Brief report

Investigating the role of hopelessness in the relationship between PTSD symptom change and suicidality

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A B S T R A C T

Background: This study served as an initial investigation of the role hopelessness may play in the relationship between PTSD symptom change and suicide intent, among a trauma-exposed, treatment-seeking sample. We explored whether the effect of PTSD symptom change on self-reported likelihood of a future suicide attempt (FSA) varies as a function of pre-treatment hopelessness, and whether reductions in hopelessness serve as a mechanism through which PTSD symptom change influences FSA likelihood.
Methods: Data was collected from participants ($N = 159$) in a larger randomized clinical trial of a suicide risk-factor intervention. Self-report questionnaires assessed hopelessness, PTSD symptoms, depression symptoms, and FSA likelihood at pre-treatment and one-month follow-up.
Results: Pre-treatment hopelessness emerged as a significant moderator, such that overall PTSD symptom reductions were related to overall decreases in FSA likelihood among those at or above (but not those below) the sample mean of pre-treatment hopelessness. In a subsample of individuals who reported FSA likelihood > 0 and elevated hopelessness at pre-treatment, overall pre-treatment-to-month-one reductions in hopelessness significantly mediated the relationship between overall PTSD symptom reductions and decreased FSA likelihood during this same time period, even after accounting for depression symptom changes.
Limitations: Data were limited to self-report measures (i.e., hopelessness, FSA likelihood). The intervention was not PTSD-specific. Mediation analyses were strictly statistical due to overlapping time-points.
Conclusions: This preliminary investigation suggests pre-treatment hopelessness may serve to identify trauma-exposed individuals for whom PTSD treatment would significantly reduce FSA likelihood. Moreover, reductions in FSA likelihood during treatment may be due in part to reduced hopelessness.

1. Introduction

Suicide presents a significant public health problem, accounting for over 40,000 annual deaths in the United States (Centers for Disease Control and Prevention, 2016). Suicide risk is demonstrably higher among individuals with a history of trauma exposure and posttraumatic stress disorder (PTSD) (Panagioti et al., 2009). Though psychological treatments reduce PTSD (e.g., Cognitive Processing Therapy [CPT]) and suicidality (Tarrier et al., 2008) independently, a paucity of research has investigated the relationship between reductions in posttraumatic stress symptoms (PTSS) and suicidality throughout treatment, or factors which may influence these outcomes.

A comprehensive review of PTSD and suicide underscored the need for investigating psychological variables related to suicide risk, such as post-traumatic sequelae, so to appropriately identify and successfully

treat those for whom suicide risk is elevated (Panagioti et al., 2009). Subsequent research suggests that PTSD-specific treatments effectively minimize suicide ideation via global PTSS reduction (Cox et al., 2016; Gradus et al., 2013). However, it may be useful to consider concomitant psychological determinants by which PTSS reductions influence suicidality.

Hopelessness, often described as negative expectancies regarding one's prospects of symptom relief, is a potential mechanism through which PTSS change may influence suicidality. Hopelessness is a robust predictor of suicidal behavior (Beck, 1986; Beck et al., 1990, 1975). Furthermore, hopelessness and suicidality are elevated among veterans with subthreshold and threshold PTSD compared to those with minimal PTSD symptoms (Jakupcak et al., 2011). Paramount to treating these conditions, initial evidence suggests hopelessness is a mechanism through which PTSS reductions occur during treatment (Gallagher and

Resick, 2012). Seemingly important, the degree to which hopelessness affects how PTSS reductions influence suicidality is poorly understood; this in spite of Beck postulating decades ago that, "By focusing on reducing sources of a patient's hopelessness, the professional may be able to alleviate suicidal crises more effectively" (Beck et al., 1975).

This study was an initial investigation of the role of hopelessness in determining how PTSS reductions affect self-reported likelihood of making a future suicide attempt among a trauma-exposed, treatment-seeking sample. Specifically, we explored whether the effect of PTSS reductions on future suicide attempt (FSA) likelihood varies as a function of pre-treatment hopelessness, and whether reductions in hopelessness serve as a mechanism through which PTSS reduction influences FSA likelihood. We hypothesized that PTSS reduction would influence FSA likelihood most among those high in pre-treatment hopelessness; and that, among those with elevated hopelessness and suicidality, reductions in hopelessness would partially account for the degree to which PTSS reductions affect FSA likelihood.

2. Methods

Individuals ($N = 376$) in the Southeastern United States were assessed for eligibility for a larger randomized clinical trial (RCT). Of those eligible ($N = 303$), the present analyses includes only participants randomized to one of three treatment arms, who reported trauma exposure during the baseline interview ($N = 195$); 30.8% of these participants met diagnostic criteria for PTSD. Participants were primarily female (55.9%), 18–79 years old ($M = 36.94$, $SD = 16.15$). Ethnic composition was 59.0% Caucasian, 26.2% African American, 1.5% Asian/Pacific Islander, and 13.3% 'Other'.

The 21-item Beck Depression Inventory-II (BDI-II) assessed depression symptom severity (Beck et al., 1996). Reliability was excellent at baseline ($\alpha = .93$) and follow-up ($\alpha = .95$).

The PTSD Checklist–Civilian Version (PCL-C) assessed the past-month severity of the 17 DSM-IV PTSD symptoms (Weathers et al., 1991). PCL-C reliability was excellent at baseline ($\alpha = .94$) and follow-up ($\alpha = .95$).

Self-reported likelihood of FSA was assessed using item four of the Suicide Behaviors Questionnaire Revised (SBQ-R) (Osman et al., 2001), which asked participants to rate how likely they would be to attempt suicide "someday" from 0 to 6 (*never-very likely*). This item was used in lieu of the full SBQ-R because the remaining questions index past suicidality without an established time-frame, which presumably provide little information about suicide risk changes throughout treatment. Baseline to month-one test-retest reliability for this item was calculated via partial correlation, controlling for treatment condition, and baseline-to-month-one PCL-C, BHS, and BDI-II change; which was deemed questionable ($r = .67$).

Hopelessness was assessed using a 3-item (items 8, 12, 14) version of the 20-item Beck Hopelessness Scale (BHS) (Beck et al., 1974). These items were included as required by the RCT's funding agency, from which data (Ringer et al., 2017) indicate that the three-item version and full BHS are similarly correlated with the SBQ-R ($z = 1.29$, $p = .20$) and PCL-C ($z = 1.62$, $p = .11$). Reliability for the 3-item version was acceptable at baseline ($\alpha = .70$) and follow-up ($\alpha = .68$).

The Structured Clinical Interview for DSM-5–Research Version (SCID-5-RV) was administered by trained doctoral students to evaluate diagnostic status and trauma history at baseline (First et al., 2015).

Participants completed an eligibility interview for a RCT of a computerized intervention targeting cognitive-affective risk factors for suicide. Participants were randomized to one of three intervention conditions; each involved three weekly, one-hour sessions. Condition one comprised a one-session cognitive AS treatment (CAST), and two sessions of an AS cognitive bias modification (CBM), as previously reported (Schmidt et al., 2017). Condition two comprised a one-session intervention based in principles of cognitive behavioral therapy to address problematic ideas and behaviors central to depression, and two

sessions of a positive CBM paradigm (Holmes et al., 2006). Condition three combined all components of the first and second conditions described above. Participants returned for a follow-up appointment one month after their last intervention appointment. Participants completed self-report questionnaires at baseline and month-one follow-up. All procedures were approved by the Florida State University Institutional Review Board.

2.1. Data analytic strategy

Data was screened for missingness, skewness, kurtosis, and outliers. Outliers were trimmed to $+/-$ twice the interquartile range from the median. To account for skew, SBQR item 4 was natural log transformed (1 + original SBQ-R item-4 response), following previous procedures (Kimbrel et al., 2016). Among the study variables, 9.5% of data was missing, including .4% of baseline PCL-C scores and 20.8% of all follow-up measures. To account for missing data, multiple imputation by fully conditional specification was executed using SPSS version 22. Moderation and mediation analyses were conducted via the Process macro for SPSS, with 5000 bootstrap resamples for mediation analyses.

The moderating effect of hopelessness on the relationship between baseline-to month-one PCL-C change and month-one SBQR item 4 was assessed, controlling for intervention condition and baseline BDI-II scores (accounting for depression symptoms, including suicidality [i.e., item 9]).

A statistical mediation model was conducted to test baseline-to-month-one hopelessness change as a mechanism through which baseline-to-month-one PTSS reductions mitigate month-one FSU likelihood. As evidence suggests scores ≥ 9 on the full BHS (i.e., endorsing half the items, or roughly similar to endorsing two of our three items) strongly predict FSA (Beck et al., 1990), this analysis was conducted in a subsample ($N = 69$) who, at baseline: 1) reported > 0 FSA likelihood, and 2) scored ≥ 2 on the three-item BHS. Baseline-to-month-one BDI-II changes were included as a simultaneous mediator to test the specificity of hopelessness change as a mediator. The indirect effect of PTSS change on FSA likelihood through these mediators is considered significant if their respective 95% confidence interval does not include 0.

3. Results

Full descriptive statistics and bivariate correlations for self-report symptom data are reported in Table 1. Bivariate correlations between treatment condition and all symptom measures were nonsignificant (p's $> .25$).

3.1. Moderation

The overall model was significant ($F[5,189] = 5.74$, $p < .001$, $r^2 = .13$). Baseline BDI-II ($B = .004$, $SE = .001$, $p < .001$), baseline BHS ($B = .053$, $SE = .019$, $p < .01$), and the PCL-C change by BHS interaction ($B = .003$, $SE = .001$, $p = .02$; $\Delta r^2 = .03$) significantly predicted month-one SBQR item-4 FSA likelihood. Conditional effects of PCL-C change on month-one FSA likelihood were significant for individuals at (BHS = 1.88; $B = .003$, $SE = .001$, $p = .02$) and $+ 1SD$ (BHS = 3.00; $B = .007$, $SE = .002$, $p < .01$) of the BHS mean, but not $-1 SD$ of the mean (BHS = .742; $B < -.001$, $SE = .002$, $p = .95$). PCL-C change ($B = -.002$, $SE = .002$, $p = .34$) and intervention condition ($B = .014$, $SE = .018$, $p = .42$) were non-significant predictors.

3.2. Statistical mediation[1]

The full model (Fig. 1) accounted for a significant amount of

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[1] A separate mediation model did not support PTSS change as a mediator of the relationship between hopelessness change and likelihood of future SAs.