

PTSD Risk and Mental Health Care Engagement in a Multi-War Era Community Sample of Women Veterans

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BACKGROUND: Post-traumatic stress disorder (PTSD) is common in women veterans (WVs), and associated with significant co-morbidity. Effective treatment is available; however, PTSD is often unrecognized.

OBJECTIVES: Identify PTSD prevalence and mental healthcare (MHC) use in a representative national WV sample.

DESIGN AND PARTICIPANTS: Cross-sectional, population-based 2008–2009 national survey of 3,611 WVs, weighted to the population.

MAIN MEASURES: We screened for PTSD using a validated instrument, and also assessed demographic characteristics, health characteristics, and MHC use in the prior 12 months. Among those screening positive, we conducted multivariate logistic regression to identify independent predictors of MHC use.

KEY RESULTS: Overall, 13.0 % (95 % confidence interval [CI] 9.8–16.2) of WVs screened PTSD-positive. Veterans Health Administration (VA) healthcare was used by 31.1 % of PTSD-positives and 11.4 % of PTSD-negatives ($p < 0.001$). Among those screening positive, 48.7 % (95 % CI 35.9–61.6) used MHC services (66.3 % of VA-users, 40.8 % of VA-nonusers; $p < 0.001$). Having a diagnosis of depression (OR=8.6; 95 % CI 1.5–48.9) and VA healthcare use (OR=2.7; 95 % CI 1.1–7.0) predicted MHC use, whereas lacking a regular provider for health care (OR=0.2; 95 % CI 0.1–0.4) and household income below the federal poverty level (OR=0.2; 95 % CI 0.1–0.5) predicted nonuse.

CONCLUSIONS: More than one in eight WVs screened positive for PTSD. Though a majority of VA-users received MHC, low income predicted nonuse. Only a minority of VA-nonusers received MHC. The majority of WVs use non-VA healthcare providers, who may be unaware of their veteran status and PTSD risk. VA outreach to educate VA-nonusers and their healthcare providers about WVs' PTSD risk and available evidence-based VA treatment options is one approach to extend the reach of VA MHC. Research to characterize barriers to VA MHC use for VA-nonusers and low income VA-users is warranted to better understand low service

utilization, and to inform program development to engage more WVs in needed MHC.

KEY WORDS: post-traumatic stress disorder; women; veterans; mental health services; utilization; Veterans hospitals.

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INTRODUCTION

Women are one of the fastest growing segments of the veteran population. There are currently an estimated 1.9 million U.S. women veterans.¹ Most obtain their health care in community settings.² In fact, one in 66 adult women in community settings is a veteran.³ However, most veteran research is conducted in Veterans Health Administration (VA) healthcare settings, leading to a gap in information about the vast majority of women veterans for conditions that are associated with military service.⁴

The lifetime prevalence of post-traumatic stress disorder (PTSD) among U.S. adult women is 9.7 %.⁵ Though military service confers an increased risk for subsequent development of PTSD, estimates of PTSD prevalence in veterans are limited to specific war cohorts or to VA healthcare users.^{6,7} We do not know the risk of PTSD in the general women veteran population.

PTSD can be a devastating condition for those afflicted, associated with increased medical comorbidity and with reduced quality of life.^{8,9} Though effective treatment is available, PTSD is often under-detected and untreated.^{10,11} Mental health (MH) services use has been examined in single war era veteran cohorts and among VA users, but this does not reflect the experiences of the larger population of veterans.¹² The prevalence of PTSD and of MH treatment in the general women veteran population is unknown.

To help clinicians in community settings understand the military sequelae and needs of women veterans in their patient population, our primary objective was to determine the prevalence of PTSD among women veterans in the general population. Our secondary objective was to deter-

mine the prevalence of MH care use among those who screen positive for PTSD. Our tertiary objective was to identify individual characteristics that predict MH care use among women screening positive for PTSD.

METHODS

Study Design and Sample

We conducted the National Survey of Women Veterans (NSWV), a population-based cross-sectional survey, in 2008–2009. Our methods have been described previously.^{13,14} In brief, the sampling frame for NSWV was created by cross-linking Veterans Health Administration, Veterans Benefits Administration and Department of Defense databases, that collectively identified more than 50 % of U.S. women veterans.¹³ The NSWV enrolled a stratified random sample of women veterans, with stratification based on VA ambulatory care use (VA use/non-use) and military service period. VA users and veterans from pre-Vietnam and Operations Enduring and Iraqi Freedom (OEF/OIF) military service eras were oversampled. Sampled veterans were mailed an advance information packet and were screened for eligibility by study interviewers. Inclusion criteria were being a woman veteran of the regular armed forces or a member of the National Guard or Reserves who had been called to duty. The study excluded current active duty military personnel, VA employees, hospitalized veterans, and nursing home residents. Study interviewers obtained consent from eligible study participants and conducted computer-assisted telephone interviews. This study was approved by the VA Greater Los Angeles Institutional Review Board, and the survey was approved by the U.S. Office of Management and Budget.

Measures

We screened for PTSD using a seven-item screening scale that has been validated in both civilian and VA primary care populations.^{15,16} The seven items included five symptoms from the DSM-IV avoidance/numbing group, and two from the hyper-arousal group. Endorsement of four or more of the seven items had a sensitivity of 80 % and a specificity of 97 % in a civilian validation study that used the DSM-IV and World Health Organization International Diagnostic Interview version 2.1 as the gold standard, and is considered a positive PTSD screen. Test performance in a VA primary care sample that was 61 % female was similar, with sensitivity of 85 % and specificity of 84 % using the cut-score of four. The outcome measure was self-reported use of MH care (VA or non-VA) in the prior 12 months.

This study utilized the Behavioral Model for Healthcare Use to examine factors associated with MH service

utilization.^{17,18} Predisposing, enabling, and need characteristics of individuals in the general population, as well as those related to veteran status, were included.¹⁴ We identified characteristics as general versus veteran-specific, because clinicians in community settings may be less aware of veteran-specific characteristics of their patients.

General predisposing factors included age, race/ethnicity, education level, marital and employment status. Veteran-specific predisposing factors included military service period (pre-Vietnam; Vietnam to pre-September 11, 2001; September 11, 2001 to the present), combat exposure, and history of military sexual assault. General enabling factors included access to and type of health insurance (none, Medicare irrespective of other insurance, other insurance alone), household income (dichotomized at 100 % of the federal poverty level), having a regular provider for health care, and geographic region. Veteran-specific enabling factors included military service-related disability (yes versus no), and knowledge of VA availability of counseling services for adjustment problems after military service (respondent thought service was offered versus not offered). Need factors included: positive screening tests for depression (using the MHI-5), anxiety (using the Generalized Anxiety Disorder 2 screener), and hazardous alcohol use (using the Audit-C with a cut-point of 3), disability status (yes versus no), and overall health status.^{19–21} We also measured characteristics of healthcare use, including the number of healthcare visits in the prior 12 months and the system for healthcare use (dichotomized as any VA versus non-VA only).

Statistical Analyses

Initial bivariate comparisons were between women veterans who tested positive on the PTSD screener (PTSD-positives) and those who did not test positive (PTSD-negatives). We compared these groups on general and veteran-specific predisposing, enabling, and need factors using chi-square tests for categorical variables and t-tests for continuous measures. The second set of comparisons were restricted to PTSD-positive women veterans, and compared those who used MH services in the prior 12 months (irrespective of VA or non-VA setting) with those who did not use MH services.

We conducted multivariate logistic regression to identify characteristics that independently predicted use of MH services among PTSD-positive women veterans. The multivariate analysis adjusted for general and veteran-specific predisposing, enabling, and need factors, and current VA healthcare use. The first step in this process involved bivariate associations between selected covariates and use of MH care among PTSD-positive women veterans. Variables that were associated with MH care use at the bivariate level were entered into the first set of multivariate

analyses. In the second set of multivariate regressions, sensitivity analyses were conducted by testing the fit of the model (using Wald test) when excluded variables from the first set of analyses were entered into the model (one at a time). All variables included in the multivariate analyses were tested for multicollinearity, and variables that were correlated with other covariates were excluded from analysis. The model with the best fit was selected as the final multivariate model. Predicted probabilities for MH care use were derived based on the presence and absence of characteristics associated with MH care use in the final model. These adjusted predicted probabilities are the marginal effects at the means, i.e., probabilities evaluated at the average values (or at the means) of the covariates.

Sampling weights were developed from the inverse of the probabilities of inclusion in the sample. All analyses applied weights to account for disproportional allocation of the population by strata, so that resulting estimates are representative of the U.S. women veteran population. All analyses were conducted using STATA version 12.0.²²

RESULTS

Population Estimates of PTSD Prevalence

The NSWV enrolled 3,611 women veterans, of whom 3,598 provided data for the PTSD screener. Thirteen percent (95 % confidence interval [CI] 9.8–16.2) of women veterans were PTSD screen-positive. Characteristics of the women veteran population by PTSD status (positive or negative) are displayed in Table 1. Socio-demographic characteristics associated with PTSD were younger age, being a racial/ethnic minority, being uninsured, and having an annual household income below the federal poverty level. Period of military service was associated with PTSD, as was combat exposure. Health characteristics associated with PTSD were fair or poor health status, disability, diagnosed depression, history of sexual assault in the military, and positive screening tests for depression and anxiety disorder. Among PTSD screen-positive women veterans, 38.3 % had previously received a diagnosis of PTSD, whereas 67.1 % had received a diagnosis of depression, with receipt of these diagnoses being strongly correlated ($p < 0.001$, data not shown). Women veterans with PTSD had more healthcare visits and were more likely to have used VA healthcare in the prior 12 months compared to those without PTSD.

Overall, 13.4 % (95 % CI 10.2–16.6) of women veterans used MH services in the prior 12 months. PTSD-positive women veterans were more likely to have used MH services (48.7 %, 95 % CI 35.9–61.6) when compared to women veterans without PTSD (8.1 %, 95 % CI 5.2–10.9), both overall and irrespective of VA use (Table 1, $p < 0.001$ for all comparisons). PTSD positive and negative women veterans

Table 1. Characteristics of the Women Veteran Population by Results of Post-Traumatic Stress Disorder (PTSD) Screener

Characteristic	PTSD (+) 13.0 % (n=767)	PTSD (-) 87.0 % (n=2,831)	p value
% or mean (SD)			
General Predisposing Factors			
Age (years; mean, SD)	46.8 (17.3)	57.4 (17.0)	< 0.001
Age group (years):			
18–44	36.9	25.9	
45–64	53.9	38.1	
≥ 65	9.2	35.9	< 0.001
Race/ethnicity:			
Hispanic	7.2	4.2	
Non-Hispanic White	61.3	79.2	
Non-Hispanic Black	15.3	10.4	
Non-Hispanic other	16.2	6.2	0.01
Married or partnered	57.5	57.7	0.98
Education, highest level:			
High school, GED, or less	17.1	17.5	
Some college	43.9	33.7	
College graduate	39.0	48.8	0.30
Employed	49.1	45.5	0.61
Veteran-Specific Predisposing Factors			
Period of military service:			
All periods prior to Vietnam era	2.6	16.0	
Vietnam era to pre-9/11/01	68.9	65.4	
9/11/01 to present	28.5	18.7	< 0.001
Combat exposure or served in combat zone	28.9	15.5	0.01
General Enabling Factors			
No regular provider for health care	28.0	24.6	0.61
Health insurance:			
None	25.5	9.2	
Medicare (with or w/o other insurance)	13.2	34.3	
Non-Medicare insurance only	61.1	56.4	< 0.001
Household income ≤ 100 % of federal poverty level	16.5	5.0	0.002
Geographic region:			
Northeast	10.6	9.1	
Midwest	17.3	18.0	
South	51.2	49.5	
West	20.9	23.4	0.95
Residence in rural area	1.5	1.8	0.76
Veteran-Specific Enabling Factors			
Has military service-connected disability	46.1	38.1	0.24
Knowledge of availability of counseling services for readjustment problems after military service	89.0	89.8	0.82
Need Factors (General and Veteran-Specific)			
Health status fair or poor	34.5	17.3	0.001
Disabled	12.3	3.2	< 0.001
History of diagnosed depression	67.1	23.8	< 0.001
History of diagnosed PTSD	38.3	3.3	< 0.001
Sexual assault in military	43.0	5.1	< 0.001
Anxiety screen positive	38.0	8.4	< 0.001
Depression screen positive	30.2	4.7	< 0.001
Hazardous alcohol use screen positive	40.1	31.0	0.20
Health Care Use			
Number of health care visits (mean, SD)	10.8 (24.4)	6.4 (11.7)	< 0.001

Table 1. (continued)

Characteristic	PTSD (+) 13.0 % (n=767)	PTSD (-) 87.0 % (n=2,831)	p value
	% or mean (SD)		
Any VA health care use in prior 12 months	31.1	11.4	< 0.001
Any mental health care use in prior 12 months	48.7	8.1	< 0.001
VA users	66.3	18.0	< 0.001
VA nonusers	40.8	6.8	< 0.001

Column headers list unweighted sample size; table percentages and means are weighted population estimates for the U.S. woman veteran population

did not differ in marital status, education level, employment, having a regular provider for healthcare, geographic region, rural location, service-connected disability, or knowledge of VA readjustment counseling services.

Mental Health Services Use in Women Veterans with PTSD

Among women veterans with PTSD, neither general nor veteran-specific predisposing factors differentiated between those who used MH services and those who did not use MH services in the prior 12 months (Table 2). Significant negative enabling factors (i.e., barriers) to MH services use were no regular healthcare provider, and household income less than 100 % of the federal poverty level (Table 2). For veteran-specific enabling factors, there were no statistically significant differences. In terms of need factors, a higher percentage of women veterans with PTSD who reported using MH services compared to those who did not use MH services in the past 12 months: were disabled, had a history of diagnosed depression, and had previously received a PTSD diagnosis. A higher percentage of women veterans with PTSD who reported MH services use in the prior 12 months, compared to those who did not use MH services, had used VA healthcare, and they had a higher mean number of healthcare visits (Table 2).

Predicted Probabilities of Mental Health Use: Adjusted Analyses

Independent predictors of MH use by PTSD-positive women veterans are given in Table 3. Having a diagnosis of depression, a diagnosis of PTSD, and being disabled were all correlated. Of these, diagnosed depression had the greatest predictive ability (adjusted odds ratio [OR]=8.6; 95 % CI 1.5–48.9) for MH services use. Current VA healthcare use (OR=2.7; 95 % CI 1.1–7.0) also predicted MH services use among PTSD-positive women veterans.

Table 2. Characteristics of 767 Women Veterans Who Screened Post-Traumatic Stress Disorder (PTSD) Positive by Use of Mental Health Services in Past 12 Months

Characteristic	Mental health use (48.7 %)	No mental health use (51.3 %)	p value
	% or mean (SD)		
General Predisposing Factors			
Age (years; mean, SD)	47.6 (15.6)	46.0 (11.5)	0.65
Age (years):			
18–44	37.1	36.7	
45–64	52.5	55.1	
≥ 65	10.4	8.1	0.93
Race/ethnicity:			
Hispanic	4.1	10.1	
Non-Hispanic White	66.1	56.7	
Non-Hispanic Black	10.9	19.5	
Non-Hispanic other	18.9	13.7	0.43
Married or partnered	65.1	50.4	0.20
Education, highest level:			
High school, GED, or less	17.4	16.9	
Some college	36.1	51.4	
College graduate	46.5	31.7	0.45
Employed	42.6	55.4	0.33
Veteran-Specific Predisposing Factors			
Period of military service:			
All periods prior to Vietnam era	1.2	3.9	
Vietnam era to pre-9/11/01	67.2	70.5	
9/11/01 to present	31.6	25.6	0.38
Combat exposure or served in combat zone	35.0	23.6	0.32
General Enabling Factors			
No regular provider for health care	8.8	46.3	< 0.001
Health insurance:			
None	27.6	23.4	
Medicare (with or w/o other insurance)	8.0	18.6	
Non-Medicare insurance only	64.4	58.0	0.29
Household Income ≤ 100 % of federal poverty level	8.0	23.5	0.02
Geographic region			
Northeast	15.7	5.7	
Midwest	16.9	17.8	
South	51.4	51.0	
West	16.0	25.5	0.35
Residence in rural area	2.0	1.1	0.51
Veteran-Specific Enabling Factors			
Has military service-connected disability	50.5	41.9	0.50
Knowledge of availability of counseling services for readjustment problems after military service	92.6	85.6	0.20
Need Factors (General and Veteran-Specific)			
Health status fair or poor	42.6	26.8	0.17
Disabled	21.2	3.8	< 0.001
History of diagnosed depression	88.5	46.8	0.004
History of diagnosed PTSD	57.0	20.5	0.004
Sexual assault in military	42.4	43.4	0.94
Anxiety screen positive	46.4	30.0	0.16
Depression screen positive	36.6	24.1	0.32

Table 2. (continued)

Characteristic	Mental health use (48.7 %)	No mental health use (51.3 %)	p value
	% or mean (SD)		
Hazardous alcohol use screen positive	40.3	39.8	0.97
Health Care Use			
Number of health care visits (mean, SD)	15.3 (25.4)	6.7 (11.4)	< 0.001
Any VA health care use in prior 12 months	42.4	20.5	0.009

Column headers list unweighted sample size; table percentages and means are weighted population estimates for the U.S. woman veteran population

Lacking a regular provider for healthcare (OR=0.2; 95 % CI 0.1–0.4), and living below the federal poverty level (OR=0.2; 95 % CI 0.1–0.5) each independently predicted lack of MH services use (see Table 3).

Effects of the presence or absence of each significant predictor on the probability of MH services use is given in Table 3, where other covariates are set to their mean value. PTSD-positive women veterans receiving health care in community (rather than VA) settings, on average had a 33.1 % predicted probability of receiving MH services, compared to a 57.4 % probability if they were VA healthcare users. Among PTSD-positive women veterans with income above the federal poverty level, and a regular health care provider in a setting outside of the VA, the predicted probability of MH services use was 21.2 % for those without diagnosed depression, and 69.8 % for those with diagnosed depression, whereas those probabilities were 42.3 % and 86.3 %, respectively, for VA healthcare users.

Table 3. Multivariate Analysis of Association /between General and Veteran-Specific Characteristics and Use of Mental Health Services in Post-Traumatic Stress Disorder (PTSD)-Positive Women Veterans

Characteristic	Adjusted odds ratio	95 % CI	Predicted probability with characteristic	
			Present	Absent
No regular provider for health care	0.2	(0.1, 0.4)	15.2	53.6
Household income ≤ 100 % of federal poverty level	0.2	(0.1, 0.5)	16.3	46.2
History of diagnosed depression	8.6	(1.5, 48.9)	58.8	14.3
Any VA health care use in prior 12 months	2.7	(1.1, 7.0)	57.4	33.1

Predicted probabilities for each characteristic calculated with other covariates set to their mean value

DISCUSSION

Thirteen percent of women veterans screened positive for PTSD. Though VA healthcare users were over-represented among PTSD-positive women veterans, the vast majority of women veterans screening positive for PTSD received their healthcare in community settings. Only a minority of PTSD-positive women veterans had received a prior diagnosis of PTSD. This suggests that many women veterans with symptoms of PTSD may not be coming to medical attention.

The PTSD screen-positive prevalence that we found is higher than lifetime PTSD estimates of 9.7 % in U.S. civilian women.⁵ The highest risk of PTSD in a large urban study was associated with assaultive violence (20.9 %).²³ Similar to that and prior veteran studies that examined military-related violence, in our study both military sexual assault and combat exposure were associated with screening PTSD positive.⁷

We found that less than one-half of PTSD-positive women veterans received MH care in the prior 12 months. Though a majority of VA-users received MH care, this was not uniform across VA user groups. Only a minority of VA-nonusers received MH services. Steps to successful engagement in MH care include PTSD detection, referral for treatment, and engagement in treatment by the veteran. A breakdown in any of these steps could contribute to the low rates of MH treatment among PTSD-positive women veterans we detected. The VA has instituted universal PTSD screening programs that reach the vast majority of VA healthcare users. These screeners, which are part of the electronic medical record (EMR) system, generate automatic clinical reminders for MH referral among those who screen positive. Similar systematic programs are not in place in most non-VA healthcare settings, and likely account for much of the VA/non-VA differences in MH treatment that we observed. However, there are several brief, easily administered PTSD screening tools available that may be incorporated into clinical processes within non-VA healthcare settings that do not currently automate screening or otherwise lack EMRs.²⁴ The VA has launched a number of media campaigns and outreach programs to increase awareness of women veterans (both VA-users and nonusers) about the MH and other services that are available to them.²⁵ The VA National Center for PTSD website has sections for veterans that are designed to educate women veterans about PTSD symptoms, treatment options and efficacy.²⁶ These VA outreach and educational efforts have the potential to extend the reach of VA MH services.

Mental health treatment engagement has not been systematically studied among all cohorts of veterans. Though assessments of MH use among OEF/OIF veterans found 35 % accessed MH services in the year returning home,²⁷ research on OEF/OIF veterans using VA care found that only a minority of this group received the full recommended number and intensity of MH treatment sessions within the first year of diagnosis.¹² This suggests that research directed

toward discerning barriers to MH treatment engagement would benefit both VA and community healthcare systems.^{28,29} Potential barriers may be at the individual, provider, healthcare system, or environment level, and all warrant systematic assessment. One identified individual barrier to seeking MH care among veterans with PTSD is holding negative and erroneous MH beliefs.³⁰ A recent review of research on MH beliefs and service use among veterans and military personnel identified several gaps in the current literature that provide direction for future research.³¹ Gaps included lack of attention to the association between MH beliefs and service use, a limited focus on personal beliefs about mental illness and MH treatment, and the use of unvalidated measures of MH beliefs as limitations that need addressing with future studies. Individual characteristics that predict MH treatment barriers and engagement should also be identified for women veterans, since this may inform intervention development as well. VA provider barriers to developing MH programs for women, and healthcare system organizational features associated with such programs, have also been studied.^{32,33} To inform development of interventions and policy to facilitate women's MH treatment engagement, next steps in that research should be to identify organizational features that are associated with greater treatment engagement and retention.

A limitation of our study is that our use of a PTSD screening instrument is not equivalent to conducting a diagnostic evaluation. With a screening assessment, some individuals who would not meet DSM-IV criteria for PTSD would screen positive, whereas some who do meet diagnostic criteria would screen negative. However, the screener we used had 80 % sensitivity and 97 % specificity in a community sample; these are very good test characteristics. Many veterans of OEF/OIF may have readjustment disorder that will not go on to develop into PTSD; and therefore, they may be more likely to have a false positive screen, whereas for other OEF/OIF veterans, their PTSD may not have yet emerged. Thus, error in estimations of screening prevalence may not be uniform across veteran populations. Language preference may influence MH care use.³⁴ VA now collects data on preferred language; however, that was not available at the time of this study, and this study was not powered to examine the influence of language preference. Despite these limitations, the relative relationship between PTSD-positive status and MH services use that we detected is likely to reflect true associations in the U.S. women veteran population. A strength of this study is its large population-based sample.

CONCLUSIONS

More than one in eight women veterans screened positive for PTSD, and a significant segment of this group did not

receive MH treatment. The majority of women veterans use healthcare providers outside of the VA who may be unaware of their veteran status and PTSD risk. Given the high PTSD prevalence rates, VA outreach to educate non-VA healthcare providers about women veterans' PTSD risk and available evidence-based PTSD treatment options is warranted. The VA National Center for PTSD website has sections for healthcare providers that are publicly accessible, and include free in-depth trainings covering trauma, PTSD assessment, and effective treatment.²⁶ Presentations at medical society and public health conferences are another way to reach diverse VA and non-VA clinical audiences. The body of research on the effects of military service on women's MH is vastly growing, which is another form of dissemination.⁴ Research to characterize barriers to VA MH services use for VA-nonusers and low income VA-users should be conducted to better understand low service utilization and to inform program development to engage more women veterans into needed MH care.

The findings of this study are significant, particularly in regard to their implications for population-based strategies to improve healthcare for women veterans. PTSD in women veterans has been shown to be associated with higher rates of reproductive and substance use disorders, and several general medical conditions.^{35,36} Though VA-wide PTSD screening and MH care are available, these services only reach a fraction of affected veterans.²⁸ Thus, more effective efforts to identify women veterans with PTSD and to engage them in care would be likely to contribute to women veterans' general as well as mental health.

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