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Military Sexual Trauma Is Associated with Eating Disorders, while Combat Exposure Is Not

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Abstract

Objective.—There are strong associations among trauma and eating disorders. However, while trauma and eating disorders are more common among veterans than other populations, there is little information on how military-specific stressors affect eating disorder risk. This study's objective was to determine whether military sexual trauma and combat exposure were independent predictors of eating disorders among women veterans, a high-risk group.

Methods.—Participants were women age 18–70, using VA medical center services, without psychotic disorders or suicidal ideation (N = 407). We estimated a cross-sectional logistic regression model to predict eating disorders (anorexia, bulimia, binge eating disorder) as a function of military sexual trauma and combat exposure, adjusting for demographic variables.

Results.—Sixty-six percent of participants reported military sexual trauma, 32% reported combat exposure, and 15% met eating disorder criteria. Mean age was 49 years (SD=13); 40% were veterans of color. Women reporting military sexual trauma had twice the odds of an eating disorder compared to women who did not (odds ratio [OR]: 2.03; 95% CI: 1.03–3.98). Combat

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Conflict of Interest

The authors report no conflicts of interest.

exposure was not associated with eating disorders. Asian race (OR: 3.36; 95% CI: 1.26–8.97) and age (OR: 1.02; 95% CI: 1.01–1.06) were associated with eating disorders.

Conclusions.—The high rates of military sexual trauma and eating disorders highlight a need for continued work. Results suggest that it may be useful to focus on women reporting military sexual trauma when implementing eating disorder screening and treatment programs. Given associations among trauma, eating disorders, obesity, and mortality, such efforts could greatly improve veteran health.

Keywords

women's health; veterans; mental health; sexual assault; military sexual trauma

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With over 20 million veterans living in the United States (National Center for Veterans Analysis and Statistics, 2016), it is important to understand how military service affects health. This need is especially pressing as military service is associated with significant stress and trauma, which itself is associated with many poor physical and mental health outcomes (Schneiderman, Ironson, & Siegel, 2005). Military stressors include combat exposure and, particularly for women, military sexual trauma, which encompasses both sexual harassment (unwanted sexual attention, like verbal remarks, touching, or pressure for sexual favors) and sexual assault (use of force, threat of force, or coercion used for sex against one's will). Over 40% of women who served in the wars in Iraq and Afghanistan report sexual harassment and roughly 10% report sexual assault (Barth et al., 2016). Rates are even higher (49%) among women using Veterans Health Administration (VHA) services (Barth et al., 2016).

Exposure to traumatic stressors, military or otherwise, is linked to the development of eating disorders (Fuemmeler, Dedert, McClernon, & Beckham, 2009; Hirth, Rahman, & Berenson, 2011; Mitchell, Mazzeo, Schlesinger, Brewerton, & Smith, 2012; Mitchell, Porter, Boyko, & Field, 2016). The role of stress and trauma in relation to eating disorders merits attention because while eating disorders are relatively rare, they are also some of the only psychological conditions that result in death (through malnutrition, suicide, and other causes (Arcelus, Mitchell, Wales, & Nielsen, 2011)). Eating disorders are especially important to identify and understand among veteran populations as military personnel and veterans have higher rates of disordered eating and obesity than the general population (Bartlett & Mitchell, 2015; Das et al., 2005; Tanofsky-Kraff et al., 2013). Improved screening could streamline the identification and treatment of eating disorders. However, targeted screening methods for veterans are hampered by a lack of information on military-specific eating disorder risk factors. Both military sexual trauma and combat exposure have been linked to the development of eating disorders (Jacobson et al., 2009; Maguen, Cohen, Cohen, et al., 2012), but past research has not usually included both forms of stress in statistical models. Examining both concurrently is important because combat exposure and military sexual trauma represent qualitatively different experiences that could have different effects on health outcomes. For example, unlike individuals who experience combat exposure, sexual trauma survivors may want to change their shape and weight to avoid unwanted attention from trauma perpetrators (Mott, Menefee, & Leopoulos, 2012).

The present study fills a gap by investigating whether military sexual trauma and combat exposure are independent predictors of eating disorders among women veterans. We focused on women veterans as they are more likely to report military sexual trauma than men veterans (Barth et al., 2016; Kimerling et al., 2010; Maguen, Cohen, Ren, et al., 2012) and are more likely to report disordered eating compared to men veterans and compared to the general US population (Bartlett & Mitchell, 2015). Understanding whether military sexual trauma and combat exposure are independent predictors of eating disorder diagnoses could improve understanding of eating disorder risk factors and inform subsequent screening, prevention, and intervention efforts. We hypothesized that both military sexual trauma and combat exposure would be associated with eating disorders, but that military sexual trauma would be a stronger predictor of eating disorders given qualitative research suggesting a specific pathway between military sexual trauma and eating disorders (Breland, Donalson, Dinh, & Maguen, 2017; Mott et al., 2012).

Methods

Participants and recruitment

We sent information about the study to all women veterans, between the ages of the 18 and 70 years, who used an urban VA medical center [*author note: replace with VA name in unblinded version*] or its associated community-based outpatient clinics (N=1,081). Women with a history of any psychotic disorder or a suicide attempt in the past five years (based on documentation in the medical record) were excluded due to ethical concerns related to their participation in a mail-based study. The initial mailing included information about the study and a stamped, addressed postcard that could be returned if a potential participant was interested in receiving a survey. Of these women, 594 return the postcard and were mailed the survey, with 407 women returning the survey by mail. Participants were paid $30 after study staff received questionnaires. All methods were approved by University and VHA Institutional Review Boards [*author note: replace with names in unblinded version*].

Measures

Demographic characteristics.—Self-reported age, race/ethnicity, military service branch, and level of education.

Military sexual trauma.—Participants answered two dichotomous (yes/no) questions: 1) “During your military service did you experience unwanted sexual attention, like verbal remarks, touching or pressure for sexual favors?” and 2) “During your military service did anyone use force, threat of force or coerce you to have sex against your will?” These questions have been validated against clinical interviews (McIntyre et al., 1999) and are used in standard VA care and other work (Barth et al., 2016; Kimerling et al., 2010; Maguen, Cohen, Ren, et al., 2012). Participants answering yes to either question were considered to have experienced military sexual trauma.

Combat exposure.—To assess combat exposure, we used a face-valid item from the Life Events Checklist for DSM-5 (Weathers et al., 2013) assessing whether individuals ever experienced “combat or exposure to a war zone (in the military or as a civilian),” those who

responded that it “happened to me” and/or that it was “part of my job,” were considered to have combat exposure.

Eating disorders.—To assess anorexia and bulimia, we used the SCOFF Clinical Prediction Guide (Morgan, Reid, & Lacey, 2000), a 5-item measure of core eating disorder symptoms. Each item is scored dichotomously (no=0; yes=1); item totals are summed with scores ≥2 suggesting probable anorexia, bulimia, and/or Eating Disorder Not Otherwise Specified. To assess binge eating disorder, we used the Eating Disorder Examination-Questionnaire (Fairburn & Beglin, 1994; Fairburn & Beglin, 2008). Binge eating disorder was defined as excessive concern about shape and/or weight and an average of 1+ objective binge episodes per week without compensatory behaviors. Both measures were self-report.

Analyses

We used a logistic regression model to predict whether participants met criteria for an eating disorder as a function of military sexual trauma and combat exposure. While anorexia, bulimia, and binge eating disorder can have different courses and treatment, we included them as a single outcome variable due to past work demonstrating that women may restrict or binge as a result of traumatic exposures (Breland et al., 2017). We adjusted analyses for participant characteristics that may be related to disordered eating (i.e., age, race, education, service branch (Bartlett & Mitchell, 2015; Gagne et al., 2012; Mitchison & Hay, 2014; Smolak, 2015)). Given the association between military sexual trauma and combat exposure (Barth et al., 2016), we tested for collinearity using variance inflation factors (VIFs), with VIFs greater than 10 indicating collinearity. We made the a priori decision to not adjust analyses for depression or PTSD, which are often comorbid with eating disorders (Mitchell, Rasmusson, Bartlett, & Gerber, 2014), due to the many shared aspects among eating disorders, depression, and PTSD and the fact that we did not know developmental timing of these conditions. All analyses were completed in STATA version 14.0.

Results

A total of 407 women returned questionnaires. Two-thirds of participants reported military sexual trauma, roughly one third reported combat exposure, and 15% met criteria for eating disorder diagnoses. Mean age was 49 years (SD = 13). Most participants completed some college and came from diverse racial/ethnic and military backgrounds. See Table 1 for additional information on participant characteristics.

Results of the logistic regression model predicting eating disorder risk as a function of military sexual trauma and combat exposure are presented in Table 2. VIFs suggested collinearity was not a concern. Women reporting military sexual trauma had twice the odds of having an eating disorder compared to women who did not report military sexual trauma (OR: 2.03; 95% CI: 1.03–3.98). Combat exposure was not associated with eating disorders. The only demographic factors associated with eating disorders were Asian race and age. Asian women had much higher odds of meeting eating disorder criteria compared to white women (OR: 3.36; 95% CI: 1.26–8.97). Each additional year of age was associated with slightly higher odds of meeting eating disorder criteria (OR: 1.03; 95% CI: 1.01–1.06).

Discussion

We conducted analyses to understand the relationship between military-specific stressors and eating disorders. We found that military sexual trauma, but not combat exposure, was an independent predictor of eating disorders. Eating disorders are associated with high mortality (Arcelus et al., 2011) and obesity (Masheb et al., 2015). Therefore, improved eating disorder screening and treatment could improve the health of the many veterans seen within and outside VHA. Our findings suggest that efforts to enhance eating disorder screening and treatment could benefit from focusing on women reporting military sexual trauma. There is overlap in symptoms across eating disorder diagnoses, therefore it will likely be important for clinicians to assess for anorexia, bulimia, and binge eating disorders when working with women reporting military sexual trauma. Such assessment is especially important given that eating disorder screening is relatively rare. For example, unlike screening for depression, PTSD, and substance use disorders, eating disorder screening it is not a clinical reminder in VHA. Given that mental health screenings are often completed via self-report questionnaires, similar to those used in this study, our results also suggest that such methods are likely to identify a substantial portion of women veterans in need of additional care.

Our findings are supported by past work identifying specific pathways from sexual trauma to disordered eating (e.g., disordered eating as way to change shape and weight to avoid attention from trauma perpetrators (Breland et al., 2017; Mott et al., 2012)). It is less clear why combat exposure was not associated with eating disorders. It is possible that women choose other ways to cope with combat-related trauma or that military sexual trauma is associated with other disorders that are responsible for its association with eating disorders. Future research is needed to tease apart these and other issues. Given the changing roles of women in the military, continued work investigating the relationship between combat exposure and disordered eating will be important as women are likely to be exposed to more combat in the future.

Our findings differ from past work in at least three other ways. First, our results suggest that previous research may not capture the full burden of military sexual trauma and eating disorders among women veterans. Rates of both were high in this study compared to past work among military and veteran populations, which estimated military sexual trauma prevalence at 40–50% (Barth et al., 2016) (vs. 66% in the present study) and eating disorder prevalence at 4–8% (Bartlett & Mitchell, 2015) (vs. 15% in the present study). The higher rates in the present study are likely due to the use of self-report measures – participants may have been more comfortable answering questions about sensitive topics, like eating disorders, anonymously via mail as opposed to in-person during study visits or medical appointments as used in other research (Berg et al., 2013; Keel, Crow, Davis, & Mitchell, 2002). Indeed, results of the present study are similar to at least one study that assessed eating disorders and military sexual trauma with self-report (Rosenbaum et al., 2016). It is also possible that differences in military sexual trauma rates are due to a focus on women from more recent conflicts in prior work (Barth et al., 2016; Kimerling et al., 2010).

The second difference from past work relates to race/ethnicity findings. Asian women in this study had increased odds of eating disorders compared to white women. Given the relatively small sample of Asian women in this study, additional research is needed to replicate this finding before conclusions can be drawn. Nonetheless, the finding is notable because past research has generally found that Asian Americans report similar rates of eating disorders as white populations (Lee-Winn, Mendelson, & Mojtabai, 2014; Marques et al., 2011). There is some evidence that Asian American college women report more maladaptive beliefs about sexual trauma than their white peers (Koo, Nguyen, Gilmore, Blayney, & Kaysen, 2014), which could make them more likely to cope with sexual trauma via disordered eating. However, given differences in sample populations between Koo et al. (2014) and the present work, more research is needed. Given their increased odds for meeting eating disorder criteria, it will also be important for future work to determine whether Asian veterans show similarly low rates of eating disorder treatment use as other Asian American populations (Lee-Winn et al., 2014; Marques et al., 2011). This is particularly important because Asian/Pacific Islander women veterans who served in the US's most recent conflicts are more likely to screen positive for PTSD than their white counterparts (Koo, Hebenstreit, Madden, & Maguen, 2016).

The third difference from past work relates to age. In contrast to prior research (Gagne et al., 2012; Smolak, 2015), we found that older age was positively associated with eating disorders. It is possible that aging is associated with changes that increase eating disorder risk (e.g., weight gain, unstructured time during retirement). However, limited research on older women and eating disorders makes it difficult to speculate about causes, as such, this is an important area of future research.

Limitations to this study include an all-woman sample from a single geographic location, a lack of information on non-military sexual trauma, and a lack of information on the timing of onset of mental health conditions. As with all survey research, there is the possibility of selection bias, though this was moderated by our recruitment methods. In addition, we used self-report measures of eating disorders and stress/trauma, rather than diagnostic clinical interviews and used a composite eating disorder outcome that could have masked differences in relationships among military sexual trauma and specific eating disorder diagnoses. Further, we did not have information on pressure to meet military weight requirements, which has been associated with disordered eating in past work (Bodell, Forney, Keel, Gutierrez, & Joiner, 2014). Nor did we collect information on participants' service eras, which complicates comparisons to past work. However, given our diverse sample and the similarities between methods in the present study and screening methods in many health care settings, we believe the findings provide valuable information that can inform clinical care and research.

We hope that future work will address these limitations, for example, by assessing possible differences in the roles of non-military sexual trauma and military sexual trauma in relation to eating disorders. In addition, we hope future work will investigate differences in associations among specific eating disorder diagnoses and trauma as well as look at differences among women who served in different eras. It will also be important to conduct longitudinal research to tease apart the relative contributions of other conditions that are

related to military sexual trauma and often comorbid with eating disorders, such as PTSD and depression.

Conclusion

Women veterans in this study reported high rates of military sexual trauma and eating disorders compared to participants in past research, highlighting a need for continued work in this area. Military sexual trauma, but not combat exposure, predicted eating disorders. Therefore, results suggest that to efficiently implement eating disorder screening and treatment programs it may be useful to focus on women reporting military sexual trauma. Given associations among trauma, eating disorders, obesity, and mortality, such efforts could greatly improve veteran health.

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Table 1.

Participant characteristics

Characteristic	*N*	%
Military sexual trauma	270	66
Harassment*	263	65
Assault¥	133	33
Combat exposure	130	32
Race/Ethnicity		
White	242	60
Black/African American	57	14
Asian	30	7
Hispanic	32	8
Other	45	11
Missing	1	0.3
Education		
High school or less	26	6
College	275	68
Graduate school	106	26
Service branch		
Air Force	88	22
Army	177	44
Marine Corps	23	6
Navy	97	24
Other	15	4
Missing	7	2
Eating Disorders		
Binge eating disorder	47	12
Anorexia nervosa	8	2
Bulimia nervosa**	9	2

*Harassment: unwanted sexual attention, like verbal remarks, touching, or pressure for sexual favors

¥Assault: use of force, threat of force, or coercion used for sex against one's will

**One participant met criteria for anorexia and bulimia nervosa

Table 2.

Results of the logistic regression model predicting eating disorder risk as a function of military sexual trauma and combat exposure

	Odds Ratio (95% CI)
Age (years)	**1.03 (1.01–1.06)**
Race/Ethnicity	
White	Reference
Black/African American	0.86 (0.35–2.14)
Asian	**3.36 (1.26–8.97)**
Hispanic	1.99 (0.71–5.57)
Other	1.98 (0.83–4.69)
Education	
High school or less	Reference
College	2.49 (0.53–11.67)
Graduate school	2.02 (0.41–9.96)
Service branch	
Air force	Reference
Army	0.78 (0.37–1.65)
Marine corps	0.94 (0.23–3.81)
Navy	1.48 (0.66–3.28)
Other	0.35 (0.04–3.00)
Military sexual trauma	**2.03 (1.03–3.98)**
Combat exposure	1.32 (0.69–2.54)

Bold indicates statistical significance at $\alpha = 0.05$.

The mean variance inflation factor (VIF) for the final model was 1.70, and the VIFs for military sexual trauma and combat exposure were 1.05 and 1.17, respectively. VIFs for other covariates were all below 5.