MILITARY MEDICINE, 165, 10:773, 2000

Changing Demographic Characteristics of Women Veterans: Results from a National Sample

Guarantor: Jessica Wolfe, PhD MPH
Contributors: Amy Stern, PhD; Jessica Wolfe, PhD MPH; Jennifer Daley, MD; Alan Zaslavsky, PhD; Shelly Folsom Roper, BA; Kimberly Wilson, PhD

Women veterans are a small but growing percentage of the U.S. veteran population. There are some indications that, along with this increase, the characteristics and military experiences of younger women veterans differ considerably from those of older colleagues. Many of these characteristics are not well defined, but they could have implications for women's health care needs and health policy initiatives. Using the first sample drawn from the Department of Veterans Affairs' new National Registry of Women Veterans, we designed and administered a telephone survey to a representative sample of women veterans across several major age groups. Groups approximated primary eras of military and wartime service based on the assumption that different eras might be associated with differing military experiences. We found a number of age-related similarities and differences in women veterans' demographic characteristics, military experiences, physical health symptoms, and functional outcomes. Women veterans in general also differed from female civilian counterparts on exposure to sexual trauma. Trends in the population of women veterans are likely to have implications for the variety of health care systems that treat women veterans.

Introduction

Although their numbers remain small, women who serve in the U.S. armed forces currently constitute more than 12% of military personnel, a marked increase from all previous decades.[1,2] These increases have occurred in the face of dramatic reductions in the overall force, suggesting that this trend is likely to continue. One consequence of these changes is the increased number of women veterans.[3] Indeed, women veterans currently represent the second fastest growing segment of the U.S. veteran population, after the aging veteran, and constitute approximately 5% of the total veteran population. This number is projected to exceed 11% of the veteran population by the year 2040.[3-5] As a consequence, the Department of Veterans Affairs (VA) and other health systems are likely to see increasing numbers of women veterans. A first step toward serving the needs of these individuals is to improve understanding about the current population of women veterans. The present study reports on a series of relevant sociodemographic, military, and health characteristics of women veterans using a representative sample drawn from a newly constructed national registry. Analysis of these characteristics would provide useful information to the variety of public and private health care systems that treat these individuals.

The change in the demographic characteristics of women veterans appears to be dramatic. Reports suggest that, on average, women veterans today are younger, more ethnically diverse, and have fewer socioeconomic resources than previous cohorts of women in the military.[6-8] Some data suggest that women veterans are increasingly likely to be employed after service at lower salaries than women who have not served in the military.[6,9] However, detailed population-based data are not available. The majority of studies suggesting such disadvantage have focused on women who use VA health care, a distinct numerical minority (<5%),[2] or on classes of women with particular illnesses.[10] Thus, broader characterizations are not readily available.

Each of the described demographic factors could have implications for the general well-being and health care needs of women veterans.[11,12] Studies in civilian women, for example, show that women of low socioeconomic status and ethnic minority group membership have more numerous and more severe health problems than women who are less disadvantaged. Disadvantaged women also manifest greater morbidity, mortality, and poorer quality of life than nonminority women with higher incomes.[13-16] Furthermore, life expectancy for at-risk women is often shorter, presumably because of higher rates of chronic disease and more limited access to health care.[17-19] To the extent that women veterans share these characteristics, we would anticipate a greater risk for negative health outcomes.

Recent changes in the role of women in the military could affect younger women veterans in particular. In the past 5 to 10 years, the majority of military occupational specialties, including combat support, have been opened to women. These opportunities could affect well-being in various ways, ranging from positive (greater occupational advancement and pay) to negative (increased exposure to peacetime and wartime stressors).[20] Similarly, the recent initiation of gender-integrated training in all branches (except the U.S. Marine Corps) could affect women positively (improved work relationships) or adversely (increased sexual harassment or assault).[21] To date, no study of which we are aware has systematically explored the extent or effect of these changes.

The sample for the present study is the first one drawn from the National Registry of Women Veterans. We created a representative sample and constructed age-based strata to explore whether there were differences in experiences and outcomes based on era of service. Use of a representative sample is important because most of the previous research on women veterans has focused exclusively on the narrow subset of individuals who use VA care[22,23] or on a single military-era cohort.[24]

Women's Health Sciences Division, National Center for Post-Traumatic Stress Disorder, VA Boston Healthcare System, Boston, MA, and Department of Psychiatry, Boston University School of Medicine, Boston, MA 02130.

Reprint requests: Dr. Jessica Wolfe, 30 Lowell Road, Wellesley, MA 02481; e-mail: jessicawolfe@mediaone.net.

This manuscript was received for review in November 1999. The revised manuscript was accepted for publication in May 2000.

(10)

Accordingly, findings from those studies may not be generalizable to the current population of women veterans. Furthermore, although some studies have alluded to certain demographic characteristics (e.g., low income, higher education)[25] or experiences (military sexual assault)[26,27] in women, the distribution of these variables and their impact in women veterans at large is unknown at present.

Method

Participants

The sampling frame for this study was the National Registry of Women Veterans (NRWV), an electronic database under construction at the time the study was initiated. To date, the NRWV estimates that more than 1.4 million women veterans were separated from active duty since January 1, 1942. The NRWV was constructed by merging official military records from a number of sources. First, computerized personnel databases from the Department of Defense (the Defense Manpower Data Center in Monterey, California and the headquarters of the individual service branches) were cross-linked with beneficiary and patient databases from the VA. Second, a portion of veterans separated from active duty before 1965 were identified from microfilm or paper-based personnel rosters maintained by the National Records and Archives Administration (National Personnel Records Center in St. Louis, Missouri). (A review of the possible effects of the National Personnel Records Center fire in 1973 suggests minimal impact on the selection of the current cohort owing to factors such as the age of the study cohort and the proportion of women in the military discharged before 1964.)

Participants in this survey were initially selected from the NRWV using stratified random sampling. Twelve analytical strata were defined using the categories of age and race (<35 years, African American; <35 years, non-African American; 35–49 years, all races; and 50 years and older, all races) and VA user status. Age ranges were chosen to approximate pre-Vietnam, Vietnam, and post-Vietnam cohorts of women veterans. User status was defined as follows: use of a VA hospital or outpatient clinic within the preceding 2 years ("current user"); use within the preceding 3–10 years ("former user"); or no VA use recorded ("non-VA user"). Smaller but critical analytical strata (e.g., those including current users and African Americans younger than 35 years old) were then oversampled to provide sufficient sample size for subgroup analyses of interest. Finally, to have the sample more closely approximate the original population of women veterans, we constructed finer strata based on age at 5-year intervals and race, resulting in a total of 52 initial sampling strata. Because of small cell sizes, however, only the 12 original strata were used in subsequent analyses. Although respondents were initially drawn according to user status based on Registry information, subsequent survey analyses revealed some discrepancies on this variable (generally <5%), especially for current and former users. Because this was a self-report survey, we chose to rely on women's report of their status for purposes of response consistency.

Using these procedures, the initial sample from the NRWV offered 6,163 unique records. After cross-linking the records with the Social Security Death Index and the Death Index maintained by Choice-Point, Inc. (formerly Equifax Government and Special Systems), additional names (decedents, duplicates, individuals with invalid Social Security numbers) were excluded, leaving 5,030 unduplicated individuals. Of the 5,030 women, 1,541 had invalid telephone numbers; an additional 1,441 women had no published telephone number and were subsequently excluded, and 90 women could not be reached by telephone or letter (e.g., continuous busy signal, answering machine, no answer) at the time of our study. Of the 1,959 contacts established, an additional group was subsequently excluded for a variety of other reasons: 120 were ineligible because of current active duty service; 52 were deceased, deaf, or not able to respond as a result of health reasons; and 97 were otherwise ineligible (e.g., never served in the U.S. armed forces, language barrier, respondent away for an extended time). Among those contacted, a total of 190 individuals (9.7%) declined to participate. A total of 1,500 women veterans completed the survey interview (77% of those contacted).

Participants were assured that their participation in the study would not have any adverse effects on VA benefits or eligibility and that their responses would remain completely confidential. All participants gave verbal informed consent. The study was approved by the institutional review board at the VA Boston Medical Center.

Procedure and Measures

To establish feasibility, content validity, administration time, and preliminary psychometric properties of our survey instrument, we conducted pilot telephone interviews with a convenience sample of 54 female veterans living in the New England area. After minimal refinement, our final multi-item survey was administered to the full sample by telephone interview. Interviews were conducted by trained interviewers from a private survey research institute with expertise in locating and surveying veteran populations, particularly those with potentially sensitive experiences (exposure to death, sexual assault). Interviews were completely automated using a computer-aided telephone interviewing system and involved a series of steps designed to diminish respondent bias and ensure valid reporting. Collection of telephone data was conducted from January 1997 through November 1997. The average duration of each interview was approximately 45 minutes.

Instrument components spanned two domains: respondent variables and institutional characteristics potentially associated with barriers to VA health care. The latter are reported in a separate paper. Survey items were derived from existing standardized scales where available. Domains of respondent attributes in the present study included sociodemographic characteristics, military variables, self-reported health conditions/symptoms, and functional status. For physical health, we specifically queried the presence of gender-specific conditions.

Sociodemographic information included age, education, marital status, annual household income, racial or ethnic identification, living arrangements, number of children, and employment and health insurance status. Health insurance questions focused on the availability and source of insurance coverage (e.g., self, employer, Medicaid, Medicare, VA).

Military factors included year and length of service, branch, highest rank, war-zone exposure, and military trauma. War-zone exposure was dichotomized based on ever being exposed to at least one of a series of combat situations (e.g., receiving

enemy fire, witnessing the death of Americans). Other military trauma included general stressors and exposure to sexual harassment or sexual assault during military service. The former was measured with a shortened version of the Life Stressor Checklist-Revised,[28] a scale that inquires about a range of highly stressful events (e.g., serious accident or injury). The scale follows other common trauma indices used in community samples.[29] Military sexual harassment was assessed by explicitly questioning the receipt of uninvited or unwanted sexual attention (e.g., touched, cornered, pressured for sexual favors, received sexually harassing verbal remarks). Military sexual assault was assessed with an item specifying receipt of sexual force or the threat of force for sexual relations against one's will. Both items have been widely used in national studies and have good face validity.[21,30]

Health variables addressed respondents' general health status, gender-specific conditions, functional status, VA-based disabilities, and use of any health care services (VA and other). Women rated their current health status on a scale from 1 (excellent) to 5 (poor). Each was also asked whether a doctor had ever diagnosed any of the following conditions: bladder control problem/incontinence; bladder infections, urine infections, or kidney infections; vaginitis or yeast infections; or irregular menstrual bleeding. A cumulative score was computed as the number of conditions endorsed (range, 0–5). Physical functioning was measured using the Physical Functioning (PF) subscale of the Medical Outcomes Study Short Form 36,[31] a widely used index with well-established psychometric properties. Items are scored on the basis of daily limitation from 1 (a lot) to 3 (not at all). Total scores range from 0 to 100, with lower scores reflecting more functional impairment. Internal consistency reliability for the PF subscale was 0.93. Finally, respondents reported the proportion of any VA service-connected disability and the primary source (physical, psychological, or both). Health care utilization included number and type (inpatient, outpatient) of health care services consumed during the past 12 months and included source of care (VA or other public or private setting). Use of VA health care was specifically subclassified as "current user" (use of a VA hospital or outpatient clinic within the preceding 2 years), "former user" (use of VA health care within the preceding 3–10 years), or "nonuser" (no recorded use of VA health care).

Weighting and Analyses

Because sampling and response rates differed by analytical strata, unweighted data in this study are not representative of the population of women veterans. Therefore, weights were calculated to represent the inverse probabilities of selection and response. These weighted data matched NRWV population distributions across the 12 analytical strata defined by race, age, and NRWV user status. Weighted frequency distributions and comparisons across three age groups (<35, 35–49, ≥50 years) were calculated using STATA[32] to determine differences in demographic, military, and health characteristics by age status. Comparisons among the three main age groups (means or proportions) were by design-corrected F tests. Where a global F test ($p < 0.05$) showed a significant difference, we conducted pairwise tests. Comparisons between pairs of groups were by design-corrected t tests.

Results

Response Rates

Compliance rates for survey participation varied from 50.5% to 86.8% for the 12 analytic strata. As seen in Table I, participation was slightly higher for younger, non-African American women (77.4%) than for women aged 35 to 49 years, younger African Americans, or respondents aged 50 years and older. Women who were current users of VA health care had higher rates of study compliance (80.9%) than nonusers (64.7%) and former users (70%).

Population Estimates (Weighted)

A profile of study respondents based on unweighted data is available from the authors.

Sociodemographic Characteristics

Women younger than 35 years were significantly less likely to have completed college than middle-aged women ($p < 0.01$) and to have children younger than 19 years living with them ($p < 0.001$) (Table II). Older women were most likely to live alone ($p < 0.001$). Both younger and middle-aged women were more likely to be ethnic minorities than older women ($p < 0.001$). Both younger and middle-aged women were significantly more likely to be employed full time than were older women ($p < 0.001$), with the highest employment levels in the middle-aged group ($p < 0.001$). Younger and older women alike were more likely to have annual household incomes less than $15,000 versus women aged 35 to 49 years ($p < 0.001$).

Although most women in this study had insurance coverage (73–79%), older women veterans were significantly less likely to have had insurance coverage during the previous 2 years compared with younger women ($p < 0.001$) or middle-aged women ($p < 0.05$). The source of this coverage varied by age. Older women were more likely to rely on Medicare ($p < 0.001$) and on coverage by the VA ($p < 0.001$). Younger and middle-aged women were more likely to have insurance coverage through their employer or union (64–65%) than older women ($p < 0.001$), corresponding roughly to employment rates in the two groups. Relatively few women relied on Medicaid. Younger women, however, used Medicaid more than middle-aged women ($p < 0.05$), who in turn used Medicaid more than the oldest group ($p < 0.01$).

Military Factors

Military characteristics are shown in Table III. Across age groups, the majority of women served in the Army, consistent

TABLE I

RESPONSE RATES OF THOSE CONTACTED (N = 1,690)

Age/Race Strata	Never VA User	Former VA User	Current VA User	Total
50+	67.7	55.8	74.3	68.6
35–49	67.7	71.1	83.6	74.4
<35, African American	50.5	80.7	82.1	71.6
<35, non-African American	67.0	73.5	86.8	77.4
Total	64.7	70.0	80.9	73.2

TABLE II

ESTIMATED POPULATION SOCIODEMOGRAPHIC CHARACTERISTICS BY AGE

	<35 years (N = 483)		35–49 years (N = 696)		50+ years (N = 321)		Total (N = 1500)	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Educational status (years)[a,b]	13.8	0.11	14.6	0.10	14.3	0.13	14.1	0.07
High school or less	31	3	23	2	29	3	28	2
Some college[a,b]	51	4	40	2	41	3	46	2
College graduate[a]	12	2	20	2	16	3	15	1
Some graduate school or graduate degree[a,b]	5	2	17	2	15	2	10	1
Marital status (%)								
Married[b,c]	57	4	53	2	39	3	54	2
Divorced	14	3	21	2	21	3	17	2
Other[b,c]	29	3	26	2	39	3	29	2
Race (%)								
Non-Hispanic, white[b,c]	66	2	66	2	89	2	69	1
Non-Hispanic, African American[b,c]	24	1	25	2	6	1	22	1
Other[c]	9	2	9	1	4	1	9	1
Annual household income (%)								
Less than $15,000[a,b,c]	15	2	8	1	31	3	15	1
$15,000–29,999	34	3	29	2	30	3	32	2
$30,000–49,999[c]	26	3	29	2	20	3	26	2
$50,000 or more[a,b,c]	21	3	31	2	12	2	23	2
Living arrangement (%)								
Lives alone[a,b,c]	13	2	20	2	45	3	19	1
Number of children younger than 19 years (%)								
0[a,b,c]	23	3	39	2	95	1	37	2
1[b,c]	28	3	25	2	3	1	24	2
2 or more[a,b,c]	49	4	36	2	2	1	39	2
Employment status (%)								
Full time[b,c]	57	4	65	2	22	3	55	2
Part time	14	3	10	1	9	2	12	2
Retired[a,b,c]	0.1	0.1	2	0.5	54	3	8	0.4
Student[a,b,c]	10	2	4	0.9	0.0	–	7	1
Not employed	17	3	18	2	14	2	17	2
Hours worked per week (%)								
<30	9	2	8	1	7	2	8	1
30–49[b,c]	53	4	53	2	10	2	49	2
50+[b,c]	9	2	13	2	4	1	10	1

[a] Significant difference between <35 and 35–49.
[b] Significant difference between <35 and 50+.
[c] Significant difference between 35–49 and 50+.

with historical trends. Women aged 35 to 49 years were more likely than older women to have served in the Air Force ($p < 0.01$). There were significant differences in terms of the length of military service. Older women were more likely to have served less than 2 years than all other women ($p < 0.001$). Cumulative length of service was not different between younger and middle-aged women. Occupationally, younger women reported the lowest rates of officer status (commissioned or noncommissioned; $p < 0.001$). Exposure to combat was low overall and differed only between middle-aged and older women ($p < 0.05$).

There were noticeable differences in rates of military sexual harassment. Both younger and middle-aged women reported significantly more military sexual harassment than older women ($p < 0.001$). However, there were no differences among groups for military-related sexual assault. Reports of other trauma exposure during military service (e.g., seeing death) indicated greater exposure among younger and middle-aged women compared with older women ($p < 0.01$ and 0.05, respectively).

Health Variables

Self-reported health and gender-specific conditions are listed in Table IV. More than half of each age group reported their current health as being "good" or "excellent." Ratings of poor health varied linearly by age, with older women reporting the worst health. The majority of women (84%) had few gender-specific health problems, with older women reporting the fewest (younger than 35 years, $p < 0.05$; 35–49 years; $p < 0.001$).

Assessment of functional status showed expected age-related declines that differed significantly by group. Scores on the PF subscale of the Medical Outcomes Study Short Form 36 were lowest for older women followed by middle-aged and younger women ($p < 0.001$).

Older women were more likely to have physical service-connected health disabilities (younger than 35 years, $p < 0.01$; 35–49 years, $p < 0.001$). These women were also more likely to report a service connection of 100% (i.e., complete disability; $p <$

TABLE III

ESTIMATED POPULATION MILITARY CHARACTERISTICS BY AGE

	<35 years (N = 483)		35–49 years (N = 696)		50+ years (N = 321)		Total (N = 1500)	
	%	SE	%	SE	%	SE	%	SE
Branch of service								
Army	43	3	44	2	44	3	43	2
Navy	26	3	21	2	27	3	24	2
Air Force[a]	24	3	30	2	19	3	25	2
Marines	6	2	4	1	6	2	6	1
Coast Guard	1	1	0.2	0.1	2	1	0.9	0.4
Length of military service[b,c]	4.2	0.19	6.4	0.29	5.8	0.48	5.1	0.16
2 years or less[a,c]	29	3	25	2	50	3	30	2
3–4 years[a,b,c]	38	4	29	2	21	3	33	2
5–10 years[a,c]	28	3	25	2	8	2	25	2
More than 10 years[b,c]	5	2	20	2	18	2	11	1
Highest rank								
Commissioned officer[a,b,c]	6	2	15	2	30	3	12	1
Noncommissioned officer[b,c]	17	3	32	2	29	3	23	2
Enlisted ranks[a,b,c]	76	3	53	2	40	3	64	2
Exposed to combat[a]	9	2	5	1	10	2	8	1
Sexually harassed during military service[a,c]	48	4	49	2	26	3	46	2
Sexually assaulted during military service	17	3	18	2	14	2	17	2
Number of traumas during service[d]								
0[a,b,c]	32	3	44	2	62	3	40	2
1	30	3	28	2	25	3	28	2
2[a,b,c]	23	3	16	2	8	2	19	2
3[a,c]	23	3	16	2	8	2	10	1
4 or more[a]	3	1	3	1	1	0.4	3	0.7

[a] Significant difference between 35–49 and 50+.
[b] Significant difference between <35 and 35–49.
[c] Significant difference between <35 and 50+.
[d] Traumas include being involved in or having someone close being involved in a serious disaster or accident, having a serious illness, being criminally or personally victimized, and being exposed to combat or upsetting war-zone experiences.

0.001). Younger women had the lowest proportion of physical service-connected disabilities. Rates of service-connected disability for psychological conditions were uniformly low, 1% or less across all age groups.

Inpatient hospital utilization was highest for the oldest and youngest groups, with significant differences between middle-aged and older women ($p < 0.01$). The majority of women reported a single inpatient admission in the past year. Outpatient utilization rates ranged from 58% to 68%. Older women reported the highest number of visits (5–10 and >10) compared with younger women ($p < 0.05$) and middle-aged women ($p < 0.001$). Also, older women were significantly more likely to be current users of VA health care than either of the other two groups ($p < 0.001$). Older women were more likely to be former users of VA care as well ($p < 0.01$). Younger and middle-aged women were the most likely to have never used VA care ($p < 0.001$); the two groups did not differ from one another.

Discussion

This study represents the first effort to characterize more comprehensively the current female veteran population, using a new national registry. Study results confirm earlier studies that suggested that the population of women veterans is indeed changing.[6,7] Our results point to the fact that younger women veterans differ in particular ways. Younger women, for example, are somewhat less well educated, more likely to be ethnic minorities, and generally earn lower incomes, at least compared with middle-aged peers. Furthermore, younger women are more likely to rely on Medicaid than other women, even though the majority of younger women are employed. This finding may be linked to younger women's slightly lower rates of employment and/or their increased likelihood of having children at home than their middle-aged counterparts.

Some of the characteristics we describe could have implications for younger women's future reliance on VA health care, a national system designated to serve individuals who are economically disadvantaged and have particular preventive or illness-based needs.[33] Despite this mission, we found that younger and middle-aged women alike used VA health care nearly one-third less than older women. Furthermore, young and middle-aged women were more likely than older women to have never used this system. One possible reason is that women veterans rely more on VA health care later in life, when they have more medical needs and fewer economic (i.e., insurance) resources. On the other hand, several of the sociodemographic characteristics we describe would suggest that younger women might be likely candidates for VA care, even at the present time. Ethnic minority status and lower incomes, for example, are often associated with greater morbidity and concurrent reliance on public programs. Still, the current results should be interpreted with some caution. Because our study was cross-sec-

TABLE IV

ESTIMATED POPULATION HEALTH CHARACTERISTICS BY AGE

	<35 years (N = 483)		35–49 years (N = 696)		50+ years (N = 321)		Total (N = 1500)	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
General health status (%)								
Excellent[a,b]	27	3	24	2	15	2	25	2
Very good[a,b]	28	3	29	2	18	3	27	2
Good	33	3	28	2	30	3	31	2
Fair[a]	9	2	13	1	18	2	12	1
Poor[a,b,c]	2	1	5	1	18	2	5	0.6
Disability rating (%)								
None[a,b]	77	2	74	2	62	3	74	1
10–50	13	1	16	1	18	2	15	0.9
51–99[a,c]	1	0.2	2	0.5	3	1	2	0.2
100[a,b]	2	0.5	2	0.5	9	2	3	0.4
Service-connected disability (%)								
For physical condition[a,b,c]	14	1	18	1	27	3	17	1
For psychological condition	1	0.3	1	0.4	0.5	0.4	1	0.2
For both	3	1	2	0.6	4	0.1	3	1
Depression score	10.0	0.6	10.9	0.5	10.5	0.7	10.3	0.02
Mean number of depressive symptoms	27	3	25	2	25	3	26	2
Physical functioning[a,b,c]	89.1	1.0	83.4	1.1	65	2.0	84.3	0.72
PTSD score	25.3	1.0	26.5	0.7	23.6	1.4	25.5	0.67
Mean number of PTSD symptoms	7	2	12	2	9	3	9	1
Alcohol abuse score	0.17	0.06	0.24	0.04	0.15	0.05	0.19	0.04
Number of female medical conditions (%)[d]								
0[a,b]	28	3	25	2	40	3	28	2
1[a,b]	30	3	31	2	21	2	30	2
2	28	3	26	2	19	3	26	2
3	13	2	16	2	16	2	14	1
4	2	1	3	1	4	1	2	0.5
Insurance coverage (%)								
Had insurance past 2 years	73	3	78	2	79	2	75	2
Part of past 2 years[a,b]	16	3	11	1	5	1	13	1
Not in past two years	11	2	12	1	15	2	12	1
Provision of medical insurance (%)								
Employer or union[a,b]	64	3	66	2	21	3	59	2
Out-of-pocket policy	8	2	8	1	6	1	8	1
Medicaid[a,b,c]	6	2	2	1	0	0	4	1
Medicare[a,b]	1	0.4	1	0.5	26	3	4	0.4
VA[a,b]	11	2	14	1	41	3	16	1
Use of inpatient services in the past year (%)[b]	18	3	11	2	20	2	16	2
Number of inpatient admissions (%)								
1	13	3	8	1	13	2	12	2
2	2	0.1	1	0.5	4	1	2	1
3	2	1	1	0.3	1	0.4	1	1
4	0.2	0.1	0.2	0.1	2	1	0.4	0.2
Use of outpatient services in the past year (%)[a,b]	58	4	58	3	68	3	59	2
Number of outpatient visits (%)								

tional, causal relationships cannot be assumed, and prospective longitudinal studies are needed to address whether our findings reflect persistent trends among (younger) women or are particular to the time at which these individuals were sampled.

Also somewhat surprising was our finding that participants overall reported health insurance at rates comparable to the U.S. population.[34] Skinner and Furey obtained similar results from a sample of women who currently used VA health care.[23] Both findings are unexpected given the number of studies showing that lack of private insurance is a strong predictor of the use of VA care.[25,35] The present findings suggest that determinants of health care selection and use may be multifaceted and that future studies are warranted, especially for high-risk groups.[36,37]

Several aspects of military service distinguished the three groups. Both younger and middle-aged women served signifi-

TABLE IV CONTINUED

	<35 years (N = 483)		35–49 years (N = 696)		50+ years (N = 321)		Total (N = 1500)	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
1	15	3	11	2	8	2	13	2
2	9	2	12	2	11	2	10	1
3	7	2	7	1	5	2	7	1
4	5	2	7	1	5	1	6	1
5–10[a,b]	14	2	11	1	22	3	14	1
More than 10	7	2	8	1	13	2	8	1
VA user status (%)								
Current[a,b]	16	2	16	1	44	3	20	1
Former[a,b]	17	2	18	2	28	3	19	1
Never[a,b]	67	3	65	2	28	3	61	2

PTSD, post-traumatic stress disorder.
[a] Significant difference between <35 and 50+.
[b] Significant difference between 35–49 and 50+.
[c] Significant difference between <35 and 35–49.
[d] Female conditions include bladder control problems/incontinence; bladder, urine, or kidney infections; vaginitis or yeast infection; and irregular menstrual bleeding.

cantly longer in the military than older women, a finding that is likely to correspond to recent changes in enlistment policies.[1] In fact, rates of serving 5 years or more were nearly twice as high for the two younger groups than for older women. Service in the armed forces now offers greater opportunity for career advancement than has been possible historically, and this feature may be especially attractive to broader groups of women. On the other hand, our results suggest possible adverse effects associated with military service. Younger women, for example, served in enlisted (i.e., nonofficer) positions at a proportionately greater rate than middle-aged or older women. Because military rank is directly linked to income and occupational status, this finding could have implications for the socioeconomic welfare of younger women. It is unlikely that this finding represents an artifact of age, because all women had completed military service when this study was conducted. Longer-range implications of this finding are unclear.

Rates of self-reported military sexual harassment, although seemingly high, closely approximated national norms for women in the United States.[21,38,39] Still, harassment rates reported by older women were substantially lower than those for other respondents. A number of explanations are possible. It is likely that the majority of older women served in the military when units and most military specialties were segregated by gender. As a result, it is conceivable that less harassment occurred. Alternatively, older women may have different perceptions of what constitutes harassment or may have a higher threshold for labeling or reporting these events. Our data cannot answer this question. Self-reported rates of military sexual assault, however, did not differ across age groups. Furthermore, our study suggests that rates of assault are substantially higher than national estimates for women in general,[30] a finding with potential implications for the military setting and its enlistees. The well-demonstrated association between sexual victimization and general well-being[40-42] suggests that this finding has particular relevance for women veterans. We believe that our results are likely to be generally reliable. Although based on self-report, our estimates are consistent with a number of other studies that have included diverse groups of active duty personnel[21] and female veterans from different settings.[27,43] If substantiated, such findings could suggest that sexual violence in the military (as in society) remains a significant problem and is one area requiring more concentrated effort at a variety of levels (i.e., policy, administrative, legal, clinical).

Risk factors notwithstanding, the majority of women veterans stated that their physical health was good. Mean scores on functional status, in fact, corresponded closely with national gender- and age-based norms.[31] These results differ from research on women using VA health care that has described striking functional impairments in VA samples of women veterans.[23] The latter is consistent with male veterans who use VA health care[36] and, as shown by our study, suggests important differences between women who do and who do not use VA health care. In contrast to physical disability ratings, we found negligible rates of service-connected disability for psychological conditions across all age groups, generally 1% or less. Such low rates seem incongruous given the reported prevalence of sexual assault in the current cohort and would appear to be at odds with the robust association between exposure to sexual violence and negative psychological outcomes.[40,44] One possible explanation for this finding is that women veterans lack knowledge about the availability of highly specialized trauma programs within the VA and, as a result, do not pursue service-related benefits that would facilitate that care.[5] Another possibility is that women veterans have made an effort to obtain service for these problems but have been largely unsuccessful. There is some preliminary evidence for this explanation,[4,10,45] but empirical studies of women's access to VA care are currently lacking.

The present study has some methodological and sampling limitations. At the time our sample was drawn, the NRWV was not complete; hence, the sampling frame was limited. Particular biases in this frame (e.g., characteristics of nonlocatable women) are unknown but could conceivably affect our results. Also, older women veterans were substantially harder to locate and enroll in the Registry (and in this study), presumably because of historical military recording practices. As a result, older women were underrepresented. In contrast, women from the Vietnam era and women who currently use VA health care services were easier to locate and participated at a higher rate than women who have never used this system of care. Although

we corrected differential response rates between analytical strata by nonresponse weighting, some undetermined biases may remain within particular strata.

Results from this study nonetheless suggest that considerable information can be gleaned from a national registry of women with military service. This information is likely to be important for health care resource planning as well as for guiding clinical initiatives. As women's roles in the military develop further, more research will be needed to specify the longitudinal effects of changes in demographic characteristics and military experiences on personal well-being and on the health care systems that serve these individuals.

Acknowledgments

This research was supported by Department of Veterans Affairs Health Services Research and Development Award SDR 93-102 to Jessica Wolfe and by the National Center for Post-Traumatic Stress Disorder, Department of Veterans Affairs. We thank Ashley Dixon and Charity Hammond for their valuable assistance and suggestions.

References

1. Maisels A, Gormley PM: Women in the Military. Washington, DC, Women's Research and Education Institute, 1994.
2. Women Veterans Treated Fiscal Year 1998. Washington, DC, Department of Veterans Affairs, 1999.
3. VA Health Care for Women: Progress Made in Providing Services to Women Veterans. GAO/HEHS-99-38. Washington, DC, US General Accounting Office, 1999.
4. VA Health Care for Women: Despite Progress, Improvements Needed. GAO/HPD-92-23. Washington, DC, US General Accounting Office, 1992.
5. Mather S, Zeiler K, Brandau B, Rahman A: A Profile of Women Treated at VA Medical Centers during Fiscal Year 1995. Washington, DC, Women Veterans Health Program, 1995.
6. Schwartz S, Klein RE: Characteristics of the Veteran Population by Sex, Race, and Hispanic Origin: Data from the 1990 Census. SR-008-94-1. Washington, DC, Department of Veterans Affairs, National Center for Veteran Analysis and Statistics, 1994.
7. Sorensen K, Field T: Projections of the U.S. Veteran Population: 1990 to 2010. SB-008-94-3. Washington, DC, Department of Veterans Affairs, National Center for Veteran Analysis and Statistics, 1994.
8. US Department of Labor: Facts on working women: outlook on women veterans. February 2, 1998. Available at http://gatekeeper.dol.gov/dol/wb/public/wb_pubs/veterans.html.
9. US Bureau of the Census: Women in the United States: A Profile. Statistical brief 95-19RV. Washington, DC, US Department of Commerce, Economics and Statistics Administration, 1995.
10. Hoff RA, Rosenheck RA: The use of VA and non-VA mental health services by female veterans. Med Care 1998; 36: 1524–33.
11. Read JP, Stern A, Wolfe J, Ouimette PC: Use of a screening instrument in women's health care: detecting relationships among victimization history, psychological distress, and medical complaints. Women and Health 1997; 26: 1–17.
12. Wolfe J, Schnurr P, Brown PJ, Furey J: Posttraumatic stress disorder and warzone exposure as correlates of perceived health in female Vietnam war veterans. J Consult Clin Psychol 1994; 62: 1235–40.
13. Golding JM, Lipton RI: Depressed mood and major depressive disorder in two ethnic groups. J Psychiatr Res 1990; 24: 65–82.
14. Kingston RS, Smith JP: Socioeconomic status and racial and ethnic differences in functional status associated with chronic diseases. Am J Public Health 1997; 87: 805–10.
15. Kogevinas M, Marmot MG, Fox AJ, Goldblatt PO: Socioeconomic differences in cancer survival. J Epidemiol Community Health 1991; 45: 216–9.
16. Sorlie P, Rogot E, Anderson R, Johnson NJ, Backlund E: Black-white mortality differences by family income. Lancet 1992; 340: 346–50.
17. Verbrugge L: The twain meet: empirical explanations of sex differences on health and mortality. J Health Soc Behav 1989; 30: 282–304.
18. Matthews S, Manor O, Power C: Social inequalities in health: are there gender differences? Soc Sci Med 1999; 48: 49–60.
19. Zambrana RE: A research agenda on issues affecting poor and minority women: a model for understanding their health needs. Women and Health 1987; 12: 137–60.
20. Wolfe J, Brown PJ, Kelley JM: Reassessing war stress: exposure and the Persian Gulf War. J Soc Issues 1993; 49: 15–31.
21. Wolfe J, Sharkansky EJ, Read JP, Dawson R, Martin JA, Ouimette PC: Sexual harassment and assault as predictors of PTSD symptomatology among U.S. female Persian Gulf War military personnel. J Interpersonal Violence 1998; 13: 40–57.
22. Kazis LE, Miller DR, Clark J, et al: Health-related quality of life in patients served by the Department of Veterans Affairs: results from the Veterans Health Study. Arch Intern Med 1998; 158: 626–32.
23. Skinner KM, Furey J: The focus on women veterans who use Veterans Administration health care: the Veterans Administration Women's Health Project. Milit Med 1998; 163: 761–6.
24. Kulka RA, Schlenger WE, Fairbank JA, et al: Trauma and the Vietnam War Generation: Report on the Findings from the National Vietnam Veterans Readjustment Study. New York, Brunner/Mazel, 1990.
25. Romeis JC, Gillespie KN, Virgo KS, Thormon KE: Female veterans' and nonveterans' use of health care services. Med Care 1991; 29: 932–6.
26. Hankin CS, Skinner KM, Sullivan LM, Miller DR, Frayne S, Tripp TJ: Prevalence of depressive and alcohol abuse symptoms among women VA outpatients who report experiencing sexual assault while in the military. J Trauma Stress 1999; 12: 601–12.
27. Murdoch M, Nichol KL: Women veterans' experiences with domestic violence and with sexual harassment while in the military. Arch Fam Med 1995; 4: 411–8.
28. Wolfe JW, Kimerling R, Brown PJ, Chrestman KR, Levin K: The Life Stressor Checklist-Revised. In Instrumentation in Stress, Trauma and Adaptation. Edited by Stamm BH, Varra EM. Northbrook, IL, Sidran Press, 1997.
29. Norris FH: Screening for traumatic stress: a scale for use in the general population. J Appl Soc Psychol 1990; 20: 1704–18.
30. Resnick HS, Kilpatrick DG, Dansky BS, Saunders BE, Best CL: Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. J Consult Clin Psychol 1993; 61: 984–91.
31. Ware JE, Snow KK, Kosinski M, Gandek B: SF-36 Health Survey Manual and Interpretation Guide. Boston, The Health Institute, New England Medical Center, 1993.
32. STATA 5.0. College Station, TX, STATA Corporation, 1997.
33. Ashton CM, Petersen NJ, Wray NP, Yu HJ: The Veterans Affairs medical care system: hospital and clinical utilization statistics for 1994. Med Care 1998; 36: 793–803.
34. Reisinger AL: Health Insurance and Access to Care: Issues for Women. New York, The Commonwealth Fund, 1995.
35. Wolinsky FD, Coe RM, Mosely RR, Homan SM: Veterans' and nonveterans' use of health services. Med Care 1985; 23: 1358–71.
36. Romeis JC, Gillespie KN, Thornman KE: Female veterans' use of health care services. Med Care 1988; 26: 589–95.
37. Rosenheck R, Stolar M: Access to public mental health services: determinants of population coverage. Med Care 1998; 36: 503–12.
38. Fitzgerald LF, Shullman SL, Bailey N, et al: The incidence and dimensions of sexual harassment in academia and the workplace. J Vocational Behav 1988; 32: 152–75.
39. Fitzgerald LF: Sexual harassment: violence against women in the workplace. Am Psychol 1993; 48: 1070–6.
40. Koss MP, Koss PG, Woodruff WJ: Deleterious effects of criminal victimization on women's health and medical utilization. Arch Intern Med 1991; 151: 342–7.
41. Koss MP, Woodruff WJ, Koss PG: Criminal victimization among primary care medical patients: prevalence, incidence, and physician usage. Behav Sci Law 1990; 9: 85–96.
42. Walker EA, Unutzer J, Rutter C, et al: Costs of health care use by women HMO members with a history of childhood abuse and neglect. Arch Gen Psychiatry 1999; 56: 609–13.
43. Skinner K, Sullivan L, Tripp T, et al: Comparing the health status of male and female veterans who use VA health care: results from the VA Women's Health Project. Women and Health 1999; 29: 17–33.
44. Walker EA, Katon WJ, Hansom J, et al: Psychiatric diagnoses and sexual victimization in women with chronic pelvic pain. Psychosomatics 1995; 36: 531–40.
45. Actions Needed to Insure That Female Veterans Have Equal Access to VA Benefits. GAO/HRS-82-98. Washington, DC, US General Accounting Office, 1982.