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The Burden of Illness in the First Year Home: Do Male and Female VA Users Differ in Health Conditions and Healthcare Utilization

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Abstract

Background—We sought to describe gender differences in medical and mental health conditions and health care utilization among veterans who used Veterans Health Administration (VA) services in the first year after combat in Iraq and Afghanistan.

Methods—This is an observational study, using VA administrative and clinical data bases, of 163,812 Operation Enduring Freedom/Operation Iraqi Freedom veterans who had enrolled in VA and who had at least one visit within 1 year of last deployment.

Results—Female veterans were slightly younger (mean age, 30 years vs. 32 for men; $p < .0001$), twice as likely to be African American (30% vs. 15%; $p < .0001$), and less likely to be married (32% vs. 49%; $p < .0001$). Women had more visits to primary care (2.6 vs. 2.0; $p < .001$) and mental health (4.0 vs. 3.6; $p < .001$) clinics and higher use of community care outside the VA (14% vs. 10%; $p < .001$). After adjustment for significant demographic differences, women were more likely to have musculoskeletal and skin disorders, mild depression, major depression, and adjustment disorders, whereas men were more likely to have ear disorders and posttraumatic stress disorder. Thirteen percent of women sought care for gynecologic examination, 10% for contraceptive counseling, and 7% for menstrual disorders.

Conclusion—Female veterans had similar rates of physical conditions, but higher rates of some mental health disorders and additionally, used the VA for reproductive health needs. They also had slightly greater rates of health care service use. These findings highlight the complexity of female Veteran health care and support the development of enhanced comprehensive women’s health services within the VA.

Introduction

Participation of women in the United States military services has increased significantly during the conflicts in Afghanistan (Operation Enduring Freedom [OEF]) and Iraq (Operation Iraqi Freedom [OIF]). At present, 15% of active military, 17% of National Guard/Reserves, and 20% of new recruits are women (Meehan, 2006). Unlike female veterans of past eras, who had low rates of Veterans Health Administration (VA) health care utilization (Hoff & Rosenheck, 1998; Skinner et al., 1999), OEF/OIF women are using the VA in record numbers. Recent studies suggest that women are now among the fastest growing segments of new VA users (Yano, 2008) with as many as 44% of women returning from Iraq and Afghanistan electing to use the VA compared to 11% in prior eras (Hayes, 2008).

To provide high-quality care to its female veterans, the VA must understand the impact of combat exposure and the complex physical and mental health needs of female veterans returning from war. Although women deployed to Iraq and Afghanistan are still officially barred by Department of Defense policy from serving in direct combat positions (such as infantry), they are not protected from exposure to combat situations and often serve side by side with combat soldiers and come under direct fire (Hoge, Clark, & Castro, 2007). Combat exposure has been associated with high levels of physical (Kang et al., 2000; Kroenke, Koslowe and Roy, 1998) and mental health conditions (Hoge, Auchterlonie, & Miliken, 2006; Seal, Bertenthal, Miner, Sen, & Marmar, 2007), and health care utilization (Kelly, Vogt, Scheiderer, Ouimette, Daley, & Wolfe, 2008). Additionally, women who are deployed may experience a number of stressors that differ from those of men, including separation from children and family, sexual assault or harassment, and poor social support (Street, Vogt, & Dutra, 2009). Studies of the OEF/OIF population have primarily focused on a majority male population and on mental health outcomes (Hoge et al., 2006; Seal et al., 2007), but a baseline study of gender differences in the overall medical, mental health, and reproductive health needs in the first year after deployment has not yet been reported.

The effects of OEF/OIF deployment on women’s physical and mental health remains unknown. Several early studies reported high rates of musculoskeletal injuries in female service members (Kowal, 1980; Reinker and Ozburne, 1979; Ross & Woodward, 1994); however, the VA Gulf War Registry reported fewer muscle and joint pains in female than in male veterans (Murphy et al., 1999). No study has looked at musculoskeletal injuries among OEF/OIF veterans. Studies of gender differences in mental health conditions among OEF/OIF veterans have shown mixed results (Seal, Metzler, Gima, Bertenthal, Maugen, & Marmar, 2009; Street et al., 2009). Further research is needed to clarify the relative prevalence of physical and mental health disorders in female and male veterans of OEF/OIF.

Female gender also confers a high risk of encountering sexual trauma in the military (Murdoch, Pryor, Polusny, & Gackstetter, 2007; Street, Gradus, Strafford, & Kelly 2007; Vogt, Pless, King, & King, 2005). Evidence suggests that women who have experienced military sexual trauma report higher levels of depression, substance abuse, and medical conditions (Frayne et al., 1999; Kimmerling, Clum, & Wolfe, 2000) than those without military sexual trauma.

Physical and mental health conditions may differ in female and male veterans in the first year after deployment. We hypothesized that female veterans would have higher rates of mental health and musculoskeletal conditions than male veterans and undertook this study to describe the national cohort of female and male veterans returning from service in Iraq and Afghanistan who have enrolled for VA services. We examine baseline gender differences in demographics, utilization, and physical and mental health conditions among veterans who use the VA in the first year after deployment.

Methods

Study Population

The study population was composed of veterans from the VA's OEF/OIF roster provided by Defense Manpower Data Center—Contingency Tracking System Deployment File. The VA OEF/OIF roster includes information on veterans' gender, race, date of birth, date of last deployment, armed forces branch (Army, Navy, Air Force, or Marines), and component (National Guard, Reserve or active duty) for all military personnel discharged from the U.S. military from October 1, 2001, to November 30, 2007. All veterans on the roster either enrolled for VA services or received VA care before January 1, 2008 ($n = 406,802$). We limited our analyses to those with an encounter within 1 year. This study was approved by the Human Investigation Committees at West Haven VA Medical Center and Yale University School of Medicine.

Data Sources

Data on eligible veterans were linked with VA administrative and clinical data contained within the VA National Patient Care Database, Decision Support Systems, and the Corporate Data Warehouse. These databases provide health care utilization and cost data, pharmacy and laboratory data, vital signs, health encounters, and coded diagnostic and procedure data (International Classification of Disease [ICD]-9 and Current Procedural Terminology) associated with all VA inpatient and outpatient encounters. To provide a cross-sectional view of health conditions and health care use among service members with varying deployment and return dates, we limited data to inpatient and outpatient visits that occurred within 1 year after the end of the last deployment.

For diagnostic and procedural data, we counted medical and mental health conditions that were coded at least once for an inpatient stay or at least twice for an outpatient visit. This was done because outpatient codes are assigned by health care providers and are expected to be less complete than inpatient codes, which are assigned by professional coders. This methodology has been found to improve accuracy in the identification of psychiatric disorders in administrative data (Lurie, Popkin, Dysken, Moscovice, & Fynch, 1992) and in identification of HIV in Medicaid data (Walkup, Wei, Sambamoorthi, & Crystal, 2004). For reproductive health codes, which often represent health maintenance rather than health problems (and by nature would have occurred once yearly or less often), we measured any single occurrence regardless of whether the visit was inpatient or outpatient.

To evaluate health conditions, we used previously validated diagnostic code groupings (Agency for Healthcare Research and Quality, 2009; Goulet et al., 2007). First, we determined the 10 most prevalent diagnostic groupings for female veterans. In order of frequency, these were back problems, joint disorders, posttraumatic stress disorder (PTSD), mild depression, female reproductive health conditions, musculoskeletal disorders, adjustment disorders, skin disorders, major depression, and ear and sense organ disorders. Each diagnostic code grouping contains a number of diagnostic and procedural codes relating to a specific health condition. For example, the most common diagnoses in the back

problems group are lumbago, backache, cervicalgia, degeneration of lumbar, lumbosacral, or intervertebral disc, and displacement of the lumbar intervertebral disc. The most common diagnoses in the joint disorders grouping are pain in the joint involving the lower leg, pain in the joint involving the ankle and foot, pain in the joint involving the shoulder region, pain in the joint—unspecified, and pain in the joint involving the pelvic region and thigh. The most common diagnoses in the female reproductive health group are gynecologic examination, abnormal glandular Pap smear of cervix, dysplasia of the cervix, and unspecified symptoms associated with female genital organs. The most common diagnoses in the musculoskeletal disorders group were limb pain, plantar fascial fibromatosis, enthesopathy of unspecified site, myalgia and myositis, and muscle spasm. The most common disorders in the ear and sense organ disorders group were tinnitus, unspecified hearing loss, and sensorineural hearing loss.

Statistical Analysis

Chi-square tests were used to assess the bivariate relationships between categorical variables and *t*-tests were used for continuous variables. We used odds ratios and 95% confidence intervals to compare the proportion of females and males receiving diagnoses within 1 year post deployment (using male veterans as the referent group). To control for potential confounding, we entered all demographic variables that were significant on bivariate analyses into multivariable logistic regression models as covariates with each disorder as the outcome. We compared any use of selected VA services (primary care, mental health, etc.) and the number of visits to each service for females and males. We determined means, standard deviations, and 95% confidence intervals for health care utilization. All analyses were performed using SAS 9.2 (SAS Institute, Inc., Cary, NC). All statistical tests were two-tailed.

Results

Of the 837,000 service members deployed to Iraq and Afghanistan who had left military service as of November 2007, 163,812 (20%) had at least one encounter of any type with the VA health system within 1 year after the end of their last deployment (19,520 women and 144,292 men).

Demographics

Our analysis was limited to those veterans who used VA within 1 year of their last deployment. Female veterans were younger, had more education, were more likely to be African American; they were less likely to be married and more likely to be officers than male veterans. Women more often served in the Army, Air Force, or Navy and less often served in the Marines (Table 1).

Health Care Utilization

Among those who used the VA in the first year after deployment, 87% of female and 80% of male veterans had at least one visit in primary care (Table 2). Among those who used primary care, female veterans had a mean of 2.6 primary care visits compared with 2.1 visits for male veterans. Forty-two percent of women and 43% of men used mental health services; among these, women had a mean of 4.0 mental health visits compared with 3.6 visits for men. Hospitalization rates were low; 2% of both women and men. Use of community care paid for by the VA was more common among women (14%) than men (11%).

Diagnoses

To examine gender differences in prevalence of medical conditions, we identified the most common conditions (using diagnostic code groupings) in female veterans and compared their frequencies with those in male veterans (Table 3). The most common conditions, in order of frequency, were back problems, joint disorders, PTSD, mild depression, female reproductive health conditions, musculoskeletal disorders, adjustment disorders, skin disorders, major depression, and ear and sense organ disorders.

On unadjusted analyses, musculoskeletal disorders, skin disorders, mild depression, major depression, and adjustment disorders were significantly more common among female than in male veterans. Back problems, ear and sense organ disorders, and PTSD were more common among male veterans (Table 3).

After adjusting for significant demographic differences (age, race, marital status, education, rank, branch, and component), female veterans were still more likely to have musculoskeletal conditions, skin disorders, mild depression, major depression, and adjustment disorders. Female veterans were less likely than male veterans to have ear disorders and PTSD.

Women also commonly sought care for reproductive health needs. In the first year post-deployment, 13% of women sought care for gynecologic examination and Pap smears, 10% for contraceptive management, and 7% for menstrual disorders.

Discussion

We found substantial differences in the demographics and physical and mental health conditions of female and male veterans seeking care in the VA within 1 year of their last deployment. In addition, we found differences in health care utilization; female veterans who used primary care and mental health services had more visits than their male counterparts and used more VA-paid community care. Many of the differences in the female and male Veteran populations reached significance owing to the large sample size; however, not all of the significant differences will prove to be clinically important.

Female veterans had similar rates of back and joint problems, but slightly higher rates of other musculoskeletal conditions (such as limb pain, myositis, myalgia, and muscle spasm) than male veterans in unadjusted and adjusted analysis. Previous anecdotal reports have suggested that heavy body armor (initially designed for men) may predispose women to musculoskeletal injury. Early Department of Defense reports suggested that women were handicapped by equipment originally designed for men (Harper, Knapik, & Depontibriand, 2007). Few studies have specifically examined physical health outcomes in female veterans after deployment. In the first Persian Gulf War registry (Stuart, Murray, Ursano, & Wright, 2002), both male and female veterans had high rates of musculoskeletal injuries. We acknowledge that the small, significant difference in prevalence of musculoskeletal conditions we observed may not prove to be clinically significant. However, it is noteworthy that women have more musculoskeletal conditions in the first year after deployment despite having less combat exposure than men. It is unclear whether the difference noted is actually due to combat-related injury, or if it is brought about by higher rates of musculoskeletal conditions, such as fibromyalgia, in the general female population. Further research is needed to specifically define the etiologies for musculoskeletal conditions in female veterans and to determine gender differences in the prevalence of musculoskeletal conditions after adjustment for combat exposure.

Mental health problems differed between men and women, with women having higher rates of all types of depression and adjustment disorders and men having slightly higher rates of PTSD. Most studies of mental health problems in OEF/OIF veterans have shown higher rates of depression among women (Seal et al., 2009). These findings are similar to those in civilian populations (Kornstein, Schazberg, & Yonkers, 1995; Weisman et al., 1996). A number of studies have found small or nonsignificant differences in PTSD symptomatology by gender (Mental Health Advisory Team, 2006; Rona, Fear, Hull, & Wessely, 2007; LaPierre, Schwegler, & LaBauve, 2007; Kang & Hyams 2005). Others studies that have adjusted for predeployment differences in mental health (Smith, Wingard, Ryan, Kritz-Silverstein, Slymen & Sallis, 2008) or combat exposure (Tanielian & Jaycox, 2008) found that female gender was associated with PTSD. Further research is necessary to fully understand the role of gender in development of deployment-related PTSD.

Our study combines an analysis of the mental and physical health needs of female veterans in the first year after deployment. The most striking result is the higher prevalence of depression among women veterans. Our results suggest that an important challenge for the VA is providing care for female veterans with depression who also have significant musculoskeletal or other health conditions. Research suggests that those with substantial mental health conditions have a high burden of medical comorbidity (Frayne et al., 2004) and poorer outcomes in some chronic diseases (Zhang, Norris, Gregg, Cheng, Beckler, & Kahn, 2005). High rates of depression and adjustment disorders may complicate the management of painful conditions such as musculoskeletal disorders and treatment of depressive symptoms in the primary care setting may improve chronic pain (Kroenke, Bair, Damush Wu, Hoke, & Sutherland, 2009). Increasing the availability of mental health services that are co-located within women's primary care clinic areas may help to facilitate the management of coexisting depression and painful musculoskeletal conditions.

In addition, there have been disparities in quality performance measures noted by gender within the VA (VA Office of Quality and Performance, 2008; Bean-Mayberry et al., 2009). These may point to the need for increased resources to care for the complex needs of women veterans.

Another important finding of our study was the common use of VA for reproductive health services among women veterans. Female reproductive health concerns were the fifth most common reason for seeking care in our study. This highlights the need for VA to make reproductive health services available and accessible to every female veteran. Interestingly, though, the frequency of reproductive health services use was somewhat lower than expected. In the year since women returned from military service, only 13% received cervical cancer screening in the VA. The VA quality metric for women receiving Pap smear tests is 90% within 3 years, and nationally, in fiscal 2008, 92% met that goal (VA Office of Quality and Performance, 2008). Our finding implies that young female veterans who are due for Pap smears are relying on non-VA providers for their reproductive health needs. Non-VA providers may not be familiar with female veterans' military history and their mental and physical health problems arising from deployment exposures. Female veterans may be at greater risk for gaps in quality of care as a result of fragmented care (Bean-Mayberry, Chang, McNeil, & Scholle, 2006). Several VA initiatives, including the Women's Comprehensive Health Implementation Plan (U.S. Senate Committee on Veterans Affairs, Sub Committee Hearing, 2009) and the Patient Centered Medical Home transformation (U.S. Department of Veterans Affairs, 2010) will decrease fragmented care by ensuring that VA primary care doctors provide gender specific care, and coordinating care provided outside the VA.

Limitations

This study has several limitations. First, these findings cannot be generalized to all veterans who have served in Iraq or Afghanistan because we only had access to data from veterans who had enrolled in VA care. Our estimates of the prevalence of physical and mental health problems among these veterans overall may be biased, because certain health conditions may cause barriers to care, and others may make veterans more likely to seek care. Another important limitation is that because we relied on ICD-9-CM codes in VA administrative databases to capture physical and mental health conditions some of our findings may be subject to misclassification bias. Furthermore, administrative codes do not capture important contextual information, such as combat exposure or military sexual trauma.

In conclusion, our study provides a description of the population of male and female veterans of Iraq and Afghanistan who use the VA in the first year after the end of their last deployment. Our results are an initial description of the burden of illness of returning veterans and provide a baseline for further longitudinal analysis. The demographics and clinical conditions of the female and male populations proved to be similar overall, but a few differences remain important, including differences in physical and mental health conditions, clinic utilization, and use of VA-paid community care. Women had similar general medical needs, additional mental health and reproductive health needs, and overall increased health care utilization. These findings will help to guide the planning of comprehensive health services for female veterans that is already underway in the VA system.

Biographies

Dr. Haskell is an Associate Professor of Medicine at Yale University School of Medicine and Medical Director of Women's Health for the VA New England Region. She is a Co-Principal investigator of the VA HSR&D funded Women Veteran's Cohort Study.

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Dr. Goulet is Assistant Professor of Psychiatry at Yale University, and is director of the methodology and biostatistics core of the VA HSR&D funded Pain Research, Informatics, Medical Comorbidities, and Education Center (PRIME) at West Haven CT.

Melissa Skanderson is the chief programmer for the VA HSR&D funded Women Veterans Cohort Study and an expert in National VA data procurement and processing.

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Table 1

Characteristics of OEF/OIF Females and Males Who Have Used VA Services Within 1 Year of Last Deployment

Characteristic	Female (<i>n</i> = 19,520), %	Male (<i>n</i> = 144,292), %	<i>p</i> -Value
Age mean (SD)	30 (8.8)	32 (9.7)	<.0001
Race			<.0001
White	53%	69%	
Black	30%	15%	
Hispanic	11%	10%	
Other/unknown	6%	6%	
Married	32%	49%	<.0001
Less than a high school education	30%	24%	<.0001
Rank			<.0001
Enlisted	91%	92%	
Officer/Warrant	9%	8%	
Branch			<.0001
Army	79%	76%	
Air Force	10%	7%	
Navy	8%	6%	
Marines	3%	11%	
Component			<.0001
Active duty	37%	37%	
National Guard	30%	41%	
Reserve	33%	22%	

Table 2

Clinic Utilization by OEF/OIF Veterans in the First Year Post Deployment

Measure	Female (n = 19,520), %	Male (n = 144,292), %	p-Value
≥1 Primary care visit	(16,095) 86.6%	(115,289) 79.9%	<.0001
No. of visits mean (SD; for primary care utilizers)	2.56 (2.0)	2.08 (1.6)	<.0001
≥1 Mental health visit	(8,222) 42.1%	(61,535) 42.6%	.011
No. of visits mean (SD; for mental health utilizers)	4.02 (6.0)	3.61 (5.6)	<.0001
≥1 Medical specialty visit	(2,068) 10.6%	(13,710) 11.9%	<.0001
No. of visits mean (SD; for medical specialty utilizers)	1.84 (1.8)	1.77 (1.7)	.06
≥1 Surgery specialty clinic visit	(5,955) 30.6%	(35,088) 24.3%	<.0001
No. of visits mean (SD; for surgical clinic utilizers)	2.28 (2.2)	2.16 (2.2)	<.0001
Hospitalized	(365) 2.5%	(3,579) 1.9%	<.0001
Fee basis services*	(2,796) 14.3%	(15,160) 10.5%	<.0001

Abbreviations: SD, standard deviation.

* Community care paid for by the VA.

Table 3
Clinical Diagnoses in Female Compared With Male OEF/OIF Veterans in First Year After End of Last Deployment

Diagnosis	Female (n = 19,520), %	Male (n = 144,292), %	OR (95% CI)	p-Value	Adjusted OR (95% CI)*	p-Value
Back problems	9.4	10.3	0.95 (0.86–0.95)	<.0001	0.97 (0.92–1.02)	.227
Joint disorders	9.2	9.5	0.97 (0.92–1.02)	.1940	1.00 (0.95–1.05)	.930
PTSD	8.4	9.7	0.86 (0.81–0.90)	<.0001	0.95 (0.89–1.0)	.459
Mild depression	6.8	4.1	1.72 (1.62–1.83)	<.0001	1.81 (1.70–1.93)	<.0001
Musculoskeletal disorders	4.6	4.1	1.13 (1.05–1.21)	.0011	1.22 (1.13–1.31)	<.0001
Adjustment disorders	4.1	3.5	1.19 (1.10–1.28)	<.0001	1.24 (1.14–1.34)	<.0001
Skin disorders	3.9	2.6	1.54 (1.42–1.66)	<.0001	1.39 (1.28–1.51)	<.0001
Major depression	3.3	1.4	2.34 (2.14–2.56)	<.0001	2.43 (2.21–2.68)	<.0001
Ear and sense organ disorders	3.0	7.3	0.40 (0.36–0.43)	<.0001	0.51 (0.47–0.56)	<.0001
Female genital disorders	6.2	—	—	—	—	—

Abbreviations: CI, confidence interval; PTSD, posttraumatic stress disorder; OR, odds ratio.

Adjusted for age, race, marital status, education, rank, branch, and component.

Reference is male veterans for all comparisons.