



Short communication

Gender differences in mental and physical health conditions in U.S. veterans: Results from the National Health and Resilience in Veterans Study



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ABSTRACT

Objectives: To characterize gender differences in the prevalence of mental and physical health conditions and evaluate the moderating effect of assaultive trauma on risk for these conditions in a nationally representative sample of male and female U.S. veterans.

Methods: Cross-sectional data were analyzed from 3157 U.S. veterans from the National Health and Resilience in Veterans Study. Multivariable logistic regression analyses assessed gender differences in health outcomes and evaluated physical and sexual trauma as possible moderators of these outcomes.

Results: Compared to male veterans, female veterans had higher prevalence estimates of lifetime posttraumatic stress (OR = 3.33) and lifetime and current major depressive (ORs = 2.10 and 2.76, respectively) disorders, and lifetime histories of arthritis, migraine headaches, and osteoporosis (ORs ranging 2.14–9.74), but lower prevalence estimates of lifetime nicotine dependence (OR = 0.46), lifetime and current alcohol use (ORs = 0.19 and 0.36, respectively) and lifetime drug use (OR = 0.39) disorders, and lifetime histories of diabetes, heart attack, and high blood pressure (ORs ranging 0.05–0.49). The elevation in risk associated with physical and sexual assault was greater for males than females for numerous health conditions (but greater for females for posttraumatic stress disorder).

Conclusions: Results provide a comprehensive assessment and characterization of gender differences in mental and physical health conditions and risk conferred by assaultive trauma for certain conditions in U.S. veterans.

1. Introduction

Only a small number of female veterans have traditionally been included in large-scale epidemiologic studies of veterans' health. In the few existing national studies, female veterans reported having poorer general health and greater prevalence of mental and chronic health conditions, including depressive and anxiety disorders and cancer, compared with their civilian counterparts [1]. Additionally, female veterans who used VA services had worse physical and mental health compared with those who did not use VA services [2].

Gender differences have been reported among veterans for specific health conditions. Among veterans who served in Operation Enduring Freedom/Operation Iraqi Freedom, females were more likely to screen positive or be diagnosed with depression and military sexual trauma, and less likely to do so for posttraumatic stress disorder (PTSD) and alcohol use disorder (AUD) than males [3,4]. Most previous studies on veterans' health have used samples that were predominantly male, only

included veterans who used VA services, or focused on veterans from more recent wars. Thus, direct comparisons of the health of male and female veterans from contemporary, nationally representative samples of U.S. veterans are needed.

Veterans have elevated exposure to assaultive trauma, which increases risk for certain health problems, including PTSD [5] and AUD [6]. Risk for exposure to various types of traumatic events differs across gender [7,8] and the association of trauma with adverse health outcomes varies by traumatic event type [9]. Thus, it is important to consider the possibility that assaultive trauma is differentially associated with health outcomes in male and female veterans.

The aims of this study were to: 1) document the prevalence of mental and physical health conditions in male and female U.S. military veterans using data from a contemporary, nationally representative sample; and 2) evaluate gender differences in the magnitude of associations between assaultive trauma and a range of health conditions.

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Table 1
Mental and physical health conditions in male and female U.S. veterans.

	Male (n = 2836) Raw frequency (weighted %)	Female (n = 321) Raw frequency (weighted %)	Bivariate analysis		Multivariable analysis Reference category: men	
			χ^2	P	OR	95% CI
Mental health measures						
Lifetime						
Alcohol use disorder	1206 (44.0)	78 (24.0)	44.18	< 0.001	0.19^{a,b,c}	0.12, 0.31
Drug use disorder	350 (13.6)	36 (11.5)	0.96	0.369	0.39^{a,b}	0.18, 0.83
Major depressive disorder	402 (15.1)	115 (34.6)	71.86	< 0.001	2.10^{a,b}	1.36, 3.24
Nicotine dependence	542 (20.2)	40 (12.2)	11.05	0.001	0.46^{a,b}	0.26, 0.83
Post-traumatic stress disorder	155 (6.8)	57 (19.4)	58.13	< 0.001	3.33^{a,b,d}	1.74, 6.40
Current						
Alcohol use disorder	400 (15.4)	24 (9.2)	8.23	0.003	0.36	0.19, 0.68
Major depressive disorder	175 (7.3)	37 (12.5)	9.97	0.003	2.76^{a,b,c}	1.46, 5.20
Post-traumatic stress disorder	86 (4.7)	16 (6.0)	0.86	0.381	0.47^{a,b}	0.11, 1.97
Current suicidal ideation	199 (9.3)	32 (11.5)	1.55	0.211	1.81 ^d	0.97, 3.36
Ever attempted suicide	123 (6.0)	42 (15.2)	35.21	< 0.001	0.81^{a,b}	0.35, 1.90
Ever received mental health treatment	546 (20.0)	131 (39.3)	58.19	< 0.001	1.42 ^a	0.91, 2.25
Lifetime physical health conditions						
Arthritis	876 (29.5)	108 (30.4)	0.12	0.738	2.14	1.38, 3.31
Asthma, chronic bronchitis, or COPD	291 (10.5)	51 (15.9)	8.00	0.006	1.52 ^{a,b}	0.82, 2.83
Cancer	467 (16.1)	28 (6.1)	20.96	< 0.001	0.74 ^b	0.38, 1.44
Chronic pain	539 (20.2)	57 (16.3)	2.60	0.125	1.14 ^b	0.67, 1.94
Diabetes	560 (18.0)	37 (10.2)	11.55	< 0.001	0.49	0.24, 0.97
Heart attack	246 (9.2)	9 (1.4)	21.08	< 0.001	0.05^{b,c,d}	0.01, 0.45
Heart disease	434 (15.2)	10 (2.7)	34.57	< 0.001	0.41 ^{a,c}	0.15, 1.10
High blood pressure	1502 (50.6)	100 (26.1)	64.43	< 0.001	0.42^{b,d}	0.27, 0.66
High cholesterol	1452 (47.4)	113 (34.2)	18.73	< 0.001	0.87	0.57, 1.31
Kidney disease	80 (2.9)	4 (0.7)	5.07	0.022	0.41	0.61, 2.72
Liver disease	49 (1.9)	5 (1.7)	0.05	> 0.999	0.49	0.07, 3.47
Migraine headaches	134 (5.0)	64 (16.9)	65.86	< 0.001	3.64^b	1.95, 6.79
Osteoporosis or osteopenia	65 (2.0)	35 (9.2)	52.95	< 0.001	9.74	4.54, 20.90
Rheumatoid arthritis	96 (3.7)	14 (3.7)	0.00	> 0.999	1.79	0.70, 4.56
Sleep disorders	540 (19.4)	60 (21.4)	0.68	0.397	0.90	0.53, 1.52
Stroke	65 (2.0)	2 (0.3)	4.17	0.04	0.08	0.00, 26.86
Traumatic brain injury	13 (0.6)	3 (0.3)	0.307	> 0.999	0.64	0.01, 77.34

Abbreviations: OR = odds ratio; 95% CI = 95% confidence interval; COPD = chronic obstructive pulmonary disease.

Note: ORs for psychiatric disorders are adjusted for age, race, marital status, education, employment status, income, combat veteran status, lifetime exposure to physical assault, lifetime exposure to sexual assault, and interactions of each assault type by gender.

ORs for suicidality, mental health treatment utilization, and physical health conditions are further adjusted for lifetime history of major depressive and/or post-traumatic stress disorder, lifetime alcohol and/or drug use disorder, lifetime nicotine dependence, and number of medical conditions.

Conditions that differed by gender are highlighted in bold font, p < 0.05.

^a Significant main effect of lifetime sexual assault.

^b Significant main effect of lifetime physical assault.

^c Significant interaction of lifetime sexual assault by gender.

^d Significant interaction of lifetime physical assault by gender.

2. Methods

2.1. Sample and assessments

Data were analyzed from Wave 1 of the National Health and Resilience in Veterans Study (NHRVS), a cross-sectional nationally representative survey of 3157 U.S. veterans conducted between October and December 2011 [8,9]. The sample was drawn from a probability-based survey panel (over 50,000 households) of a nationally representative U.S. adult sample, maintained by GfK Knowledge Networks, Inc. When the NHRVS was fielded, 4750 veterans were in the survey panel; 3408 (71.7%) responded to an invitation to participate. Of these, 3188 (93.5%) confirmed eligibility (current or past active military status) with a screening question, and 3157 (92.6%) completed the 60-minute, confidential online survey. Sociodemographic characteristics and prevalence estimates of assaultive trauma for male (n = 2836) and female (n = 321) veterans are shown in Supplementary Table I.

Lifetime AUD, drug use disorder (DUD), MDD, and nicotine dependence were assessed with an adapted self-report version of the Mini-International Neuropsychiatric Interview [10]. Lifetime and current PTSD were assessed using the PTSD Checklist for DSM-IV [11]. The

Alcohol Use Disorders Identification Test-10 [12] and Patient Health Questionnaire-4 [13] assessed current AUD and MDD, respectively. A modified question from the Patient Health Questionnaire-9 [14] assessed current suicidal ideation. Participants were asked, “How often have you been bothered by thoughts of hurting yourself in some way?” and “In the past 2 weeks, how often have you been bothered by thoughts you might be better off dead?”. Those who responded several days (≥ 1) on either question were coded positive for current suicidal ideation. Attempting suicide and receiving mental health treatment were assessed with the questions, “Have you ever tried to kill yourself?” and, “Have you ever received mental health treatment (e.g., prescription medication or psychotherapy for a psychiatric or emotional problem)?”, respectively. Physical health conditions were assessed using a checklist of various conditions preceded by the question, “Has a doctor or health care professional ever told you that you have any of the following medical conditions?”.

The Trauma History screen [15] assessed lifetime exposure to assaultive traumatic events. Participants who reported ever being hit or kicked hard enough to injure as a child and/or adult, and/or being attacked with a weapon were coded positive for lifetime physical assault. Participants were coded positive for lifetime sexual assault if they reported ever experiencing forced sexual contact as a child and/or

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