



## Research paper

## Sexual dysfunction is associated with suicidal ideation in female service members and veterans

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## ABSTRACT

**Background:** Suicide is a leading cause of premature death among military service members/veterans (SM/Vs). The Interpersonal Theory of Suicide (Joiner, 2007) proposes that higher thwarted belonging, perceived burdensomeness, and acquired capability confer increased risk for suicide. However, no studies have examined the association of sexual dysfunction, a possible component of thwarted belonging and perceived burdensomeness, with suicidal ideation. The present study explored whether sexual dysfunction was associated with suicidal ideation when accounting for mental health, demographic, and military characteristics among female SM/Vs. **Method:** Female SM/Vs ( $n = 710$ ) completed an anonymous online survey assessing demographics, mental health, military characteristics, sexual dysfunction, and suicidal ideation.

**Results:** One hundred fifty-nine participants (22.39%) reported suicidal ideation during the preceding two weeks. A multivariable ordinal regression adjusted for age, marital status, probable posttraumatic stress disorder (PTSD), probable depression, race/ethnicity, Army service, and deployment history. Lower sexual functioning (adjusted odds ratio [AOR] = 0.98, 95% confidence interval [CI] = 0.95–0.99), probable PTSD (AOR = 2.54, 95% CI = 1.61–4.01), and probable depression (AOR = 5.28, 95% CI = 3.34–8.34) were associated with suicidal ideation. Post-hoc analyses examined the association of suicidal ideation with specific components of sexual functioning: difficulties with sexual arousal (AOR = 0.87, 95% CI = 0.79–0.97) and sexual satisfaction (AOR = 0.85, 95% CI = 0.75–0.96) were associated with suicidal ideation.

**Limitations:** Data were cross-sectional and limited to self-report.

**Discussion:** Sexual dysfunction is associated with suicidal ideation, accounting for established mental health, military, and demographic characteristics among female SM/Vs. Efforts to prevent suicidal ideation in female SM/Vs may be enhanced by screening for and treating sexual dysfunction, particularly sexual arousal and satisfaction.

## 1. Introduction

Suicide is a leading cause of preventable death among United States (U.S.) service members/veterans (SM/Vs; Shively, 2010). Recent data from veterans enrolled in the Department of Veterans Affairs (VA) estimated that in 2014, approximately twenty veterans died by suicide each day (VA Office for Suicide Prevention, 2016). Female veterans are at particularly elevated risk for dying by suicide, relative to civilian females (McCarthy et al., 2009; McFarland et al., 2010). In 2014, adjusting for age, female veterans were 2.4 times more likely to die by suicide than civilian females (Department of Veterans Affairs, 2016). Furthermore, suicide rates among female veterans have increased above and beyond the rates observed among civilian females. Further

underscoring the magnitude of this problem, from 2001 to 2014, the age-adjusted suicide rate for female veterans increased by 85.2%, while the age-adjusted rate for male veterans increased by 30.5% (Department of Veterans Affairs, 2016). According to a 2016 report by the VA Office for Suicide Prevention, “rates of suicide have remained relatively stable among male patients between 2001 and 2014 and increased among female VA patients during that same time period” (Department of Veterans Affairs, 2016, p. 14).

These findings emphasize the necessity of continued efforts to prevent suicide among female SM/Vs. A key component to enhancing such efforts is identifying factors related to suicidality in female SM/Vs. Nock et al. (2013) proposed that effectively preventing suicide among service members would require several processes, including “using

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exploratory studies to discover new risk and protective factors” (p. 97). They noted that extrapolating from existing theories of suicidal behavior and/or exploratory studies could be useful in this important endeavor. The present study proposes to utilize this approach to examine whether sexual dysfunction may be uniquely associated with suicidal ideation among female SM/Vs, conceptualizing from a leading theory of suicide, the Interpersonal Theory of Suicide (IPTS).

The IPTS proposes that thwarted belonging, perceived burdensomeness, and the acquired capability for suicide confer unique risk for suicide (Joiner, 2007). Thwarted belonging is defined as an unmet need for reciprocal social connectedness. Perceived burdensomeness is defined as perceiving one's own existence to have a negative impact on others. Finally, the acquired capability for suicide is defined as a tolerance for pain and a sense of fearlessness regarding one's own death (Joiner, 2007; Van Orden et al., 2010). According to the IPTS, thwarted belonging and perceived burdensomeness contribute to suicidal ideation, whereas acquired capability influences whether an individual can engage in suicidal self-directed violence when suicidal desire is present. The presence of all three components is posited to confer the greatest risk for suicide (Joiner, 2007; Van Orden et al., 2010).

The IPTS has been tested extensively in various samples, with strong support for some aspects of the theory (e.g., the association between perceived burdensomeness and suicidal ideation) and mixed support for other components (e.g., interactive effects) (Ma et al., 2016). Nonetheless, the IPTS may offer particular utility for explaining suicidal thoughts and behaviors among SM/Vs, due to military experiences (e.g., training, exposure to firearms, combat), the potential for injury and psychiatric sequelae, and the stress of reintegration (c.f. Brenner et al., 2008; Monteith et al., 2009; Selby et al., 2010). Research with SM/Vs has obtained support for the roles of perceived burdensomeness and, to a lesser extent, thwarted belongingness in suicidal ideation and attempts among SM/Vs (Anestis et al., 2015; Bryan et al., 2012, 2010; Monteith et al., 2013; Pfeiffer et al., 2014). Although examinations of the IPTS among female SM/Vs have been virtually absent from the literature, the few studies that have been conducted with female SM/Vs support the roles of perceived burdensomeness and thwarted belongingness in female veterans' experiences of suicidal ideation (Gutierrez et al., 2013; Monteith et al., 2017).

Thus, efforts to identify novel risk factors for suicidality in female SM/Vs may benefit from utilizing the IPTS as a framework and by considering experiences which contribute to female SM/Vs' experiences of thwarted belongingness and perceived burdensomeness. Prior studies in veteran and nonveteran samples examining the association of thwarted belonging and perceived burden with suicidality have focused primarily on family conflict, social isolation, unmarried status, loneliness, and living alone (Van Orden et al., 2010). Undoubtedly, the etiology of one's sense of belonging and burdensomeness is likely multifaceted and, to date, no studies have examined the association of sexual dysfunction, a possible component of thwarted belonging and perceived burdensomeness, with suicidal ideation in SM/Vs.

Several deployment experiences and post-deployment mental health conditions confer unique risk for sexual dysfunction, including physical injury (Cuenca, Sampietro-Crespo, Virseda-Chamorro, and Martín-Espinosa, 2015), traumatic brain injury (Ponsford et al., 2013), posttraumatic stress disorder (PTSD) (Schreiner-Engel and Schiavi, 1986), depression (Bartlik et al., 1998; Perlman et al., 2007), and sexual trauma (Turchik et al., 2012). In addition, females are at elevated risk for experiencing sexual dysfunction, relative to men; 43% of women in the National Health and Social Life Survey had sexual dysfunction, compared to 31% of men (Laumann et al., 1999). Thus, examining the association between sexual dysfunction with suicidal ideation among female SM/Vs would be a novel contribution that could potentially provide key information related to correlates of suicidal ideation among female SM/Vs.

The purpose of the current study was to examine if sexual dysfunction related to suicidal ideation after accounting for established risk

factors for suicidal ideation (i.e., probable PTSD and depression), in addition to demographic and military characteristics (i.e., age, race, marital status, service in the Army, deployment history) in a sample of female SM/Vs. It was hypothesized that higher sexual dysfunction would be associated with suicidal ideation. An exploratory aim was to examine whether specific types of sexual dysfunction (i.e., arousal, desire, lubrication, orgasm, satisfaction, and pain) were associated with suicidal ideation.

## 2. Method

### 2.1. Participants and procedure

Participants' data ( $n = 710$ ) were extracted from a larger dataset ( $n = 848$ ) collected to better understand the associations between military sexual trauma (MST), sexual dysfunction, and couples' relationship quality in female SM/Vs. Of the 848 participants in the parent study, 710 (83.73%) had complete data and comprise the current sample. To determine if there were statistically significant differences between the parent sample and the current sample, we used bivariate tests to explore possible group differences with regard to suicidal ideation, sexual dysfunction, probable PTSD or depression screening, partnered status, deployment history, service in the Army, Caucasian race, and age. Participants in the parent sample were more likely to screen positive for probable depression ( $\chi^2 [2, N = 769] = 5.43, p = 0.02$ ; parent sample: 47.5%; current sample: 32.5%). No other statistically significant differences were found (all  $p$ 's  $> 0.05$ ).

Targeted social media advertisements were used to recruit female SM/Vs who were in a romantic relationship. Advertisements were directed to partnered female English-speaking SM/Vs aged 18–65. Key terms to recruit this demographic included those who self-identified as being in a domestic partnership, engaged, in a romantic relationship, or married, and those who worked as government employees, in the military, or self-identified as veterans. However, participants were included in the study regardless of their marital status (married, not married), but had to complete questionnaires on the variables described above and further detailed below. Those interested in participating advanced to a confidential online website where they were provided with a letter of information explaining the study and completed self-report screening items confirming sex, service in the military, age (18 years or older), and relationship status. Given the anonymous nature of the survey, we included participants who met initial screening criteria. To ensure that survey participants indeed were SM/Vs, we excluded those who did not provide at least two of three key military service indicators, including branch of service, rank, and military operations specialty. Only one person was excluded from the present analyses as a result of not providing key military service indicators. Participants who did not meet screening criteria could not advance in the survey. Survey completers could navigate to a separate online platform to enter their identifying information to receive \$15 compensation for participating. The Institutional Review Board at Utah State University approved this study.

### 2.2. Measures

Participants completed a demographic inventory assessing age, relationship status (married or not married), race/ethnicity (Caucasian, Black, American Indian, Latina, Biracial), and military characteristics (branch, number of deployments).

Suicidal ideation was assessed using Item 9 from the Patient Health Questionnaire-9 (PHQ-9), which asks: “During the past two weeks, how often have you been bothered by thoughts that you would be better off dead or hurting yourself in some way?” (Kroenke and Spitzer, 2002). This item is scored using an ordinal scale of 0 (not at all), 1 (some of the days), 2 (more than half the days), or 3 (nearly every day). This item has been used extensively to assess for suicidal ideation and has

demonstrated acceptable reliability (Bauer et al., 2013; Uebelacker et al., 2011; Walker et al., 2010). Higher scores are associated with suicide attempts and death (Simon et al., 2013; Walker et al., 2010).

Sexual dysfunction was assessed using the 19-item *Female Sexual Function Index* (FSFI; Rosen et al., 2000). Items are rated using a Likert scale ranging from 0 to 5 or 1–5. Participants are directed to answer questions in reference to the previous four weeks. Questions have varying Likert anchors, and the scale is scored using an algorithm developed by the scale's authors. The total score ranges from 2 to 36, and a higher score indicates higher sexual functioning. Cronbach's alpha in the current sample was adequate, 0.96. The FSFI also includes subscales of arousal, desire, lubrication, orgasm, satisfaction, and pain. Subscale scores range from 0 to 6, with the exception of satisfaction, which ranges from 0.80 to 6. As with the full scale, higher scores indicate better sexual functioning in each domain.

Probable PTSD diagnosis was measured using the *Posttraumatic Stress Disorders Checklist for DSM-5* (PCL-5; Weathers et al., 2013), a 20-item self-report inventory assessing how bothered an individual was by each PTSD symptom outlined in DSM-5 (corresponding to Criteria B-E) over the past month, with items rated on a five-point Likert scale from “not at all” to “extremely.” Items are summed for a total score that ranges from 0 to 80. Scores > 33 suggest a probable PTSD diagnosis (Wortmann et al., 2016). Cronbach's alpha in the current sample was 0.97.

Probable depression diagnoses were assessed using the PHQ-2 (Kroenke et al., 2003), a 2-item self-report inventory assessing how bothered an individual was by the two cardinal symptoms of depression (depressed mood and anhedonia) over the preceding two weeks (Kroenke and Spitzer, 2002). Items are scored on a four-point ordinal scale ranging from 0 (not at all) to 3 (nearly every day). Scores range from 0 to 6, and scores > 3 suggest a probable depression diagnosis. Cronbach's alpha in the current sample was 0.90. Dummy coding was used to identify probable PTSD and probable depression diagnoses (1 = yes; 0 = no) in all analyses.

### 2.3. Analytic plan

Associations of suicidal ideation with sexual dysfunction, probable PTSD, probable depression, history of deployment, marital status, age, service in the Army, and race were assessed using bivariate odds ratios. Suicidal ideation was regressed on sexual dysfunction, probable PTSD, probable depression, history of deployment, marital status, age, service in the Army, and race in a multivariable regression with ordinal outcomes. For the exploratory aim, a series of six post-hoc ordinal regressions (one for each FSFI subscale) were conducted to examine the unique association of specific sexual dysfunctions with suicidal ideation when accounting for probable PTSD, probable depression, history of deployment, marital status, age, service in the Army, and race.

## 3. Results

Table 1 includes descriptives, unadjusted odds ratios (OR), adjusted ORs (AORs), and 95% confidence intervals (CI). Similar to the U.S. military, the majority of the sample reported service in the Army (Department of Defense, 2010). Participants were aged  $32.28 \pm 7.35$  years. The majority of the sample identified as Caucasian ( $n = 554$ ; 78.03%) whereas a minority of participants identified as Black ( $n = 36$ ; 5.07%), American Indian ( $n = 4$ ; 0.56%), Latina ( $n = 46$ ; 6.48%) or Biracial ( $n = 70$ ; 9.86%). Most identified as married and reported a history of being deployed. A minority reported symptoms suggestive of probable PTSD or depression. The average score of  $22.32 \pm 8.41$  on the FSFI was slightly higher than the average score in the norm sample of females reporting sexual dysfunction ( $M = 19.20 \pm 6.63$ ) and lower than healthy controls ( $M = 30.50 \pm 5.29$ ) (Rosen et al., 2000).

One hundred fifty-nine participants (22.39%) reported being bothered by at least some suicidal ideation over the past two weeks (i.e.,

**Table 1**

Descriptive characteristics, adjusted and unadjusted odds ratios and confidence intervals for sexual functioning and demographic, military, and mental health covariates in statistically predicting suicidal ideation.

	N (%) / M (SD)	Unadjusted OR (95%CI)	Adjusted <sup>a</sup> OR (95%CI)
<b>Sexual Functioning<sup>b</sup></b>	<b>22.32 (8.41)</b>	<b>0.94 (0.93–0.96)</b>	<b>0.98 (0.95–0.99)</b>
<b>Probable PTSD (1 = yes; 0 = no)</b>	<b>248 (34.93%)</b>	<b>6.48 (4.43–9.49)</b>	<b>2.54 (1.61–4.01)</b>
<b>Probable Depression (1 = yes; 0 = no)</b>	<b>231 (32.54%)</b>	<b>9.38 (6.32–13.91)</b>	<b>5.28 (3.34–8.34)</b>
Deployed (1 = yes; 0 = no)	359 (50.56%)	0.87 (0.62–1.24)	0.95 (0.64–1.40)
Married (1 = yes; 0 = no)	516 (72.68%)	0.90 (0.61–1.33)	0.76 (0.49–1.17)
Age	32.28 (7.35)	1.00 (0.98–1.02)	0.99 (0.97–1.03)
Army (1 = yes; 0 = no)	380 (53.52%)	0.83 (0.58–1.17)	0.87 (0.59–1.29)
Caucasian race <sup>c</sup> (1 = yes; 0 = no)	554 (78.03%)	<b>0.62 (0.41–0.91)</b>	0.67 (0.43–1.04)

Note. SD = standard deviation; OR = odds ratio; CI = confidence interval. Significant variables are noted in bold.

<sup>a</sup> Adjusted for deployment history, married status, age, service in the Army, and Caucasian race.

<sup>b</sup> Higher scores indicate better sexual functioning, whereas lower scores indicate more sexual dysfunction.

<sup>c</sup> Adjusted results were unchanged when adjusting for other racial backgrounds.

PHQ-9 suicidal ideation item  $\geq 1$ ). Of those, 84 (52.83%), 41 (25.79%), and 34 (21.38%) endorsed being bothered by suicidal ideation several days, more than half the days, or nearly every day during the prior two-week period, respectively. At the bivariate level, suicidal ideation was associated with lower sexual functioning, probable PTSD, probable depression, and non-Caucasian race (see Table 1). In particular, those reporting Latina ethnicity ( $M = 0.67$  [ $SD = 0.99$ ];  $t[49] = -2.13$ ,  $p = 0.04$ ) were more likely to report being bothered by at least some suicidal ideation over the past two weeks compared to all other races/ethnicities ( $M = 0.36$  [ $SD = 0.78$ ]). When suicidal ideation was regressed onto sexual dysfunction, probable PTSD, probable depression, history of deployment, marital status, age, service in the Army, and race, suicidal ideation was associated with lower sexual functioning, probable PTSD, and probable depression (see Table 1). Adjusting for other types of race/ethnicity (i.e., Black, American Indian, Latina, or Biracial) did not change the associations described above.<sup>1</sup>

When examining the association of specific sexual dysfunctions with suicidal ideation for our exploratory aim, lower sexual arousal and sexual satisfaction were associated with higher suicidal ideation, accounting for probable PTSD, probable depression, history of deployment, marital status, age, service in the Army, and race. Sexual desire, lubrication, orgasm, and pain were unrelated to suicidal ideation (see Table 2).

## 4. Discussion

To our knowledge, this is the first study to examine the association between sexual dysfunction and suicidal ideation among female service members/veterans (SM/Vs). Our findings suggest that sexual dysfunction may be a key indicator of suicidal ideation in female SM/Vs. Notably, the associations between sexual dysfunction – and in particular, low arousal and satisfaction – with suicidal ideation were significant when accounting for probable depression and PTSD. Although PTSD and depression are both associated with sexual dysfunction (Atlantis and Sullivan, 2012; Tran et al., 2015; Yehuda et al., 2015), they do not appear to fully explain this association, emphasizing the

<sup>1</sup> Full results accounting for race/ethnicity of Black, American Indian, Latina, and Biracial are available upon request from the corresponding author.

**Table 2**Adjusted<sup>a</sup> odds ratios and confidence intervals examining whether specific types of sexual functioning are associated with suicidal ideation.

	Arousal	Desire	Lubrication	Orgasm	Pain	Satisfaction
<b>Sexual Functioning<sup>b</sup></b>	<b>0.87 (0.79–0.97)</b>	1.08 (0.94–1.24)	0.92 (0.84–1.01)	0.91 (0.83–1.01)	0.97 (0.89–1.06)	<b>0.85 (0.75–0.96)</b>
<b>Probable PTSD (1 = yes; 0 = no)</b>	<b>2.51 (1.59–3.96)</b>	<b>2.66 (1.69–4.18)</b>	<b>2.55 (1.61–4.02)</b>	<b>2.53 (1.60–4.00)</b>	<b>2.70 (1.72–4.24)</b>	<b>2.50 (1.58–3.94)</b>
<b>Probable Depression (1 = yes; 0 = no)</b>	<b>5.17 (3.27–8.18)</b>	<b>5.37 (3.38–8.51)</b>	<b>5.44 (3.45–8.57)</b>	<b>5.31 (3.36–8.39)</b>	<b>5.50 (3.50–8.68)</b>	<b>4.96 (3.12–7.88)</b>
Deployed (1 = yes; 0 = no)	0.97 (0.65–1.43)	0.97 (0.65–1.44)	0.94 (0.64–1.40)	0.95(0.64–1.41)	0.96 (0.65–1.42)	0.96 (0.65–1.42)
Married (1 = yes; 0 = no)	0.74 (0.48–1.28)	0.76 (0.49–1.18)	0.76 (0.50–1.18)	0.78 (0.49–1.17)	0.78 (0.51–1.04)	0.72 (0.46–1.11)
Age	0.99 (0.97–1.03)	0.99 (0.97–1.03)	0.99 (0.97–1.03)	0.99 (0.97–1.03)	1.00 (0.97–1.03)	0.99 (0.97–1.03)
Army (1 = yes; 0 = no)	0.87 (0.59–1.28)	0.87 (0.59–1.29)	0.88 (0.60–1.30)	0.88 (0.60–1.31)	0.88 (0.59–1.30)	0.86 (0.58–1.27)
Caucasian race (1 = yes; 0 = no)	0.67 (0.43–1.04)	0.66 (0.43–1.03)	0.67 (0.43–1.04)	0.68 (0.44–1.05)	0.67(0.43–1.04)	0.66 (0.42–1.02)

Note. Significant variables are noted in bold.

<sup>a</sup> Adjusted for deployment history, married status, age, service in the Army, and Caucasian race.<sup>b</sup> Higher scores indicate better sexual functioning in each domain, whereas lower scores indicate more sexual dysfunction.

need to identify mediators of this relationship. Mediators were not identified in the current study as our measures of probable depression and suicidal ideation came from the same scale, and use of items from the same scale to identify potential mediators of sexual dysfunction with suicidal ideation could result in problems with multicollinearity.

In research with male patients with sexual disorders, male participants attributed their suicidal thoughts and attempts to their sexual dysfunction and “inability to satisfy their partners” (Rajkumar and Kumaran, 2015, p. 116). Consistent with this finding, sexual satisfaction was negatively associated with suicidal ideation in the present study. Eliciting women's experiences with sexual dysfunction and determining the reasons why sexual satisfaction and arousal relate to their experiences of suicidal ideation will be particularly important in light of our findings. Unfortunately, research on sexual functioning among SM/Vs, particularly women, has been sparse (Kauth, 2012).

One potential explanation for the significant association between sexual dysfunction and suicidal ideation in the current sample is that female SM/Vs who experience difficulty with sexual functioning (e.g., arousal, satisfaction) feel alienated from their partners. Women who experience various types of sexual dysfunction (e.g., low sexual desire, sexual pain, and arousal disorder) report less emotional satisfaction, physical satisfaction, and happiness with their primary partner (Laumann et al., 1999). Thus, a potential source of belonging and support (one's partner) and protective factor (Braithwaite et al., 2010) may instead instill stress or conflict, potentially leading to thwarted belongingness. Alternately, sexual difficulties, such as arousal, may cause individuals to feel like a burden to their partners. To our knowledge, no studies have examined whether sexual dysfunction is associated with perceived burdensomeness or thwarted belongingness among female SM/Vs. Such research may be valuable in elucidating potential drivers of suicidal ideation among female SM/Vs who are experiencing sexual dysfunction.

#### 4.1. Clinical implications

Results from the present study underscore the importance of screening female SM/Vs for sexual dysfunction, as the presence of dysfunction may serve as a key indicator of suicidal ideation, even after accounting for probable depression and PTSD. Disclosure of sexual dysfunction by female SM/Vs may also prompt screening for recent suicidal thoughts. Relatedly, assessing and treating sexual dysfunction among female SM/Vs may be important to enhancing an overall sense of well-being, particularly considering that sexual dysfunction is associated with lower levels of happiness and decreased quality of life (Laumann et al., 1999; McCabe, 1997; Wilcox et al., 2014). Unfortunately, only a minority of individuals seek treatment for sexual dysfunction (Laumann et al., 1999). Moreover, common couples' therapy interventions, including those provided within VA settings (e.g., Monson and Fredman, 2012), typically do not include screening or treatment for sexual dysfunction. Indeed, sexual dysfunction is likely

highly under-diagnosed. This was reflected in the present study: for example, despite the fact that participants reported scores on the FSFI suggesting more sexual dysfunction than a sample of healthy controls (Rosen et al., 2000), only one participant indicated that she had been previously diagnosed with a sexual dysfunction. In addition, SM/Vs may be reluctant to disclose sexual dysfunction and suicidal ideation to providers due to stigma, shame, or distrust (Fergus et al., 2002; Ganzini et al., 2013). Many providers do not address their patients' sexual health, either due to their own perceptions about being able to competently address these issues or reluctance to begin such conversations (c.f. Tran et al., 2015). Yet providers can be valuable in assessing and treating sexual dysfunction, rather than waiting for patients to mention such concerns on their own accord. Our findings further underscore the necessity of broaching these important topics with female SM/Vs.

#### 4.2. Limitations

The current study is not without limitations. The sample was comprised of a non-representative convenience sample of female SM/Vs, the majority of whom were married and Caucasian. In addition, the survey was based on cross-sectional self-report data, which used screening measures to assess symptoms and probable disorders, rather than using diagnostic interviews. Consequently, we were unable to determine actual diagnoses, nor determine whether sexual functioning is predictive of suicidal ideation (or rule out the converse possibility: that suicidal ideation in itself may lead to worse sexual functioning). Suicidal ideation was assessed using the PHQ-9 Item 9 (Kroenke and Spitzer, 2002). Although this has been widely used for this purpose (Louzon et al., 2016; Simon et al., 2013; Walker et al., 2010), we are unaware of any published studies that have examined the reliability and validity of using the PHQ-9 Item 9 in an online format. In addition, using a single-item measure of suicidal ideation is a limitation, as it could make it more difficult to detect an effect. PHQ-9 Item 9 is limited to thoughts about suicide and does not measure suicidal intent or attempts, which will be important to examine as outcomes in subsequent studies on sexual functioning. Participants in the current study were less likely to meet criteria for probable depression relative to participants in the parent study, which may have impacted findings observed in the current study. Finally, our analyses did not account for prior sexual trauma (e.g., childhood sexual abuse, military sexual assault), which may be important to consider in future research given their associations with sexual dysfunction (Neumann et al., 1996; Sadler et al., 2012; Turchik et al., 2012) and suicidal ideation (Monteith et al., 2016a, 2016b).

#### 4.3. Future research

Although our aim was to understand the role of sexual functioning in suicidal ideation among female SM/Vs, it will be important to investigate whether these findings extend to male SM/Vs, who also

experience high rates of sexual disorders (Wilcox et al., 2014). Examining whether our results extend beyond suicidal ideation to suicidal intent and actual suicide attempts will be a critical step to elucidating the role of sexual dysfunction in suicidality. In light of the limitations described above, future research could investigate the association between sexual dysfunction with various forms of suicidality (i.e., suicidal ideation, suicidal intent, suicide attempts) using clinician-based diagnoses of sexual disorders in a longitudinal study comprised of a representative sample of both female and male SM/Vs. In addition to examining potential mediators of the association between sexual dysfunction and suicidal ideation (e.g., thwarted belongingness, perceived burdensomeness), examining culture, beliefs about one's sexuality, and beliefs regarding femininity may be important moderators to consider in subsequent research on the relationship between sexual functioning and suicidal ideation. Finally, identifying effective methods of implementing treatments for sexual disorders among female SM/Vs within large systems of care (e.g., military, VA) will be critical.

## Disclosures

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The Institutional Review Board at Utah State University approved all study procedures.

## Author contributions

Dr. Blais and Mr. Kugler had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

*Study concept and design:* Blais

*Acquisition, analysis, or interpretation of data:* Blais, Kugler, Monteith  
*Drafting of the manuscript:* Blais, Kugler, Monteith

*Critical revision of the manuscript for important intellectual content:*

Blais, Kugler, Monteith

*Statistical analysis:* Blais

*Obtaining funding:* Blais

*Administrative, technical, or material support:* Blais, Kugler

*Study supervision:* Blais

## Limitations

Data were cross-sectional and based on self-report. Data were collected from a convenience sample of female service members and Veterans.

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## Conflicts of interest

The authors have no conflicts of interest to disclose. The views expressed are those of the authors and do not necessarily represent the views or policy of the Department of Veterans Affairs or the United States Government.

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