Sex Differences in PTSD Among US Military Veterans:

Role of Trauma, Coping, and Social Factors

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A higher prevalence of posttraumatic stress disorder (PTSD) among females has been consistently documented.[1] For example, a nationally representative study of the US adult population found that the prevalence of lifetime PTSD was 8.0% in females and 4.1% in males.[2] This difference is especially evident among military veterans, in whom experiences such as military sexual trauma (MST), which is more prevalent among females, may place female veterans at greater risk for PTSD.[3] Despite considerable attention to this sex difference,[1–6] however, scarce research has examined factors that may contribute to it.

Sex differences in PTSD prevalence may be attributable to differences in trauma exposures (eg, adverse childhood experiences, sexual trauma), psychological traits (eg, resilience), and social factors (eg, loneliness).[4–8] Here, we analyzed data from a nationally representative sample of US veterans to examine how a wide range of such factors might indirectly account for sex differences in PTSD.

Methods

Sample. Participants were drawn from the National Health and Resilience in Veterans Study (NHRVS), which surveyed a nationally representative sample of 4,069 U.S. veterans from KnowledgePanel, a probability-based, online survey panel.

Measures. PTSD symptoms were assessed using the PTSD Checklist for *DSM-5*, with a score ≥31 indicative of a positive screen for PTSD ($\alpha = 0.96$).[9] Table 1 lists other measures.

Data Analysis. Chi-square and independent samples *t* tests were conducted to compare study variables by sex and identify possible mediating variables. An exploratory mediation analysis was then conducted to identify indirect factors that influence the relationship between sex and PTSD; trauma, psychological trait, and social variables that differed by sex ($P < .05$) in bivariate analyses were entered as potential mediators, and sociodemographic and military variables as covariates.

Results

Table 1 shows sample characteristics and potential mediating variables. Female veterans were 2.5 times more likely than male veterans to screen positive for PTSD, N = 66 (weighted 15.5%) vs N=174 (weighted 6.2%), $\chi^2 = 46.89$, $P < .001$. However, the direct effect of female sex in predicting PTSD was no longer significant after accounting for indirect effects of trauma, psychological trait, and social variables ($P = .51$). Collectively, the indirect effect of these factors accounted for 81.2% of the total effect of sex in predicting PTSD, with direct potentially traumatic events, loneliness, and MST having the strongest magnitude indirect effects (Table 1).

Discussion

Using data from a large, nationally representative sample of US veterans, we found that sex differences in PTSD were attributable to differential exposure to certain traumatic events, such as childhood sexual assault and MST, and social factors, such as greater loneliness. Lack of engagement in acceptance-based coping strategies also indirectly mediated the association between being female and screening positive for PTSD. This finding may be explained in part by higher rates of sexual trauma among female veterans, as previous research has found that sexually traumatized individuals often have difficulty acknowledging and processing painful emotions.[10] Taken together, these findings extend prior work[4,5,7,8,11] to emphasize the importance of targeting childhood and sexual trauma, and loneliness, and bolstering acceptance-focused coping in the treatment of PTSD among female veterans.

One limitation of this study is that it focused solely on binary categories of biological sex without considering the roles of gender or the experiences of nonbinary and transgender individuals. Further, given the cross-sectional study design, temporal relationships among variables are unclear, and it is possible that sex may moderate associations between risk factors for PTSD.

Nevertheless, these findings provide an empirical foundation for further research to evaluate longitudinal relationships among risk factors for PTSD, and evaluate prevention and intervention efforts targeting sex- and gender-sensitive risk factors for PTSD among military veterans and other trauma-exposed populations.

Table 1.

Sample Characteristics and Potential Mediators of PTSD Among Male and Female US Military Veterans

	Male (N = 3,564; weighted 90.2%)	Female (N = 505; weighted 9.8%)	Bivariate test of difference t or χ^2	P	Pairwise contrast	
Background characteristics						
Age, y	63.6 (15.3)	49.4 (13.3)	17.69	<.001		
Race/ethnicity			39.00	<.001		
White, non-Hispanic	2,950 (79.3%)	368 (66.9%)			M > F	
Black, non-Hispanic	231 (10.3%)	65 (19.3%)			F > M	
Hispanic	264 (6.5%)	43 (7.5%)			—	
Other	119 (3.9%)	29 (6.3%)			F > M	
College degree or higher education	1,588 (32.0%)	239 (39.2%)	8.54	.003		
Married/partnered	2,612 (73.5%)	273 (62.4%)	22.12	<.001		
Employment status			141.20	<.001		
Working	1,320 (46.2%)	291 (66.4%)			F > M	
Retired	2,081 (47.2%)	144 (17.8%)			M > F	
Unemployed/disabled	163 (6.6%)	70 (15.8%)			F > M	
Annual household income >$60,000	2,088 (58.7%)	269 (57.3%)	0.29	.59		
Years of military service			4.39	.11		
3 or less	1,333 (37.2%)	179 (36.6%)				
4–9	1,445 (41.6%)	221 (46.1%)				
10+	786 (21.2%)	105 (17.3%)				
Combat veteran	1,270 (36.3%)	83 (22.5%)	29.72	<.001		
Potential mediating variables						Indirect effect estimate (SE)
Adverse childhood experiences[a]	1.4 (1.9)	2.5 (2.3)	10.20	<.001		0.024 (0.01)*
Direct potentially traumatic events[b]	3.1 (2.5)	3.9 (2.6)	5.98	<.001		.046 (0.014)**
Indirect potentially traumatic events[b]	5.6 (7.1)	6.5 (7.6)	2.35	.009		−0.003 (0.004)
Military sexual trauma[c]	104 (3.5%)	217 (44.2%)	859.61	<.001		0.104 (0.039)**
Index traumatic event[b]			209.01	<.001		
Interpersonal violence	321 (11.5%)	162 (38.9%)			F > M	−0.017 (0.017)
Illness/injury	930 (29.2%)	122 (29.1%)			—	
Disaster/accident	1,397 (44.5%)	127 (26.0%)			M > F	
Combat/captivity	429 (13.9%)	19 (5.7%)			M > F	
Injury/harm/death to other	31 (0.9%)	2 (0.3%)			—	
Resilience[d]	39.3 (6.8)	37.5 (6.6)	5.03	<.001		0.010 (0.011)
Purpose in life[e]	21.3 (4.9)	20.4 (4.6)	3.19	<.001		0.003 (0.003)
Self-sufficient coping strategies[f]	1.8 (0.9)	1.5 (0.8)	5.50	<.001		−0.117 (0.054)*
Socially-supportive coping strategies[f]	0.6 (0.7)	0.8 (0.7)	4.87	<.001		−0.074 (0.053)
Avoidance coping strategies[f]	0.3 (0.6)	0.5 (0.6)	4.31	<.001		−0.014 (0.018)
Social network size[g]	8.3 (11.3)	6.6 (5.9)	2.99	.001		0.018 (0.019)
Social support[g]	18.7 (5.2)	17.5 (5.0)	4.15	<.001		−0.002 (0.003)
Loneliness[h]	4.6 (1.8)	5.6 (2.1)	10.13	<.001		0.047 (0.018)**

Sources for measures are as follows:

[a]Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the Adverse Childhood Experiences (*ACE*) Study. *Am J Prev Med*. 1998;14(4):245–258.

[b]Weathers FW, Blake DD, Schnurr PP, et al. The Life Events Checklist for *DSM-5* (LEC-5). 2013.

[c]Kimerling R, Gima K, Smith MW, et al. The Veterans Health Administration and military sexual trauma. *Am J Public Health*. 2007;97(12):2160–2166.

[d]Campbell-Sills L, Stein MB. Psychometric analysis and refinement of the Connor-Davidson Resilience Scale (CD-RISC): validation of a 10-item measure of resilience. *J Trauma Stress*. 2007;20(6):1019–1028.

[e]Schulenberg SE, Schnetzer LW, Buchanan EM. The Purpose in Life Test-Short Form: development and psychometric support. *J Happiness Stud*. 2011;12:861–876.

[f]Carver CS. You want to measure coping but your protocol's too long: consider the brief COPE. *Int J Behav Med*. 1997;4(1):92–100.

[g]Sherbourne CD, Stewart AL. The MOS social support survey. *Soc Sci Med*. 1991;32(6):705–714.

[h]Hughes ME, Waite LJ, Hawkley LC, et al. A short scale for measuring loneliness in large surveys: results from two population-based studies. *Res Aging*. 2004;26(6):655–672.

Results of mediation analysis (ie, indirect effects) are adjusted for age, race and ethnicity, education, and marital/partnered, employment, and combat veteran status.

Planned post hoc analyses revealed that certain potentially traumatic events, which were more prevalent among female veterans, and certain self-sufficient coping strategies, which were less prevalent, indirectly mediated the association between female sex and PTSD. These variables included childhood emotional neglect (31.0% vs. 14.9%, indirect effect = 0.133, SE = 0.039, $P < .001$), childhood sexual assault (36.0% vs. 4.2%, indirect effect = 0.118, SE = 0.039, $P = .003$), and adulthood sexual assault (36.0% vs 4.2%, indirect effect = 0.292, SE = 0.123, $P = .017$); and lack of engagement in acceptance-based coping strategies, which were subsumed under the count of self-sufficient coping strategies (ie, "Please select coping strategies that you most commonly use to deal with these symptoms—Acceptance [eg, accepting the reality that it happened]"; 41.4% vs 52.6%, indirect effect = 0.113, SE = 0.026, $P < .001$).

Statistically significant indirect effect: *$P < .05$; **$P < .01$.

Abbreviations: F = female, M = male, SE = standard error.

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