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Nonsuicidal Self-Injury and Borderline Personality Disorder Features as Risk Factors for Suicidal Ideation among Male Veterans with Posttraumatic Stress Disorder

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Abstract

U.S. veterans are at increased risk for suicide compared to their civilian counterparts, accounting for approximately 20% of all deaths by suicide. Posttraumatic stress disorder (PTSD) and symptoms of borderline personality disorder (BPD) have each been associated with increased suicide risk. Additionally, emerging research suggests that nonsuicidal self-injury (NSSI) may be a unique risk factor for suicidal behavior. Archival data from 728 male veterans with a PTSD diagnosis receiving care through an outpatient Veterans Health Administration (VHA) specialty PTSD clinic were analyzed. PTSD diagnosis was based on a structured clinical interview administered by trained clinicians. BPD features were assessed using a subscale of the Personality Assessment Inventory, and NSSI and suicidal ideation (SI) were assessed by self-report. Findings revealed that NSSI (58.8%) and BPD features (23.5%) were both relatively common in this sample of male veterans with PTSD. As expected, each condition was associated with significantly increased odds of experiencing SI compared to PTSD alone (*ORs* ranged from 1.2 to 2.6); moreover, co-occurring PTSD+NSSI+BPD was associated with significantly increased odds of experiencing SI compared with PTSD (*OR* = 5.68), PTSD+NSSI (*OR* = 2.57), and PTSD+BPD (*OR* = 2.13). The present findings provide new insight into the rates of NSSI and BPD features

among male veterans with PTSD and highlight the potential importance of these factors in suicide risk.

Keywords

Suicide; suicidal ideation; nonsuicidal self-injury; borderline personality disorder; posttraumatic stress disorder; veterans

United States military veterans account for only 8.5% of the United States population but 20% of deaths by suicide each year (Department of Veterans Affairs [VA] Office of Mental Health and Suicide Prevention, 2017). There are approximately 20 deaths by suicide per day among veterans, six of which occur among veterans currently using Veterans Health Administration (VHA) health services (Department of Veterans Affairs [VA], 2017; Department of Veterans Affairs & Department of Defense [VA/DoD], 2013). Veterans face many risk factors for suicide, including physical and mental health diagnoses (VA, 2017; VA/DoD, 2013) and high rates of posttraumatic stress disorder (PTSD; Bullman & Kang, 1994; Sareen et al., 2005) and nonsuicidal self-injury (NSSI; Kimbrel et al., 2015, 2016).

Approximately 21% of veterans seeking care from VHA are diagnosed with PTSD (Gates et al., 2012), and veterans with a PTSD diagnosis are up to four times more likely to experience suicidal ideation (SI) than those without a PTSD diagnosis (Jakupcak et al., 2009). Notably, PTSD shares symptom overlap (e.g., emotion dysregulation, dissociation, and anger/irritability) with another robust risk factor for suicidal behavior, borderline personality disorder (BPD; American Psychiatric Association [APA], 2013). A small study ($n=34$, 53% psychiatric inpatients) conducted under DSM-III-R criteria suggested that as many as 76% of combat veterans with PTSD also met criteria for BPD (Southwick, Yehuda, & Giller, 1993). This is consistent with findings of high co-occurrence between BPD and PTSD in community outpatient clinics (Harned, Rizvi, & Linehan, 2010) but has not been replicated with updated DSM criteria among diverse samples of veterans.

Moreover, emerging research suggests that a sizable proportion of veterans with PTSD engage in NSSI (e.g., Kimbrel et al., 2014), defined as deliberate self-directed violence resulting in personal injury without intent to die (Crosby, Ortega, & Melanson, 2011). Examples of NSSI include, but are not limited to, cutting, burning, or hitting oneself. NSSI is distinguished from suicidal behavior by the absence or presence of an individual's desire and intent to die by the action. For example, cutting oneself without desire and intent to die is an example of NSSI; whereas, engaging in cutting with the desire and intent to die is a suicide attempt. Although NSSI is, by definition, functionally distinct from suicidal behavior, growing research suggests that NSSI is associated with heightened risk for suicide attempts and SI (Bryan et al., 2015; Hamza, Stewart, & Willoughby, 2012). Indeed, a recent meta-analysis supported NSSI as the strongest predictor of future suicide attempts but was unable to examine the effect of NSSI on SI due to the dearth of research examining this question (Reibero et al., 2016). SI, however, was one of the strongest predictors of death by suicide, which highlights the importance of clarifying the relationship of NSSI to SI.

NSSI occurs at high rates among individuals with both PTSD and BPD (e.g., Bentley et al., 2015), presumably due to their shared association with emotion dysregulation (Chapman et al., 2006). Indeed, the regulation of emotions, including both relieving emotional pain (Klonsky, 2007) and increasing positive affect (Sacks et al., 2008), is among the most commonly endorsed functions of NSSI. Notwithstanding NSSI being among BPD criteria and a potentially associated feature of PTSD, NSSI has been proposed as an independent diagnosis (APA, 2013; see Zetterqvist, 2015 for a review). Emerging evidence suggests NSSI disorder is comorbid at similar rates with multiple types of psychopathology (e.g., Glenn & Klonsky, 2013; Gratz, Dixon-Gordon, Chapman, & Tull, 2015) and is associated with more suicidal ideation and behavior (i.e., attempts; Glenn & Klonsky, 2013). Among veterans returning from Iraq and Afghanistan, NSSI has been found to predict current active SI above and beyond other risk factors, including mental health diagnoses (Kimbrel et al., 2014). This is consistent with past findings that NSSI was more strongly associated with suicide attempts than were other risk factors, including BPD (Klonsky et al., 2013; Reibero et al., 2016). Of relevance to the present study, Bryan and colleagues (2015) found that over one-third of suicide attempts among their nonclinical veteran and military sample were preceded by NSSI following SI.

There is growing evidence linking PTSD, BPD, and NSSI to suicidal ideation. Among an adolescent sample, NSSI was associated with emotion dysregulation, suicidal ideation, and suicide attempts above and beyond the impact of BPD (Glenn & Klonsky, 2013). Among women, the co-occurrence of PTSD and BPD is associated with greater emotion dysregulation, NSSI, and suicidal behavior than is BPD alone (see Harned, Rizvi, & Linehan, 2010). Despite these findings, no study has, to our knowledge, examined these four variables together.

Fluid Vulnerability Theory (FVT; 2006) and the Interpersonal Theory of Suicide (IPTS; Joiner, 2005) are two complementary theories of suicide risk that help inform our understanding of PTSD, BPD, and NSSI as risk factors for SI (see Bryan, Grove, & Kimbrel, 2017). FVT posits that suicide risk fluctuates with dynamic changes across four categories of risk and protective factors (i.e., cognitive, emotional, physical, and behavioral). In addition to affecting each of these domains, PTSD, NSSI, and BPD are conditions that increase individuals' baseline risk, lower the activation threshold for crisis, and impair the ability to recover from crisis. IPTS suggests specific mechanisms that may affect these processes. Namely, that the capability to engage in lethal suicidal self-injury is acquired through trauma exposure and engaging in NSSI (i.e., by lowering fear of pain and death). Additionally, symptoms of all three conditions contribute to feelings of perceived burdensomeness and thwarted belongingness through negative cognitions (e.g., self-hatred, beliefs of worthlessness), emotional lability (e.g., mood swings, extreme negative emotions, uncontrolled anger), disrupted relationships (e.g., social isolation, relational discord), et cetera.

Studies on these constructs have largely been conducted with female civilian populations in community outpatient clinics (e.g., Harned, Rizvi, & Linehan, 2010), and research examining BPD and NSSI among men is conspicuously lacking. This has led to methods of NSSI commonly used by men (e.g., wall/object punching; Kimbrel, Thomas, et al., in press)

being overlooked. To our knowledge no study has yet examined the prevalence of BPD or its relationship to suicide risk among male veterans with PTSD. Thus, the degree to which extant findings apply to military or male populations, particularly male veterans, remains unknown. This is a notable oversight, given that recent research has observed high rates of both suicidal behavior and NSSI among male veterans (e.g., Hoffmire, Kemp, & Bossarte, 2015; Kimbrel et al., 2014).

Present Study

The aims of the present study were to extend existing research by examining PTSD, BPD, NSSI, and SI together among male veterans of the U.S. military. We did this by 1) documenting the rates of BPD features and current NSSI among male veterans with PTSD, and 2) examining the odds of experiencing SI associated with these phenomena. We hypothesized that BPD features and NSSI would each be significantly and independently associated with SI and that the presence of both phenomena among veterans with PTSD would be associated with the highest odds of SI.

Method

Participants

We analyzed archival data from 728 male veterans with a diagnosis of PTSD receiving care through an outpatient VHA specialty PTSD clinic between 2000 and 2014. The VHA defines veterans as “A person who served in active military, naval or air service who was discharged or released from service under conditions ‘other than dishonorable.’” (VA, 2014; VA 2018). Former and current members of the National Guard and Reserves may be eligible for VHA services if they were previously called to and served active duty other than training (VA, 2018). Participants’ ages ranged from 20 to 86 ($M = 48.69$, $SD = 12.31$) years. The majority of participants were non-Hispanic Black/African American ($n = 336$, 46.6%) or non-Hispanic White ($n = 335$, 46.0%). Approximately 3% ($n = 21$) of the sample identified as Hispanic. The majority of participants were married ($n = 414$, 56.9%) or divorced, separated, or widowed ($n = 226$, 31.0%). All veterans were diagnosed with PTSD, and 61.8% ($n = 450$) were diagnosed with co-occurring depression.

Procedure

PTSD diagnosis was based on a structured clinical interview administered by trained clinicians. Data were part of a standard initial evaluation for the PTSD clinic in which participants completed clinical interviews and a battery of self-report assessments. Storage and use of these data for research purposes was approved by the institutional review board at Durham VA Medical Center. Written informed consent to use their data for research purposes was obtained from each veterans prior to evaluation. Agreeing or declining to participate did not impact veterans’ care. The present study did not include women veterans or male veterans who did not receive a diagnosis of PTSD. Of the 871 male veterans with PTSD who completed measures of the variables of interest, 138 (15.8%) were excluded due to invalid profiles on the personality assessment using standard cutoff scores (Morey, 2003), and five more were dropped from the analyses due to missing data on the outcome variable.

Measures

Demographic Information.—Demographic information collected included age, gender, race, and marital status.

Probable Borderline Personality Disorder.—Borderline personality features were measured using the Borderline Features Scale (BOR) of the Personality Assessment Inventory (PAI; Morey, 1991). The PAI is a 344-item self-report measure of personality pathology. Respondents rate each item on a 4-point Likert-type scale. The BOR is composed of four subscales assessing affective instability (BOR-A), identity problems (BOR-I), negative relationships (BOR-N), and self-harm behaviors (BOR-S). Each subscale reflects a component characteristic of BPD. BOR-A reflects emotional sensitivity, lability, and dysregulation. BOR-I reflects elements of unstable identity, lack of purpose, and feelings of emptiness. BOR-N captures history of unstable relationships and feelings of betrayal and abandonment. BOR-S measures impulsive engagement in high risk activities, such as drug abuse, risky sexual encounters, and reckless financial decisions. It is important to note that BOR-S is not an assessment of self-directed violence or suicidal behavior (Morey, 2003). Previous research has shown that a BOR total scale score > 65 is sufficiently sensitive and specific to identify individuals with a clinical diagnosis of BPD (Jacobo, Blais, Baity, & Harley, 2007); however, due to the shared features of BPD with severe PTSD, we used a highly conservative calculation of BPD features diagnosis requiring scores > 75T on the BOR and > 75T on at least 3 of the 4 BOR subscales, as elevations above 70T on three or more BOR subscales are associated with increased probability of patients meeting full diagnostic criteria for BPD (Morey, 2003). Consistent with previous research examining BPD and NSSI together, the self-injury criterion was retained in the BPD variable.

Nonsuicidal Self-Injury.—Consistent with previous research, five self-reported behavioral items were used to measure NSSI, including severe scratching/skin picking, cutting, hitting, burning, and wall/object punching (Kimbrel, Thomas, et al., 2017; Kimbrel et al., in press). With the exception of wall punching, these items reflect the deliberate self-harm subscale (Sacks, Flood, Dennis, Hertzberg, & Beckham, 2008) of the Habit Questionnaire (HQ; Resnick & Weaver, 1994). This subscale distinguishes NSSI (i.e., deliberate self-directed violence with the intent to injure) from body-focused repetitive behaviors (i.e., habitual, repetitive behavior that may result in injury). Wall/object punching was included because it is a form of NSSI shown to be common among men (Kimbrel et al., in press). Respondents rated each item for lifetime presence (yes/no) and frequency within the past two weeks (not at all, once, two to four times, five or more times). Frequency within the past two weeks was coded dichotomously (absent versus present) to reflect current NSSI.

Suicidal Ideation.—Item 9 from the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) was used to measure current suicidal ideation. BDI-II item 9 reflects the presence of “suicidal thoughts or wishes” in the past two weeks. Respondents select the statement that best describes their experience of suicidal ideation/intent from the following options: 0 “I don’t have any thoughts of killing myself,” 1 “I have thoughts of killing myself, but I would not carry them out,” 2 “I would like to kill myself,” and 3 “I would kill myself if

I had the chance". This item was scored as a dichotomous variable of self-reported absence (0) or presence (1–3) of any level of SI within the past two weeks.

Data Analysis

Univariate statistics and bivariate relationships among variables were examined prior to hypothesis testing. Logistic regression (SAS PROC LOGISTIC) was used to model the presence of SI as a function of the presence of BPD features and endorsement of current NSSI. Logistic regression provides odds ratios for the presence of SI based on group membership. Specifically, participants (i.e., male veterans diagnosed with PTSD) were identified as a) not having severe BPD features or any NSSI (PTSD group), b) having BPD features but not NSSI (PTSD+BPD group), c) not having BPD features but engaging in NSSI (PTSD+NSSI group), and d) demonstrating both BPD features and NSSI (PTSD+NSSI+BPD group). Subjects were each assigned to one group such that there was no overlap in group membership. Differences in odds between groups are statistically significant when the associated 95% confidence interval (CI) does not span 1.

Results

Table 1 presents the distribution of NSSI and BPD features among veterans with PTSD. The majority of the sample ($n = 599$, 82.3%) reported at least one of these conditions. Over half the sample ($n = 428$, 58.8%) endorsed engaging in at least one act of NSSI within the past two weeks. A quarter of the sample ($n = 171$, 23.5%) met the cutoff for severe BPD features. One hundred twenty-four participants (17.0%) endorsed both BPD features and current NSSI (i.e., PTSD+BPD+NSSI group), representing 72.5% of those with BPD features and 29.0% of those with current NSSI. The PTSD+NSSI group consisted of 304 participants, and the PTSD+BPD group had 47 participants. Two-hundred fifty-three participants neither endorsed NSSI on the HQ nor met the cutoff for severe BPD features (i.e., PTSD-only group).

Of the 428 veterans reporting current NSSI, approximately half (48.4%, $n = 207$) endorsed using multiple forms of NSSI during the past two weeks. Wall/object punching was the most commonly reported form of NSSI (68.7%, $n = 294$), followed by severe scratching/skin picking resulting in injury (60.1%, $n = 257$), hitting (26.9%, $n = 115$), burning (10.3%, $n = 44$), and cutting (7.0%, $n = 30$). Over half the sample endorsed SI during the past two weeks ($n = 379$, 52.1%). All variables were correlated at $p < .0001$.

As illustrated in Figure 1, veterans in the PTSD+NSSI, PTSD+BPD, and PTSD+NSSI+BPD groups were significantly more likely to report current SI than those in the PTSD only group. Logistic regression results are presented in Table 2. PTSD+NSSI ($OR = 2.21$, 95% CI = 1.57, 3.11) and PTSD+BPD ($OR = 2.66$, 95% CI = 1.41, 5.05) were significantly associated with current SI. The odds of experiencing SI did not significantly differ between these groups ($OR = 1.21$, 95% CI = 0.65, 2.26). The PTSD+NSSI+BPD group exhibited the greatest odds for SI ($OR = 5.68$, 95% CI = 3.49, 9.22), which was significantly higher than those observed for PTSD+NSSI and PTSD+BPD ($OR = 2.57$, 95% CI = 1.61, 4.11 and $OR = 2.13$, 95% CI = 1.04, 4.34, respectively).

Discussion

Results of this study demonstrate the influence of NSSI and probable BPD on risk for SI among male veterans suffering from PTSD. Both BPD features and NSSI were common, with more than half the sample (58.79%) endorsing current NSSI and almost a quarter of the sample (23.5%) having severe BPD features. Notably, 71% of male veterans who endorsed NSSI did so in the absence of BPD features, suggesting that NSSI may also be an associated feature of PTSD.

Consistent with our hypothesis, NSSI and BPD features were each independently related to increased odds of SI, and there was not a significant difference in SI between the PTSD+NSSI and PTSD+BPD groups. Thus, NSSI alone or BPD features alone conferred equivalent risk for SI among the present sample. This finding suggests the relevance of NSSI to SI among male veterans with PTSD (independent of BPD features), although further research is needed. Given evidence that emotion dysregulation is a robust risk factor for SI (e.g., Anestis, Bagge, Tull, & Joiner, 2011), this finding may reflect the heightened emotion dysregulation observed in both BPD features and NSSI. Unsurprisingly, the presence of both NSSI and BPD features among male veterans with PTSD conferred the greatest SI risk, as those in the PTSD+NSSI+BPD group had 5.68 times the odds of experiencing SI than those with only PTSD.

The present findings should be interpreted within the context of the study limitations. First, the use of cross-sectional, self-report data does not allow for causal inference. Second, findings from a sample of male veterans with PTSD cannot be generalized to other populations, such as women veterans or civilians. It also remains unknown whether the era of service would influence the rates of NSSI and BPD among male veterans with PTSD, or their relationships to SI within this population. Additionally, data for the present study reflect DSM-IV-TR criteria for PTSD and limited types of self-reported NSSI; therefore, it remains unknown whether these findings will replicate using DSM-5 criteria for PTSD and/or NSSI disorder. Finally, although the use of such a conservative threshold for determining BPD features likely decreased the likelihood of false positives, it may also have resulted in the exclusion of some veterans who experienced significant symptoms and impairment consistent with BPD. Future research utilizing structured clinical interviews of BPD is needed. Notwithstanding these limitations, the present study is, to our knowledge, the first to explore NSSI and BPD features among male veterans with PTSD. The large sample is representative of male veterans seeking PTSD treatment in a VHA specialty clinic; therefore, findings from this study may be generalizable to this population. Given the relative lack of research, additional empirical questions abound. Further research is needed to explore the presence and impact of NSSI and co-occurring BPD among male veterans with PTSD. Because PTSD is associated with emotion dysregulation and increased negative emotions, male veterans with PTSD may use NSSI as a coping strategy for regulating intense negative emotions. A recent study found that ICD-11 criteria for complex PTSD appears more strongly associated with BPD, self-harm and SI than is DSM-5 PTSD (Hyland, Shevlin, Fyvie, & Karatzias, 2018). Research using DSM-5 and ICD-11 are needed to replicate and expand the present findings. Expanding our knowledge of the role of NSSI and BPD in the associated difficulties and trajectory of PTSD may improve care for veterans

with PTSD who are at risk for or are experiencing SI. Additionally, a better understanding of the impact of co-occurring BPD among male veterans with PTSD and its relationship to suicide risk is essential for appropriate treatment planning and suicide risk management. Further research is needed to replicate and expand existing research, while including variables that may also influence these relationships. The interrelationships of PTSD, NSSI, and BPD should also be examined among women veterans, who are at elevated risk for suicidal behavior compared to their male counterparts (Hoffmire, et al., 2015). It is possible that the relationships of these variables may be different among veterans of different wartime eras. Research is needed to examine how such variations may relate to clinical presentation and treatment needs. Overall, the findings of the present study provide new insight into the relationships of NSSI and BPD features to suicidal ideation among male veterans with PTSD and highlight the need for careful assessment and management of these factors.

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Figure 1.
Percentage of veterans in each group who endorsed current suicidal ideation.

Table 1.

Number of Veterans in Each Group and Proportion of Variable Overlap

	<i>n</i>	
	NSSI (Column %)	BPD (Column %)
NSSI	304 ^a (71.0)	124 ^b (72.5)
BPD	124 ^b (29.0)	47 ^c (27.5)

Column % is the percentage of veterans exhibiting the column variable (i.e., NSSI or BPD) who are represented in each cell group.

Total *N* = 728 male veterans with PTSD; PTSD only group, *n* = 253, 34.8% of total sample.

^aPTSD+NSSI group

^bPTSD+NSSI+BPD group

^cPTSD+BPD group

Table 2.

Logistic Regression Analysis of Suicidal Ideation Among Male Veterans with PTSD

	OR	95% CI	Prob. ($\alpha = .05$)
PTSD+NSSI vs PTSD	2.21	[1.57, 3.12]	< .0001
PTSD+BPD vs PTSD	2.67	[1.41, 5.05]	0.003
PTSD+NSSI+BPD vs PTSD	5.68	[3.49, 9.22]	< .0001
PTSD+NSSI vs PTSD+BPD	1.21	[0.65, 2.26]	0.55
PTSD+NSSI+BPD vs PTSD+NSSI	2.57	[1.61, 4.12]	< .0001
PTSD+NSSI+BPD vs PTSD+BPD	2.13	[1.04, 4.34]	0.04

PTSD = posttraumatic stress disorder; NSSI = nonsuicidal self-injury; BPD = borderline personality disorder features; OR = odds ratio; CI = confidence interval