lower burden of treatment participation (i.e., reduced travel/time) and fewer trauma-related stimuli for MST-related anxiety and avoidance (e.g., seeing other former military personnel who resemble the perpetrator within VA). Demographic factors including age, race, marital status, and theater (OEF/OIF/OND vs. other theaters) were examined for their association with treatment dropout in consideration of findings from previous studies (Erbes, Curry, & Leskela, 2009; Garcia, Kelley, Rentz, & Lee, 2011; Szafranski et al., 2016). Finally, an exploratory examination was completed to assess correlates of self-reported reasons for dropout.

Methods

Participants

Participants were women veterans, age 21 and above, who met DSM-5 criteria for either PTSD or subthreshold PTSD as determined by the Clinical Administered PTSD Scale

(CAPS-5; Weathers, Blake, et al., 2013) secondary to a military sexual trauma event. Subthreshold PTSD was operationalized as endorsement of: (1) PTSD Criteria A (traumatic event), B (intrusion), and C (avoidance); (2) PTSD Criterion D (cognition and mood) or E (arousal and reactivity); *and* (3) both duration and impairment criteria (Franklin, Piazza, Chelminski, & Zimmerman, 2015). Individuals were recruited from a Southeastern VA Medical Center catchment area, including affiliated community outpatient clinics. Inclusion/exclusion criteria were evaluated via diagnostic intake after informed consent was obtained. Women veterans from all theaters that met eligibility criteria were included. In addition, those patients meeting inclusion criteria were asked to maintain medications at current dosages when medically possible. Participants who recently initiated new prescription medications were required to wait 4 weeks prior to study entry to ensure medication stabilization, at which point self-report portions of the assessment battery were re-administered. Individuals with active psychosis or dementia, suicidal ideation with intent, and alcohol and/or substance use disorders were excluded from participation; however, to maximize generalization of results, the presence of other forms of psychopathology was not a basis for exclusion.

Measures

Demographics.—A self-report assessment of demographics included age, marital status (married vs. not), and race/ethnicity (White, non-Latinx; Black, non-Latinx; other). This measure was administered at baseline only.

Emotion Regulation.—The Difficulties in Emotion Regulation Scale (DERS) was completed at baseline and posttreatment. The DERS is a brief, 36-item questionnaire designed to assess multiple aspects of emotion dysregulation (Gratz & Roemer, 2004). The measure yields a total score from six subscales: (1) Nonacceptance of emotional responses; (2) Difficulties engaging in goal directed behavior; (3) Impulse control difficulties; (4) Lack of emotional awareness; (5) Limited access to emotion regulation strategies; and (6) Lack of emotional clarity. A total score was computed for the current study. Previous research has found the DERS to have high internal consistency, good test-retest reliability, and adequate construct and predictive validity (Gratz & Roemer, 2004).

Depression.—Depression diagnosis was determined by the Mini-International Neuropsychiatric Interview (MINI; Sheehan et al., 1998) at baseline. Participants were categorized as either having depression (=1) or not (=0).

PTSD.—The PTSD Checklist for DSM-5 (PCL-5) is a 20-item measure corresponding to the DSM-5 symptom criteria for PTSD (Weathers, Litz, et al., 2013). Total scores range from 0 to 80; higher scores reflect greater PTSD severity. The PCL-5 was used both as a clinical outcome in analyses and as a tool to monitor participants' progress throughout the course of treatment. The baseline measure was used for the current analyses. The PCL-5 has been validated in veterans and has good internal consistency, test-retest reliability, convergent validity, and discriminant validity (Bovin et al., 2016).

Treatment Dropout.—Treatment completion was defined as either completing 12 sessions of PE or demonstrating clinically significant and adequate gains prior to the 12th session; this was defined as achieving a 24-point reduction from baseline on the PCL-5 across two consecutive weekly assessments, a standard used in our prior PTSD treatment outcome research that reflects a 1.5 standard deviation change in PTSD symptoms from baseline to follow-up (Acierno et al., 2016; 2017). It was also required that both the participant and the therapist agreed that the participant had successfully completed treatment to ensure that it was a true successful completion rather than a case of early termination. Those who did not complete treatment were considered to be individuals who dropped out from treatment.

Procedures

A full description of the ongoing study procedures is reported elsewhere (Gilmore et al., 2016). All protocols were approved by the local VAMC Research and Development committee as well as the Institutional Review Board at the affiliated university, and the study was registered in [ClinicalTrials.gov](https://www.clinicaltrials.gov). A data safety and monitoring board reviewed the conduct of the study. Participants provided written informed consent and completed the baseline assessment before enrollment. Eligible and willing participants were then randomly assigned (1:1) to one of the two individual exposure therapy treatment conditions: telemedicine or standard in-person delivery. Following treatment, veterans completed a post-treatment assessment inclusive of the same measures delineated above. Clinical assessors were blind to participant condition.

Treatment.—PE was used to treat MST-related PTSD. PE is a manualized treatment (Foa et al., 2007) that includes the following components: a) psycho-education about the common reactions to traumatic events, presentation of the treatment rationale, and breathing retraining (sessions 1 and 2); b) repeated in vivo exposure to traumatic stimuli (in vivo exercises are assigned as homework during sessions 3 through 11); c) repeated, prolonged, imaginal exposure to traumatic memories (imaginal exposure is implemented during sessions 3 through 11; patients listen to session audiotapes for homework between sessions); and d) relapse prevention strategies and further treatment planning (session 12).

The active intervention phase was 12 weeks in duration. Participants randomized to telemedicine treatment received weekly sessions of PE via in-home video-conferencing technology, and participants randomized to standard delivery treatment received weekly sessions of the identical PE protocol via standard in-person care delivery. The same clinicians conducted treatment for both conditions, adhered to the treatment manual outlined above, and received weekly supervision. Additionally, a quantitative measure of protocol adherence was used by providers during treatment to ensure compliance with the prescribed elements of PE. All sessions were audiotaped, and 20% of sessions were rated for competence and adherence by trained master's level research clinicians.

Treatment fidelity was high. In a random sample of 51 sessions that were evaluated for fidelity, the overall fidelity rating was 94%. Fidelity ratings covered three topic areas: 1) therapy elements ($M_{TherapyElements} = 81\%$), which addressed the completion of session-specific procedures according to the PE treatment manual as described above; 2) adherence

($M_{Adherence} = 100\%$), which queried if therapists only implemented interventions included in the PE workbook; and 3) therapist factors ($M_{TherapistFactors} = 100\%$; e.g., conveying confidence in the treatment, providing coherent explanations, using client-relevant examples as relevant, being prepared for session, etc.).

Procedures to Minimize Drop-out.—Participants were educated regarding the treatment process and expectations for treatment participation at the time of consent. During session 1, therapists stressed the importance of attendance and compliance throughout the course of treatment. Additionally, study personnel made reminder telephone calls 24 hours prior to each session; coordinated care, as needed, with veterans' case managers, psychiatrists, social workers, and primary care providers; and accommodated veterans' schedules for treatment sessions. Although treatment engagement was encouraged, participants retained the right to discontinue treatment at any point per IRB protocol. Once a participant indicated a desire to discontinue treatment, study staff discussed the decision with the participant, documented the reason for dropout, and asked if they would like to complete follow-up assessments, for which monetary compensation was provided.

Data Analysis Plan

A logistic regression was computed with treatment dropout as the outcome. Main predictors included treatment condition (telemedicine vs. in person) and difficulties with emotion regulation. Covariates included in the model were age, race/ethnicity (White, Non-Latinx vs. ethnic/racial minority), marital status (currently married vs. not currently married), theater (OEF/OIF/OND vs. other theaters), baseline PTSD symptoms, and baseline diagnosis of depression. All analyses were completed in IBM SPSS Statistics Version 25.0.

To examine correlates of reasons for treatment dropout, the same predictors (treatment condition, difficulties with emotion regulation, age, race/ethnicity, marital status, theater, baseline PTSD symptoms, and baseline diagnosis of depression) were examined as associated with reasons for dropout. Separate logistic regressions were conducted examining the correlates of each reason for dropout (if the reason included over 10% of the sample who dropped out). Individuals who completed treatment were excluded from these analyses. Therefore, each comparison examined one reason for dropout compared to all other reasons for dropout. For example, one analysis examined logistics-related reasons to dropout (=1) as compared to distress (=0) and unknown reasons (=0).

Results

Descriptive Statistics

A total of 68 participants (50%) of the total enrolled ($n = 136$) dropped out of the treatment. Descriptive statistics are presented in Table 1. The majority of participants met full criteria for PTSD ($n = 117$), while one met subthreshold PTSD criteria ($n = 1$). The most common reasons for dropout were logistics-related reasons (16.2%) and distress (11.8%). Some participants (14%) did not report their reason(s) for dropout, most often because study personnel were not able to reach them for follow-up.

Logistic Regression

The omnibus model was statistically significant ($\chi^2=11.33$, $p = .04$) and the overall effect of the model was small (Nagelkerke $R^2=.12$; Cox and Snell $R^2=.09$). Classification was adequate, with the overall model identifying dropout classification 58.2% of the time. More specifically, the model correctly identified treatment completers 70.3% of the time, and the model correctly identified those who dropped out of treatment 44.8% of the time. The only significant predictor of treatment dropout was difficulties with emotion regulation (odds ratio = 1.03, $p < .01$) (see Table 2). Individuals with more difficulties with emotion regulation ($M = 116.18$; $SD = 25.46$) were significantly more likely to dropout of treatment than those with fewer difficulties with emotion regulation ($M = 105.00$; $SD = 22.92$). Treatment condition, baseline PTSD symptoms, baseline diagnosis of depression, and race/ethnicity were not associated with dropout.

Reasons for Dropout

Logistics-related reasons, distress, and unknown reasons were examined as outcomes (see Table 3). There were no significant predictors of logistics-related reasons or distress reasons for dropout. The only significant predictors of unknown reasons for dropout were age and difficulties with emotion regulation. Participants who were younger and who had more difficulties with emotion regulation were less likely to provide a reason or reasons for dropout.

Discussion

Despite widespread dissemination of evidence-based treatments for PTSD, dropout remains a significant barrier to effective care. While several PTSD clinical trials have reported on treatment dropout rates (Goetter et al., 2015; Gros et al., 2018), far fewer studies have specifically examined factors associated with dropout (Eftekhari et al., 2019; Erbes et al., 2009; Garcia et al., 2011; Holder et al., 2019; Szafranski et al., 2016). Among those that identified significant factors related to dropout (e.g., age, marital status, military theater, and PTSD symptom severity), results remain inconsistent and treatment implications remain unclear across individual studies of this topic. The current study extends prior research by examining factors associated with treatment dropout among women veterans with MST-related PTSD and focusing on difficulties with emotion regulation—a potential predictor of PTSD treatment dropout that may be important in PE and other empirically supported treatments for PTSD.

Our study hypotheses regarding emotion regulation were partially supported. As hypothesized, participants who endorsed more difficulties with emotion regulation were significantly more likely to drop out of treatment than those reporting fewer difficulties. Surprisingly, there was no difference in treatment dropout based on delivery modality (i.e., telemedicine vs. in person). Further, exploratory examinations of correlates of reasons for dropout suggested that younger participants and those with more difficulties with emotion regulation were less likely to provide a reason for dropping out of treatment relative to older participants and those with fewer difficulties with emotion regulation. Combined, these

findings provide a better understanding of factors related to PE treatment completion among women veterans with MST-related PTSD.

Several researchers have posited that some individuals who experience difficulties in emotion regulation may not be able to tolerate the distress and negative affect that arise from the initial application of emotional processing techniques related to PE and other evidence-based treatments, and may be more likely to drop out of treatment prematurely (see Brown et al., 2018; Cloitre et al., 2005). Findings from the current study partially support this notion. Specifically, we found that individuals with more difficulties with emotion regulation are at higher risk of dropping out of PTSD treatment compared to those with fewer difficulties. This is an important and positive finding in that emotion regulation is a modifiable variable, relative to demographic and historical variables previously associated with treatment completion (Erbes et al., 2009; Garcia et al., 2011; Szafranski et al., 2016). Note, however, that some individuals with difficulties with emotion regulation did successfully complete PTSD treatment. Therefore, effective emotion regulation is not necessarily a *requirement* for successful completion of PTSD treatment. Instead, it is more likely that emotion regulation skills enhance treatment completion likelihood (e.g., Linehan et al., 2015).

Previous research has attempted to address emotion dysregulation among individuals with PTSD using different frameworks. The framework within Dialectical Behavior Therapy (DBT) suggests that stabilization is required in relation to suicidal behavior and non-suicidal self-injurious behavior prior to beginning PE (see Linehan, 1993 for protocol on exposure-based treatments and see Harned et al., 2012; Harned et al., 2014 for pilot findings with PTSD specifically). However, there are many individuals who have PTSD and difficulties with emotion regulation who do not engage in suicidal or non-suicidal self-injurious behavior and who do not meet full criteria for Borderline Personality Disorder, and therefore an intensive treatment like DBT or a sequential/phase-based treatment would not be indicated. Others have used the stabilization approach for veterans by adding an 8-session skills training in emotion regulation and interpersonal functioning (Skills Training in Affective & Interpersonal Regulation; STAIR) to treatment prior to PE, which has been successfully implemented both in person (Cloitre, Koenen, Cohen, & Han, 2005) and via home-based telehealth among veterans with MST (Weiss, Azevedo, Gimeno, & Cloitre, 2018). However, this sequential approach has yet to demonstrate efficacy among individuals who have PTSD but do not have Borderline Personality Disorder relative to the direct application of frontline treatments for PTSD. The findings from the current study, combined with previous research, do not suggest a sequential/phase-based approach for this population. To address PTSD treatment retention, the findings from the current study suggest the potential benefit of leveraging evidence-based DBT skills building for improving emotion regulation skills *in conjunction with* (not in a sequential/phase-based approach) evidence-based PTSD treatment if deemed clinically necessary by therapists.

Surprisingly, there was no significant difference in dropout rates based on delivery modality. It was initially hypothesized that individuals with MST-related PTSD would be more likely to complete treatment via telemedicine compared to in-person care due to barriers associated with in-person service delivery in a setting (i.e., Veterans Affairs Medical Centers)

influenced by the same military organizational principles that provided context for the experience of MST. However, because the study was affiliated with the Veterans Affairs Medical Centers regardless of treatment assignment, it is possible that the affiliation, rather than the physical space in which treatment was delivered, was a trauma cue. It may be possible that treatment provided outside of the context of the VA (i.e., a clinic unassociated with the VA) may yield higher treatment retention. Recent research has found that women are more likely than men to initiate treatment for PTSD within the VA (Valenstein-Mah, et al., 2019); however, that study did not examine MST specific to PTSD.

Future research should consider examining the association of facets of institutional betrayal as well as assessments of unit cohesion and other institutional factors that may contribute to the development of long-term PTSD after experiencing MST. Specifically, trust, safety beliefs, and disclosure (e.g., Holliday & Monteith, 2019) may be important factors to consider when examining treatment dropout in future research.

Limitations

Despite notable strengths, some limitations of the present study are worth discussion. First, self-report measures were used to assess emotion regulation, and the questions on these measures were not specific to emotion regulation in the presence of trauma cues. Therefore, future work may consider examining emotion regulation using behavioral assessments as well as assessing emotion regulation specific to tolerating trauma cues within PE. Second, we did not assess trauma-related cognitions; therefore, future research should examine both trauma-related cognitions and emotion dysregulation to assess if emotion dysregulation remains a predictor of treatment dropout after controlling for trauma-related cognitions. Third, treatment dropout was dichotomized in the current study, and those who began exposure components of treatment were in the same category as those who did not. Fourth, only women veterans were included in the current study and future research should examine correlates of treatment dropout among men with MST-related PTSD. The current study also excluded individuals with substance use disorders and did not fully assess childhood exposure to potentially traumatic events. Previous work has found that childhood exposure to potentially traumatic events is not associated with treatment dropout among those with MST-related PTSD (Holder, Holliday, & Suris, 2019), and future research should examine the impact of childhood trauma and substance use disorders on dropout among women with MST. Previous literature has found that treatment fidelity is associated with outcomes among samples of veterans with MST-related PTSD (Holder, Holliday, & Suris, 2019). However, the current study did not include fidelity by therapist and could not compare fidelity across individual participants. Future work should continue to examine this potentially important factor in terms of treatment retention. Finally, the current sample was limited in terms of diversity in symptom presentation and racial/ethnic and gender identity. Future work would benefit from the use of larger, more diverse samples to examine potential differences in racial/ethnic background, gender identity, and sexual orientation with regard to emotion regulation and treatment dropout. Despite these limitations, findings from the current study have important implications for clinical practice and future research.

Implications for Practice

Despite prior research suggesting that upwards of 50% of women with a history of MST have a diagnosis of PTSD (Kimerling et al., 2010), it is possible that many of these individuals may not want to engage in trauma-related treatment. Additionally, researchers have posited that there is a need for increased outreach efforts to engage women who want to participate in PTSD-related treatment for MST (Calhoun et al., 2019). Building upon this, for those who do engage in treatment, factors related to premature termination remain a critical concern. Therefore, the current study suggests that emotion regulation skills may be an important predictor of treatment completion. An important first step is to replicate this finding in future research and in other clinical settings. If this is replicated in future research, concurrently integrated emotion regulation skills training may be beneficial to individuals who have difficulties with emotion regulation in conjunction with PE treatment to decrease dropout likelihood. However, prior to any changes in treatment delivery, more work is needed to determine if emotion regulation skills training is helpful within this population and for whom it is the most beneficial. Future work should examine if these findings are replicable using other treatment-seeking populations, and if completing emotion regulation skills training is effective in increasing treatment completion rates for PE and other evidence-based treatments for PTSD.

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References

- Acierno R, Gros DF, Ruggiero KJ, Hernandez-Tejada MA, Knapp RG, Lejuez CW, ... & Tuerk, P. W. (2016). Behavioral activation and therapeutic exposure for posttraumatic stress disorder: A noninferiority trial of treatment delivered in person versus home-based telehealth. *Depression and Anxiety*, 33, 415–423. [PubMed: 26864655]
- Acierno R, Knapp R, Tuerk P, Gilmore AK, Lejuez C, Ruggiero K, ... & Foa EB (2017). A non-inferiority trial of Prolonged Exposure for posttraumatic stress disorder: In person versus home-based telehealth. *Behaviour Research and Therapy*, 89, 57–65. [PubMed: 27894058]
- Allard CB, Nunnink S, Gregory AM, Klest B, & Platt M (2011). Military sexual trauma research: A proposed agenda. *Journal of Trauma & Dissociation*, 12(3), 324–345. doi:10.1080/15299732.2011.542609 [PubMed: 21534099]
- Belleau EL, Chin EG, Wanklyn SG, Zambrano-Vazquez L, Schumacher JA, & Coffey SF (2017). Pre-treatment predictors of dropout from prolonged exposure in patients with chronic posttraumatic stress disorder and comorbid substance use disorders. *Behaviour Research and Therapy*, 91, 43–50. [PubMed: 28147254]
- Bovin MJ, Marx BP, Weathers FW, Gallagher MW, Rodriguez P, Schnurr PP, & Keane TM (2016). Psychometric properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-fifth edition (PCL-5) in veterans. *Psychological Assessment*, 28, 1379–1391. [PubMed: 26653052]
- Brown WJ, Dewey D, Bunnell BE, Boyd SJ, Wilkerson AK, Mitchell MA, & Bruce SE (2018). A critical review of negative affect and the application of CBT for PTSD. *Trauma, Violence, & Abuse*, 19(2), 176–194. doi: 10.1177/1524838016650188
- Calhoun PS, Schry AR, Dennis PA, Wagner HR, Kimbrel NA, Bastian LA, ... & Straits-Tröster K (2018). The association between military sexual trauma and use of VA and non-VA health care

- services among female veterans with military service in Iraq or Afghanistan. *Journal of interpersonal violence*, 33(15), 2439–2464. doi:10.1177/0886260515625909 [PubMed: 26802046]
- Cloitre M, Miranda R, Stovall-McClough KC, & Han H (2005). Beyond PTSD: Emotion regulation and interpersonal problems as predictors of functional impairment in survivors of childhood abuse. *Behavior Therapy*, 36(2), 119–124. doi: 10.1016/S0005-7894(05)80060-7
- Eftekhari A, Crowley JJ, Mackintosh MA, & Rosen CS (2019). Predicting treatment dropout among veterans receiving prolonged exposure therapy. *Psychological Trauma: Theory, Research, Practice, and Policy*, Advanced online publication. doi: 10.1037/tra0000484
- Ehring T, & Quack D (2010). Emotion regulation difficulties in trauma survivors: The role of trauma type and PTSD symptom severity. *Behavior therapy*, 41(4), 587–598. doi:10.1016/j.beth.2010.04.004 [PubMed: 21035621]
- Erbes CR, Curry KT, & Leskela J (2009). Treatment presentation and adherence of Iraq/Afghanistan era veterans in outpatient care for posttraumatic stress disorder. *Psychological Services*, 6(3), 175. doi: 10.1037/a0016662
- Greene T, Buckman J, Dandeker C, & Greenberg N (2010). The impact of culture clash on deployed troops. *Military Medicine*, 175, 958–963. [PubMed: 21265302]
- Franklin CL, Piazza V, Chelminski I, & Zimmerman M (2015). Defining subthreshold PTSD in the DSM-IV literature: a look toward DSM-5. *The Journal of nervous and mental disease*, 203(8), 574–577. [PubMed: 26133273]
- Garcia HA, Kelley LP, Rentz TO, & Lee S (2011). Pretreatment predictors of dropout from cognitive behavioral therapy for PTSD in Iraq and Afghanistan war veterans. *Psychological Services*, 8(1), 1. doi: 10.1037/a0022705
- Gilmore AK, Davis MT, Grubaugh A, Resnick H, Birks A, Denier C, ... & Acierno R (2016). “Do you expect me to receive PTSD care in a setting where most of the other patients remind me of the perpetrator?”: Home-based telemedicine to address barriers to care unique to military sexual trauma and veterans affairs hospitals. *Contemporary Clinical Trials*, 48, 59–64. [PubMed: 26992740]
- Goetter E, Bui E, Ojserkis R, Zakarian R, Brendel R, & Simon N (2015). A Systematic review of dropout from psychotherapy for Posttraumatic Stress Disorder among Iraq and Afghanistan combat veterans. *Journal of Traumatic Stress*, 28(5), 401–409. doi:10.1002/jts.22038 [PubMed: 26375387]
- Gratz KL, & Roemer L (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of psychopathology and behavioral assessment*, 26(1), 41–54. doi: 10.1023/B:JOBA.0000007455.08539.94
- Gros DF, Allan NP, Lancaster CL, Szafranski DD, & Acierno R (2018). Predictors of treatment discontinuation during prolonged exposure for PTSD. *Behavioural and Cognitive Psychotherapy*, 46, 35–49. [PubMed: 28669360]
- Gros DF, Yoder M, Tuerk PW, Lozano BE, & Acierno R (2011). Exposure therapy for PTSD delivered to veterans via telehealth: Predictors of treatment completion and outcome and comparison to treatment delivered in person. *Behavior Therapy*, 42(2), 276–283. doi: 10.1016/j.beth.2010.07.005 [PubMed: 21496512]
- Gutner CA, Gallagher MW, Baker AS, Sloan DM, & Resick PA (2016). Time course of treatment dropout in cognitive-behavioral therapies for posttraumatic stress disorder. *Psychological Trauma: Theory, Research, Practice, and Policy*, 8(1), 115. doi: 10.1037/tra0000062
- Harned MS, Korslund KE, Foa EB, & Linehan MM (2012). Treating PTSD in suicidal and self-injuring women with borderline personality disorder: Development and preliminary evaluation of a dialectical behavior therapy prolonged exposure protocol. *Behaviour Research and Therapy*, 50, 381–386. [PubMed: 22503959]
- Harned MS, Korslund KE, & Linehan MM (2014). A pilot randomized controlled trial of Dialectical Behavior Therapy with and without the Dialectical Behavior Therapy Prolonged Exposure protocol for suicidal and self-injuring women with borderline personality disorder and PTSD. *Behaviour Research and Therapy*, 55, 7–17. [PubMed: 24562087]

- Hembree EA, Rauch SA, & Foa EB (2003). Beyond the manual: The insider's guide to prolonged exposure therapy for PTSD. *Cognitive and Behavioral Practice*, 10(1), 22–30. doi: 10.1016/S1077-7229(03)80005-6
- Hernandez-Tejada MA, Zoller JS, Ruggiero KJ, Kazley AS, & Acierno R (2014). Early treatment withdrawal from evidence-based psychotherapy for PTSD: Telemedicine and in-person parameters. *The International Journal of Psychiatry in Medicine*, 48(1), 33–55. doi: 10.2190/PM.48.1.d [PubMed: 25354925]
- Holder N, Holliday R, Wiblin J, LePage JP, & Surís A (2019). Predictors of dropout from a randomized clinical trial of cognitive processing therapy for female veterans with military sexual trauma-related PTSD. *Psychiatry Research*, 276, 87–93. [PubMed: 31030005]
- Holder N, Holliday R, & Suris A (2019). The effect of childhood sexual assault history on outpatient cognitive processing therapy for military sexual trauma-related posttraumatic stress disorder: A preliminary investigation. *Stress and Health*, 35, 98–103. [PubMed: 30259650]
- Holliday R, Monteith LL (2019). Seeking help for the health sequelae of military sexual trauma: A theory-driven model of the role of institutional betrayal. *Journal of Trauma & Dissociation*, 20, 340–356. [PubMed: 30714879]
- Jeffreys MD, Reinfeld C, Nair PV, Garcia HA, Mata-Galan E, & Rentz TO (2014). Evaluating treatment of posttraumatic stress disorder with cognitive processing therapy and prolonged exposure therapy in a VHA specialty clinic. *Journal of anxiety disorders*, 28(1), 108–114. doi: 10.1016/j.janxdis.2013.04.010 [PubMed: 23764125]
- Kimerling R, Gima K, Smith MW, Street A, & Frayne S (2007). The Veterans Health Administration and military sexual trauma. *American Journal of Public Health*, 97(12), 2160–2166. doi:10.2105/AJPH.2006.092999 [PubMed: 17971558]
- Kimerling R, Street AE, Pavao J, Smith MW, Cronkite RC, Holmes TH, & Frayne SM (2010). Military-related sexual trauma among Veterans Health Administration patients returning from Afghanistan and Iraq. *American journal of public health*, 100(8), 1409–1412. doi: 10.2105/AJPH.2009.171793 [PubMed: 20558808]
- Klingensmith K, Tsai J, Mota N, Southwick SM, & Pietrzak RH (2014). Military sexual trauma in US veterans: results from the National Health and Resilience in Veterans Study. *Journal of Clinical Psychiatry*, 75(10), 1133–1139. doi: 10.4088/JCP.14m09244
- Landes SJ, Garovoy ND, & Burkman KM (2013). Treating complex trauma among veterans: Three stage-based treatment models. *Journal of Clinical Psychology*, 69(5), 523–533. doi: 10.1002/jclp.21988 [PubMed: 23529776]
- Linehan M, Korslund K, Harned M, Gallop R, Lungu A, & Neacsiu A et al. (2015). Dialectical Behavior Therapy for high suicide risk in individuals with Borderline Personality Disorder. *JAMA Psychiatry*, 72(5), 475. doi:10.1001/jamapsychiatry.2014.3039 [PubMed: 25806661]
- Linehan M (2014). *DBT skills training manual* (2nd ed). New York: The Guilford Press.
- Linehan M (1993). *Skills training manual for treating borderline personality disorder*. New York: The Guilford Press.
- Luterek JA, Bittinger JN, & Simpson TL (2011). Posttraumatic sequelae associated with military sexual trauma in female veterans enrolled in VA outpatient mental health clinics. *Journal of Trauma & Dissociation*, 12(3), 261–274. doi: 10.1080/15299732.2011.551504 [PubMed: 21534095]
- Maguen S, Li Y, Madden E, Seal KH, Neylan TC, Patterson OV, DuVall SL, Lujan C, & Shiner B (2019). Factors associated with completing evidence-based psychotherapy for PTSD among veterans in a national healthcare system. *Psychiatry Research*, 274, 112–128. [PubMed: 30784780]
- Marusak HA, Martin KR, Etkin A, & Thomason ME (2015). Childhood trauma exposure disrupts the automatic regulation of emotional processing. *Neuropsychopharmacology*, 40, 1250. [PubMed: 25413183]
- Mott JM, Mondragon S, Hundt NE, Beason Smith M, Grady RH, & Teng EJ (2014). Characteristics of US veterans who begin and complete prolonged exposure and cognitive processing therapy for PTSD. *Journal of Traumatic Stress*, 27(3), 265–273. doi:10.1002/jts.21927 [PubMed: 24948535]

- Rauch SA, Eftekhari A, & Ruzek JI (2012). Review of exposure therapy: a gold standard for PTSD treatment. *Journal of rehabilitation research and development*, 49(5), 679–688. doi: 10.1682/JRRD.2011.08.0152 [PubMed: 23015579]
- Rauch S, & Foa E (2006). Emotional processing theory (EPT) and exposure therapy for PTSD. *Journal of Contemporary Psychotherapy*, 36(2), 61. doi: 10.1007/s10879-006-9008-y
- Scott JC, Pietrzak RH, Southwick SM, Jordan J, Silliker N, Brandt CA, & Haskell SG (2014). Military sexual trauma interacts with combat exposure to increase risk for posttraumatic stress symptomology in female Iraq and Afghanistan veterans. *Journal of Clinical Psychiatry*, 75, 637–743.
- Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, Hergueta T, Baker R, Dunbar GC (1998). The Mini-International Neuropsychiatric Interview (MINI): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry*, 59, 22–33.
- Suris A, & Lind L (2008). Military sexual trauma: A review of prevalence and associated health consequences in Veterans. *Trauma, Violence, & Abuse*, 9, 520–269.
- Suris A, Lind L, Kashner TM, & Borman PD (2007). Mental health, quality of life, and health functioning in women veterans: Differential outcomes associated with military and civilian sexual assault. *Journal of Interpersonal Violence*, 22, 179–197. [PubMed: 17202575]
- Szafranski DD, Gros DF, Menefee DS, Norton PJ, & Wanner JL (2016). Treatment adherence: An examination of why OEF/OIF/OND veterans discontinue inpatient PTSD treatment. *Military behavioral health*, 4(1), 25–31. doi: 10.1080/21635781.2015.1093976
- Tull MT, Barrett HM, McMillan ES, & Roemer L (2007). A preliminary investigation of the relationship between emotion regulation difficulties and posttraumatic stress symptoms. *Behavior Therapy*, 38(3), 303–313. doi: 10.1016/j.beth.2006.10.001 [PubMed: 17697854]
- Turchik J, & Wilson S (2010). Sexual assault in the U.S. military: a review of the literature and recommendations for the future. *Aggression and Violent Behavior*, 15(4), 267–277. doi:10.1016/j.avb.2010.01.005
- VA/Department of Defense (2017). VA/DoD clinical practice guideline for the management of posttraumatic stress disorder and acute stress. Version 3. Retrieved from: <https://www.healthquality.va.gov/guidelines/MH/ptsd/VADoDPTSDCPGFinal.pdf>
- Valenstein-Mah H, Kehle-Forbes S, Nelson D, Danan ER, Vogt D, & Spoont M (2019). Gender differences in rates and predictors of individual psychotherapy initiation and completion among Veterans Health Administration users recently diagnosed with PTSD. *Psychological Trauma: Theory, Research, Practice, and Policy*, 11, 811–819.
- van Minnen A, Arntz A, & Keijsers GPJ (2002). Prolonged exposure in patients with chronic PTSD: Predictors of treatment outcome and dropout. *Behaviour research and therapy*, 40(4), 439–457. doi: 10.1016/S0005-7967(01)00024-9 [PubMed: 12002900]
- van Minnen A, Hendriks L, & Olf M (2010). When do trauma experts choose exposure therapy for PTSD patients? A controlled study of therapist and patient factors. *Behaviour Research and Therapy*, 48(4), 312–320. doi: 10.1016/j.brat.2009.12.003 [PubMed: 20056195]
- Affairs Veterans. (2019). Military Sexual Trauma - Mental Health. Retrieved from <https://www.mentalhealth.va.gov/mentalhealth/msthome/index.asp>.
- Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, & Keane TM (2013). The clinician-administered PTSD scale for DSM-5 (CAPS-5). Interview available from the National Center for PTSD at www.ptsd.va.gov.
- Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, & Schnurr PP (2013). The PTSD Checklist for DSM-5 (PCL-5). Scale available from the National Center for PTSD at www.ptsd.va.gov.
- Weiss BJ, Azevedo K, Webb K, Gimeno J, & Cloitre M (2018). Telemental health delivery of Skills Training in Affective and Interpersonal Regulation (STAIR) for rural women veterans who have experienced military sexual trauma. *Journal of Traumatic Stress*, 31(4), 620–625. [PubMed: 30070399]
- Wilson LC (2018). The prevalence of military sexual trauma: A meta-analysis. *Trauma, Violence, & Abuse*, 19, 584–597. doi: 10.1177/1524838016683459

Zinzow HM, Britt TW, Pury CL, Jennings K, Cheung JH, & Raymond MA (2015). Barriers and facilitators of mental health treatment-seeking in US active duty soldiers with sexual assault histories. *Journal of Traumatic Stress*, 28(4), 289–297. doi:10.1002/jts.2202 [PubMed: 26215254]

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Descriptive Statistics

Table 1

	Completed Treatment		Dropped Out of Treatment		Total	
	M (SD)	% (N)	M (SD)	% (N)	M (SD)	% (N)
Age	43.78 (11.76)	-	43.03 (11.33)	-	43.40 (11.51)	-
Telemedicine (vs. in person)	-	50.00% (34)	-	51.50% (35)	-	50.70% (69)
White, Non-Latinx (vs. racial/ethnic minority)	-	27.90% (19)	-	25.00% (17)	-	26.50% (36)
Depression diagnosis	-	85.30% (58)	-	82.40% (56)	-	83.80% (114)
Difficulty with emotion regulation	105.00 (22.95)	-	116.18 (25.47)	-	110.55 (24.77)	-
PTSD symptoms	52.16 (13.71)	-	53.04 (11.51)	-	52.60 (12.62)	-

Table 2

Logistic Regression Predicting Treatment Dropout

	B	S.E.	Odds Ratio	p
Telemedicine (vs. in person)	0.199	0.383	1.220	.603
White (vs. racial/ethnic minority)	−0.311	0.439	0.732	.478
Difficulties with emotion regulation	0.031	0.011	1.032	.004
Posttraumatic stress symptoms	−0.026	0.020	0.974	.199
Depression diagnosis (vs. not)	0.270	0.611	1.310	.659

Table 3.

Logistic Regressions Predicting Self-Reported Reasons for Treatment Dropout

	Distress				Logistics-Related				Unknown			
	B	S.E.	p	Odds Ratio	B	S.E.	p	Odds Ratio	B	S.E.	p	Odds Ratio
Age	.015	.028	.591	1.015	.036	.027	.186	1.037	-.112	.041	.006	.894
Telemedicine (vs. in person)	-.583	.657	.375	.558	-.426	.649	.512	.653	-.246	.759	.746	.782
White (vs. racial/ethnic minority)	-.035	.770	.964	.966	.625	.731	.392	1.869	.844	.792	.287	2.325
Difficulties with emotion regulation	-.019	.019	.334	.982	-.027	.019	.161	.974	.056	.024	.020	1.058
Posttraumatic stress symptoms	.048	.043	.261	1.049	.014	.043	.751	1.014	-.620	.046	.364	.959
Depression diagnosis	.188	1.015	.853	1.207	-20.569	1517.6284	.999	.000	.290	3.547	.935	1.336