An Examination of Factors That Influence Receipt of Reproductive Health Screenings Among Female Veterans

Madisen Ferras, MPH*; Judy Dye, PhD, APRN, ANP-BC†; Guadalupe X. Ayala, PhD, MPH*;‡; Emily Schmied, MPH, PhD*,

ABSTRACT

Introduction:
As the number of women veterans grows, so does the need to ensure they receive timely health care, including preventive reproductive health screenings such as cervical cancer screenings and mammograms. However, little is known about the rates of reproductive health screenings among veterans and what factors may be related to screening. The objectives of this cross-sectional study were to (1) understand healthcare treatment-seeking experiences among women veterans, (2) determine the rate of adherence to screening guidelines for cervical and breast cancers, and (3) examine potential correlates of adherence to clinical reproductive health screening guidelines.

Materials and Methods:
Women veterans completed an electronically administered survey, which assessed personal characteristics, psychological health symptoms, military service history, health insurance status, healthcare-seeking experiences (e.g., barriers to and satisfaction with care), and receipt of cervical and breast cancer screenings. Multivariable logistic regression identified factors associated with adherence to clinical guidelines for cervical and breast cancer screening.

Results:
Of the 90 women (mean age = 38.78; SD = 12.19) who participated, 64 (71.10%) reported meeting all age-applicable screening guidelines. The most common barriers to obtaining women’s health care were availability of convenient appointment times, finding time in your schedule to make and go to an appointment, and long wait times for appointments. Multivariable logistic regression revealed veterans without a regular women’s health provider were less likely to adhere to guidelines than those with a regular provider (OR = 0.16; 95% CI, 0.04-0.57).

Discussion:
Many women veterans are unable to receive reproductive health screenings; continued efforts are needed to determine how to increase adherence in this unique population.

INTRODUCTION

As the number of women veterans in the USA grows, so does the need to ensure they receive timely, tailored, and high-quality healthcare. One critical aspect of quality care is the receipt of preventive screenings, such as reproductive health screenings, including cervical cancer screenings and mammograms. These screenings are particularly important for women veterans, who may experience environmental and occupational exposures during service that could affect their reproductive health, such as exposure to hazardous chemicals, burn pits, military sexual assault, or combat-associated injuries. In fact, estimates suggest that nearly half of women veterans receiving care in Department of Veterans Affairs (VA) facilities have at least one diagnosed reproductive health issue (e.g., pelvic floor disorders and urinary conditions). Further, women veterans experience risks for reproductive cancers similar to their civilian counterparts.

Clear clinical recommendations exist regarding the frequency of reproductive health screenings, which, when implemented, can improve reproductive health outcomes among women. It is important that women veterans adhere to these guidelines; however, research regarding adherence is inconsistent and limited. For instance, published estimates of adherence rates for reproductive health screenings range from 28% to nearly 92%. Also, previous studies have not examined rates of cervical cancer screenings and mammograms, making it difficult to determine the extent to which women veterans meet overall guidelines. Additionally, many prior studies regarding reproductive health screenings among veterans include only those seeking care from VA facilities or VA-connected facilities. This may lead to inaccurate estimates, as research indicates many female veterans do not receive obstetric and gynecological care from the VA, but rather from non-VA-affiliated organizations.

In addition to determining reproductive health screenings rates among women veterans, it is important to identify factors that might influence receipt of these services. Prior research...
indicates women veterans face a variety of challenges when seeking care, including issues related to accessing the healthcare system. For instance, some women veterans report a lack of knowledge or understanding about their VA eligibility and healthcare benefits or services.\(^1\),17 Others have reported concerns over the convenience and/or quality of the care available to them.\(^1\),17 Additionally, some women may not have a regular women’s healthcare provider, which has been associated with lower rates of preventive service utilization, including cervical cancer screenings and mammograms.\(^13\),18 While the VA and other healthcare sectors have been working to improve women’s health services for the last decade, it is clear several barriers to receiving preventive services persist.\(^19\),20

Screening adherence among women veterans may also be influenced by psychosocial factors. Female veterans are more likely to experience psychological health issues, including depression and PTSD, compared to male veterans and civilian women.\(^4\),9,21 Some evidence suggests that individuals with these psychological issues may be less likely to receive reproductive health screenings.\(^15\),22,23 One leading explanation for the link between reproductive health screenings and psychological health symptoms that may be particularly relevant among veterans is interpersonal violence and sexual trauma, as women who have experienced abuse report experiencing increased fear, embarrassment, and anxiety during physical exams and clinical encounters.\(^4\),9,21 Conversely, evidence suggests that women with greater levels of social support are more likely to receive reproductive health screenings.\(^24\),25

Regular clinical preventive services are essential to protect, promote, and maintain the health and well-being of women, including those who have served in the military.\(^12\),13 With the growing female veteran population, more research is needed to understand their experiences seeking women’s healthcare after leaving active duty. The objectives of this pilot study were to determine the rate of adherence to reproductive health screenings, as well as identify factors associated with adherence to screening guidelines among women veterans who receive care from both within and outside the VA system.

**MATERIAL AND METHODS**

Data were collected as part of a larger cross-sectional pilot study, which examined the health-related quality of life and healthcare-seeking experiences of female veterans. A subset of the data from the larger study are presented here; the criteria used to determine participant inclusion in the present study are described below.

**Study Population**

Participants included women veterans who served in any branch of the U.S. Armed Forces. To be eligible, participants had to be female veterans over the age of 18 years, who were no longer on active duty, and who had been separated for more than a year. The latter criterion was applied because this study sought to determine potential challenges to receiving these screenings after transitioning to the civilian sector.

**Study Procedure**

Convenience and snowball sampling were used to recruit participants through virtual methods. Electronic recruitment fliers were sent to veteran-affiliated groups, such as university student veterans’ offices and local veteran organizations; these groups distributed the flier to their members via email and/or social media (e.g., Facebook). The flier included a link to an online eligibility screener; once eligibility was confirmed, participants were directed to the study consent form and consenting participants were advanced to the study survey. Participants completing the 15-20 minute survey received a $25 incentive. Data collection occurred between November 2020 and June 2021. Study procedures were approved by (San Diego State University) Institutional Review Board.

**Measures**

The study survey assessed personal characteristics, military service history, and various healthcare-seeking experiences, including receipt of reproductive health screenings.

**Receipt of reproductive health screenings**

Reproductive health screening recommendations specify that women 21-65 years old receive cervical cancer screenings every 3 years and that those over 50 years of age receive mammograms binnally.\(^2\),3 To assess receipt of women’s preventive screenings and determine whether they were adherent to recommendations, participants reported the date of their most recent cervical cancer screening and, if they were over the age of 50 years, their most recent mammogram. The difference between the survey completion date and the date of each screening was computed to determine if the participant had received the screenings within the recommended interval. One dichotomous variable was computed to determine overall adherence to both age-appropriate screenings (i.e., only women over 50 years are recommended to receive mammograms), which served as the focal study outcome. Participants who reported receiving both age-appropriate exams in the recommended time frame were coded as adherent, and participants with one or both screenings outside the recommended guidelines were coded as non-adherent.

**Healthcare satisfaction**

Satisfaction with women’s healthcare was measured using seven items derived from existing instruments.\(^26\)–29 Participants reported their perceptions of their provider, including how well the provider listened, explained conditions and treatments to the participant, involved the participant in decisions about their care, and how honest and trustworthy the participant felt the provider was. Additionally, participants rated their satisfaction with the amount of time they had with the provider and the health professionals’ knowledge of women’s health issues overall, as well as their knowledge about the issue for which they were being seen. All items were answered
Barriers to care
Barriers specific to women’s healthcare were assessed with a 10-item scale adapted from previous research. Participants were asked to assess how much of a problem the following 10 factors were when seeking or attempting to seek care for women’s health issues: discomfort over speaking with a provider, determining what services are covered by insurance, finding a provider in network, cost of care, finding transportation, finding the time to make and go to an appointment, availability of convenient appointment times, long wait times for appointments, and choice of provider. Response options ranged from no problem at all (1) to a very serious problem (5). Items were examined individually, and a mean scale score was computed, with higher scores indicating greater challenges (α = 0.88).

Social support
The 12-item Multidimensional Scale of Perceived Social Support was used to measure social support. Participants rated their agreement with statements such as “There is a special person who is around when I am in need.” Response options ranged from very strongly disagree (1) to very strongly agree (7). A mean scale score was calculated, with higher scores indicating greater social support (α = 0.96).

Psychological health symptoms
Psychological health symptoms were measured using the 4-item Patient Health Questionnaire. Participants reported how frequently they were bothered by four symptoms (e.g., feeling nervous, anxious, or on edge) within the past 2 weeks. Response options were provided on a 4-point scale, ranging from not at all satisfied (1) to completely satisfied (5). Items were averaged to create a composite mean scale score, with a higher score reflecting higher levels of satisfaction (α = 0.97).

Data analyses
Descriptive statistics, including means and frequencies, were computed to examine the distribution of all study variables. Cronbach’s alpha (α) was computed to determine the internal consistency of all scales. Group comparison tests, including chi-square and t-tests, were computed to examine differences between women who did and did not meet screening guidelines. Multivariable logistic regression was used to identify factors associated with adherence to screening guidelines; factors hypothesized to be associated with adherence included in the final model were demographic characteristics, having a regular women’s health provider, satisfaction with care, barriers to care, social support, and psychological health symptoms. The alpha level was set at 0.05. All statistical analyses were conducted using SPSS (IBM Corp, 2020).

RESULTS
Participant Characteristics
Table I shows the characteristics of the 90 participating women veterans. Their mean age was 38.78 (SD = 12.19), and two-thirds (66.7%) reported their race as non-Hispanic white. Participants from all military branches were surveyed; the mean time since leaving active duty service was 10.12 years (SD = 9.9).

Women’s Healthcare-Seeking Experiences
All participants reported having at least one type of healthcare coverage, including 80% (n = 72) who had VA coverage. The majority (58.9%) of participants had a regular women’s healthcare provider or team of providers (Table II). Barriers to care and healthcare satisfaction are also presented in Table II. The most common barriers reported to obtaining women’s healthcare service were availability of convenient appointment times (mean = 2.08; SD = 1.11) and finding time in your schedule to make and go to an appointment (mean = 2.03; SD = 1.11). The overall degree of satisfaction with healthcare was high (mean = 4.27, SD = 0.83; range: 1-5). Among all individual satisfaction items, the amount of time the patient had with the provider received the lowest score (mean = 4.10, SD = 0.91), and trustworthiness of the provider received the highest score (mean = 4.39; SD = 0.85).

Adherence to Reproductive Health Screening Guidelines
Sixty-seven (74.40%) participants reported receiving a cervical cancer screening, and 17 (85.0%) participants over the age of 50 years (n = 20) reported receiving a mammogram within the clinically recommended time frame. In total, 64...
TABLE I. Participant Characteristics and Military Service Experiences (n = 90)

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%) or mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean, years)</td>
<td>38.8 12.19</td>
</tr>
<tr>
<td>Relationship status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>51 56.7%</td>
</tr>
<tr>
<td>Cohabiting/in a relationship/single</td>
<td>39 43.3%</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>60 66.7%</td>
</tr>
<tr>
<td>Other</td>
<td>30 33.3%</td>
</tr>
<tr>
<td>Sexual orientation</td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>80 88.9%</td>
</tr>
<tr>
<td>LGBTQ+</td>
<td>10 11.1%</td>
</tr>
</tbody>
</table>
| Number of children (mean)
  a)                                                   | 1.12 1.17          |
| Annual household income                |                    |
| Less than $25,000                      | 10 11.1%           |
| $25,000-$49,999                        | 25 27.8%           |
| $50,000-$100,000                       | 40 44.4%           |
| Greater than $100,000                   | 15 16.7%           |
| Social support (range: 1-7)            | 5.15 1.54          |
| Psychological symptoms
  b)                                                   | 43 47.8%           |
| Branch served                          |                    |
| Navy                                   | 16 17.8%           |
| Air Force                              | 21 23.3%           |
| Marine Corps                           | 16 17.8%           |
| Army                                   | 35 38.9%           |
| Coast Guard                            | 2 2.2%             |
| Time since separating from service
  (mean, years)                           | 10.12 9.92         |

a) Mean for all participants, including those with no children; b) based on 4-item Patient Health Questionnaire scoring guidelines.

Participants (71.10%) met all of the age-applicable recommendations for both types of screenings (Table II). Group comparison tests revealed one significant difference between women who did and did not adhere to screening guidelines—more women who met guidelines reported having a regular healthcare provider than those who did not (67.2% vs. 32.8%; \(X^2[1] = 6.30, P < .05\)).

Factors Associated With Adherence to Clinical Reproductive Health Screening Guidelines

Multivariable logistic regression analysis identified factors associated with adherence to screening guidelines (Table III). Results revealed participants who did not have a regular gynecologist or women’s healthcare provider were less likely to adhere to screening guidelines than those who had a regular women’s health provider (OR = 0.16, 95% CI, 0.04-0.57). The model also revealed that older female veterans were less likely to adhere to guidelines compared to younger female veterans (OR = 0.95, 95% CI, 0.90-0.99).

DISCUSSION

Researchers and clinicians have increasingly focused on improving access to and the quality of care for women veterans\(^2\); however, many gaps remain specific to the receipt of cervical and breast cancer screenings. In this study, we determined the prevalence of adherence to these reproductive health screenings among women veterans who received care from both within and outside the VA, their satisfaction with healthcare received, and barriers they face when seeking women’s healthcare. This study found that over two-thirds of veterans had received the recommended screenings, despite experiencing some challenges when seeking care. This finding is consistent with the available past research indicating that not all women are receiving screenings\(^9,15\) and solidifies...
the need for continued efforts to ensure that all women are able to access women’s health services. Participants in this study identified the challenges they experienced specifically when seeking women’s healthcare. In line with previous research, the most commonly reported barriers to receiving care were logistical in nature, such as availability of convenient appointments and long wait times. These results highlight the need for an increased number of specialized women’s health providers in healthcare facilities, which is a key tenant of a recent act passed into law specifying that all VA facilities should have at least one designated women’s health provider (i.e., S.514 Deborah Sampson Act, 2021). It could also indicate a greater need for telehealth services, which could make it more feasible for women to meet with providers during working hours or reduce the wait time for in-person appointments. While telehealth could improve rates of consultations for emergent health issues, it would likely not improve adherence to reproductive screening guidelines, whose screenings must be conducted in person, but it could increase the opportunity for providers to remind or encourage patients to be screened if due. This may be particularly important in the coronavirus disease 2019 era, as early data indicate that women may be unable to receive their recommended screenings due to healthcare disruptions.

Cancer outcomes are improved when identified early; thus, it is important that women veterans receive reproductive health screenings per recommendations. In this study, nearly one-third of women were overdue for at least one screening and results identified an inverse relationship between adherence and age, such that more younger women had missed screenings. These results could be indicative of the challenges veterans face when first transitioning from active duty to the civilian sector, as research has shown veterans may find it difficult to navigate the changes in their healthcare access. However, it is also possible that other factors, such as knowledge of screening recommendations, could also contribute to this finding, as some research from civilian populations has shown a decline in cervical cancer testing among young women in recent years. Continued efforts must be made to educate separating service members on how to identify and access care following their transition.

Another significant factor associated with adherence to reproductive health screening guidelines in this study was access to specialized women’s health providers; women who reported having a regular women’s health provider were more likely to report receiving screenings. In this study, over half (58.90%) of participants reported having a regular women’s health provider. Little research has been conducted on the importance of having a regular women’s health provider in the veteran population; however, civilian research reports that women who do not have a regular clinician are less likely to receive certain preventive services. Future studies should inquire whether having a regular women’s health provider may increase screenings in the female veteran population.

Of additional interest were the findings that women received their cervical and/or breast cancer screenings from a variety of sources (both VA and civilian), and that insurance type (VA or other) was not related to screening adherence. These findings indicate that when leaving active duty, women veterans may benefit from training on how to navigate not only their VA insurance benefits, but also other insurance and healthcare systems, a conclusion that was also made in a 2015 VA report. These findings also indicate that adherence to reproductive health screenings may not differ based on where women veterans seek care. This is a positive finding and may reflect the considerable effort and resources put forth by the U.S. Government and the VA toward the improvement of VA services, including the provision of women’s healthcare (e.g., VA Women’s Health Research Network, Center for Women Veterans).

Several study limitations should be noted. First, the generalizability is limited by the small sample size and lack of representation from all service branches, racial/ethnic groups, and sexual minorities. An important step in the effort to maximize health of women veterans is to engage representative samples of veterans in research. Unfortunately, the current study sample size precluded examination of adherence by individual racial/ethnic groups, and future efforts should be made to recruit more robust, diverse participant groups. Second, this study relied exclusively on self-report, which is subject to recall and response bias. Third, the cross-sectional design does not allow for causation to be inferred. Fourth, the study relied on convenience sampling, which could further introduce bias. Despite these limitations, the results add to the literature regarding reproductive health screenings among women veterans.

### TABLE III. Factors Associated with Adherence to Clinical Guidelines for Women’s Reproductive Health Screenings (n = 90)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Multivariable logistic regression OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>0.95 (0.90-0.99)*</td>
</tr>
<tr>
<td>Relationship status: unmarried</td>
<td>3.36 (0.69-16.46)</td>
</tr>
<tr>
<td>Race/ethnicity: minoritized racial or ethnic group or multiracial</td>
<td>0.49 (0.14-1.77)</td>
</tr>
<tr>
<td>Annual household income</td>
<td>1.47 (0.63-3.45)</td>
</tr>
<tr>
<td>Insurance type: VA or VA plus other</td>
<td>4.06 (0.82-20.18)</td>
</tr>
<tr>
<td>VA or VA plus another insurance</td>
<td>0.16 (0.04-0.57)**</td>
</tr>
<tr>
<td>No regular women’s health provider</td>
<td></td>
</tr>
<tr>
<td>Barriers to care (range: 1-5)</td>
<td>0.49 (0.18-1.30)</td>
</tr>
<tr>
<td>Satisfaction with care (range: 1-5)</td>
<td>1.03 (0.49-2.17)</td>
</tr>
<tr>
<td>Social support (range: 1-7)</td>
<td>0.90 (0.57-1.41)</td>
</tr>
<tr>
<td>Psychological health symptoms present</td>
<td>1.83 (0.49-6.84)</td>
</tr>
</tbody>
</table>

*OR: odds ratio; CI: confidence interval; *P < .05; **P < .01.

aReferent group: married; breferent group: Non-Hispanic White; cReferent group: non-VA care; dReferent group: has a regular provider; eReferent group: no psychological health symptoms; fFor continuous variables, odds ratios reflect the odds associated with a 1 unit of change.

Downloaded from https://academic.oup.com/milmed/advance-article/doi/10.1093/milmed/usac036/6540073 by guest on 04 March 2022
CONCLUSIONS
This study is one of the first to identify the rate of adherence to women's reproductive health screening guidelines among female veterans from both within and outside the VA; although the generalizability of the results is limited by the small sample, the results have important implications for future research, policy, and practice. While the overall adherence rate was relatively high, it still fell short of the national goals established in the Healthy People 2030 initiative (i.e., 84.3% cervical cancer screening; 77.2% mammography).

Our findings suggest culturally tailored programs, and outreach and policy interventions that address structural and environmental barriers to care, are needed to improve screening rates. Additionally, efforts should be made to adopt policies that allow and/or encourage women to select one provider or team of providers as their regular women’s health care practitioner and to offer a wide range of appointment times, including evenings and weekends. Finally, while this study did not identify differences in reproductive health screening rates between patients who sought care at the VA or outside the VA, future research should continue to focus on recruiting female veterans who regularly use healthcare outside of the VA to ensure data are representative of the population at large. As early detection of cancer is a means of reducing mortality and health disparities, it is crucial that more research be done to determine how to increase screening rates in this unique population.

ACKNOWLEDGMENT
None declared.

FUNDING
This work was supported by an intramural grant awarded by the College of Health and Human Services at San Diego State University. No authors have conflicts of interest to report.

CONFLICT OF INTEREST STATEMENT
None declared.

REFERENCES


