Female veterans who have experienced military sexual trauma (MST) are at elevated suicide risk, yet knowledge is limited regarding correlates of suicide ideation (SI) in this population. MST is associated with a higher risk of posttraumatic stress disorder (PTSD) relative to other trauma types; however, no studies have examined whether experiencing SI differs based on the source of PTSD symptoms (MST-related, non–MST-related). Female service members/veterans (SM/Vs; n = 311) who screened positive for MST and reported exposure to a Criterion A event completed an online survey assessing self-reported demographics, PTSD, depression, the source of their PTSD symptoms, and SI. Ninety-one (29.3%) reported experiencing current SI, and 223 (71.7%) identified MST as the source of their current PTSD symptoms. Participants who identified MST as the source of their PTSD symptoms were over two times more likely to report SI, compared to those who described non–MST-related events as the source of their PTSD symptoms. Compared to those who reported the source of their PTSD symptoms as combat-/deployment-related, those who identified MST as the source were at least three times as likely to report current SI. Results underscore the importance of efforts to address MST-related PTSD symptoms when working with female SM/Vs.
Female veterans are at heightened risk for suicide, compared to civilian females (Department of Veterans Affairs [VA], 2016). In 2014, age-adjusted suicide rates for female veterans (18.9 per 100,000) were 2.4 times higher than those reported for female civilians (7.2 per 100,000; VA, 2016). Although suicide rates have increased for male and female veterans and civilians, the magnitude of the increase in age-adjusted suicide rates from 2001 to 2014 was particularly high for female veterans (85.2%) and exceeded those reported for both civilian females (39.7%) and male veterans (30.5%; VA, 2016).

Similar to studies of civilian women with histories of sexual assault (Ullman & Brecklin, 2002), female veterans who have experienced military sexual trauma (MST) are at heightened risk for suicide (33.4 per 100,000), compared to female veterans who screen negative for MST (14.6 per 100,000; Kimerling, Makin-Byrd, Louzon, Ignacio, & McCarthy, 2016). The VA defines MST as “psychological trauma...[that] resulted from a physical assault of a sexual nature, battery of a sexual nature, or sexual harassment which occurred while the Veteran was serving on active duty, active duty for training, or inactive duty training” (U.S. Government, 2014, p. 285). The association between MST and suicide is particularly concerning considering that approximately 28.0% of VA-enrolled females report MST when screened (VA, 2017). Further, a recent study of female veterans demonstrated that 25% of females did not report their MST during screening (Blais, Brignone, Fargo, Galbreath, & Gundlapalli, 2017), and a recent meta-analysis concluded that 38.4% of female service members and veterans (SM/Vs) report experiencing MST (Wilson, 2016). While these rates of MST are notably higher than VA estimates, these findings emphasize the importance of identifying factors that relate to suicide ideation (SI) among female SM/Vs who have experienced MST.

One avenue for addressing this is to elucidate the role of posttraumatic stress disorder (PTSD) in MST survivors’ experiences of SI. MST is associated with increased risk for developing PTSD (Surís, Lind, Kashner, Borman, & Petty, 2004). Moreover, MST predicts PTSD more strongly than other types of trauma, including pre- and postmilitary trauma and childhood sexual abuse (Himmelfarb, Yaeger, & Mintz, 2006; Surís et al., 2004; Yaeger, Himmelfarb, Cammack, & Mintz, 2006). There is also emerging evidence that the source of veterans’ PTSD symptoms relates to the severity of their psychiatric symptoms. Among veterans seeking PTSD treatment, those with a history of sexual trauma (including MST) had more severe clinician-rated PTSD symptoms than veterans seeking PTSD treatment for combat trauma or other trauma types (Jakob, Lamp, Rauch, Smith, & Buchholz, 2017). Another study found that, among veterans with PTSD, those with MST as their index trauma demonstrated more severe self-reported and clinician-rated PTSD symptoms, compared to those with combat trauma as their index trauma (Holliday, Williams, Matlock, & Surís, 2015). A more recent study also reported that, among veterans seeking PTSD treatment, those with MST as their self-reported index trauma reported more severe symptoms of depression and dissociation, compared to those with military combat trauma as their index trauma (Sexton, Raggio, McSweeney, Authier, & Rauch, 2017).

Yet studies examining the source of PTSD symptoms in SI among MST survivors are limited (Gradus, Street, Suvak, & Resick, 2013; Monteith, Bahraini, & Menefee, 2017; Surís, Link-Malcolm, & North, 2011). Such studies observed that PTSD symptoms are associated with SI among Veterans with a history of MST, although these associations were not significant when accounting for depressive symptoms (Monteith et al., 2017; Surís et al., 2011). But more importantly, these studies did not examine the actual source of participants’ PTSD symptoms in relation to SI. Thus, it is unknown whether the source of SM/Vs’ PTSD symptoms (i.e., MST-related or not) differentially relates to risk for SI. Elucidating the association between trauma source and SI may help with identifying which female MST survivors are...
at heightened risk for SI, in addition to informing decisions regarding which traumas to prioritize in treatment for female SM/Vs with PTSD from multiple types of traumas (e.g., MST, combat, childhood abuse). This is essential, as veterans who have experienced MST are more likely to have also experienced other traumatic events (Luterek, Bittinger, & Simpson, 2011).

This study examined whether female SM/Vs’ likelihood of reporting SI differed based on the source of their PTSD symptoms (MST-related vs. non–MST-related [i.e., combat/deployment-related]). Given previous findings that MST more strongly predicts PTSD relative to other trauma types (Yaeger et al., 2006), we hypothesized that female SM/Vs who reported the source of their PTSD symptoms as MST-related would be more likely to report experiencing recent SI, compared to those who reported the source of their PTSD symptoms as non–MST-related (i.e., combat/deployment-related).

METHOD

Participants and Procedures

Data were drawn from a larger dataset \((n = 833)\) collected to better understand associations between MST, relationship satisfaction, and sexual dysfunction in female SM/Vs. As the focus of this study was to better understand correlates of SI in MST survivors, only participants who endorsed at least one experience of military sexual assault or harassment were included in analyses. Thus, participants for this secondary analysis included 311 female SM/Vs with a history of MST who also reported exposure to a Criterion A event. Of the 833 participants in the parent study, 680 (81.6%) reported a history of MST. Of those 680, 361 (53.1%) reported a Criterion A event. Twenty-five (6.9%) participants did not complete the measure of SI, and 25 (6.9%) had missing data at random, resulting in the final sample of 311.

Facebook and electronic listservs serving female SM/Vs were used to recruit partnered, English-speaking female SM/Vs aged 18–65. Participants who identified as nonpartnered were included, as relationship status was not a dependent variable. Participants completed measures using Qualtrics. Screening items confirmed sex, military service, and age. Those not meeting screening criteria could not advance in the survey or were not included in analyses. Those eligible to participate were provided with a Letter of Information explaining the study, completed questionnaires, and were offered $15 for participating. Prior to conducting analyses, additional items were used to confirm military service, using responses to survey items, including branch of service, military operations specialty codes, rank, and deployment dates and locations. Other studies using similar methodology confirmed military service using this approach (c.f. Pedersen et al., 2015). The Utah State University Institutional Review Board approved this study.

Measures

Military Sexual Trauma. A slightly modified version of the VA MST Screening Questionnaire was used to assess for history of MST, including both sexual harassment and sexual assault occurring during military service. Participants were asked to indicate via electronic checkmark which forms of military sexual harassment (uninvited and unwanted sexual attention) they had experienced, if any, while in the military, including touching, cornering, pressure for sexual favors, or verbal remarks. Military sexual assault was assessed via an affirmative response to the question: “When you were in the military, did someone ever use force or threat of force to have sexual contact with you against your will?” Responses to either question (indicating experiences of sexual harassment and/or sexual assault, respectively) were then collapsed into a single item to indicate a history of MST \((yes = 1; no = 0)\). A “yes” response to either item was considered a positive MST screen, which was required for inclusion in this secondary analysis.
Posttraumatic Stress Disorder. The PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013) assessed probable PTSD diagnosis and symptom severity. This 20-item inventory assesses how bothered respondents have been in reference to a stressful military experience in the past month by each PTSD symptom in DSM-5 (Criteria B through E), using a 5-point Likert scale from not at all to extremely. The sum score ranges from 0 to 80. Scores $\geq 31$ suggest a probable PTSD diagnosis (Bovin et al., 2016). Cronbach’s alpha for the PCL-5 was .96 in the current sample.

Trauma Source. A single open-ended item designed for the parent study assessed whether PTSD symptoms experienced during the past month, as reported on the PCL-5, met criteria for probable Criterion A and were due to MST experiences (“The stressful military experience that I referenced was [please describe this experience below]”). Responses were coded as Criterion A events (yes = 1; no = 0) by the authors, both of whom reviewed all responses and arrived at consensus regarding the coding of different responses. Probable Criterion A events were those that met the definition of Criterion A, per the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5; American Psychiatric Association, 2013). Participants whose events did not meet Criterion A, or who provided insufficient information to determine whether Criterion A had been met, were excluded from analyses. These same responses were then coded as involving MST (yes = 1; no = 0). Responses that were not deemed to be due to MST were reviewed to determine a set of possible codes that aptly categorized the nature of the non–MST-related traumas. The authors arrived at consensus regarding the following codes: (1) combat-/deployment-related (e.g., “on a base that was mortared every night”); (2) nonmilitary (e.g., “my son died in his sleep and I found his body”); (3) domestic violence (e.g., “abusive first marriage”); (4) military but not combat- or deployment-related (e.g., “being bullied by superiors”); (5) exposure to suicide (e.g., “suicide of fellow soldier in front of me”).

Depression and SI. The Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001) was administered and assessed how bothered individuals have been by symptoms of depression in the past 2 weeks, using a 4-point ordinal scale ranging from 0 (not at all) to 3 (nearly every day). In order to assess depressive symptoms (a covariate) and SI (our dependent variable), the PHQ-8 (Kroenke et al., 2008) scoring was used to assess depression, while the PHQ-9 Item 9 (“During the past two weeks, how often have you been bothered by thoughts that you would be better off dead or of hurting yourself in some way?”) was used as our measure of SI (Kroenke & Spitzer, 2002). The PHQ-8 includes all PHQ-9 items excluding the SI item. Total scores range from 0 to 32. Scores $\geq 10$ suggest a probable depression diagnosis. Cronbach’s alpha for the PHQ-8 in the current sample was .92. Of note, higher scores on the PHQ-9 Item 9 have been shown to strongly predict suicide attempt and moderately predict subsequent death by suicide (Simon et al., 2013). It has an ordinal scale of 0 (not at all), 1 (some of the days), 2 (more than half the days), or 3 (nearly every day).

Demographics. Participants also provided their age, relationship status, race, and military characteristics (branch, number of deployments). As the majority of the sample reported service in the Army and being White (see “Results”), branch was dichotomously categorized as having served in the Army (dummy code = 1) or other (dummy code = 0) and race was dichotomously categorized as being White (dummy code = 1) or non-White (dummy code = 0).

Analytic Plan

Associations of SI with trauma source (e.g., MST-related = 1, non–MST-related = 0), PTSD, depression, history of deployment, marital status, age, service in the Army, and race were assessed using bivariate odds ratios (ORs). SI was subsequently
regressed on trauma source (MST-related/non-MST-related), probable PTSD or probable depression, deployment history, marital status, age, service in the Army, and race in a multivariable regression with ordinal outcomes. Dummy coding was used to identify probable PTSD and probable depression diagnoses (1 = yes; 0 = no). Analyses were then repeated, adjusting for PTSD or depressive symptom severity, rather than probable diagnoses. Due to the high correlation between PTSD and depression in the sample (Pearson’s $r = .71$, $p < .001$), separate models were run adjusting for PTSD (probable diagnosis, symptom severity) or depression (probable diagnosis, symptom severity) to avoid issues with multicollinearity (c.f. Vatcheva, Lee, McCormick, & Rahbar, 2016). As an exploratory analysis, we then compared MST-related PTSD to specific trauma sources (i.e., combat-/deployment-related) to determine whether specific traumas were related to SI. Due to the low frequency of the other non-MST-related trauma sources (i.e., nonmilitary trauma, domestic violence, military noncombat, and exposure to suicide; as ranging from 5 to 13), only combat-/deployment-related PTSD ($n = 58$) was compared to MST-related PTSD. SPSS v.25 was used for analyses (IBM Corp., 2017).

**RESULTS**

Table 1 includes descriptives and unadjusted odds ratios (OR) and their 95% confidence intervals (CI). The majority of participants identified as married, White, reported service in the Army, and had deployed. Over half met probable diagnostic criteria for depression and PTSD. Ninety-one (29.3%) reported SI during the preceding 2 weeks. Of those, 43 (47.3%), 28 (30.8%), and 20 (22.0%) endorsed being bothered by SI several days, more than half the days, or nearly every day during the prior 2-week period, respectively. Over two-thirds ($n = 223$; 71.7%) identified MST as the source of their PTSD-related symptoms. The remaining participants described non-MST sources of their PTSD symptoms ($n = 88$); of those, 58 (18.6%), five (1.6%), six (1.9%), 13 (4.2%), and six (1.9%) reported combat-/deployment-related, nonmilitary trauma, domestic violence, military but not combat-related, or exposure to suicide as their trauma source, respectively.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Descriptive Characteristics and Unadjusted Odds Ratios (ORs) Examining the Association of the Source of Current PTSD Symptoms, Demographic, Military, and Mental Health Characteristics With Suicide Ideation</th>
</tr>
</thead>
<tbody>
<tr>
<td>MST as the source of PTSD symptoms (vs. other trauma; 1 = yes; 0 = no)</td>
<td>223 (71.7%)</td>
</tr>
<tr>
<td>Probable PTSD (1 = yes; 0 = no)</td>
<td>183 (58.8%)</td>
</tr>
<tr>
<td>PTSD symptom severity</td>
<td>37.57 (21.81)</td>
</tr>
<tr>
<td>Probable depression (1 = yes; 0 = no)</td>
<td>182 (58.5%)</td>
</tr>
<tr>
<td>Depression symptom severity</td>
<td>11.98 (7.13)</td>
</tr>
<tr>
<td>Deployed (1 = yes; 0 = no)</td>
<td>177 (56.9%)</td>
</tr>
<tr>
<td>Married (1 = yes; 0 = no)</td>
<td>232 (74.6%)</td>
</tr>
<tr>
<td>Age</td>
<td>32.3 (6.73)</td>
</tr>
<tr>
<td>Army (1 = yes; 0 = no)</td>
<td>177 (56.9%)</td>
</tr>
<tr>
<td>Race (1 = White; 0 = non-White)</td>
<td>236 (75.9%)</td>
</tr>
</tbody>
</table>

CI, confidence interval; $M$, mean; MST, military sexual trauma; PTSD, posttraumatic stress disorder; $SD$, standard deviation.

*p $\leq .05$; **$p \leq .01$; ***$p \leq .001$. 

**TABLE 1**

Descriptive Characteristics and Unadjusted Odds Ratios (ORs) Examining the Association of the Source of Current PTSD Symptoms, Demographic, Military, and Mental Health Characteristics With Suicide Ideation.
MST-Related PTSD Versus Non-MST-Related PTSD

At the bivariate level (Table 1), SI was associated with whether PTSD symptoms were MST-related, probable PTSD and depression diagnoses, as well as PTSD and depression symptom severity. Both adjusted multivariate models were significant, including the model accounting for probable depression, $\chi^2 (7, n = 308) = 48.75, p \leq .001$, and the model adjusting for probable PTSD, $\chi^2 (7, n = 308) = 39.66, p \leq .001$. In both models, those who reported that their PTSD symptoms were due to MST (vs. non-MST) were over twice as likely to report experiencing recent SI (see Table 2). As demonstrated in Table 2, similar results were obtained when adjusting for depressive symptom severity, $\chi^2 (7, n = 308) = 93.60, p \leq .001$, and PTSD symptom severity, $\chi^2 (7, n = 308) = 68.95, p \leq .001$. Participants who reported that their PTSD symptoms were due to MST continued to be over two times more likely to report experiencing recent SI.

MST-Related PTSD Versus Combat-/Deployment-Related PTSD

As an exploratory aim, we examined the association of specific trauma sources with SI. As indicated earlier, due to the low

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<th>TABLE 2</th>
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<tbody>
<tr>
<td>Adjusted OR (95% CI)$^{a,b}$</td>
<td>Adjusted OR (95% CI)$^{a,c}$</td>
<td>Adjusted OR (95% CI)$^{a,d}$</td>
<td>Adjusted OR (95% CI)$^{a,e}$</td>
</tr>
<tr>
<td>MST as the source of PTSD symptoms (vs. other trauma; 1 = yes; 0 = no)</td>
<td>2.00 (1.00–4.03)*</td>
<td>2.37 (1.20–4.70)*</td>
<td>2.17 (1.04–4.52)*</td>
</tr>
<tr>
<td>Probable PTSD (1 = yes; 0 = no)</td>
<td>–</td>
<td>4.36 (2.38–7.96)***</td>
<td>–</td>
</tr>
<tr>
<td>PTSD symptom severity</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Probable depression (1 = yes; 0 = no)</td>
<td>5.92 (3.10–11.29)***</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Depression symptom severity</td>
<td>–</td>
<td>–</td>
<td>1.21 (1.16–1.27)***</td>
</tr>
<tr>
<td>Deployed (1 = yes; 0 = no)</td>
<td>1.10 (0.64–1.91)</td>
<td>1.09 (0.63–1.86)</td>
<td>1.27 (0.72–2.25)</td>
</tr>
<tr>
<td>Married (1 = yes; 0 = no)</td>
<td>0.85 (0.47–1.55)</td>
<td>0.83 (0.46–1.48)</td>
<td>0.71 (0.37–1.32)</td>
</tr>
<tr>
<td>Age</td>
<td>1.00 (0.96–1.04)</td>
<td>1.01 (0.97–1.05)</td>
<td>1.00 (0.96–1.04)</td>
</tr>
<tr>
<td>Army (1 = yes; 0 = no)</td>
<td>1.07 (0.63–1.81)</td>
<td>1.14 (0.68–1.93)</td>
<td>0.95 (0.55–1.65)</td>
</tr>
<tr>
<td>Race (1 = White; 0 = non-White)</td>
<td>0.75 (0.42–1.36)</td>
<td>0.84 (0.47–1.49)</td>
<td>0.76 (0.41–1.41)</td>
</tr>
</tbody>
</table>

CI, confidence interval; $M$, mean; MST, military sexual trauma; PTSD, posttraumatic stress disorder; OR, odds ratio; SD, standard deviation.

$^a$Adjusted for all demographic variables included in this table.

$^b$Also adjusted for probable depression diagnosis.

$^c$Also adjusted for probable PTSD diagnosis.

$^d$Also adjusted for depression severity.

$^e$Also adjusted for PTSD severity.

$p \leq .05$; **$p \leq .01$; ***$p \leq .001$. 

Suicide Ideation and Trauma Source
frequency of nonmilitary trauma, domestic violence, military noncombat, and exposure to suicide as the source of their PTSD symptoms (all *n* < 14), only combat-/deployment-related PTSD (*n* = 58) was compared to MST-related PTSD. At the bivariate level, when MST-related PTSD was compared to combat-/deployment-related PTSD, those who reported MST-related PTSD were over four times more likely to report SI (OR = 4.03, 95% CI = 1.75–9.27), relative to participants who reported that their PTSD was due to combat-/deployment-related events. This association remained consistent when accounting for demographic and military covariates, as well as probable PTSD diagnosis (AOR = 3.78, 95% CI = 1.54–9.30, χ²[7, *n* = 279] = 36.15, *p* ≤ .001), probable depression diagnosis (AOR = 3.05, 95% CI = 1.22–7.62, χ²[7, *n* = 279] = 42.59, *p* ≤ .001), PTSD symptom severity (AOR = 3.04, 95% CI = 1.20–7.69, χ²[7, *n* = 279] = 59.10, *p* ≤ .001), or depressive symptom severity (AOR = 3.10, 95% CI = 1.17–8.22, χ²[7, *n* = 279] = 82.79, *p* ≤ .001).

**DISCUSSION**

This analysis sought to examine the relevance of the source of female SM/Vs’ PTSD symptoms to their experiences of recent SI. All women in the present sample reported a history of MST, yet only some reported MST as the source of their current PTSD symptoms. Females who identified the source of their current PTSD symptoms as MST, as opposed to a non–MST-related trauma source (e.g., combat/deployment-related events), were significantly more likely to report more frequently being bothered by recent SI—an association that was not accounted for by PTSD or depression symptom severity nor probable diagnoses. These results are reminiscent of findings within the broader PTSD literature demonstrating that MST is associated with greater risk of adverse outcomes, such as PTSD, than other trauma types (Himmelfarb et al., 2006; Jakob et al., 2017; Surís et al., 2004; Yaeger et al., 2006), and that veterans who report MST as their most distressing trauma report more severe psychiatric symptoms (e.g., PTSD, depression, disorders of extreme stress not otherwise specified; Holliday et al., 2015; Luterek et al., 2011; Sexton et al., 2017). However, to our knowledge, this is the first study to examine these considerations in relation to SI. Together, these results suggest that attributing the source of one’s current PTSD symptoms to MST, relative to other traumatic events, may be particularly deleterious in female SM/Vs.

Moreover, our exploratory analyses specifically comparing MST to combat-/deployment-related trauma as the self-reported source of PTSD symptoms extend previous literature, which has found that MST is associated with more severe psychiatric symptoms (e.g., PTSD, depression, dissociation) than combat trauma (Holliday et al., 2015; Sexton et al., 2017). Although one prior study found that combat, relative to other types of trauma (e.g., interpersonal trauma), was most closely associated with poorer mental health outcomes among female veterans, they did not examine MST or SI specifically (Hassija, Jakupcak, Maguen, & Shipherd, 2012). Notwithstanding, these studies suggest that exploring trauma sources may be a critical pathway to better understand SI among female SM/Vs.

It will be important to identify possible explanations for these results. It may be that women who identify MST as the source of their PTSD symptoms experienced different sequelae and perpetrators of MST. Considering that MST is often perpetrated by fellow service members that one works with and resides near, the context of MST may have differed in important ways from other trauma that female SM/Vs experience (e.g., combat). Relatedly, a possible explanation for the more severe outcomes associated with attributing PTSD symptoms to MST (relative to other types of trauma) involves the institutional context in which MST occurs and the feelings of betrayal that may ensue when MST occurs within the context of a previously trusted
Future research is needed to explore these possibilities further.

Limitations of the current study should be acknowledged. This was a cross-sectional study with a convenience sample of female SM/Vs. Data were based on participant self-report, rather than clinician interview. Data on when the traumatic event occurred or the number of traumatic events that females experienced were not collected. Thus, we were unable to account for other lifetime traumatic exposures or the recency of trauma exposure. As a result, we cannot rule out the possibility that females who endorsed MST as their index trauma reported more severe SI because they perhaps experienced a greater number of lifetime traumatic events (or experienced MST more recently) than participants who endorsed non–MST-related events as the source of their PTSD symptoms. Future research should include a more comprehensive assessment of lifetime trauma history, including exploration of index traumas. In addition, use of the PHQ-9 Item 9 to measure SI is limited in that it does ask about the frequency with which a person has been bothered by thoughts of oneself being better off dead or of hurting themselves in some way, which does not necessarily distinguish passive thoughts about death from thoughts about intentional self-harm. Future research in this area would be strengthened by using measures that comprehensively assess the severity of SI and also suicide attempts. Finally, determination of military service history was based on self-report, rather than official Department of Defense documentation.

If replicated in additional studies, these results suggest that the perceived source of female MST survivors’ PTSD symptoms may be important to consider when determining which treatment targets to prioritize, particularly when attempting to decrease SI. Prioritizing current MST-related PTSD symptoms may be particularly critical. However, future research is needed to test this hypothesis, particularly in light of the limitations of the present study. In addition, research should also examine these associations in male SM/Vs to determine whether there are sex differences with regard to the trauma source and risk of experiencing SI. Such differences could have important implications for clinical interventions.

REFERENCES


Manuscript Received: August 27, 2017
Revision Accepted: January 17, 2018