Received: 28 March 2023 | Revised: 25 September 2023 | Accepted: 25 September 2023

DOI: 10.1002/jts.23004

ISTSS International Society for Traumatic Stress Studies WILEY

RESEARCH ARTICLE

Evidence-based treatment for posttraumatic stress disorder decreases suicidal ideation by reducing perceived burdensomeness among veterans in an outpatient program

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Abstract

Evidenced-based posttraumatic stress disorder (PTSD) treatments generally reduce suicidal ideation (SI), and the interpersonal theory of suicide (ITS) may theoretically account for this finding. The ITS posits that SI stems from feeling like a burden (i.e., perceived burdensomeness) and a lack of belonging (i.e., thwarted belongingness). Previous research suggests that change in PTSD severity has a significant indirect effect on change in SI through changes in perceived burdensomeness, but not thwarted belongingness, among patients receiving residential PTSD treatment in a Veterans Affairs (VA) medical center; however, no research has investigated these associations in an outpatient VA setting with fewer confounding factors that might affect ITS constructs. Therefore, the current sample included veterans ($N = 126$) who completed PTSD treatment and pre- and posttreatment assessments in a VA outpatient clinic. Results from parallel models of multiple indirect effects suggest that change in PTSD severity was indirectly associated with change in SI through changes in perceived burdensomeness, $B = 0.35$, $p < .001$; $\beta = .36$, $p < .001$, $SE = .10$, 95% CI [.15, .54], but not thwarted belongingness, $B = 0.14$, $p = .146$; $\beta = .14$, $p = .161$, $SE = .10$, 95% CI [−.05, .33]. Additional models were examined using PTSD cluster scores for exploratory purposes. The results indicate that PTSD treatment reduces the perceived and objective burden of PTSD to decrease SI. Study findings support the importance of access to evidence-based care to treat PTSD and alleviate burdensomeness for suicide prevention.

Suicide is a significant phenomenon that has received increased public attention, particularly among former U.S. military service members. Despite coordinated suicide risk assessment, prevention, and intervention efforts, suicide rates increased 47.1% across the United States from 2005 to 2018, including 6.3% among veterans. Nationwide, 38,152 lives were lost to suicide in 2020, including those of 6,146 veterans (U.S. Department of Veterans Affairs [VA], 2022).

Suicidal ideation (SI) and behaviors are particularly evasive due to numerous risk factors and pathways to suicide (Tureki & Brent, 2016). The association between posttraumatic stress disorder (PTSD) and suicidal thoughts and/or behaviors is complex. In a recent systematic review, Holliday et al. (2020) investigated the association between PTSD and SI and attempts in a veteran population and reported mixed findings, as some included articles reported a lower risk of suicide among individuals diagnosed with PTSD, whereas most studies documented PTSD as a risk factor for suicide in a veteran population (e.g., Gradus, 2018).

The interpersonal theory of suicide (ITS; Joiner, 2005; Van Orden et al., 2010) illuminates a pathway to suicide among veterans with PTSD. The ITS suggests that suicidal behavior results from the concurrent presence of (a) SI, resulting from a combination of *perceived burdensomeness* and *thwarted belongingness*, and (b) *capability for suicide* (formerly "acquired capability"). Perceived burdensomeness refers to beliefs of being a burden on others and/or on society. Thwarted belongingness refers to a perceived lack of meaningful and supportive relationships or membership in valued social groups, resulting in deleterious mental health concerns (e.g., loneliness). Capability for suicide is the ability to overcome the inherent drive for self-preservation and fear of death to engage in suicidal behavior, which can also be acquired through repeated exposure to psychologically or physically painful or fear-inducing life events (Smith & Cukrowicz, 2010).

Perceived burdensomeness

For veterans, feelings of burdensomeness may stem from the loss of a sense of self and/or status and feelings of purposelessness following military service (Brenner et al., 2008). Difficulties reintegrating into society and securing civilian employment can contribute to occupational impairment and financial stress (Brenner et al., 2008; Short et al., 2019). Mental and/or physical injuries may affect one's ability to maintain employment, impact their engagement in activities, and require accommodation from loved ones (Fredman et al., 2016; Monson et al., 2010). Notably, evidence suggests that caregivers do experience a sense of burden when caring for their partners with PTSD. Loved ones of individuals with PTSD may also feel a sense of burden when taking over tasks over tasks their partners find unpleasant, withholding their own thoughts and feelings, or changing social activities (Fredman et al., 2016; Monson et al., 2010), and partners of veterans with PTSD have reported psychological distress, depression, and SI (Manguno-Mire et al., 2007).

Thwarted belongingness

Veterans report thwarted belongingness due to time spent away from family and friends and struggling to engage in these relationships after homecoming (Brenner et al., 2008). Due to values instilled in the military and masculine stereotypes regarding mental health, veterans may also be reluctant to reach out to others for support (e.g., Pietrzak et al., 2009). Thwarted belongingness may be particularly relevant to the veteran population given the overlap in symptoms inherent in a PTSD diagnosis (Blain et al., 2021). Ahern et al. (2015) suggest that the combination of viewing the military as an extended family, finding comfort in the structure of the military, experiencing a perceived lack of support from close others and institutions upon returning home, and struggling to find "a new normal" can predict how successfully a veteran transitions to civilian life. Veterans with PTSD may be less likely to pursue these opportunities to connect to due avoidance of external reminders of their traumatic experiences and the tendency to isolate.

Capability for suicide

Capability for suicide tends to be higher among military personnel (Bryan et al., 2010; Van Orden et al., 2008). Military-related experiences can increase the capability for suicide (Brenner et al., 2008; Joiner, 2005), as repeated exposure to feared or painful stimuli results in a desensitization to those stimuli (Overmeier, 2002). Joiner et al. (2016) have also proposed that proneness to suicide may result from pathological self-sacrifice for the perceived betterment of the group and that certain subgroups, such as military service members and veterans, may be more prone to self-sacrifice and more capable of engaging in suicidal behavior.

PTSD and ITS

Research supports the applicability of the ITS among veterans with PTSD but generally favors perceived burdensomeness over thwarted belongingness as a robust predictor of SI (e.g., Blain et al., 2021; Monteith et al., 2013, 2017). Furthermore, Blain and colleagues (2021) found perceived burdensomeness, but not thwarted belongingness, to exhibit significant indirect effects in the associations between SI and both changes in PTSD symptom severity and changes in negative cognitions of the self in a sample of veterans in residential PTSD treatment. An examination of specific PTSD symptom clusters further illuminates the association between PTSD and suicidal thoughts and/or behaviors within the context of the ITS. Kolnogorova et al.

(2021) examined associations between PTSD symptom clusters, as outlined in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV*; American Psychiatric Association, 1994), and SI and investigated whether perceived burdensomeness and thwarted belongingness mediated these associations in a large military sample (N = 773). The authors found that perceived burdensomeness mediated the associations in three out of the four *DSM-IV* PTSD clusters (i.e., reexperiencing, avoidance, and hyperarousal, but not numbing) and SI. Notably, PTSD was measured using a self-report checklist of *DSM-IV* PTSD symptoms (i.e., PTSD Checklist for *DSM-IV*–Military Version [PCL-M]; Weathers et al., 1993), warranting additional research using a clinician-rated structured interview of the current *DSM-5* symptoms. For this study, both self-report and clinician-rated measurements were used to assess PTSD symptoms. Although largely similar in estimates of changes in PTSD symptoms over time, Lee et al. (2022) found differences between the two measures in estimating symptom change such that clinician-rated measurement was found to demonstrate higher degrees of symptom improvement than the self-report measure at follow-up time points.

PTSD treatment and suicidal ideation

One way to prevent suicide is to directly address the underlying factors contributing to SI with evidence-based interventions. Evidence-based treatments for PTSD include cognitive processing therapy (CPT; Resick et al., 2017), prolonged exposure (PE; Foa et al., 2007), cognitive behavioral conjoint therapy (CBCT; Monson & Fredman, 2012), and present-centered therapy (PCT; Schnurr et al., 2001). These therapies are associated with significant reductions in SI across treatment (e.g., PE standalone, PE and PCT: L. A. Brown et al., 2019; CPT: Stayton et al., 2019), potentially through changes in the ITS constructs. Most previous studies have examined ITS constructs in residential treatment settings, whereas the results may differ in outpatient settings for many reasons (e.g., dosage of sessions, access to staff, presence of group vs. individual pretreatment symptom severity).

Suicidal ideation in veterans remains an elusive phenomenon despite notable assessment, prevention, and intervention efforts developed for this population. There is evidence that SI and behavior do not have a linear association. Wastler et al. (2022) reported that 36% of U.S. adults who reported past suicidal behavior denied ever having experienced an active suicidal thought, and 11% denied having a suicidal thought entirely. Among individuals who had recently attempted suicide, 54% denied recent active SI, and 23% denied suicidal thoughts. Although heightened SI can lead to suicide, it is not the only variable at play; however, no research has investigated these associations across other evidence-based treatments and outpatient settings that are inherently different from more restrictive and intensive residential treatment programs. Additionally, no research to date has examined these associations using *DSM-5* criteria and the gold-standard clinician-rated structured interview.

The goal of the current study was to address these gaps by investigating whether changes in clinician-rated and self-reported *DSM-5* PTSD symptom severity and changes in SI were indirectly associated through changes in perceived burdensomeness and thwarted belongingness across evidence-based PTSD treatment delivered in a VA outpatient setting. We hypothesized that PTSD symptom severity, whether clinician-rated or self-reported, would be indirectly associated through perceived burdensomeness but not thwarted belongingness. Similar associations between PTSD cluster scores, ITS constructs, and SI were also examined for exploratory purposes.

METHOD

Participants

Participants included veterans (N = 126; M_{age} = 46.55 years, SD = 15.8) who completed assessment upon initiation and termination of evidenced-based treatment for PTSD, including CPT (63.5%), PE (17.5%), CBCT (10.3%), PCT (5.6%), or mixed evidence-based treatment methods (i.e., switching therapies midtreatment [e.g., completing sessions of CPT, then initiating a full course of PE] due to patient request or treatment nonresponse; 3.2%) in an outpatient trauma specialty clinic at a VA medical center in the Midwestern United States. Admission to the outpatient clinic was contingent upon a diagnosis of PTSD (86.5%) or a *DSM-5* defined "other specified trauma- or stressor-related disorder" (i.e., subthreshold PTSD or not meeting the full diagnostic threshold for PTSD Criteria A–E;13.5%). PTSD diagnostic status was determined using the Clinician-Administered PTSD Scale for the *DSM*-5 (CAPS-5; Weathers, Blake, et al., 2013a). Sample characteristics are displayed in Table 1.

Procedure

The VA Office of Research and Development and the affiliated University of Cincinnati Institutional Review Board approved the examination of data collected as part of routine clinical care. Veterans participated in pre- and posttreatment assessments conducted by masters- or doctoral-level trained clinicians that included structured clinician-rated clinical interviews and self-report measures. Of note, the same battery of self-report questionnaires, with one

TABLE 1 Demographic variables

Variable	*M*	*SD*
Age (years)	47.12	15.97
	n	**%**
Sex		
Male	113	86.9
Female	17	13.1
Race/ethnicity		
White	100	76.9
Black/African American or other	25	19.3
Marital status		
Married or remarried	77	59.2
Divorced, separated, or widowed	18	13.9
Never married or did not report	35	26.9
Employment		
Employed	65	50.0
Disabled, unemployed, or retired	46	35.3
Student	10	7.7
Military branch		
Army	68	52.3
Other branch or multiple branches	59	45.4
Service connection for PTSD		
Service-connected	56	43.1
Not service-connected	69	53.1
Service era		
Post-9/11	73	56.1
Persian Gulf	14	10.8
Post-Vietnam	17	13.1
Vietnam	25	19.2
Index traumatic event		
Combat	72	55.4
Adult sexual assault	14	10.8
Childhood sexual abuse	5	3.8
Childhood physical abuse	6	4.6
Witness to death (nonmilitary)	16	12.3
Other trauma	17	13.1

Note: PTSD = posttraumatic stress disorder; 9/11 = September 11, 2001, terrorist attacks.

exception, and clinician-administered instruments were used in a recent study from the same clinic (i.e., Blain et al., 2021). In that study, participants received treatment in the residential PTSD program, whereas the current study examined participants in the outpatient PTSD program. Participants did not overlap in analyses for these two studies. Data were analyzed from an archival database collected as part of routine clinical care. Informed consent for this study was waived; however, participants provided consent to participate in treatment.

Measures

PTSD diagnosis and symptom severity

The CAPS-5 (Weathers, Blake, et al., 2013a) is a structured clinical interview that was used to diagnose full or subthreshold PTSD for admission to the outpatient clinic and assess PTSD symptom severity at both pre- and posttreatment. Each symptom is rated on a scale of 0 (*absent*) to 4 (*extreme*), with scores of 2 or higher meeting the diagnostic threshold of a PTSD symptom. Items are summed for a total score (range: 0–80), with higher scores indicating higher levels of PTSD symptom severity. In this sample, the CAPS-5 demonstrated good internal consistency at pretreatment, Cronbach's $\alpha = .80$, and excellent internal consistency at posttreatment, Cronbach's $\alpha = .90$, which aligns with the internal consistency reported in other studies that have employed samples of veterans with PTSD (e.g., Weathers et al., 2018; Cronbach's $\alpha = .88$). PTSD symptoms were assessed at pre- and posttreatment with regard to the past month and past week, respectively, as consistent with other studies (Weathers et al., 2001), and to ensure the assessment time window did not significantly overlap with treatment (Walter et al., 2014; Weathers et al., 2001). The CAPS-5 was administered by trained and licensed clinical staff (i.e., psychologists and social workers) or psychology trainees under a supervisor's license and review. Criterion A was ascertained via discussion with the participant regarding which traumatic event, as indicated on the Life Events Checklist for *DSM-5* (Weathers, Blake, et al., 2013b), caused the most distress in the participant's current functioning.

The PTSD Checklist for *DSM-5* (PCL-5; Weathers, Litz, et al., 2013) is a 20-item self-report measure of PTSD symptoms. Items are rated on a 4-point scale ranging from 0 (*not at all*) to 4 (*extremely*) and based on how much the symptoms have bothered the respondent during a given timeframe. Item scores are summed for a total score ranging from 0 to 80, with higher scores indicating a higher level of PTSD symptom severity. In the present study, PTSD symptoms were assessed at pre- and posttreatment with regards to the past month and the past week, respectively. Internal consistency was good at pretreatment, Cronbach's $\alpha = .87$, and excellent at posttreatment, Cronbach's $\alpha = .96$, consistent with those reported in other studies using veteran samples (e.g., Bovin et al., 2015; Cronbach's $\alpha = .96$).

Perceived burdensomeness and thwarted belongingness

The 15-item Interpersonal Needs Questionnaire–15 (INQ-15; Van Orden et al., 2012) is a self-report measure of perceived burdensomeness (six items) and thwarted

belongingness (nine items) and was derived from the ITS (Joiner, 2005; Van Orden et al., 2010). Respondents rate items on a 7-point scale ranging from 1 (*not at all true for me*) to 7 (*very true of me*). Item responses are summed across the two subscales, with higher scores indicative of higher perceptions of being a burden or not belonging around others. In the present sample, the internal consistency was good at pre- and posttreatment for both the Perceived Burdensomeness subscale, Cronbach's αs = .90 and .89, respectively, and the Thwarted Belongingness subscale, Cronbach's α = .85 and .90, respectively. Internal consistency values of the subscales at pre- and posttreatment in the present study were consistent with those found in a similar sample of veterans seeking trauma-focused treatment (e.g., Monteith et al., 2013).

Suicidal ideation

The Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991) is a 21-item, self-report measure of SI in the past week (19 items), past suicide attempts (one item), and the desire to die during the most recent suicide attempt (one item). Respondents rate items on a 3-point scale. Item responses (Items 1–19) can be added to obtain a sum score of SI. The BSS has been shown to be reliable and valid for use with adults in outpatient treatment settings (Bryan et al., 2015; G. K. Brown et al., 2000). In the present study, internal consistency was excellent at pretreatment, Cronbach's α = .95, and posttreatment, Cronbach's α = .95, which is consistent with a similar sample of veterans seeking trauma-focused residential treatment (Monteith et al., 2017).

Data analysis

Mean total scores were computed at pre- and posttreatment using descriptive statistics. Repeated-measures *t* tests and Cohen's *d* effect sizes were calculated to examine changes in all study variables across treatment. BSS Items 1–19 total scores were positively skewed at pre- and posttreatment, and log transformations improved the normality of the distributions for subsequent analyses. Residualized change scores for all study variables (i.e., BSS, PCL-5, CAPS-5, INQ–Thwarted Belongingness, and INQ–Perceived Burdensomeness) were used in the main study analyses (i.e., parallel models of multiple indirect effects) and calculated using separate linear regressions predicting each posttreatment score based on pretreatment scores. The SPSS (Version 28.0) PROCESS macro (Hayes, 2013) was used to test the main and exploratory analyses through parallel multiple-mediator models. Indirect effects were tested using a bootstrap estimation approach with 5,000 samples. The 95% bias-corrected confidence intervals (CIs) were analyzed to evaluate the statistical significance of the indirect effects, which were considered statistically significant if they did not include 0.

RESULTS

Study variables

Almost one third of participants (30.8%) reported SI at pretreatment, as measured by a total score of BSS Items 1–19 higher than 0. Some participants (17.0%) endorsed a history of suicide attempts, ranging from one (10.8%) to two or more (6.2%). The means and standard deviations for study variables at pre- and posttreatment and paired-samples *t* tests across treatment are listed in Table 2. All study variables significantly decreased across treatment and were associated with medium-to-large effect sizes, *d*s = 0.48–1.59, apart from the decrease in the BSS total score, which demonstrated a small effect size, *d* = 0.16.

Main analyses

Two separate parallel models of multiple indirect effects were conducted to examine whether changes in PTSD symptom severity, as measured using the CAPS-5 and PCL-5, and changes in SI, as measured using BSS Items 1–19, were indirectly associated through changes in the INQ-15 Perceived Burdensomeness and Thwarted Belongingness subscales. The models produced similar results. Therefore, only the CAPS-5 model is described below for brevity of reporting (see Figure 1). The results indicated that change in PTSD symptom severity was indirectly related to change in SI through change in perceived burdensomeness. First, change in PTSD symptom severity was positively associated with changes in perceived burdensomeness, Path a_1 = .57, *SE* = .07, 95% CI [.42, .71], and thwarted belongingness, Path a_2 = .53, *SE* = .08, 95% CI [.37, .68]. Change in perceived burdensomeness, after controlling for change in PTSD symptom severity, positively predicted change in SI, Path b_1 = .35, *SE* = .10, 95% CI [.15, .54], although change in thwarted belongingness did not, Path b_2 = .14, *SE* = .10, 95% CI [−.05, .33]. Change in PTSD symptom severity had a positive, direct effect on change in SI, Path *c* = .38, *SE* = .08, 95% CI [.21, .54]. When changes in perceived burdensomeness and thwarted belongingness were included in the model, this direct effect was no longer significant, Path *c'* = .11, *SE* = .10, 95% CI [−.10, .31]. The indirect effect for change in perceived burdensomeness, but not thwarted belongingness, was significant.

TABLE 2 Contrast of study variables at pretreatment and posttreatment

Variable	Pretreatment		Posttreatment				
	M	*SD*	*M*	*SD*	*t*(129)	95% CI[a]	Cohen's *d*
CAPS-5	33.58	9.23	16.61	11.96	16.88***	[14.99, 18.97]	1.59
PCL-5	49.38	12.46	26.90	19.13	15.23***	[19.56, 25.41]	1.39
INQ-15 PB	15.54	9.13	10.46	6.27	6.59***	[3.55, 6.60]	0.56
INQ-15 TB	36.57	12.46	30.34	13.22	5.67***	[4.06, 8.41]	0.48
BSS[b]	2.23	5.09	1.33	5.88	2.42*	[0.17, 1.64]	0.16

Note: CI = confidence interval; CAPS-5 = Clinician-Administered PTSD Scale for *DSM-5*; PCL-5 = PTSD Checklist for *DSM-5*; INQ-15 = Interpersonal Needs Questionnaire–15; PB = perceived burdensomeness; TB = thwarted belongingness; BSS = Beck Scale for Suicide Ideation.

[a]Confidence interval for mean change from pretreatment to posttreatment.

[b]Total scores for Items 1–19 at pretreatment and posttreatment were positively skewed; thus, log transformations were used to improve normality.

*$p < .05$. **$p < .10$. ***$p < .001$.

CAPS-5 symptom cluster scores

Additional parallel models of multiple indirect effects were conducted to examine whether changes in PTSD symptom cluster scores (i.e., intrusions, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity), as measured using the CAPS-5, and changes in SI were indirectly associated through changes in perceived burdensomeness and thwarted belongingness. The pattern of results for the negative alterations in cognitions and mood cluster and arousal cluster scores were comparable to those for the main models; that is, the indirect effect for change in perceived burdensomeness, but not thwarted belongingness, was significant (see Figure 2 for details); however, the intrusions and avoidance cluster scores exhibited different patterns of results.

For the intrusions cluster, change in total score was positively associated with changes in perceived burdensomeness, Path $a_1 = .46$, $SE = .08$, 95% CI [.30, .62], and thwarted belongingness, Path $a_2 = .50$, $SE = .08$, 95% CI [.35, .65]. Change in perceived burdensomeness, after controlling for change in intrusions, positively predicted change in SI, Path $b_1 = .33$, $SE = .09$, 95% CI [.15, .51], although change in thwarted belongingness did not, Path $b_2 = .10$, $SE = .09$, 95% CI [−.09, .28]. Change in intrusions had a positive direct effect on change in SI, Path $c = .40$, $SE = .08$, 95% CI [.01, .57]. When changes in perceived burdensomeness and thwarted belongingness were included in the model, this direct effect remained significant, Path $c' = .20$, $SE = .10$, 95% CI [.01, .39], indicating a partial direct effect.

For the avoidance cluster, the avoidance total score was positively associated with changes in perceived burdensomeness, Path $a_1 = .43$, $SE = .08$, 95% CI [.27, .59], and thwarted belongingness, Path $a_2 = .37$, $SE = .08$, 95% CI [.21, .54]. Changes in perceived burdensomeness and thwarted belongingness, after controlling for change in avoidance, positively predicted change in SI, Path $b_1 = .41$, $SE = .09$, 95% CI [.22, .59], and Path $b_2 = .18$, $SE = .09$, 95% CI [.01, .36], respectively. Change in avoidance had a positive direct effect on change in SI, Path $c = .21$, $SE = .09$, 95% CI [.03, .38]. When changes in perceived burdensomeness and thwarted belongingness were included in the model, this direct effect was no longer significant, Path $c' = -.04$, $SE = .09$, 95% CI [−.22, .14]. The indirect effects for changes in perceived burdensomeness and thwarted belongingness were both significant.

DISCUSSION

Although PTSD is a well-documented risk factor for SI, more research is needed to understand this association. To our knowledge, the present study was the first to examine whether changes in PTSD symptom severity and SI were indirectly associated through changes in perceived burdensomeness and thwarted belongingness across evidence-based, outpatient PTSD treatment. This study expands upon existing literature (e.g., Kolnogorova et al., 2021) to include the examination of associations between PTSD cluster scores and SI using clinician-rated and self-reported assessments of *DSM-5* PTSD criteria.

Scores on measures of all study variables significantly decreased from pre- to posttreatment. This is consistent with prior literature suggesting that evidence-based treatment for PTSD results in decreased SI across various treatment settings (e.g., Blain et al., 2021; Resick et al., 2017; Stayton et al., 2019). Further, change in PTSD symptom severity was significantly predictive of change in SI regardless of whether symptoms were clinician-rated or self-reported. This is consistent with research suggesting that PTSD is a risk factor for SI and, therefore, as PTSD symptoms decrease, there would also be an expected decrease in SI (L. A. Brown et al., 2019; Martin et al., 2021; Stayton et al., 2019).

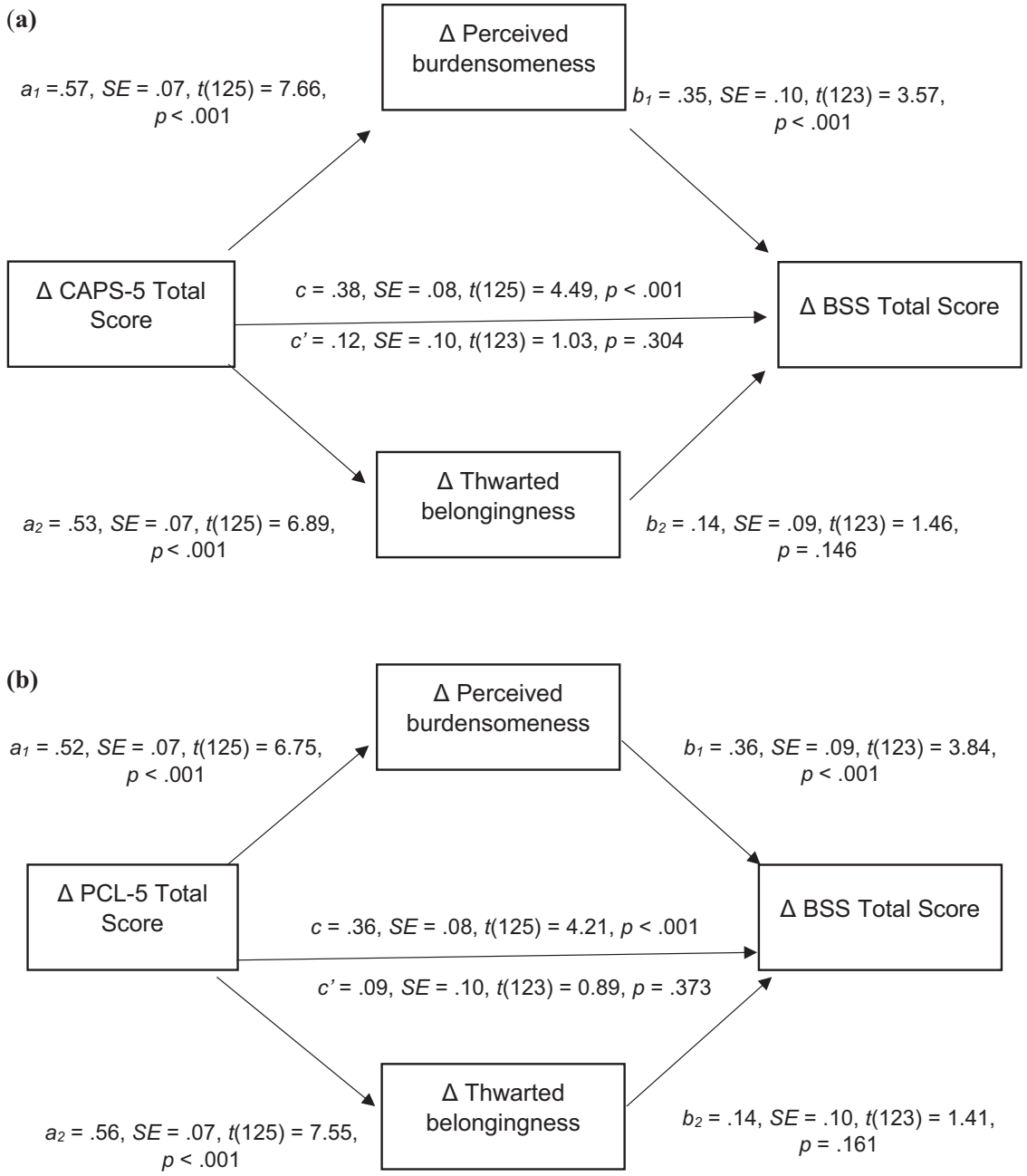

FIGURE 1 Models of indirect associations between residualized changes in (A) clinician-rated and (B) self-report posttraumatic stress disorder (PTSD) symptom severity and suicidal ideation via perceived burdensomeness and thwarted belongingness

Note: Clinician-rated PTSD symptoms were measured using the Clinician-Administered PTSD Scale for *DSM-5* (CAPS-5), and self-reported PTSD symptoms were measured using the PTSD Checklist for *DSM-5* (PCL-5). Perceived burdensomeness and thwarted belongingness were measured using the Interpersonal Needs Questionnaire–15. Suicidal ideation was measured using Items 1–19 of the Beck Scale for Suicide Ideation (BSS). Total scores for BSS Items 1–19 at pretreatment and posttreatment were log-transformed to improve normality.

The findings support our hypothesis that changes in PTSD severity and SI would be indirectly associated through changes in perceived burdensomeness but not thwarted belongingness. This is consistent with prior research demonstrating that perceived burdensomeness is a stronger predictor of SI when compared to thwarted belongingness in veteran and active military samples (e.g., Blain et al., 2021; Monteith et al., 2017). A recent meta-analytic review also found that perceived burdensomeness was more strongly associated with suicidal thoughts and behaviors (Chu et al., 2017). As veterans progress through evidence-based treatment for PTSD, they may feel better

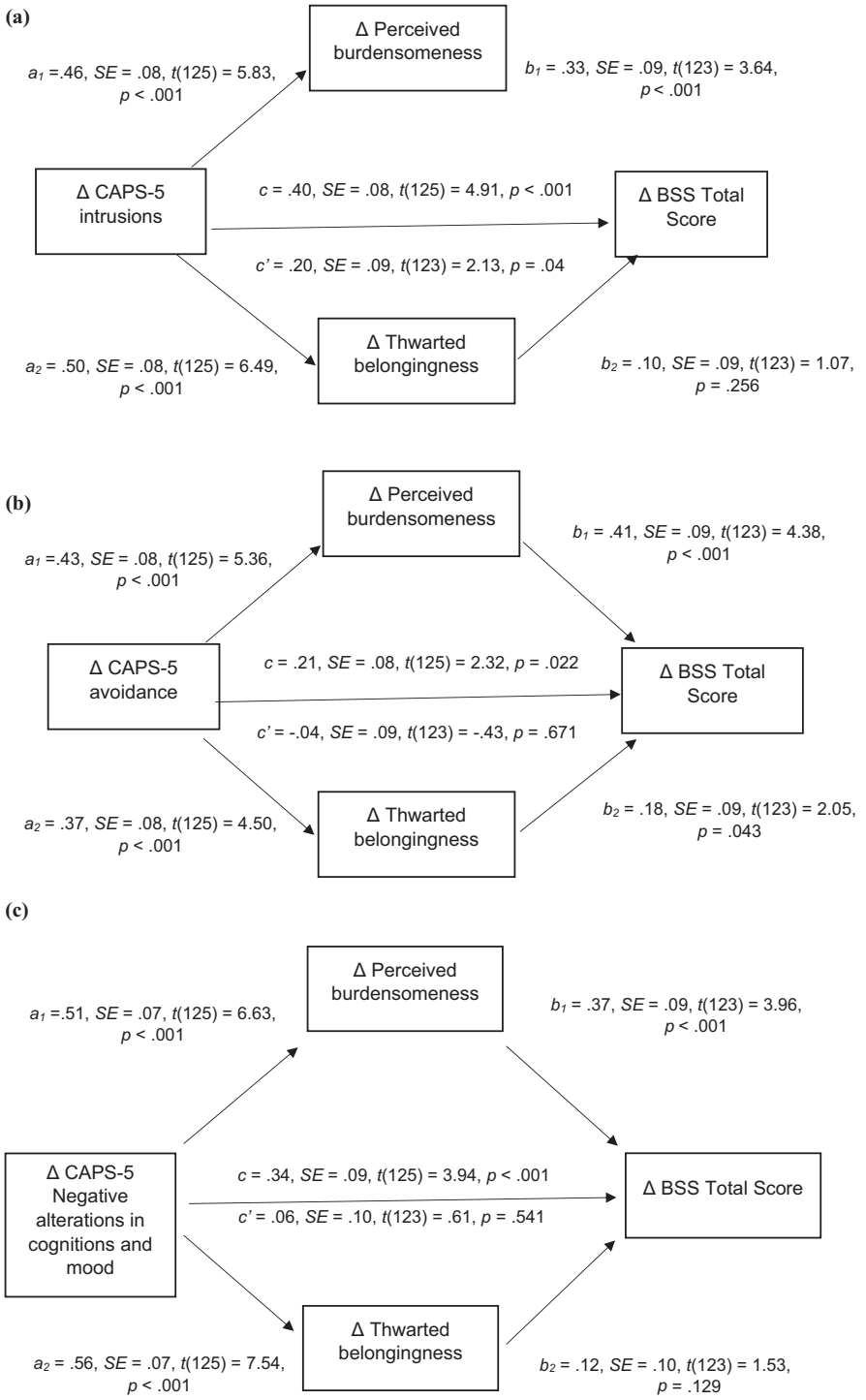

FIGURE 2 Models of indirect associations between residualized changes in clinician-rated posttraumatic stress disorder (PTSD) symptom cluster scores for (A) intrusions, (B) avoidance, (C) negative alterations in cognitions and mood, and (D) alterations in arousal and reactivity and suicidal ideation via perceived burdensomeness and thwarted belongingness

Note: PTSD symptoms were assessed using the Clinician-Administered PTSD Scale for *DSM-5* (CAPS-5). Perceived burdensomeness and thwarted belongingness were measured using the Interpersonal Needs Questionnaire–15. Suicidal ideation was measured using Items 1–19 of the Beck Scale for Suicide Ideation (BSS). Total scores for BSS Items 1–19 at pretreatment and posttreatment were log-transformed to improve normality.

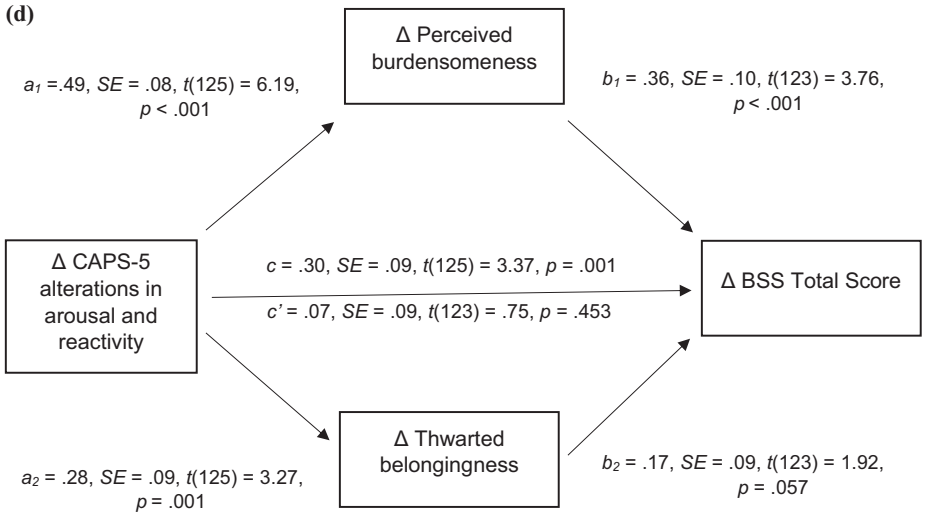

FIGURE 2 Continued

equipped to cope with unpleasant emotions and reminders of their traumatic experiences and may be more willing to approach previously avoided stimuli that may have led to a reliance on others to get their needs met. As veterans are commonly indoctrinated that asking for help implies weakness (e.g., Burns & Mahalik, 2011), increased feelings of self-efficacy throughout treatment may lead to reduced feelings of burdensomeness. Additionally, PTSD treatment may alleviate the objective burden of PTSD due to decreasing symptom levels and related distress and functional impairment.

Indirect effects were nonsignificant for thwarted belongingness in the association between PTSD symptom severity and SI, which contributes to the mixed findings in the current literature. Thwarted belongingness has exhibited similar nonsignificant results in other veteran samples (e.g., Chu et al., 2017); however, associated constructs, such as social support, have often been associated with decreased SI in other trauma-exposed samples (e.g., Panagioti et al., 2014). Based on the current findings, veterans with PTSD may represent a unique case in which these individuals are less likely to seek out social engagement due to related PTSD symptoms (i.e., detachment or estrangement from others) and, in turn, may not perceive a lack of belonging to be as distressing as has been observed in other clinical samples without PTSD. Previous studies have also reported nonsignificant associations between thwarted belongingness and SI in veteran samples (e.g., Blain et al., 2021; Monteith et al., 2013, 2017). Additionally, past research has suggested that thwarted belongingness may only predict SI when high levels of perceived burdensomeness are also present (Monteith et al., 2013). Finally, evidence suggests that thwarted belongingness does not always demonstrate a clear association with SI and may be more frequently endorsed than perceived burdensomeness (Short et al., 2019). Our findings suggest that it may be beneficial to emphasize the role of perceived burdensomeness when applying the ITS in veterans with PTSD, as opposed to other samples, to predict suicidal ideation.

Current findings also indicate that the indirect effects of changes in perceived burdensomeness and thwarted belongingness on change in SI may vary across PTSD symptom clusters. Although the pattern of results for the negative alterations in cognitions and mood and alterations in arousal and reactivity cluster scores closely mirrored the results of the PTSD total score analyses, the intrusions and avoidance cluster scores demonstrated different results. That is, the intrusions cluster model indicated a partial direct effect of change in perceived burdensomeness on change in SI, and the avoidance cluster model indicated an indirect effect of both perceived burdensomeness and thwarted belongingness on change in SI. These results are partially consistent with findings reported by Kolnogorova and colleagues (2021), who found that perceived burdensomeness mediated the associations between SI and the *DSM-IV* reexperiencing, avoidance, and arousal clusters but did not exhibit the same indirect effect when examining the emotional numbing cluster. However, the researchers had a much larger sample ($N = 773$) than our study and only included veterans and active-duty military members who had recently endorsed recent thoughts of death or had a prior suicide attempt. In contrast, only 30.8% of participants in the current sample endorsed SI. This suggests that our results may have been affected by floor effects when considering SI. Another possible explanation for the partial indirect effect of perceived burdensomeness on the association between the intrusions cluster and SI is that intrusion

symptoms are less readily visible to close others than symptoms of negative alterations in cognition and mood, increased arousal, and avoidance. As a result, veterans may not perceive intrusion symptoms to be the predominant source of symptom burden to their support systems or society.

With regard to the indirect effect of both perceived burdensomeness and thwarted belongingness on changes in SI in the avoidance cluster, these constructs are likely to be particularly salient for veterans who report high levels of internal and external avoidance. These veterans may feel burdensome to others because they believe they are unable to be in situations or engage in activities that remind them of their traumatic experiences and may not feel like they belong because they have a difficult time connecting with others or are avoidant of their internal thoughts and emotions. As symptoms of internal and external avoidance may keep veterans with PTSD disconnected emotionally and physically from close others and their environments, suicide may provide a perceived escape from the constant reminders of trauma they face in their everyday lives.

Several limitations should be kept in consideration when interpreting these results. First, the current study was not a randomized controlled trial; therefore, temporal and causal associations among study constructs cannot be inferred. The results from the current study may be due in part to the dynamic nature of SI as well as the role of time. Second, the sample represented a relatively small group of mostly White, male, heterosexual veterans, so the results may not generalize to more diverse populations. Furthermore, the small sample size prohibited the analysis of differences across treatment groups (e.g., CPT, PE). In addition, given that only 30.8% of veterans in the current sample reported SI at pretreatment, the findings may be suppressed by a relatively smaller frequency of SI at baseline. A further limitation is that only data from treatment completers were examined. The literature on trauma-focused treatment indicates moderate-to-high dropout rates throughout the course of treatment (Edwards-Stewart et al., 2021); thus, the exclusion of these individuals from the present study may have obscured important data from individuals who were experiencing high levels of distress or SI that led to their termination of treatment. It is unclear whether SI contributed to reasons for dropout in this specific sample, as this was beyond the scope of the current study. Further, the literature indicates that military personnel tend to underreport SI (Anestis et al., 2017). This not only undermines the effectiveness of current risk assessments and safety protocols for high-risk veterans but also makes unclear the true extent of the SI a veteran may be experiencing. Future research is also needed to fully examine the ITS. The current study did not assess veterans' capability for suicide, the third component of the ITS.

Longitudinal data is needed to examine causality among the study variables. Future research examining a more diverse group of veterans may reveal important variability of these constructs across diverse populations. Veterans who experience SI do not necessarily go on to attempt suicide; therefore, examining veterans who have attempted suicide to further clarify the role of perceived burdensomeness and thwarted belongingness in a more severe clinical sample with more acute suicidal thoughts and/or behaviors is warranted. It will be important for future researchers to focus on veterans who did not complete a full course of trauma-focused therapy to determine other possible variables linked with SI and dropout. The inclusion of measures such as the Fearlessness About Death subscale of the Acquired Capability for Suicide Scale (ACSS; Ribeiro et al., 2014; Van Orden et al., 2008) in future research would be vital for fully evaluating the predictive value of this theory.

Clinicians may benefit from future research geared toward targeting ITS constructs both within evidence-based PTSD treatments and as standalone interventions to reduce SI above and beyond the standard treatment delivery represented in this study. Research suggests that interventions for reducing perceived burdensomeness and thwarted belongingness via psychoeducation, cognitive bias modification, cognitive restructuring, behavioral activation, and other related techniques are effective in reducing SI (e.g., Allan et al., 2018; Short et al., 2019). Therefore, using cognitive behavioral techniques embedded in existing evidence-based treatments to decrease SI would likely be plausible and effective. For example, for CPT and PE, the two most widely disseminated PTSD treatments within the VA, clinicians could target and restructure beliefs related to thwarted belongingness and perceived burdensomeness (e.g., "I do not belong anywhere," "People in my life would be better off if I were gone") or assign in vivo exposures specifically targeting these constructs (e.g., asking for and receiving help, reconnecting with loved ones, participating in hobbies, volunteering), respectively.

The present study provides further evidence that perceived burdensomeness, in addition to thwarted belongingness for people with significant levels of avoidance symptoms, is an important assessment and treatment target for individuals who report PTSD symptoms and co-occurring SI. Interventions that alleviate the objective burden of PTSD and allow for challenging perceptions of burdensomeness cognitively or behaviorally, such as evidence-based treatments for PTSD, may be of particular benefit for veterans who endorse PTSD symptoms and SI.

Ultimately, this type of targeted treatment may decrease the rate of suicide in veterans.

OPEN PRACTICES STATEMENT

The study reported in this article was not formally preregistered. Neither the data nor the materials have been made available on a permanent third-party archive; inquiries about the data or materials can be sent via email to Colleen.martin4@va.gov.

AUTHOR NOTE

The content of this manuscript does not necessarily reflect the views of the United States Government or the Department of Veterans Affairs.

Kathleen M. Chard is a co-author of *Cognitive Processing Therapy for PTSD: A Comprehensive Manual* and receives royalties from this publication.

The authors would like to sincerely thank all staff at the Trauma Recovery Center for their assistance with data collection and management.

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How to cite this article: Blain, R. C., Martin, C. E., Ehlinger, C. C., & Chard, K. M. (2023). Evidence-based treatment for posttraumatic stress disorder decreases suicidal ideation by reducing perceived burdensomeness among veterans in an outpatient program. *Journal of Traumatic Stress*, *36*, 1138–1150. https://doi.org/10.1002/jts.23004