Sexual Assault in Women Veterans: An Examination of PTSD Risk, Health Care Utilization, and Cost of Care

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Objective: This study examines the differential impact of military, civilian adult, and childhood sexual assault on the likelihood of developing posttraumatic stress disorder (PTSD). It also examines the relationship of military sexual assault (MSA) to service utilization and health care costs among women who access services through Veterans Affairs (VA). **Methods:** A convenience sample of 270 veteran women receiving medical and/or mental health treatment at the VA North Texas Healthcare System participated in the study. Participants were interviewed using the Clinician Administered PTSD Scale (CAPS) and categorized into a sexual assault group using the Interview of Sexual Experiences (ISE). A chart review was also conducted to determine the frequency of diagnoses among the women. Data regarding health care utilization was obtained from self-report using the Utilization and Cost Patient Questionnaire (UAC-PQ) and VA administrative records. **Results:** Compared with those without a history of sexual assault, women veterans were 9 times more likely to have PTSD if they had a history of MSA, 7 times more likely if they had childhood sexual assault (CSA) histories, and 5 times more likely if they had civilian sexual assault histories. An investigation of medical charts revealed that PTSD is diagnosed more often for women with a history of MSA than CSA. CSA was associated with a significant increase in health care utilization and cost for services, but there was no related increase in use or cost associated with MSA. **Conclusion:** Women veterans have differential rates of PTSD due to sexual assault, with higher rates found among those assaulted while on active duty. Although women with MSA are more likely to have PTSD, results suggest that they are receiving fewer health care services. **Key words:** military sexual assault, posttraumatic stress disorder, women veterans, health care utilization, health care costs, and sexual assault.

PTSD = posttraumatic stress disorder; **MSA** = military sexual assault; **CSA** = civilian sexual assault; **ChSA** = childhood sexual assault; **VA** = Veterans Affairs; **UAC-PQ** = Utilization and Cost Patient Questionnaire; **ISE** = Interview of Sexual Experiences; **CAPS** = Clinician Administered PTSD Scale; **NSA** = no sexual assault; **SD** = standard deviation; **ER** = emergency room; **SE** = standard error.

Approximately 1 in 10 women report being sexually assaulted at least once in their lifetime (1,2). Although sexual violence occurs against women of all age groups and occupations, a review of the literature indicates that the rates of sexual assault for women veterans is significantly higher than for civilian women, with about 1 in 4 experiencing sexual assault during their lifetime (3,4). Recent studies suggest that rates of posttraumatic stress disorder (PTSD) among female veterans or active duty members are also higher than those found in national civilian studies (5–7), with rape being the most frequent traumatic event associated with the onset of PTSD in women (8). However, no study has specifically examined if military status is an important risk factor for PTSD.

Research indicates strong relationships between PTSD and several other mental disorders, including alcohol abuse and dependence, major depression, and panic disorder (5,8). Research also indicates that PTSD tends to become chronic and less amenable to treatment when the symptoms endure for more than 3 months (9). The sequelae of PTSD have been linked to a variety of additional problems, such as impairments in physical health and social and occupational functioning, and also to multiple costs to society, such as unemployment, lost work time, and increased health care utilization and cost (10–11).

The persistent effects of sexual trauma on psychological and physical functioning can result in increased rates of mental health and medical service use (12). Women who experience sexual assault tend to be high health care utilizers (13) and are more likely than men to talk to their doctor about their symptoms and to take more medication (14). For example, Waigandt et al. (14) found that that sexually assaulted women made significantly more visits to their physicians per year than did nonvictims. In addition, sexual assault victims are more likely to see a physician than they are to seek help from legal aid, mental health services, or victim's assistance services (13). In a study examining utilization of a crime victim's compensation program, sexual assault and the presence of PTSD were associated with greater utilization of services compared with other types of crime or diagnoses (15).

Women veterans with military sexual assault (MSA) report significantly more physical symptoms and have poorer overall health functioning compared with women veterans with no MSA (16,17). Poorer overall health functioning, depressive symptomatology, and alcohol problems in women reporting MSA compared with veterans with no MSA history have been found, suggesting that there are significant differences between veterans with MSA and no MSA (18). However, a limitation of this study is that PTSD was not assessed, and assumptions about differential rates of PTSD and its relationship to health outcomes cannot be made based on the study design and data collected.

Although sexual assault in any environment can be associated with detrimental effects, one can hypothesize that the consequences of MSA may differ from nonmilitary sexual assault. The nature of the perpetrator–victim relationship has been found to be associated with the severity of subsequent symptoms (19) and in MSA, the woman's perpetrator may be a coworker, supervisor, or personnel with higher rank. The woman veteran may be required to continue working with her perpetrator, which is less likely to occur in many civilian situations. Although today's military is an all-volunteer force, military personnel are not considered to be volunteers in the usual sense of the word. They are unable to leave their duty stations without permission and they are subject to disciplinary action, including court marshal, if they attempt to leave. Consequently, women who are sexually assaulted are not able to transfer easily to another duty station or to quit their jobs. Therefore, they are often forced to have repeated contact with the perpetrator. This is not the case in the civilian work environment. In addition, the unit cohesion that usually provides a protective barrier in the military setting may not be available to a woman who has been assaulted by another member of the unit (20). It has been hypothesized that such unique aspects of the military system might intensify the severity of symptoms seen after sexual assault (16), especially given that military personnel have no down time to process the trauma because they are always considered to be on duty.

Sexual trauma program practitioners report clinical differences in diagnosing and treating different types of sexual trauma (MSA, civilian sexual assault [CSA], and child sexual assault [ChSA]), but there is a paucity of scientific literature examining these differences. Specifically, there are no known systematic clinical studies investigating the consequences of MSA verses CSA and how survivors of these assault types may differentially develop PTSD. In addition, there are no known published studies that examine the effect of MSA on health care utilization and costs. Examining the relationships between MSA and mental health variables is especially important given the large number of women currently serving in Afghanistan and Iraq.

This study assesses the differential impact of MSA, CSA, and ChSA on the likelihood of developing PTSD. A secondary aim is to examine the relationship of trauma history on health care utilization and cost of care among women veterans who access care through Veterans Affairs (VA). Primary hypotheses include the following: (1) sexual assault among women veterans is a risk factor for PTSD; (2) women veterans who have experienced sexual assault are more likely to have PTSD if they were sexually assaulted while on active duty; and (3) MSA is associated with increased levels of health care utilization and cost.

Both use of VA and non-VA sources of care were considered. Use of VA care was measured from provider-based VA files. Use of non-VA sources of care was measured by the Utilization and Cost Patient Questionnaire (UAC-PQ) (21,22). The reliability of the UAC-PQ applied to women veterans with trauma was assessed by comparing VA provider records with UAC-PQ self-reports on VA care. We also examined medical chart diagnoses among the three groups to examine diagnoses and corroborate our findings.

METHODS
Sample

Eligible participants were female veterans enrolled in a medical and/or mental health clinic within the VA North Texas Health Care System who were seen for at least one outpatient appointment during the 5 years before contact. We did not include non-VA users because we were interested in the health care utilization and cost of care for women currently seeking VA care.

Participants were recruited by the research coordinator, who was a doctoral level psychologist, between 1997 and 2000. Recruitment procedures involved advertising for the study via fliers at the Dallas VA Medical Center and approaching women veterans at all medical and mental health clinics within the medical center. Those women veterans who became aware of the study from the advertised fliers were informed to call the study coordinator for more information. When these women called, the study coordinator read a description of the study, answered questions about enrollment, and screened the women to ensure that they were female veterans enrolled at the VA North Texas Health Care System. Those women approached in one of the clinics within the Dallas VA Medical Center were given a description of the study and had enrollment questions answered by the research coordinator.

With both recruitment methods, participants were told that we were examining health, quality of life, use of health care services, and trauma history including sexual trauma (results of health and quality-of-life data are reported elsewhere). If the woman veteran was interested in participating in the study, an appointment was made to obtain informed consent and complete the study measures.

A total of 385 women veterans were recruited. Of this number, 77 (20%) declined to participate, 31 (8%) scheduled appointments to participate but did not show up, and 7 (2%) cancelled appointments and did not reschedule, leaving a final sample of 270 women (70%).

Procedures

After obtaining informed consent, subjects were interviewed about their sexual assault histories. Data regarding utilization of care was obtained from both administrative records and participant self-report. Assault history was obtained before the standardized assessment for PTSD. Due to the nature of this study, the research coordinator and the two interviewers were females with master's level or doctoral degrees in clinical/counseling psychology or social work.

Measures

Sexual Assault

A review of the literature indicated a lack of instruments that included MSA as one of the types used to categorize subjects into groups according to sexual assault history. Previously published instruments reviewed were found to differentiate only between adult sexual assault and ChSA. A frequently used measure, the Sexual Experiences Survey (23), did not allow the ability to capture qualitative information that differentiated trauma types, which was needed for this study. As a result, we designed Interview of Sexual Experiences (ISE). The ISE provides the patient with specific definitions and examples of sexual harassment and assault before asking questions about exposure in each of the following three settings: (1) as a child younger than the age of 14, (2) as a civilian adult, not serving in the military, and (3) as an adult on active duty in the military. The definitions used come from the National Women's Study (24) and are as follows.

Sexual Harassment

Uninvited and unwanted sexual advances, physical contact, verbal comments, and/or similar behavior of a sexual nature. Some examples are demands for sexual favors, jokes, references to body parts, innuendoes, and gestures.

Sexual Assault

Any type of sexual conduct including vaginal, anal, or oral sex, achieved or attempted without the person's consent and with the use of threat or force.

Unwanted sexual attention or talk includes things such as demands or suggestions for sexual favors, unwanted phone calls, being followed, or whistles, jokes, looks, and gestures.

Unwanted sexual touching includes things such as being patted on the bottom, being rubbed up against, and being fondled.

Unwanted vaginal sex includes sexual intercourse (penis inserted in vagina) or having items (or fingers) inserted into the vagina. Unwanted oral sex includes being forced to take a man's penis in the mouth or being forced to submit to him performing oral sex on oneself. Unwanted anal sex includes having a penis or any other object (including fingers) inserted in the anus.

To determine the validity of the ISE, we administered the sexual assault items from the event history assessment used in the National Women's Study (24). This allowed for a comparison of the frequency of unwanted sexual touching and unwanted sex across instruments. Agreement occurred in 96% of cases. If adjusted for chance, the agreement was 93% ($\kappa = 0.934$ [+0.023]), with a sensitivity of 0.97 and specificity of 0.97. This reflects very high agreement and suggests the presence of concurrent validity.

For the purposes of this study, veterans were classified as having ChSA if they reported at least one sexual assault while they were less than 14 years old and had no MSA or CSA histories. If they reported at least one sexual assault that occurred while they were adults and not on active duty, and they had no ChSA history, they were classified as CSA. Veterans were classified as having MSA if they reported at least one sexual assault that occurred while on active duty. Women veterans with both ChSA and CSA histories were categorized in the ChSA group. Patients reporting ChSA and CSA in addition to MSA were still included in the MSA group. The contributions of the ChSA and CSA assaults were statistically controlled for in analyses for the MSA group. For patients in the CSA group who had both ChSA and CSA, the contribution of CSA was controlled for in the analyses.

PTSD

The Clinician Administered PTSD Scale (CAPS), which measures the frequency and intensity of PTSD symptoms according to Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, criteria, was used to clinically determine a diagnosis of current PTSD (25). The CAPS was administered up to three times per subject, with different events used for criterion A: MSA, CSA, ChSA, and/or other traumatic experience. If they did not indicate any traumatic events, then the CAPS was not administered. The CAPS has good psychometric properties (test–retest reliability for all 17 items ranges from 0.90 to 0.98, with internal consistency of 0.94), and the total severity score of the CAPS strongly correlates with other measures of PTSD (Mississippi Scale for Combat-related PTSD, $r = 0.91$; PK scale of the Minnesota Multiphasic Personality Scale-2, $r = 0.77$) (25).

The two interviewers used in this study were trained during their doctoral internship on the use of the CAPS by the primary author. Training included face-to-face sessions in which reliable administration of the CAPS was presented with published data and manuals on administering the CAPS available from the National Center for Post-traumatic Stress Disorder. Train-ing included observation of the primary author administering the CAPS to multiple patients. The interviewers were then observed administering the CAPS and given feedback. Both interviewers used the instrument successfully throughout their year of training. Because they were initially trained in a clinical setting, inter-rater reliability was not calculated for the present study.

UAC-PQ

The UAC-PQ (21) is a face-to-face, structured interview with care quantified into units (visit, days, encounters) and classified by setting and provider. Psychometrically, UAC-Q has been tested on public mental health outpatients, with intraclass correlations of 45% (single raters) and 70% (group) and an average bias of 7% (21).

Administrative Databases

Inpatient care and outpatient care files were accessed through the VA's Austin Automation Center. These databases permitted the measurement of patient use of care at any VA Medical Center.

Direct Health Care Cost

VA utilization was taken from all services provided by any VA facility to a study patient. Unit costs were obtained from VA's Reasonable Charges program for FY2001, representing the 80th percentile of national transaction charges. These same transaction charge rates were applied to non-VA sources of care so that VA and non-VA comparisons would reflect differences in utilization rather than differences in cost schedules. Non-VA use of care was measured with the UAC-PQ. Patient responses were translated into unit costs by regressing VA care measured with the UAC-PQ with VA costs calculated with VA administrative databases (22). These "cost regressions" were applied to UAC-PQ responses for non-VA care to compute the cost of non-VA care.

RESULTS

Participant Characteristics

As shown in Table 1, the mean age of the 270 female veterans in the sample was 46.69 years (standard deviation [SD] = 11.52). More than half of the study participants were Caucasian ($n = 173$, 64.1%), 32.2% were African American ($n = 87$), and 4% ($n = 8$) were Hispanic. The mean number of years of education for the sample was 14.5 ± 2.0 years (range = 10–20 years). One third of the sample was married ($n = 88$, 32.6%), whereas 58 participants (21.5%) were never married, and 92 participants (34.1%) were divorced. Just over half ($n = 144$, 53.3%) indicated that they were unemployed at the time of their participation in the research interview. The participants came from all service branches, with the majority from the Army ($n = 126$, 46.7%), followed by the Air Force ($n = 82$, 30.4%), Navy ($n = 47$, 17.4%), Marines ($n = 14$, 5.2%), and Coast Guard ($n = 1$, 0.4%).

Women veterans with a positive history for sexual assault

TABLE 1. Demographic Characteristics of Sample by Sexual Assault (SA) Type

	Total Sample	Type of Sexual Assault			Childhood	Any
		None	Military	Civilian Adult		
N	270	97 (35.6%)	89 (33.0%)	105 (38.9%)	73 (27%)	173 (64.1%)
Mean age (SD)	46.7 yrs (11.5)	48.8 yrs (13.4)	45.1 yrs (8.1)	45.4 yrs (8.9)	45.4 yrs (9.8)	45.5 yrs (9.8)
Caucasian	64.1%	58.1%	67.4%	65.7%	64.4%	66.9%
Not married	55.6%	60.5%	54.5%	57.1%	57.5%	54.4%
High school education	87.4%	88.4%	85.4%	84.8%	80.8%	86.0%
Unemployed	53.3%	53.6%	55.7%	52.4%	52.1%	55.3%

Note. Military, Civilian Adult, and Childhood SA categories are not mutually exclusive. Of the veterans with Civilian SA histories, a total of 84 had no history of Military SA.

were significantly younger than those veterans with no history of sexual assault (NSA) (mean = 45.55 vs. 48.77, $p < .05$). Subsequent analyses comparing MSA veterans to CSA veterans revealed no significant differences between the groups on any of the demographic characteristics.

Comparison of Present Sample With Previous National Sample

An examination of the demographic profile of our sample reveals many similarities with a previous random national sample reported by Skinner et al. (26). For example, the mean age and education levels are comparable between samples for those who experienced MSA (age = 42.6 vs. 45.1 years; education = 14 vs. 14.5 years) in Skinner's sample and ours, respectively. Similarly, marital status, pattern of military service, and employment status are also comparable between samples. The only recognizable dissimilarity, although slight, is that our sample consisted of more diversity in terms of racial backgrounds (32.6% non-Caucasians experiencing MSA) compared with Skinner's sample (23.2% non-Caucasians experiencing MSA).

Experience of Sexual Assault

A participant was considered to have had an experience of sexual assault if she made an affirmative response to the question, "Did you experience unwanted vaginal, oral, or anal sex. . . " for the type of sexual assault specified (i.e., military, civilian adult, or childhood). Of the 270 participants, 173 (64.1%) reported a positive history for at least one of the three types of sexual assault assessed: 89 (33.0%) reported MSA, 105 (38.9%) reported CSA, and 73 (27.0%) reported ChSA. The numbers provided exceed 173 because of the endorsement of multiple types of sexual assault by many of the veterans. For example, 27 (10.0%) reported both MSA and CSA, 18 (7.0%) reported both CSA and ChSA, 15 (6.0%) reported both MSA and ChSA, and 17 (6.0%) reported a positive history for all three types of sexual assault assessed. Of those veterans reporting CSA, 84 indicated no history of MSA. Of the women veterans who reported MSA, only 5.6% reported that their perpetrator was a civilian. There were no significant differences between branches of military service and experience of sexual assault, regardless of the type of sexual assault reported.

Risk of PTSD

When considering the results of the CAPS, 94 women (35%) reported symptoms that met the criteria for a current diagnosis of PTSD. Those diagnosed with PTSD were significantly younger (mean = 44.27 vs. 47.26, $p < .05$), typically reported a positive history of sexual assault (89.4% vs. 62.7%, $p < .001$), and more frequently noted a current status of unemployment (64.5% vs. 50%, $p < .05$). Of those women who did not have a history of sexual assault, 10 (10.4%) met the criteria for a current diagnosis of PTSD for a nonsexual assault event.

Between-group differences in PTSD were computed as odds ratios (with 95% confidence intervals [CI] in parenthe-

ses) calculated from logistic regressions. Estimates were adjusted with covariates to account for differences in age (in years at time of interview assessing PTSD symptoms), ethnicity (African American vs. other), education (in years), marital status (divorced/never married vs. other), and employment status (past year employed full or part time vs. not employed). Measured associations are invariant to the presence or absence of covariates. Results are reported in Table 2.

Female veterans with a positive history of any type of sexual assault were 5 times more likely to meet the CAPS criteria for PTSD than were veterans without a history of sexual assault (adjusted odds ratio [OR] = 5.24, 95% CI = [2.39–11.47], Wald [1] = 17.14, $p < .0001$). When the type of sexual assault was examined, MSA was associated with a more than 9-fold increased risk of PTSD (adjusted OR = 9.27, 95% CI = [3.75–22.95], Wald [1] = 23.18, $p < .0001$), and ChSA was associated with a 7-fold increased risk of PTSD (adjusted OR = 7.26, 95% CI = [2.75–19.17], Wald [1] = 16.02, $p < .0001$) compared with a 5-fold increased risk of PTSD (adjusted OR = 4.64, 95% CI = [2.04–10.54], Wald [1] = 13.45, $p < .0001$) associated with CSA. After adjusting for demographic differences and using ChSA and CSA histories as covariates, MSA was associated with an almost 4-fold increased risk of PTSD diagnosis for all women veterans within the sample (adjusted OR = 3.87, 95% CI = [2.09–7.17], Wald [1] = 18.5, $p < .0001$).

We also examined MSA as a risk factor for PTSD by subgroup. Focusing on the subgroup of female veterans with any positive history for sexual assault, an experience of MSA

TABLE 2. Adjusted Odds Ratios for Posttraumatic Stress Disorder (PTSD) Diagnosis by Clinical Interview

Type of Sexual Assault	All Veterans in Sample Regardless of Assault History (n = 173)	
	Adjusted OR	95% CI
Any SA	5.238‡	2.39–11.47
Military SA	9.270‡	3.75–22.95
Childhood SA	7.262‡	2.75–19.17
Civilian Adult SA	4.639‡	2.04–10.54

Type of Sexual Assault	Veterans with Sexual Assault Histories Only (n = 173)	
	Adjusted OR†	95% CI
Any SA	2.725§	1.41–5.25
Childhood SA	3.257¶	1.04–10.20
Civilian Adult SA	4.145§	1.72–10.01

* PTSD risk for veterans with positive histories of SA as compared to veterans with no history of SA.
† PTSD risk for veterans with a positive history of Military SA by patient group.
¶ $p < 0.05$; § $p < 0.01$; ‡ $p < 0.0001$.
Analyses adjusted for demographic differences in age, ethnicity, marital status, education, and employment status. SA = sexual assault; OR = odds ratio; CI = confidence interval.

was associated with a 3-fold increased risk of PTSD, even after adjusting for the influence of demographic variables (adjusted OR = 2.73, 95% CI = [1.41–5.25], Wald [1] = 8.97, $p < .01$). Focusing on veterans with a positive history of ChSA, the experience of MSA resulted in a more than 3-fold increased risk for developing PTSD (adjusted OR = 3.26, 95% CI = [1.04–10.20], Wald [1] = 4.11, $p < .05$). In contrast, focusing on veterans without a history of ChSA, the experience of MSA resulted in a 5-fold increased risk of PTSD (adjusted OR = 5.06, 95% CI = [2.34–10.93], Wald [1] = 17.03, $p < .0001$). Similarly, for veterans who experienced CSA (with or without ChSA history), an experience of MSA conferred a 4-fold increased risk for PTSD (adjusted OR = 4.15, 95% CI = [1.72–10.01], Wald [1] = 9.98, $p < .01$). Interestingly, the risk of PTSD was only slightly lower for veterans with the experience of MSA but without the experience of CSA ($n = 123$) (adjusted OR = 3.88, 95% CI = [1.64–9.23], Wald [1] = 9.47, $p < .005$). The reader is referred to Clayton and Hills (27) for further information regarding the Wald test.

Medical Record Diagnosis of Psychiatric Disorders

Further analyses were performed to investigate the impact of the type of rape on clinical diagnoses obtained from patient medical records for the 5 years prior to enrollment into the study. Specifically, Yates corrected χ^2 tests were performed to determine the relationship between medical record diagnosis of psychiatric disorders and type of sexual assault experience. As shown in Table 3, there were significant differences in the likelihood of receiving certain psychiatric diagnoses based on the history of sexual assault. In this table, "Yes" refers to the experience of the specified assault, whereas "No" refers to the absence of an assault history for the specified assault. Compared with veterans with no assault history, those with any history of sexual assault had significantly higher rates of all psychiatric diagnoses with the exception of other anxiety disorders. Furthermore, a strong trend emerged for increased diagnostic prevalence of other anxiety disorders ($p < .05$).

For veterans with a positive history of MSA, there were significantly higher rates of PTSD and depressive disorder diagnoses compared with veterans without a history of MSA. The most common diagnosis for those with MSA was depres-

sion (56.2%), followed closely by PTSD (41.6%). The experience of CSA conferred a higher risk for the psychiatric diagnoses of PTSD, other anxiety disorders, depressive disorders, substance use disorders, and personality disorders. Interestingly, no significant associations were found between the experience of ChSA and medical record psychiatric diagnoses.

Utilization and Cost

Utilization and cost data were available on 230 participants. This subsample did not differ significantly from excluded patients ($N = 40$) with respect to mean age (46.7 vs. 46.7, t [267] = 0.02, $p = .99$), African-American status (33.0% vs. 27.5%, χ^2 [4] = 2.58, $p = .63$), mean years of education (14.5 vs. 14.3, t [268] = 0.72, $p = .47$), high school graduate status (87.0% vs. 90.0%, χ^2 [1] = 0.29, $p = .59$), living alone (67.7% vs. 65.0%, χ^2 [1] = 0.11, $p = .74$), or past year employment status (62.4% vs. 52.5%, χ^2 [1] = 1.40, $p = .24$).

There were 127 of 230 patients (54%) who used non-VA sources of care. Only 8 of 230 patients (3%) were getting psychiatric services from non-VA sources of care, a sample too small statistically to analyze. However, 104 of 230 patients (45%) were getting general medical care from non-VA sources. There were 228 of 230 (99%) who made at least one psychiatric visit, 228 of 230 (99%) who made at least one general medical visit, and 216 of 230 (94%) who had at least one general medical encounter with the VA. There were 112 of 230 subjects (49%) who made at least one trip to the emergency room (ER) from any source, 74 of 230 subjects (32%) used the VA ER, and 61 of 230 (27%) used the ER from non-VA sources.

VA administrative files and UAC-PQ self-reports were compared to assess the reliability of the UAC-PQ to measure use of health care for the study population. For combined annual emergency and outpatient care (VA reported mean annual visits = 20.9, SD = 24.9), the intraclass correlation was 0.40, with patients underreporting 8.9% of visits ($\Delta = -1.9$, standard error [SE] = 1.6, t [229] = 1.18, $p = .24$, 95% CI = [−5.0, 1.2]). Although VA records revealed that 99% of the sample had at least one outpatient psychiatric encounter (VA reported mean annual visits = 6.1, SD = 12.8), patients tended to under-report only 4.6% of their VA recorded psychiatric visits ($\Delta = 0.3$ visits, SE = 0.8, t [229] = 0.33, $p =$

TABLE 3.   **Psychiatric Medical Record Diagnoses According to Experience of Sexual Assault (SA)**

	Percentage of Veterans Diagnosed with Psychiatric Disorders According to Experience of Sexual Assault[a]							
	Military SA (n = 89)		Childhood SA (n = 105)		Civilian Adult SA (n = 73)		Any SA (n = 173)	
	Yes	No	Yes	No	Yes	No	Yes	No
PTSD	41.6%**	8.9%	27.4%	16.6%	27.6%*	14.6%	27.7%**	5.2%
Depressive disorders	56.2%*	38.9%	52.1%	40.9%	59.0%**	35.4%	54.3%**	27.1%
Other anxiety disorders	19.1%	19.4%	23.3%	18.1%	25.7%*	15.2%	23.1%	12.5%
Substance use disorders	18.0%	10.6%	17.8%	11.4%	19.0%*	9.1%	16.8%*	6.3%

* $p < 0.05$; ** $p < 0.001$.
[a] These 2 $\times$ 2 comparisons are tested using Yates corrected χ^2 (continuity corrected).
PTSD = posttraumatic stress disorder.

.74, 95% CI [−1.9, 1.4]), with a comparable intraclass correlation of 0.40. For nonemergency medical visits (VA reported mean annual visits = 14.1, SD = 14.9), patients tended to under-report 12.9% of their VA recorded medical visits (Δ = 1.8 visits, SE = 1.2, t [229] = 1.57, p = .12, 95% CI[−4.09, 0.46]), but with a comparable intraclass correlation of 0.40. UAC-PQ responses agreed with VA records in whether the patient used ER care (83.9%, κ = 0.65) and inpatient admission (93.7%, κ = 0.73). When both UAC and VA records reported inpatient use (VA reported inpatient days = 11.2, SD = 17.9), including both medical and psychiatric stays, patients generally over-reported days stayed by 85.4% (Δ = 9.5, SE = 3.6, t [23] = 2.67, p = .014, 95% CI[2.14, 16.95]), although after adjusting for this bias, patient responses were generally good predictors of inpatient days (intraclass correlation = 0.59).

To use UAC-PQ responses to estimate non-VA costs, we determined cost models by regressing UAC-PQ responses describing VA utilization onto VA estimated costs. The cost model with the best fit was selected to estimate non-VA costs by specialty and setting. The models were the following: outpatient medical costs: $2091.6 (506.0) [first visit] + $363.3 (34.1) [visits] − $1.20 (0.17) [visits]^2, R^2 = 0.66; outpatient psychiatric costs: $290.6 (49.8) [visits] − $12.47 (2.38) [visits]^2 + $0.237 (0.034) [visits]^3 − $0.0011 (0.000) [visits]^4, R^2 = 0.65; ER costs: $329.3 (25.6) [visits], R^2 = 0.42; inpatient medical costs: $1276.9 (121.6) [days] + $10.42 (1.46) [days]^2, R^2 = 0.89; and inpatient psychiatric costs: $6414.2 (725.4) [first day] − $8.66 (1.51) [days]^2 + $0.164 (0.025) [days]^3 − $0.00068 (0.00000) [days]^4, R^2 = 0.51. Note that [first day] and [first visit] assumes the value of 1 if the patient had at least 1 inpatient day or visit and 0 otherwise. Standard errors are reported in parentheses.

The average reporting sample patient incurred a total of $13,460 (SD = 22,268) per year of direct health care costs. Most of these costs went for nonemergency medical care; 99% of subjects had at least one nonemergency medical outpatient encounter for a mean per patient cost of $11,144 (SD = 20,650)

and a nonemergency psychiatric visit at $1750 (SD = 5,335) per user. Of study patients (N = 112), 49% had at least ER visit at an average annual cost of $1070 (SD = 1,130) per user.

Although the VA appears to be the principal provider of care for these subjects, our estimates suggest that only $10,088 (SD = 22,130) of the care, or 74.9% of total costs, were from VA facilities. Overall, 54% of the sample (N = 128) had at least one encounter with a nonVA hospital, clinic, or ER. Specifically, 44% of patients (N = 105) obtained nonemergency medical care from non-VA sources, averaging $6,190 (SD = 5217) per user, and 26% of patients (N = 61) sought emergency care averaging $891 (SD = 1180) per user. On the other hand, only 3% of patients (N = 8) used non-VA psychiatric services, for an average use rate of $9,199 (SD = 8120).

Table 4 reports the direct cost of care by sexual assault status (NSA, CSA/ChSA, and MSA), as well as mean cost differences between women veterans with non-MSA and NSA histories (CSA/ChSA-NSA), and between women veterans with MSA and non-MSA histories (MSA-CSA/ChSA).

Compared with NSA history, a CSA is associated with a significant increase in cost for all medical services as well as psychiatric and ER visits. Medical costs alone are greater with a history of sexual assault, but they are not statistically significant. When only VA provider sources are considered, there are significantly higher costs for psychiatric, ER, and medical visits for patients with a history of sexual assault. There is no additional increase in cost of care associated with a history of MSA. In fact, numerically, we observed a reduction in costs, suggesting that patients with MSA access fewer services than do CSA veterans. Lower cost associated with military status is pervasive throughout all services, with the exception of non-VA total costs. Military status is associated with an overall increase in the cost of service, although the amount is not statistically significant.

DISCUSSION

The results of this study confirm that women veterans have differential rates of PTSD caused by sexual assault, with higher rates found among those assaulted while on active duty.

TABLE 4. Differences in Direct Health Care Costs by Type of Sexual Trauma (n = 230)

| Categories | No Sexual Assault (NSA) | Non-Military SA (CSA/ChSA) | | | | Military Sexual Assault (MSA) | | | |
| | | Total | Non-Military SA minus NSA | | | Total | MSA minus Nonmilitary SA | | |
			Adjusted Difference	t	p		Adjusted Difference	t	p
All Services	$10,061	17,689	$7,628	2.39	.018	14,781	−2,908	0.26	.80
ER**	$406	787	$381	2.99	.003	743	−$44	1.44	.15
Psychiatric	$872	2,599	$1,727	2.43	.016	1,683	−916	0.41	.68
Medical	$8,783	14,302	$5,519	1.75	.081	12,354	−$1,948	0.32	.75
VA Total	$7,368	14,267	$6,899	1.09	.28	10,880	−$3,387	0.20	.84
VA-ER**	$265	459	$194	2.12	.035	426	−$33	0.19	.85
VA-Psychiatric	$740	2,082	$1,342	2.63	.009	1,545	−$537	0.32	.75
VA-Medical	$6,363	11,726	$5,363	2.13	.035	8,909	−$2,817	0.60	.55
Non-VA Total**	$2,661	3,159	$498	1.15	.25	2,547	$612	0.39	.70

** Computed using use vs. no use and volume models.
Note. Values adjusted for demographic differences.

SEXUAL ASSAULT IN WOMEN VETERANS

In our sample, if a woman was assaulted while in the military, she was 9 times more likely to have PTSD compared with veterans without sexual assault histories. Women veterans with a positive history of any type of sexual assault were 5 times more likely to meet diagnostic criteria for PTSD than were those veterans without a history of sexual assault. Among all female veterans within the total sample, regardless of past history of sexual assault, after controlling for demographic differences and the influence of ChSA and CSA, MSA was still associated with at least a 3-fold increased risk of PTSD diagnosis.

The greater likelihood of PTSD in MSA veterans needs to be further explored. One hypothesis to support this finding may be that the nonnurturing environment of the military may affect whether a women veteran with MSA seeks assistance for her health needs. When one is assaulted in the military, mental health needs are likely suppressed because it may affect career and deployment capabilities. Assault victims may possibly adopt a sick role in which they do not seek assistance, which leads to less health care utilization even after the military. This sick-role behavior may explain the increased likelihood of having PTSD symptoms.

Chart diagnoses of mental illnesses revealed interesting patterns of mental illnesses by sexual assault histories. Those veterans with any history of assault had significantly higher rates of all psychiatric diagnoses, with the exception of other anxiety disorders, compared with veterans with no assault history. There were significant differences between MSA and NSA and between CSA and NSA with PTSD and depression diagnoses. There were no significant differences in psychiatric diagnoses found between them and veterans with no sexual assault. This may be because the comparison group of no ChSA has veterans with MSA and CSA, and the diagnoses recorded in the charts reflect the effects of adult trauma. Thus, the mean differences between the groups are not very great. Another factor that may affect the results is the length of time between the index trauma, with ChSA occurring long before adult traumas. Factors such as history of treatment and development of coping skills may affect development and diagnoses of mental illness.

Given that we expected that women with MSA would be more likely than their counterparts to have PTSD, we hypothesized that this would lead to higher utilization and cost of care. We found that a history of sexual assault was associated with increased health care costs. However, contrary to our hypothesis, women veterans with MSA received fewer services in all settings compared with those with CSA, resulting in no additional increase in cost of care associated with a MSA. For example, for all health care services combined, health care costs for the average woman veteran with NSA history resulted in about $10,061 per year, while averaging about $17,689 for women veterans with histories of nonmilitary sexual assault. Within the same category, the average health care cost for a woman veteran with a history of MSA was approximately $14,781. Although health care costs for women veterans with MSA history were higher than those

for women veterans with NSA history, they were lower compared with woman veterans with a civilian (nonmilitary assault) history. Lower cost associated with military status was pervasive throughout all services, with the exception of non-VA total costs. Military status was associated with an overall increase in the cost of service, although the amount was not statistically significant and is speculative within this small sample.

It is unclear whether the increased likelihood of PTSD could be the result of using fewer services or if those women access fewer services, which then affects health outcomes. One possible explanation may be that the military environment may affect whether a women veteran with MSA seeks assistance for her health needs. In our clinical experience, women veterans have consistently told us that they did not access health care because they believed it would affect their careers and deployment readiness. Similarly, one might speculate that women with MSA might choose not to obtain mental health care from VA facilities because they may view the facilities as being affiliated with the organization that employed their perpetrator. Their tendency to not seek medical assistance leads to less health care utilization, which may continue even after the military. These are hypotheses, and a better understanding of the contributing mediating factors is necessary for future studies.

In light of the current findings, the limitations of the present study should be considered. Our study was an observation-based, single-site, retrospective study predicting current PTSD symptoms from assault histories. It should be acknowledged that our study took place in a VA setting, where there may be possible selection biases for those seeking treatment, such as obtaining compensation for symptoms resulting from activities that occurred on active military duty.

Because the sexual assault groups were not mutually exclusive, it is probable that some participants could have had a history of more than one sexual assault, with the additive effects of the traumas potentially increasing the distress level and subsequent development of PTSD. In an attempt to clarify this probability, statistical differences were controlled. Our study also did not study the impact of the rank of the perpetrator, the victim's premorbid psychiatric history, or family psychiatric history, which also may have affected postassault psychological adjustment.

Thirty percent of women approached for the study refused to participate. Given that we have no demographic data on these women, we were unable to determine if the clinical characteristics may have differed, possibly introducing selection bias into the sample. In addition, it is important to consider that some women veterans have been discharged from the military after reporting sexual assault to their supervisors. Such women may not be represented in a VA sample because they are unaware that they have legal access to MSA treatment, resulting in conservative estimates in the present study. Therefore, the results found in this study may be only generalizable to women who seek treatment at VA medical centers.

In conclusion, the study revealed that women with MSA were 9 times more likely to have PTSD compared with women veterans with NSA histories, yet they were less likely to use health care services. Our study also indicates that there is no additional increase in the cost of care associated with MSA, suggesting less health care utilization. This finding has significant health care policy implications. Given that these women are underutilizing services, additional emphasis on identifying MSA histories among veterans is necessary early in health care use to assess for and treat associated symptoms. The VA has responded to this essential identification by requiring that all new veterans seeking VA services be screened for MSA.

Finally, the study demonstrated that the UAC-PQ can be used reliably to assess veterans' use of health care services, with intraclass correlations between self-report and actual care indicating good predictive utility with this instrument.

APPENDIX: ISE
[Read the following definitions to the subject.]
Sexual Harassment

Uninvited and unwanted sexual advances, physical contact, verbal comments, and/or similar behavior of a sexual nature. Some examples are demands for sexual favors, jokes, references to body parts, innuendoes, and gestures.

Sexual Assault

Any type of sexual conduct including vaginal, anal, or oral sex, achieved or attempted without the person's consent and with the use of threat or force.

Unwanted sexual attention or talk includes things such as demands or suggestions for sexual favors, unwanted phone calls, being followed, whistles, jokes, looks, and gestures.

Unwanted sexual touching includes things such as being patted on the bottom, being rubbed up against, being fondled.

Unwanted vaginal sex includes sexual intercourse (penis inserted in vagina) or having items (or fingers) inserted into the vagina. Unwanted oral sex includes being forced to take a man's penis in the mouth or being forced to submit to him performing oral sex on oneself. Unwanted anal sex includes having a penis or any other object (including fingers) inserted in the anus.

[*Then say, "Now I'm going to ask you a few questions about your experiences with sexual harassment and assault." Then ask the questions below placing checks in the boxes for all items that apply to subject.*]

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