

Gender Differences in Rates of Depression, PTSD, Pain, Obesity, and Military Sexual Trauma Among Connecticut War Veterans of Iraq and Afghanistan

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Abstract

Purpose: The current wars in Iraq and Afghanistan have led to an increasing number of female veterans seeking medical and mental healthcare in the Department of Veterans Affairs (VA) healthcare system. To better understand gender differences in healthcare needs among recently returned veterans, we examined the prevalence of positive screenings for depression, posttraumatic stress disorder (PTSD), military sexual trauma (MST), obesity, and chronic pain among female and male veterans of Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) receiving care at the VA Connecticut Healthcare System.

Methods: We performed a retrospective, cross-sectional data analysis of OEF/OIF veterans at VA Connecticut who received services in either Primary Care or the Women's Health Clinic between 2001 and 2006.

Results: In this study, 1129 electronic medical records (1032 men, 197 women) were examined. Female veterans were more likely to screen positive for MST (14% vs. 1%, $p < 0.001$) and depression (48% vs. 39%, $p = 0.01$) and less likely to screen positive for PTSD (21% vs. 33%, $p = 0.002$). There was no significant gender difference in clinically significant pain scores. Men were more likely than women to have body mass index (BMI) $>30 \text{ kg/m}^2$ (21% vs. 13%, $p = 0.008$).

Conclusions: These results suggest that important gender differences exist in the prevalence of positive screenings for MST, depression, obesity, and PTSD. As the VA continues to review and improve its services for women veterans, clinicians, researchers, and senior leaders should consider innovative ways to ensure that female veterans receive the health services they need within the VA system.

Introduction

THE CURRENT WARS IN Iraq and Afghanistan have engendered a growing population of female veterans seeking healthcare through the Veterans Administration (VA). At present, 15% of active military, 17% of National Guard/Reserves, and 20% of new recruits are women.¹ Recent studies suggest that women are among the fastest growing segments of new users of VA healthcare and that as many as 40% of women returning from Iraq and Afghanistan may elect to use the VA.²

Accommodating women who have served in Operation Enduring Freedom (OEF) (in Afghanistan) or Operation Iraqi Freedom (OIF) poses a unique challenge for the VA. Women are serving extended and repeated deployments in Iraq and

Afghanistan, potentially putting them more at risk of physical or mental health problems than female veterans from previous eras.³ Because the VA previously has provided care for a largely male population, the influx of female veterans who have served in Iraq or Afghanistan, with potentially different healthcare needs, raises concerns about providing high-quality care for female veterans.

Certain medical and mental health conditions, including depression,⁴ posttraumatic stress disorder (PTSD),⁵ chronic pain,⁶⁻¹⁰ and sexual trauma,¹¹ are more prevalent in women than men in civilian populations. Obesity is less prevalent in women in civilian populations.¹² For VA strategic planning, it is important to determine the prevalence of these conditions in women veterans so that appropriate services are allocated to meet their needs.

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Preliminary studies of the prevalence of these conditions in women veterans show results that differ from those found in the civilian population. In contrast to studies in civilian populations, some preliminary evidence suggests that men and women deployed in Iraq may have similar rates of PTSD and depression.^{13,14} Because of the large body of civilian evidence that these conditions are more common in women, further research is clearly needed to clarify the relative prevalence of mental health disorders in female and male veterans of OEF/OIF and to monitor the trajectory of these disorders over time after deployment.

Unlike studies of PTSD and depression, in studies of pain, preliminary evidence shows that women veterans may have a higher prevalence of pain than male veterans (similar to civilian reports). In one survey of women veterans seen in a primary care clinic, a higher prevalence of persistent pain was found in female veterans (78%)¹⁵ than had been noted in male veterans (50%) in a previous study.¹⁶

Gender differences in the identification and treatment of military sexual trauma (MST) are also an important consideration for the VA. MST is defined as severe or threatening forms of sexual harassment and sexual assault sustained in military service. The annual incidence of sexual assault is 3% among active duty women and 1% among active duty men. Sexual coercion and unwanted sexual attention within the military occur at an annual rate of 8% and 27%, respectively, among women and 1% and 5%, respectively, among men.¹⁷ Evidence suggests that women who have experienced MST report higher levels of depression, substance abuse, and medical conditions^{18,19} than those without MST. A more recent study suggests that there is a strong association between MST and mental health conditions, including PTSD, eating disorders, and personality disorders.¹¹

Obesity is also a growing problem in the VA, as it is associated with an increased risk of adverse outcomes in the general population.²⁰ A study of veterans receiving care at VA medical facilities found the prevalence of obesity to be higher among women (37%) than men (33%).²¹

In the VA, universal screening for medical and mental health conditions, including depression, PTSD, MST, body mass index (BMI), and a pain score, is required. (MST is a one-time screen. Depression screening, PTSD screening, and the BMI measurement are performed annually, and pain scores are recorded as part of vital signs at every visit.) Because further studies are needed to clarify whether there are gender differences in the burden of stress-related conditions in female and male veterans of OEF/OIF, we chose to use the VA clinical reminder screening data to further evaluate this patient population. We hypothesized that female veterans would be more likely to have positive screens for depression, PTSD, MST, and obesity than male veterans and to have higher pain scores.

In this article, we report the use of text processing techniques to retrieve screening data from the electronic medical record to determine the frequency of positive screens for stress-related conditions in female veterans of OEF/OIF.

Materials and Methods

Sample and sources of data

We performed a retrospective, cross-sectional data analysis using electronic medical records of OEF/OIF veterans at VA

Connecticut who received services in either Primary Care or the Women's Health Clinic from October 1, 2001, through May 7, 2007. To identify OEF/OIF veterans in Connecticut, we obtained the local OEF/OIF roster file through the OEF/OIF Coordinator at VA Connecticut. The local roster contained Connecticut OEF/OIF military discharges from October 1, 2001, through May 7, 2007, who had enrolled for services or used VA care.

All demographic variables, including sex, age, race/ethnicity, marital status, and service-connected disability (i.e., a disability caused by an injury or illness incurred in or aggravated by military service), were extracted from electronic medical records. Pain scores, height, and weight were extracted from the vital signs package in the electronic medical record, and screening data were extracted from progress notes using text processing technology. Pain scores are recorded in the electronic medical record by a health technologist who takes the patient's vital signs and asks the patient to rate pain on a scale of 0–10. Pain scores were dichotomized in two ways: any pain (pain score of ≥ 1) and pain score > 4 (clinically relevant pain). Height is measured yearly at medical visits, and weight is recorded at every visit. BMI was calculated from patient height and weight according to the standard BMI calculation: weight (kg)/height (m)². Anyone with BMI > 30.0 kg/m² is considered obese.²²

The primary outcome for this study was a positive screen for PTSD, depression, pain, obesity, or MST. Figure 1 shows the questions used for screening at the VA for depression, PTSD, and MST. A positive screen for depression is a score ≥ 3 points of a possible 6, and a positive screen for PTSD is a positive answer to three of four questions. A positive answer to either question about sexual trauma confers a positive screen. In the VA, an electronic clinical reminder package prompts a provider to do recommended annual screenings for medical and mental health conditions. The clinical reminder and the screening results are automatically stored as text in the medical record progress note. We were, thus, able to capture the clinical reminder data by searching the progress notes using the text indexing and searching tools in the database management system SQL server 2005.²³

A sample of 25 male and 25 female veterans was randomly selected to perform a check of the reliability of the text processing techniques. The electronic record data were manually reviewed and compared with the text processing results, and a simple kappa was performed to test for the level of agreement beyond chance between the measures. In our validation test comparing electronic text processing techniques with manual chart review, there was very good agreement between the two techniques (mean $\kappa = 0.91$). Agreement was strongest for MST ($\kappa = 0.94$). The agreement statistics suggest that the electronic text processing methods were a good substitute for chart review in determining the presence of screening for these conditions.

Analyses

Chi-square tests were used to test the significance of differences for all categorical variables. Logistic regression analyses were used with positive screens for pain, PTSD, depression, MST, and obesity as outcomes, with gender as an independent variable. These analyses were adjusted for the potentially confounding effects of age, race, marital status,

<p>Depression screening</p> <ol style="list-style-type: none"> 1. During the past 2 weeks, how often have you been bothered by little interest or pleasure in doing things? 2. During the past 2 weeks, how often have you been bothered by feeling down, depressed, or hopeless? <p>Patients are asked to respond with "not at all," "several days," "more than half the days," or "nearly everyday."</p> <p>PTSD screening</p> <ol style="list-style-type: none"> 1. In your life, have you ever had any experience that was so frightening, horrible, or upsetting that in the past month it has caused you to <ol style="list-style-type: none"> a. have nightmares about it b. tried hard not to think about it; went out of your way to avoid situations that remind you of it c. were constantly on guard, watchful or easily startled d. were numb or detached from others, activities, or your surroundings? (yes or no) <p>Military sexual trauma (MST)</p> <ol style="list-style-type: none"> 1. When you were in the military, did you ever receive uninvited or unwanted sexual attention (i.e., touching, cornering, pressure for sexual favors, or verbal remarks)? 2. Did someone ever use force or threat of force to have sexual contact with you against your will?

FIG. 1. Depression, PTSD, and MST screening questions.

and service-connected disability. We present odds ratios (OR) and 95% confidence intervals (CI) that were drawn from these logistic regression analyses. All statistical analyses were performed using SAS version 9 (SAS Institute, Inc., Cary, NC).

Results

A total of 197 female and 1032 male veterans of OEF/OIF were seen at least once in a primary care or women's health clinic at VA Connecticut between 2001 and 2006. Female veterans were younger ($p < 0.0001$), more likely to be black or unknown race than white ($p < 0.001$), and less likely to be married ($p < 0.01$) than male veterans (Table 1). More than 90% of all veterans were screened for depression and MST, and just under 90% of male and female veterans were screened for PTSD. Because pain is measured as a vital sign along with height and weight, 100% of veterans were screened for pain. There were no statistically significant differences in screening rates by gender for pain, depression, PTSD, or MST.

Among the veterans who were screened for depression, PTSD, pain, and MST, female veterans were more likely to screen positive for depression (48% vs. 39%, $p = 0.012$) but less likely to screen positive for PTSD (21% vs. 33%, $p = 0.002$).

Female veterans were less likely to screen positive for any pain (38% vs. 45%, $p < 0.0001$), but there was no significant difference by gender in pain scores >4 (clinically significant pain). Positive screening for MST was significantly more common in female than male veterans (14% vs. 1%, $p < 0.001$). Men were more likely to be obese than women (21% vs. 13%, $p = 0.008$) (Table 2).

The age, race, service-connected disability, and marital status adjusted ORs for the association of a positive screen with gender are shown in Table 3. Female gender was associated with a significantly greater odds for a positive screen for depression (OR 1.58, 95% CI 1.15-2.17) and MST (OR 25.6, 95% CI 10.23-63.94) compared with male gender. However, female gender was negatively associated with a positive screen for PTSD (OR 0.55, 95% CI 0.37-0.82) or obesity (OR 0.58, 95% CI 0.37-0.92) compared with male gender.

Discussion

Our study provides preliminary data about gender differences in positive screening for depression, PTSD, pain, MST, and obesity in returning veterans from Iraq and Afghanistan. These data items were chosen for study because previous

TABLE 1. CHARACTERISTICS OF VA CONNECTICUT OEF/OIF VETERANS, BY GENDER, 2001-2006

	Overall	Female	Male	p value
Total number	1229	197	1032	
Age (mean), years	32	30	32	0.0004
Race, n (%)				
Black	133 (11)	38 (19)	95 (9)	
White	788 (64)	105 (53)	683 (66)	<0.001
Other	308 (25)	54 (27)	254 (25)	
Marital status, n (%)				
Currently married	431 (35)	50 (26)	381 (37)	
Separated/divorced/widowed	149 (13)	31 (5.5)	118 (11.1)	
Never married	637 (52)	114 (58)	523 (50)	
Unknown	5 (0.4)	0	5 (0.5)	0.004
Service-connected disability ^a	440 (36)	75 (38)	365 (35)	0.468

^aService-connected disability, disability caused by an injury or illness incurred in or aggravated by military service.

TABLE 2. DIFFERENCES IN RATES OF POSITIVE SCREENINGS BY GENDER IN VA CT OEF/OIF VETERANS

	Female positive screen n (%)	Male positive screen n (%)	p value
MST ^a	26 (14)	6 (1)	<0.001
PTSD	37 (21)	292 (33)	0.002
Depression	92 (48)	380 (39)	0.012
BMI >30	25 (13)	215 (21)	0.008
Any pain ^b	71 (38%)	464 (45%)	<0.0001
Pain score >4 ^c	49 (65)	286 (62)	0.608

^aMST, military sexual trauma; PTSD, posttraumatic stress disorder; BMI, body mass index.

^bAny pain, pain score >0 (scale 0–10).

^cPain >4, clinically significant pain.

research supported a hypothesis that women veterans might be more or less vulnerable to these conditions than male veterans.^{4–11,14} Knowledge of the prevalence of physical and mental health problems in female veterans will be essential for the VHA as it plans for the predicted increase in the female veteran population in the next few years.²

Screening data indicate that MST and depression were more prevalent among female veterans than male veterans, with 14% of women in the sample screening positive for MST, and nearly half (48%) of all women in the sample screening positive for depression. This is in concordance with national and non-VA (civilian) data sources⁴ that report that women are at twice the risk of depression regardless of racial or ethnic background or economic status.

In our study, women were less likely to screen positive for PTSD (21% screened women vs. 33% screened men). This was in contrast to our hypothesis (based on primarily civilian data) that has shown twice the rate of PTSD in females as in males after trauma exposure. Two other recently published studies^{13,14} have shown minimal differences in the prevalence of PTSD among male and female veterans of the Afghanistan and Iraq conflicts. Whether there are gender differences in the risk of PTSD and other mental health problems among

women and men exposed to similar levels of combat remains an important unanswered question, but our results suggest that military duty in Iraq confers a lower risk of PTSD in women compared with men. One hypothesis suggests that risk has more to do with the intensity and frequency of combat experience than with gender.³ In addition, it is possible that the “healthy warrior effect” (the disproportionate loss of psychologically unfit personnel early in training)²⁴ might even be the playing field for men and women deployed. Our data did not include combat exposure, and disentangling the relationship among PTSD, MST, and combat exposure remains an important research question to be answered.

In our study, there were no statistically significant differences in pain scores between male and female veterans. Although previous studies have reported higher rates of many different pain conditions^{6–10} in women compared with men, we did not find a significant difference in rates of clinically significant pain among female vs. male veterans screened for pain.

Overall, fewer people met the criteria for obesity in this study in comparison to previous studies of veterans. This may reflect the young age of our population and their recent military discharge, as obesity is more prevalent in older age groups.²⁵ However, there was a statistically significant difference between male and female veterans who met obesity criteria according to BMI standards. To address the growing problem of obesity, in 2004 the VA introduced the Managing Overweight and/or Obesity for Veterans Everywhere (MOVE) program. Though the MOVE program has been successful in the VA, the VA must continue to adapt this program to meet the needs of younger veterans. Given that previous studies have found an association between PTSD and obesity,²⁶ the VA must continue to adapt its programs for PTSD and other risk factors for obesity among OEF/OIF veterans.

A number of limitations in this work are worth reporting. The results presented in this study are based on veterans of OEF/OIF who have sought care in VA Connecticut over the last 6 years and, thus, are not necessarily representative of veterans in general. Additionally, our data are taken from VA Clinical Reminders and should be interpreted only as screening data. We are not able to determine from electronic screening data whether PTSD, depression, or sexual trauma preexisted, occurred postdeployment, or resulted from a traumatic exposure in OEF/OIF. It is also unknown what proportion of those who screen positive for these conditions are later given a diagnosis of depression or PTSD. However, a recent study of validity of screening instruments reported sensitivity and specificity of the two-item depression screen (score ≥ 3) ranging from 76% to 93% sensitive and 89% to 95% specific.²⁷ One study of the four-item PTSD screen in OEF/OIF veterans found a sensitivity from 46% to 73% and a specificity as high as 86%.²⁸

As the VA plans for staffing and structure of women’s health programs, it will be important to consider gender-specific treatment for certain mental health conditions. Because of the higher prevalence of positive screening for depression and MST in women, the integration of primary care, gynecological care, and mental health services may be particularly important for female veterans. In the past, VA hospitals have cared primarily for male veterans. Many VA healthcare providers are unfamiliar with women veterans’

TABLE 3. AGE, RACE, SERVICE-CONNECTED DISABILITY, AND MARITAL STATUS ADJUSTED ODDS OF POSITIVE SCREEN AS FUNCTION OF GENDER AMONG OEF/OIF VETERANS AT VA CONNECTICUT, OCTOBER 1, 2001–OCTOBER 1, 2006

	Female vs. male			p value
	OR	Lower confidence limit (95%)	Upper confidence limit (95%)	
Any pain ^a	0.72	0.52	1.00	0.05
Pain score >4 ^b	1.14	0.68	1.91	0.63
PTSD	0.53	0.35	0.79	0.002
MST	25.49	10.10	64.35	<0.001
Depression	1.57	1.14	2.17	0.01
BMI>30	0.58	0.37	0.92	0.02

^aAny pain, pain score >0 (scale 0–10)

^bPain >4, clinically significant pain.

PTSD, posttraumatic stress disorder; MST, military sexual trauma; BMI, body mass index.

health issues. To attend to this problem, some VA hospitals have opened women's health clinics where women receive full-service care, including primary care, gynecological care, and mental healthcare. Our data underscore the high prevalence of positive screens for depression and military sexual trauma in female veterans and support the need to further evaluate whether women's clinics will be increasingly useful for the treatment of complex and co-occurring physical and mental health issues that may result from military service.

Disclosure Statement

The authors have no conflicts of interest to report.

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