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Gender-Specific Risk Factors for Psychopathology and Reduced Functioning in a Post 9/11 Veteran Sample

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Abstract

U.S. combat veterans frequently encounter challenges after returning from deployment, and these challenges may lead to difficulties in psychological and social functioning. Currently, research is

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limited on gender-related differences within this population, despite female veterans comprising a growing portion of the U.S. military with roles and exposures similar to their male counterparts. Using secondary analysis, we examined 283 returning combat veterans (female=29.4%) for differences in psychopathology and trauma history. Female veterans were more likely to report a history of sexual trauma than their male counterparts, whereas male veterans were more likely to report greater frequency of gambling in the past year, impulsivity and hypersexuality. No gender-related differences were identified for depression, anxiety, insomnia, or substance-use disorders, although both men and women veterans had higher rates than those found in the general population. While both male and female combat veterans report various mental health problems as they transition back into civilian life, gender-related differences relating to sexual trauma, hypersexuality and impulsivity warrant additional investigations with respect to the potential impact they may have on veteran reintegration and treatment.

Keywords

veteran; physical trauma; sexual trauma; psychopathology; gender differences; risk factors

U.S. combat veterans who served in post 9/11 military conflicts often experience mental and physical health problems as they transition back into civilian life (Epidemiology Program, 2015). These veterans can face many challenges as they leave the military including difficulties with posttraumatic stress disorder (PTSD), depression, and substance-use disorders (Khaylis, Polusny, Erbes, Gewirtz, & Rath, 2011). Although service-related mental health issues affecting post 9/11 veterans receive attention within the Veterans Affairs (VA), relatively less attention has been paid to gender-related differences in veterans' risk factors, such as trauma history, and psychopathology within this population. Compared to previous U.S. military conflicts, the number of women deployed to combat zones has increased considerably since 9/11. Women now represent about 10% of military personnel deployed, and their roles have never been more similar to those of their male counterparts (Department of Defense, 2009).

Sexual and physical trauma in childhood or adulthood has been linked to long-lasting and deleterious outcomes for veterans as well as civilians. Such outcomes include, PTSD, impaired functioning, lower quality of life and less life satisfaction (Greene, Neria, & Gross, 2016). Sexual trauma in childhood or during military service in female veteran and service member populations has been linked to homelessness, poorer physical health and mental health (Tsai et al., 2012), and difficulties in work or daily activities (Millegan et al., 2015). Similarly, male veterans who reported recent sexual trauma were more likely to have left military service, have poorer mental health, and be unemployed or disabled post-service (Millegan et al., 2016).

Rates of trauma are high among U.S. veteran cohorts. Female veterans are significantly more likely than civilian women to report adult sexual assault (49% to 22%) (Shultz et al., 2006). In males, for example, a study of 133 male veterans with PTSD receiving inpatient psychiatric care found high rates of trauma, with 96% reporting a history of physical or sexual victimization during their lifetime (Lapp et al., 2005).

Differences between men and women U.S. Military Veterans: PTSD, Impulsivity, and Hypersexuality

In a review of studies on PTSD among post 9/11 military service members (Crum-Cianflone & Jacobson, 2014), seven studies found that women were more likely to report PTSD post-deployment than men, four studies found that men were more likely than women to suffer PTSD after their service, and seven studies found no gender-related differences among PTSD post-deployment. In some studies, women who are post 9/11 veterans have been more likely to report depression and sexual harassment than men, while men have been more likely to report problematic alcohol use and combat experiences post deployment (Lapierre, Schwegler & LaBauve, 2007). Male and female veterans have been found equally likely to report probable PTSD and anxiety disorders (Street et al, 2013). A PTSD diagnosis has been associated with poor mental health functioning, substance-use disorders, and physical health problems in female veterans but not in male veterans (Zinzow et al., 2007).

Impulsivity has been associated with multiple psychiatric disorders and substance and behavioral addictions and often relates to problem severity for individuals suffering with these disorders (Moeller, Barratt, Dougherty, Schmitz & Swann, 2001; Verdejo-García, Lawrence & Clark, 2008). Research in civilian populations suggests that impulsivity may increase the risk of suicide and negatively impact social support (Kotler et al., 2001). In addition, a meta-analysis using 277 studies including 741 effect sizes found men, as compared to women, are significantly more likely to endorse more sensation-seeking and risk-taking behaviors, and men (versus women) showed a modest deficit in effortful control (Cross, Copping, & Campbell, 2011). Conversely, women demonstrated greater punishment sensitivity compared to men.

Impulsivity often involves difficulties focusing on tasks or inhibiting responses to the environment, and has been described using multiple theoretical frameworks (Evenden, 1999; Whiteside & Lynam, 2001). In the current study, we adopt Lynam, Smith, Whiteside, and Cyders' (2006) five-factor model of impulsivity which includes: (1) positive urgency (i.e., the tendency to act shortsightedly when experiencing positive moods), (2) negative urgency (i.e., the tendency to act shortsightedly when experiencing negative moods), (3) lack of planning or deliberation (i.e., the tendency to act "without thinking"), (4) lack of perseverance (i.e., a failure to tolerate boredom or to remain focused despite distraction), and (5) sensation-seeking (i.e., the tendency to seek out novel or thrilling experiences).

Hypersexuality (e.g., compulsive sexual behaviors) is defined as having difficulties in controlling inappropriate or excessive sexual fantasies, urges/cravings, or behaviors that generate subjective distress or impairment in one or more important areas of functioning and, like impulsivity, has been associated with other psychiatric disorders (Kraus, Voon, & Potenza, 2016). Currently, there is a limited understanding of gender-related differences in hypersexuality as it relates to U.S. military veterans. For example, among U.S. male veterans, hypersexuality was associated with gambling, anxiety, lifetime history of suicidality, sexually transmitted infections, poor mental health functioning, and PTSD symptom severity; in addition, more U.S. male veterans than female veterans endorsed problems with hypersexuality (13.8% and 4.3%, respectively) (Kraus et al., 2017). Another

study found that digital sex partner seeking (i.e., using the internet to find sexual partners) was six times more likely to occur among U.S. military veterans who reported clinical levels of hypersexuality than among those who did not report clinical levels of hypersexuality (Turban et al., 2017). In short, hypersexuality is associated with both psychological and physical health problems among U.S. military veterans, yet remains largely uninvestigated.

In the current study, we examined gender-related differences in psychopathology and trauma exposure in a sample of OIF/OEF/OND (Operation Iraqi Freedom/Operation Enduring Freedom/Operation New Dawn) veterans. Given findings of previous research, we hypothesized that female (versus male) veterans would be more likely to report sexual trauma in childhood or adulthood and depression and less likely to have substance-use disorders, hypersexuality, and impulsivity. Despite these differences, we expected that both men and women would have high rates of psychological difficulties post-deployment.

Methods

Participants

The current study is a secondary analysis of data drawn from the Survey of the Experiences of Returning Veterans (SERV). The project received approval from the Institutional Review Board of the Department of Veterans Affairs. Written informed consent was obtained from all enrolled participants. The SERV study was a cohort study of male and female OEF/OIF/OND veterans followed for up to five years to examine gender-related differences in factors relating to addictive behaviors, and the relationship of these behaviors to co-occurring psychiatric disorders. Women veterans were oversampled in the study given its emphasis on examining gender-related differences among OEF/OIF/OND veterans.

Six hundred and fifty-six veterans completed the initial baseline interview between September 2011 and July 2014 for the parent study (Time 1). Between July 2014 and February 2015, we conducted an Internet-based follow-up study to ask SERV veterans additional questions about their sexual and general health (Time 2). Of the 656 veterans who completed the initial baseline SERV telephone interview, 50 were excluded from the follow-up study (11 did not consent to be contacted for future research studies and 39 did not have emails), leaving 606 eligible veterans. Of those emailed, 295 veterans completed the Internet-based survey; an additional 12 veterans were removed from further analyses due to missing data (see Turban et al., 2017 for additional details on sample characteristics). This study was a naturalistic longitudinal observation study and did not involve any treatment or intervention component, however, mental health treatment (VA and non-VA) was assessed as part of the study.

Of the 283 veterans surveyed for this study, most were male (70.6%, $n=197$) with a mean age of 35.1 ($SD=9.2$) years. The sample was 69.3% non-Hispanic white/Caucasian, 10.1% non-Hispanic black/African American, and 20.6% other. Much of the sample was employed full-time (46.2%). Over half of the sample were married (54.8%). Nine percent were high-school graduates, 47.3% had an associate degree/some college, and 43.7% had graduated from a university. Overseas deployments were: 41.0% (once), 32.4% (twice) and 26.6%

(three or more). The four branches of the military were represented (65.9%=Army, 12.5%=Air Force, 10.8%=Marine Corps, and 10.8%=Navy).

Measures

Time 1: Telephone baseline data—We used structured clinical interviews over the phone to collect baseline data. The Primary Care Evaluation of Mental Disorders (PRIME-MD) (Spitzer, Kroenke, & Williams, 1999) was used to assess for depression, the anxiety module of the Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV) for anxiety disorders, and the AUDADIS-IV (AUDADIS-IV; Grant, et al., 2003) for substance-use disorders. We used the Insomnia Severity Index (Bastien, Vallières, & Morin, 2001) when assessing clinical insomnia ($\alpha=0.75$) and the PTSD symptom checklist (PCL-civilian; $\alpha=0.96$) (Wilkins, Lang, & Norman, 2011) for assessing PTSD symptom severity (DSM-IV criteria). We used the PCL-C rather than the military version because the sample were all discharged Veterans, and no longer actively in the military. We used the Massachusetts Gambling Screen (MAGS) to assess gambling behavior frequency and diagnostic criteria for pathological gambling (MAGS items 16–27) (Shaffer, LaBrie, Scanlan & Cummings, 1994); however, given sample size of the study and low item endorsement on the MAGS, we only include gambling frequency in current study. Both childhood physical and sexual trauma were assessed using items taken from the Deployment Risk and Resilience Inventory (DRRI; King, King, Vogt, Knight, & Samper, 2006). Child sexual trauma was defined by affirmative responses to at least one of the following five items: “Before age 18, I believe that I was sexually abused,” “Before age 18 someone molested me,” “Before age 18 someone tried to make me do sexual things or watch sexual things,” “Before age 18, someone tried to touch me in a sexual way or tried to make me touch them,” and “Before age 18, someone threatened to hurt me or tell lies about me unless I did something sexual with them.” Military sexual trauma was assessed with the following two items: “While I was deployed, the people I worked with touched me in a sexual way against my will” or “physically forced me to have sex”. Sexual victimization post-deployment was assessed with the following item: “Since returning home, I experienced unwanted sexual activity as a result of force, threat of harm or manipulation”. Child physical abuse was defined as an affirmative response to at least one of the following three items: “Before age 18, people in my family hit me so hard that it left me with bruises or marks,” “Before age 18, the punishments I received seemed cruel,” and “Before age 18, I was punished with a belt, a board, a cord, or some other hard object”. Adult physical assault was assessed by the following item, “Since returning home, I have been seriously physically injured by another person (for example, hit or beaten up)”.

Time 2 Web-based data collection—We used the UPPS-P Impulsive Behavior Scale (Lynam, Smith, Whiteside, & Cyders, 2006; Cyders et al., 2007), a 45-item questionnaire, to assess impulsivity. The UPPS-P has a total score ($\alpha=0.90$) and five subscales: Premeditation (lack of) ($\alpha=0.73$), Negative Urgency ($\alpha=0.83$), Positive Urgency ($\alpha=0.86$), Sensation-Seeking ($\alpha=0.78$), and Perseverance (lack of) ($\alpha=0.83$).

We used the Hypersexual Behavior Inventory (HBI) (Reid et al., 2011), a 19-item scale, that measures characteristics of hypersexuality – that is, engaging in sexual behavior in response

to stress or dysphoric mood, repeated unsuccessful attempts to control sexual thoughts, urges, and behaviors, and sexual behavior leading to impairment in functioning. The HBI has a total score ($\alpha=0.96$) and three subscales: Consequences (e.g., “My sexual thoughts and fantasies distract me from accomplishing important tasks.”) ($\alpha=0.89$), Coping (e.g., “I use sex to forget about the worries of daily life.”) ($\alpha=0.93$), and Control (e.g., “My sexual cravings and desires feel stronger than my self-discipline.”) ($\alpha=0.93$).

Procedure

The general procedures employed to recruit U.S. military veterans for the SERV project have been described elsewhere (Smith et al., 2014). All SERV participants were recruited through several outlets (e.g., Facebook, YouTube, media outlets, Department of Veteran Affairs resource listservs, and word of mouth). Eligibility requirements were as followed: (a) separated (discharged) from any branch of the US military; (b) a veteran of Iraq, Afghanistan, or surrounding waters; (c) at least 18 years of age; (d) English speaker; and, (e) living in the U.S. For Time 1, veterans completed a baseline telephone interview that lasted 60–90 minutes and were paid \$50 for participation. For Time 2, veterans completed a web-based survey using Qualtrics© to complete questionnaires. The web-based survey took around 20 minutes to complete, and veterans were paid \$15 for their time. All U.S. military veterans’ identities were protected, including via blocking IP addresses to maintain anonymity for all participants.

Data Analysis

We used SPSS-22 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 23.0) for descriptive statistics, Pearson chi-squares, logistic regression analyses, and ANCOVA series to determine gender-related differences in psychopathology and trauma exposure in our sample. Two-sided tests and overall alpha level of 0.05 for all primary hypotheses were employed.

Results

Socioeconomic characteristics for men and women veterans are reported in Table 1. There were no significant differences in marital status, family income, employment status, or religious attendance. Men and women differed on demographic characteristics including age, race, and military experience (including military branch and number of deployments) (Table 1).

High rates of physical and sexual victimization were reported (Table 2). Seventy-three percent ($n=203$) of veterans surveyed reported childhood physical abuse; however, no differences were observed between men and women. In adulthood, 34 men and 16 women reported having been physically assaulted. A large proportion of participants ($n=63$, 22.6%), and more women than men, reported lifetime sexual victimization. Much sexual victimization occurred before the age of 18 years; 47 veterans reported childhood sexual victimization, and women compared to men reported a higher frequency of childhood sexual victimization. Thirteen veterans (4.7%) reported sexual assault while deployed overseas (i.e., military sexual trauma [MST]), and the majority of those with MST were women (10 of 13,

76.9%). An additional 10 veterans (100% women) reported post-deployment sexual victimization.

Because we found significant differences between men and women in age, race, military branch and number of deployments, we performed logistic regressions on each of the binomial criterion variables of interest adjusting for significant demographic covariates. No significant differences in reported addictive behaviors or mental health conditions were observed between male and female veterans with the exception of men reporting having gambled within the last year, after adjusting for multiple comparisons (Bonferroni correction, $p < 0.01$; Table 2). In addition, although mental health treatment utilization was relatively low in this sample given the number of psychological difficulties reported, no significant differences in treatment utilization were found between men and women veterans.

We then performed a series of Analysis of Covariance (ANCOVA) for the UPPS-P total and its subscales as well as HBI total and subscales to determine if there were differences between men and women in impulsivity and hypersexuality while adjusting for significant demographic covariates. As shown in Table 2, when comparing male and female veterans on level of impulsivity as measured by the UPPS-P, men scored higher in total impulsivity than women; however, this difference was largely due to the differences in the level of reported sensation-seeking between men and women. Men also endorsed greater hypersexuality than did women, both its total score as well as its subscales (Table 2).

Discussion

Overall, our findings indicate that both male and female veterans showed elevated risk for lifetime physical and sexual victimization, with female veterans more likely to experience sexual trauma in childhood or adulthood. Due to the frequency of childhood physical abuse within the sample (75.1% of men and 67.1% of women), we were unable to examine childhood physical abuse as a potential predictor. We recognize that our sample reported significantly higher rates of childhood sexual and physical trauma that were above the national average (Gilbert, Widom, Browne, Fergusson, Webb & Janson, 2009), thus reflecting high acuity among veterans, many of whom were deployed repeatedly overseas to combat zones. Overall, we found high rates of psychiatric disorders and substance-use disorders among U.S. returning veterans. Although rates were higher for both women and men than found in the general population, differences in veteran literature has trended toward men experiencing more of problems in substance-use disorders, impulsivity, and hypersexuality (Cross, Copping, & Campbell, 2011; Kraus et al., 2017; Lapierre, Schwegler & LaBauve, 2007), and yet we found no differences between male and female in substance-use disorders, depression, anxiety, insomnia, PTSD symptom severity, and physical trauma history after adjusting for multiple comparisons. Results also revealed that men were about two times more likely to have gambled in the past year than their female counterparts, although we did not assess veterans on attributes associated with problem gambling. Taken together, the current findings suggest that recently returned combat veterans have significant physical and sexual trauma histories and are experiencing serious difficulties in mental

health and addiction that should be assessed and addressed during routine medical visits, both within community and VA healthcare settings.

Our hypothesis that male veterans would be more likely to report hypersexuality and impulsivity than their female counterparts was supported. Differences were apparent in sensation-seeking and hypersexuality. In a 2014 study of 234 veterans (James, Strom & Leskela, 2014), those who screened positive for PTSD reported more negative urgency and risk-taking behaviors, but no group differences were found in sensation-seeking, suggesting that distinct correlates of sensation-seeking need further study. Our finding that men may be more likely to experience difficulty controlling thoughts, feelings and behaviors associated with hypersexuality is consistent with previous research (Kraus et al., 2017; Smith et al., 2014) and highlights the need for comprehensive screening for hypersexuality and other sexual risk behaviors among active-duty personnel and veteran populations.

Our recent findings should be interpreted in light of their limitations. First, the use of cross-sectional data cannot speak to causation or directionality of associations observed. Additionally, the gap between the baseline telephone interview and web-based follow up study is also a study limitation. We were unable to track the length of time between baseline and follow-up data collection. However, by examining reported pre-military, military and post-military trauma, we are able to report on cumulative traumatic experiences despite a small sample size. In addition, only binary gender items were approved for this study and as this was before the repeal of Don't Ask Don't Tell (DADT), sexual orientation was also not assessed in this study. In the future, research should seek to deconstruct the effects of different types of trauma occurring at different stages in a veteran's life. Longitudinal designs are needed to examine if psychopathology among veterans changes as a function of time (e.g., pre- and post-deployment) between male and female veterans. Sexual trauma, particularly amongst women, appears to be an important consideration before, during and after deployment, and the potential risk factors and clinical correlates of sexual victimization warrant additional investigation in larger samples. An additional limitation involves the self-report measures used to collect data on veterans' sociodemographics, psychiatric and sexual characteristics, which are susceptible to response bias that could lead to under- or over-reporting of mental health concerns by veterans. Another limitation is the relatively small sample size. For example, the findings of more men reporting alcohol dependence, gambling behaviors, PTSD, and insomnia may have reached statistical significance with a larger sample, and this possibility warrants additional investigation.

In conclusion, this study described the psychiatric and substance-use characteristics of post 9/11 military veterans and investigated possible differences between female and male veterans. It is important to note that although both female and male veterans in our sample reported high rates of physical victimization and psychiatric and substance-use histories, the levels of impulsivity, in particular sensation-seeking, and hypersexuality were greater in male veterans. Further investigation of these differences is warranted, including the degree to which these may relate to trauma experiences in both women and men. Future research should consider and further examine gender-related differences and their possible impact on community reintegration and functioning for returning war veterans.

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Table 1

Demographics of previously deployed U.S. military veterans by gender

		<i>Gender</i>		<i>p</i> -value
		Male (<i>n</i> =197) (%) / <i>M</i> (<i>SD</i>)	Female (<i>n</i> =82) (%) / <i>M</i> (<i>SD</i>)	
Age, Years		34.0 (8.6)	37.9 (10.0)	0.001
Military Branch				
	Army	66.0%	65.9%	0.002
	Air force	11.2%	15.9%	
	Marines	14.7%	3.3%	
	Navy	8.1%	17.1%	
Religious Service Attendance				
	Never	31.0%	31.7%	0.52
	Several times per year	37.1%	30.5%	
	At least Monthly	32.0%	37.8%	
Combined Family Income				
	Under \$35K	40.5%	31.7%	0.36
	\$35-\$75K	37.9%	46.3%	
	\$75K or Higher	22.1%	22.0%	
Marital status				0.39
	Married	55.8%	52.4%	
	Previously			
	Married	16.2%	23.2%	
	Never Married	27.9%	24.4%	
Number of Deployments				
	One	34.7%	56.1%	0.003
	Two	36.7%	22.0%	
	Three or more	28.6%	22.0%	
Employment Status				
	Full-time	48.2%	41.5%	0.55
	Part-time	12.7%	15.9%	
	Other (unemployed, disability)	39.1%	42.7%	
Race				
	White	72.3%	62.2%	0.04
	Black	7.2%	17.1%	
	Other	20.5%	20.7%	

Note. Pearson chi-squares were used for categorical variables and student t-test (two tailed) was used for continuous variables.

Table 2.

Trauma history, addictive behaviors, and mental health conditions among male and female US military veterans, adjusted for age, race, military branch and number of deployments

	Female Veterans		Male Veterans				
	n	%	n	%	Wald	OR	<i>p</i> -values
<u>Trauma History</u>							
Childhood Physical Abuse	55	67.1%	148	75.1%	3.43	1.78	0.06
Adulthood Physical Assault	16	19.5%	34	17.3%	0.15	1.15	0.70
Adulthood Sexual Assault	43	50.0%	20	11.2%	37.60	0.12	0.001
Childhood Sexual Abuse	29	35.4%	18	9.2%	21.08	0.19	0.001
<u>Addictive Behaviors</u>							
Alcohol Dep. (Lifetime)	25	30.5%	84	42.6%	2.98	1.66	0.08
Nicotine Dep. (Lifetime)	35	42.7%	125	63.8%	0.83	1.46	0.36
Drug Dep. (Lifetime)	6	7.3%	11	5.6%	0.45	1.73	0.50
Gambling (Past Year)	32	39.0%	106	54.1%	7.43	2.22	0.006
<u>Mental Health Conditions</u>							
Major Depression	23	28.0%	66	33.7%	1.63	1.48	0.20
PTSD (PCL-C score > 36)	47	57.3%	137	69.5%	5.62	2.02	0.02
Anxiety Disorder (Lifetime)	37	45.1%	78	39.8%	0.25	0.87	0.62
Insomnia (Clinical)	31	67.4%	95	80.5%	3.99	2.31	0.05
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>Partial η^2</i>	<i>p</i> -values
<u>Impulsive Behaviors</u>							
Total Score	2.11	0.35	2.30	0.31	19.79	0.07	<0.001
Negative Urgency subscale	2.24	0.57	2.34	0.53	2.88	0.01	0.09
Lack of Premeditation subscale	2.05	0.41	2.07	0.41	0.50	0.00	0.48
Lack of Perseverance subscale	1.80	0.53	1.93	0.49	8.10	0.03	<0.05
Sensation Seeking subscale	2.54	0.44	2.86	0.38	26.00	0.09	<0.001
Positive Urgency subscale	2.02	2.21	0.49	0.50	8.92	0.03	<0.01
<u>Hypersexuality</u>							
Total Score ^a	25.01	7.83	34.32	15.23	27.53	0.09	<0.001
Consequences subscale ^b	4.37	1.02	6.13	3.08	26.70	0.09	<0.001
Coping subscale ^c	11.10	5.33	14.26	6.84	13.21	0.05	<0.001
Control subscale ^d	9.55	3.01	13.94	7.02	30.19	0.10	<0.001

Notes. PCL-C = PTSD Checklist Civilian Version. UPPS-P = Impulsive Behavior Scale. OR = Odds Ratio (95% Confidence Interval).

All analyses were adjusted for age, race, military branch and number of deployments.

Sample size ranges from 277 to 283.

^a Absolute range, 19–95.

^b Absolute range, 4–20.

^c Absolute range, 7–35.

^d Absolute range, 8–40.

Partial η^2 statistics were calculated for continuous variables where 0.0099 = small, 0.0588 = medium, and 0.1379 = large effect sizes (Cohen, 1988).

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