Are there Gender Differences in Diabetes Care Among Elderly Medicare Enrolled Veterans?

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OBJECTIVE: To examine gender differences in diabetes care process measures and intermediate outcomes among veteran clinic users.

DESIGN: A retrospective cohort study using Veterans Health Administration (VHA) and Medicare files of VHA clinic users with diabetes. Diabetes care process measures were tests for hemoglobin A1c (HbA1c), low-density lipoprotein (LDL-C) values, and eye exams. Intermediate outcomes were HbA1c and LDL-C values below recommended thresholds. Chi-square tests and logistic regressions were used to assess gender differences.

PARTICIPANTS: Study population included 3,225 women and 231,922 men veterans with diabetes, enrolled in Medicare fee-for-service and alive at the end of fiscal year 2000.

RESULTS: Overall, there were no significant gender differences in HbA1c or LDL-C testing. However, women had higher rates in these process measures than men among the non-African American minorities. Women were more likely to have completed eye exams (odds ratio [OR]=1.11; 99% confidence interval [CI]=1.10, 1.23) but were less likely to have LDL-C under 130 mg/dL (OR=0.77; 99% CI=0.69, 0.87).

CONCLUSIONS: Among VHA patients with diabetes, clinically significant gender inequality was not apparent in most of diabetes care measures. However, there was evidence of better care among nonwhite and non-African American women than their male counterparts. Further research on interaction of race and gender on diabetes care is needed. This includes evaluation of integrated VHA women's health programs as well as cultural issues. Lower LDL-C control among women suggests areas of unmet needs for women and opportunities for future targeted quality improvement interventions at system and provider levels.

KEY WORDS: diabetes; women; veterans; quality of care; gender differences.

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Type 2 diabetes in the general¹ and in the veteran population² is highly prevalent and increasing.³ Because diabetes is a highly prevalent and costly disease in both women and men^{4,5} it has become an important target for population disease management programs among managed care organizations including the Veterans Health Administration (VHA). The VHA, the largest integrated health care system in the United States, beginning in 1995 instituted programs designed to ensure the predictable and consistent provision of high-quality care everywhere in the system and to optimize the value of VHA health care.⁶ These formalized quality improvement initiatives have resulted in veterans that use VHA facilities having significantly better care than individuals using the Medicare fee-for-service (FFS) program.⁷ In the context of diabetes care, it has been shown that VHA facilities had higher rates in process measures of diabetes care when compared with Medicare FFS⁷ and better lipemic and glycemic control when compared with other commercial plans.⁸

However, because the majority of the VHA health care recipients are men, it is not clear as to whether the better care observed in the VHA health care system is universal among men and women veterans or merely a reflection of better care for men veterans. Prior studies have analyzed gender differences in VHA and nonVHA care and found that women were substantially more likely to use nonVHA services.^{9,10} Women veterans' use of VHA services is influenced by the scope of clinic services and satisfaction with those services.¹¹ Indeed, prior reports have documented problems with various aspects of the care delivered to women in the VHA.^{12,13} Women who received care in the VHA did not feel welcome¹⁴ and gender awareness in terms of gender-role ideology, gender sensitivity toward women veteran's privacy needs and care giving responsibilities needed improvements.¹⁵

In response, the VHA has developed numerous programs designed to enhance services for women veterans, including comprehensive women's health centers at a number of facilities.¹⁶⁻¹⁸ However, it is not known how effective these

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program changes have been for women's health care in general, or for the management of chronic diseases (such as diabetes) in women. It is crucial to assess care among women VHA patients with diabetes, because of gender differences in complications and consequences of diabetes. Women diagnosed with type 2 diabetes over the age of 65 years had excess mortality compared with their nondiabetic counterparts; this finding has not been replicated in men.¹⁹ Similarly, diabetes-related coronary heart disease was higher in women than men, even after controlling for conventional risk factors.²⁰

Therefore, the primary objective of this paper is to compare diabetes care process measures and intermediate outcomes between men and women veterans. Such comparative assessments are important in identifying unmet needs of women veterans so that targeted efforts can be undertaken to improve diabetes care.

METHODS

Data

The data set used in this study is derived from the VHA's national *Diabetes Epidemiologic Cohort* (DEpiC) database.² Diabetes Epidemiologic Cohort is a merged data set of information from the VHA and the Medicare FFS claims for all VHA patients with diabetes. Briefly, the data set contains all VHA users with possible diabetes who were identified using 2 inpatient or outpatient International Classification of Diseases—Ninth Edition (ICD-9) diagnoses of diabetes, HbA1c tests, or the prescription of antidiabetic specific medication or monitoring supplies. A criterion of 2 or more ICD-9-CM codes for diabetes from outpatient or inpatient physician visits (VHA and Medicare) over a 24-month period had high sensitivity (73%) and specificity (98%) against patient self-report, comparable to prior reports using the Medicare Current Beneficiary Survey.²¹ For the present study we used the merged VHA and FFS data from Medicare for the years 1998 to 2000. Demographic information was derived from both VHA National Patient Care Data (NPCD) files and from the Denominator files from Medicare. For utilization and comorbidity information, we used claim files from Medicare (MEDPAR, Physician/Supplier and Outpatient Institutional files) and the administrative data from NPCD (Inpatient and Outpatient Clinic).

Study Population

The analytical population for the current study consisted of veterans with diabetes who had used VHA health care during fiscal year (FY)1998 to FY1999, aged 65 and older, who were also dually enrolled in Medicare FFS in fiscal years 1999 and 2000, and alive at the end of FY2000. We restricted the analysis to the older adults because universal coverage of Medicare begins at age 65. We restricted our Medicare population to FFS enrollees (FFS enrollment during FYs 1999 and 2000 and no HMO coverage) because data for Medicare managed care participants are not yet available. We excluded decedents to ensure a uniform exposure period for all the veterans in the study population. Deaths were identified using the VHA Beneficiary Identification and Records Locator Subsystem and the Medicare Denominator File.^{22,23}

Of the total 258,492 veterans with diabetes age 65 and above who were dually enrolled in Medicare FFS, 22,848 died

in FY 1999 and 2000. Of these, an additional 497 had no race information. The final study population was 235,147 VHA clinic users: 3,225 (1.4%) women and 231,922 (98.6%) men. The VA New Jersey Healthcare System Institutional Review Board approved the study.

MEASURES

Dependent Variables

Diabetes Process of Care Measures. The process measures included receipt of at least 1 test (for A1c and LDL-C) or eye exam in FY 2000 and were derived from VHA Health Analysis Information Group data (HAIG) laboratory reports or from the CPT codes from Medicare Physician/Supplier and Outpatient Institutional files. The CPT codes for HbA1c were 83036, 82985, 82962; LDL-C codes were 83716, 83721, 80061, 80062, 82465, 83718, 84478. Eye exams in the VHA were defined by Clinic Stop codes 407 and 408. In Medicare, eye exams were defined according to guidelines specified by The Health Plan Employer Data and Information Set²⁴ with the slight modification of being based on a single year period, rather than a 2-year period. We focused only on these 3 measures because of well-established performance standards for these process measures.²⁵

Intermediate Outcomes of Diabetes Care. The intermediate outcomes (HbA1c and LDL-C values) were the last reported values from VHA HAIG in FY 2000. Because Medicare claims do not contain information on the results of the tests, the study population was restricted to veterans who had their HbA1c and LDL-C tests completed at VHA facilities and had no missing values for intermediate outcomes of care. Although HbA1c control is a major focus of attention in diabetes care, optimal diabetes care incorporates a multiple risk factor approach including management of cardiovascular disease risk. Therefore, we used both HbA1c values and LDL-C values as intermediate outcomes. Values of less than 9% of HbA1c and LDL-C level of <130 mg/dL were defined as meeting the Diabetes Quality Improvement Project performance measures used in the VHA and private care sector during the study period.^{26–28}

Independent Variables

Demographic characteristics included gender, race (white, African American, and Other racial minorities including Latinos, Native Americans, Asians, and others), marital status (married, widowed, divorced/separated, and never married). Because nearly 2% of veteran clinic users had missing marital status codes, we also included a missing category. A proxy of income/poverty status was created using VHA Enrollment Priority Groups.²⁹ All veterans in priority group 5 (poor and no service-connected disabilities) were coded as poor, and others were coded as not poor. Health status covariates included physical (PCI) and mental conditions (MCI) derived from Selim Comorbidity Index.³⁰ The Selim PCI is a count of 30 physical conditions. The Selim MCI is the count of 6 mental conditions. These clinical conditions were taken from the medical history questionnaires in the Medical Outcomes Study and were screened for prevalence in veteran populations. These indexes have been specifically developed using the VA patients' survey and have been used to risk-adjust outcomes in the veteran population. All the independent variables were measured as of

baseline (i.e., FY1999). Finally, we included number of face-to-face visits in FY2000 as a control variable.

Statistical Techniques

Chi-square tests were used to assess simple unadjusted association between gender and process of diabetes care measures and intermediate outcomes of diabetes care. We used logistic regression models to investigate the effect of gender on the diabetes care measures controlling for other covariates and reported the results at 99% CI. First, a full model containing all independent variables as well as 2-way interaction terms of gender and all other independent variables (e.g., gender by race, gender by age) were constructed for each of the 4 dependent variables to examine effect modification.

Second, to help our understanding of how gender effects may vary across different subpopulations, we also conducted subgroup analyses³¹⁻³³ to evaluate gender effects within each

level of selected independent variables with the presence of control variables. Specifically, within each subpopulation, a logistic regression model containing gender and other independent variables was constructed for each outcomes variable.

RESULTS

We found significant gender differences in the distribution of demographic, economic, and health status characteristics. As shown in Table 1, compared with men, women with diabetes were older, more likely to be white (89.5% vs 83.0%), and more likely to be widowed (35.7% vs 10.4%). Men and women had comparable physical health status as defined by number of physical health conditions. However, a higher proportion of women than men were diagnosed with psychiatric conditions (23.3% vs 18.0%).

Gender Differences in Diabetes Process of Care Measures: Unadjusted

Table 2 displays overall and subgroup unadjusted percentages of completed diabetes process measures for men and women. Overall, 75.6% of women and 75.8% of men were tested for HbA1c, not a statistically significant difference (Table 2). However, we did find very small but statistically significant gender

Table 1. Description of the Veterans Health Administration (VHA) Clinic Users With Diagnosed Diabetes By Gender Fiscal Years 1998 to 2000

	Women		Men	
	N	%	N	%
All	3,225	100.0	231,922	100.0
Race ^a				
White	2,888	89.6	192,434	83.0
African American	262	8.1	30,024	12.9
Hispanic	26	0.8	5,698	2.5
Others	49	1.5	3,766	1.6
Age (y) ^a				
65 to 74	1,425	44.2	149,596	64.5
75+	1,800	55.8	82,326	35.5
Marital status ^a				
Married	878	27.2	162,169	69.9
Single	428	13.3	12,734	5.5
Divorced/separated	676	21.0	28,673	12.4
Widowed	1,151	35.7	24,157	10.4
Unknown	92	2.9	4,189	1.8
Physical comorbidity				
None	78	2.4	5,034	2.2
1 to 2	606	18.8	42,509	18.3
3 to 4	999	31.0	69,170	29.8
5 to 6	738	22.9	56,521	24.4
7+	804	24.9	58,688	25.3
Psychiatric comorbidity ^a				
Yes	751	23.3	41,818	18.0
None	2,474	76.7	190,104	82.0
Poverty status ^a				
Poor	1,893	58.7	121,613	52.4
Other	1,332	41.3	110,309	47.6
Number of total face-to-face visits in FY 2000 ^a				
0 to 2	161	5.0	12,588	5.4
3 to 4	271	8.4	22,411	9.7
5 to 6	388	12.0	30,291	13.1
7 to 8	396	12.3	32,022	13.8
9 to 10	400	12.4	29,396	12.7
11 to 12	364	11.3	24,839	10.7
13+	1,245	38.6	80,377	34.7
Mean (SD)	12.47 (8.58)		11.51 (7.84)	

Based on veteran clinic users with diabetes, aged 65 and older, who were dually enrolled in Medicare fee-for-service in fiscal years 1999 and 2000 and were alive as the end of fiscal year 2000. Superscript a's indicate significant gender differences in the distribution of the independent variables at .01 level.

FY, fiscal year.

Table 2. Gender Differences in Unadjusted Percentages With Completed Diabetes Process of Care Measures Among Veteran Clinic Users With Diabetes, FY2000

	HbA1c Test		LDL-C Test		Eye Exam	
	Women %	Men %	Women %	Men %	Women %	Men %
All	75.6	75.8	66.4	68.9 [†]	68.3	66.7
Race						
White	76.4	77.3	67.4	70.5 [‡]	68.6	67.2
African American	67.6	72.2	54.6	60.2	64.9	64.9
Hispanic	65.4	50.4	69.4	60.5	65.4	64.4
Others	79.6	66.5	76.9	65.0	71.4	62.6
Age (y)						
65 to 74	78.4	76.5	68.1	70.7*	68.6	66.6
75+	73.5	74.6	65.2	65.6	68.1	66.9
Marital status						
Married	77.9	76.7	71.3	71.3	69.1	68
Single	72.9	71.9	67.1	60.8 [‡]	68.2	63.2*
Divorced/separated	75.6	74.1	62.3	62.8	69.9	63.9 [†]
Widowed	75.8	74.5	65.9	64.8	67.3	64.3*
Unknown	66.3	73.6	56.5	70.1 [‡]	62.0	60.0
Physical comorbidity						
None	55.1	49	33.3	36.1	18.0	27.5
1 to 2	73.3	72.1	62.5	60.2	61.1	54.3 [‡]
3 to 4	74.5	76.6	65.1	67.8	69.2	67.5
5 to 6	77.6	77.9	66.9	72 [‡]	72.0	71.6
7+	79.1	77.9	74	76.3	74.3	73.5
Psychiatric comorbidity						
Yes	77.8	75.9	65.8	67.5	65.0	66.0
None	75	75.8	66.7	69.2 [‡]	69.3	66.9*
Poverty status						
Poor	77.7	75.6*	67.4	68.6	67.7	65.5*
Other	72.8	76.1 [‡]	65.2	69.2 [‡]	69.1	68.1

Note: Based on veteran clinic users with diabetes, aged 65 and older, who were dually enrolled in Medicare fee-for-service in fiscal year 1999 and fiscal year 2000 and were alive as of the end of fiscal year 2000. HbA1c, hemoglobin A1c; LDL-C, low-density lipoprotein cholesterol; FY, fiscal year.

*P<.05. [†]P<.01. [‡]P<.001.

Table 3. Adjusted Odds Ratios and 99% Confidence Intervals for Women With Completed Diabetes Process of Care Measures Among Veteran Clinic Users With Diabetes (overall and by subgroups), FY2000

	HbA1c Test		LDL-C Test		Eye Exam	
	AOR	99% CI	AOR	99% CI	AOR	99% CI
Full model	1.01	(0.91 to 1.13)	1.04	(0.94 to 1.15)	1.11*	(1.00 to 1.23)
Race						
White	1.01	(0.90 to 1.13)	1.05	(0.94 to 1.17)	1.11*	(1.00 to 1.24)
African American	0.84	(0.59 to 1.19)	0.89	(0.64 to 1.23)	1.01	(0.70 to 1.45)
Hispanic and others	1.98*	(0.99 to 3.99)	1.77*	(0.89 to 3.54)	1.33	(0.67 to 2.67)
Age (y)						
65 to 74	1.10	(0.93 to 1.31)	0.97	(0.84 to 1.13)	1.08	(0.92 to 1.27)
75+	0.95	(0.82 to 1.10)	1.09	(0.95 to 1.25)	1.14	(0.99 to 1.31)
Marital status						
Married	1.03	(0.83 to 1.27)	1.01	(0.83 to 1.24)	1.01	(0.83 to 1.23)
Single	1.02	(0.76 to 1.36)	1.35 [†]	(1.02 to 1.78)	1.21	(0.90 to 1.62)
Divorced/separated	1.06	(0.83 to 1.35)	0.99	(0.80 to 1.23)	1.26*	(0.99 to 1.59)
Widowed	1.02	(0.85 to 1.23)	1.06	(0.89 to 1.25)	1.08	(0.91 to 1.29)
Unknown	0.69	(0.38 to 1.24)	0.54 [‡]	(0.30 to 0.95)	1.01	(0.56 to 1.83)
Physical comorbidity						
None	1.32	(0.68 to 2.54)	1.00	(0.51 to 1.96)	0.64	(0.27 to 1.47)
1 to 2	1.04	(0.81 to 1.33)	1.25*	(1.00 to 1.56)	1.35 [‡]	(1.07 to 1.69)
3 to 4	0.90	(0.74 to 1.09)	1.03	(0.86 to 1.23)	1.07	(0.89 to 1.29)
5 to 6	0.98	(0.78 to 1.24)	0.92	(0.74 to 1.13)	1.03	(0.83 to 1.29)
7+	1.15	(0.92 to 1.45)	1.04	(0.84 to 1.28)	1.09	(0.87 to 1.35)
Psychiatric comorbidity						
Yes	1.16	(0.92 to 1.46)	1.05	(0.85 to 1.29)	0.97	(0.78 to 1.19)
None	0.97	(0.86 to 1.1)	1.04	(0.93 to 1.17)	1.16 [†]	(1.03 to 1.31)
Poverty status						
Poor	1.09	(0.94 to 1.26)	1.05	(0.92 to 1.20)	1.09	(0.95 to 1.25)
Other	0.91	(0.77 to 1.07)	1.03	(0.88 to 1.20)	1.14*	(0.97 to 1.35)

Note: Based on veteran clinic users with diabetes, aged 65 and older, who were dually enrolled in Medicare fee-for-service in fiscal year 1999 and fiscal year 2000 and were alive as of the end of fiscal year 2000.

Independent variables for the models included the variables listed in the table plus the number of face-to-face visits.

HbA1c, hemoglobin A1c; LDL-C, low-density lipoprotein cholesterol; AOR, adjusted odds ratios; CI, confidence interval.

* $P < .05$. [†] $P < .01$. [‡] $P < .001$.

differences (66.4% among women and 68.9% among men) in the rates of LDL-C testing. There were no significant gender differences in eye exams (68.3% for women vs 66.7% for men).

We found that a higher percentage of women than men, who belonged to racial minorities other than African Americans, and those with low incomes, were tested for HbA1c. For LDL-C testing, we found single women were more likely to be tested compared with single men; other subpopulations where women were statistically significantly less likely to get LDL-C tested included whites, young-old, those who were not poor, veterans with 5 to 6 physical comorbidities, and those with no mental illness. Eye exams were more likely among women than men in subgroups such as those without psychiatric conditions, those who were single, divorced/separated, widowed, and the poor.

Gender Differences in Diabetes Process of Care Measures: Adjusted

Table 3 shows adjusted OR (AOR) for women for completed diabetes process measures for the overall study population as well as AORs from subgroup analyses. Overall, there were no gender differences in HbA1c and LDL-C testing but women were more likely than men to have an eye exam. Analyses of interaction terms from the full models for the process measures revealed (data not shown) that gender effects were different by racial groups (HbA1c), poverty status (HbA1c), marital status (LDL-C), and mental health status (eye exam).

These modifying effects could be understood better in the subgroup analyses. As in the bivariate analyses, subgroup gender differences were noted for all diabetes process of care measures. The findings were generally comparable with bivariate findings but we found significant additional differences. For example, for HbA1c testing, we found women from the nonwhite, nonAfrican-American group were still more likely than men to be tested for HbA1c ($0.01 < P < 0.05$). For LDL-C testing, we found women who belonged to racial minorities other than African American, the single women, and those with 1 to 2 physical comorbid conditions were more likely than their men counterparts to be tested for LDL-C; other effects were nonsignificant. The positive effect of gender on receipt of eye exam was evident in most subpopulations.

Gender Differences in Intermediate Outcomes

Analyses for intermediate outcomes were restricted to veterans who had their testing completed in the VHA system and for whom the laboratory values were available ($n = 178,256$ [2,440 women]) for HbA1c control and 161,869 (2,144 women) for LDL-C control. Overall, comparably high percentages of women and men had HbA1c values less than 9% (women: 91%; men: 90.6%); neither were there gender differences by subpopulations. Therefore, we do not show detailed results of HbA1c control.

In our study, 84.0% of women and 87.1% of men had LDL-C values under 130 mg/dL (Table 4). After controlling for

Table 4. Gender Differences in Unadjusted Percentages With LDL-C in Control and Adjusted Odds Ratios and 99% Confidence Intervals for Women With LDL-C Control Among Veteran Clinic Users With Diabetes (overall and by subgroups), FY2000

	Women %	Men %	Logistic Regression	
			AOR	99% CI
<i>n</i>	2,144	159,725		
All	84.0	87.1 [‡]	0.77 [‡]	(0.66 to 0.90)
Race				
White	84.6	88.2 [‡]	0.77 [‡]	(0.65 to 0.91)
African American	77.6	79.2	0.91	(0.54 to 1.53)
Hispanic and others	77.8	85.2	0.55	(0.23 to 1.32)
Age (y)				
65 to 74	82.7	86.3 [‡]	0.77 [‡]	(0.62 to 0.96)
75+	85.0	88.6 [‡]	0.76 [‡]	(0.61 to 0.94)
Marital status				
Married	84.5	87.6*	0.73 [‡]	(0.54 to 0.97)
Single	86.1	84.7	1.00	(0.63 to 1.57)
Divorced/separated	82.0	84.1	0.81	(0.58 to 1.14)
Widowed	83.5	86.7*	0.73 [‡]	(0.56 to 0.95)
Unknown	88.5	93.5	0.48	(0.15 to 1.54)
Physical comorbidity				
None	88.5	81.0	1.72	(0.34 to 8.71)
1 to 2	78.4	82.4*	0.78*	(0.56 to 1.08)
3 to 4	83.4	85.6	0.82	(0.62 to 1.08)
5 to 6	85.0	88.1*	0.75*	(0.54 to 1.05)
7+	87.1	90.7 [‡]	0.65 [‡]	(0.47 to 0.90)
Psychiatric comorbidity				
Yes	84.0	86.6	0.81	(0.58 to 1.12)
None	83.9	87.2 [‡]	0.75 [‡]	(0.63 to 0.90)
Poverty status				
Poor	83.3	86.1 [‡]	0.75 [‡]	(0.61 to 0.92)
Other	84.9	88.2 [‡]	0.78 [‡]	(0.61 to 1.00)

Note: Based on veteran clinic users with diabetes, aged 65 and older, who were dually enrolled in Medicare fee-for-service in fiscal year 1999 and fiscal year 2000 and were alive as of the end of fiscal year 2000. Independent variables for the models included the variables listed in the table plus the number of face-to-face visits.

LDL-C, low-density lipoprotein cholesterol; AOR, adjusted odds ratios; CI, confidence interval, FY, fiscal year.

* $P < .05$. [‡] $P < .01$; [‡] $P < .001$.

listed covariates, women were less likely to have LDL-C control (AOR=0.77; 99% CI=0.69, 0.87). For example, married women were less likely to have lower LDL-C control than married men (AOR=0.7; 99% CI=[0.54, 0.97]). Among the non African-American minorities, women were more likely to have LDL-C under control (99.8% vs 85.2%), although this discrepancy was not statistically significant.

DISCUSSION

The present study set out to explore gender differences in diabetes care among veterans and extends previous studies on diabetes quality of care among veterans. A major finding of our study is that, among VHA patients with diabetes, clinically significant gender inequality was not apparent in most of the measures of diabetes care. Although there is no gold standard for what is considered "clinically significant," the National Committee for Quality Assurance (NCQA) defines a clinically significant difference in adherence to performance measurement among plans as greater than 5%.³⁴

Although we did not find overall gender differences in the completion of HbA1c and LDL-C tests, there were significant differences by gender in some subpopulations. We found that

among racial minorities other than African Americans, women were more likely than men to have completed HbA1c and LDL-C tests. Our data showed that only about half of Hispanic men had any A1c tests, while the average for women were 65%. It is likely that these gender differences may be due to differences in health care seeking behavior among the non African-American minority groups. For example, Latino men have been shown to have the hardest time gaining access to health care.³⁵ Our finding also raises the intriguing possibility that innovative care delivery strategies, such as interdisciplinary women's health centers implemented at multiple VHA facilities, may have contributed to better diabetes management in vulnerable subgroups; further research is warranted.

We found that women veterans were more likely than men veterans to have completed eye exams, after adjusting for relevant covariates. The use of greater health care services by women is not new and has been documented in the literature. Our findings about higher health service utilization by women with diabetes than men, is consistent with research from other countries.^{36,37} Similarly, in chronic illnesses such as asthma, women tend to use more health care and more medications,³⁸ with women incurring higher expenditures in ambulatory care.³⁹ Among veterans, women have been shown to have significantly higher quality of outpatient mental health care.¹⁰ As our results *did* adjust for frequencies of office visits, this finding requires further research to analyze other possible drivers of this greater use of eye care among women than men.

Our study found that women had a lower likelihood of LDL-C control compared with men, a finding consistent with the many studies that document gender disparities in cardiovascular care,⁴⁰⁻⁴² and LDL-C control and treatment among patients with diabetes.^{36,43} As dyslipidemia is a major contributor to adverse cardiovascular outcomes in diabetes, this would place substantial numbers of women veterans at risk for macrovascular end organ damage and death. Gu et al.⁴⁴ found that women did not experiencing the same improvement in coronary heart disease (CHD) events and mortality as men over the last 30 years. Natarajan et al.⁴⁵ found that women who had long-lasting diabetes (≥ 10 years) were at higher risk of CHD mortality than their men counterparts. Although women and men were equally likely to be tested for LDL-C in all racial groups, white women were less likely to have acceptable LDL-C control than white men. This finding suggests need for future research into the interaction of racial and gender disparities in cardiac outcomes because the observed lack of gender differences in racial minorities in our study could be because of relatively small sample size among women veterans. In fact, our tests of the gender effects across different racial groups showed no statistical significance.

Another interesting finding of our study is that married women were less likely to have LDL-C control than married men. This finding may suggest that among the elderly, the relationship between marital status and preventive health care may differ between men and women. Marriage is considered a form of social support⁴⁶ where many studies have shown that married individuals have substantially better health care,^{47,48} health outcomes, and quality of life.⁴⁹⁻⁵¹ However, the positive impact may be greater for men than for women; while marital ties had a protective effect on mortality of men no such effect was found in women.⁵²

An important limitation of the study is that veteran clinic users are a selected subgroup and the findings may not be

generalizable to the entire veteran population. In addition, Medicare managed care enrollees were excluded, again limiting the generalizability of the findings, although nationally they only account for 13% of Medicare beneficiaries.⁵³ Another important limitation is that administrative data do not capture information on potentially relevant covariates such as health behaviors, education, and health literacy, which may be potential sources of residual confounding. For example, women veterans tend to be more educated than men,⁵⁴ which could affect their diabetes health literacy; health literacy is shown to affect maintenance of glycemic control especially among disadvantaged populations.⁵⁵

Despite these limitations, our study, by following a large national cohort of women veterans across VHA and Medicare systems of care, contributes significantly to the assessment of gender differences in diabetes care in a naturalistic setting. Our findings highlight some unmet needs among women veterans and the need for further research in the gender gap in management of diabetes, specifically cardiovascular disease risk management. We also identify subgroups of patients for whom gender differences favor women, pointing to the need to further examine whether and how innovative VHA clinical programs have fostered enhanced care in these groups.

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Voices of Women Veterans (continued)

HARASSMENT AND ABUSE

"It was terrible to deal with the sexual harassment (the term didn't even exist then). Other than that, I was proud to be part of the U.S. Armed Services. People are amazed that I'm a veteran. I don't fit their preconceived idea of what a veteran should be like . . . for one, I'm female."

"At first, my experience was very demeaning by my upper chain of command. I remember it like yesterday. Standing parade on the starboard side of the ship up by the bridge while the person in charge over the new women on the ship verbally abused us . . . telling us how stupid we were and how worthless our contribution to the Navy would be. His words were very colorful . . . I wanted to make a difference. When I came back in for a second time, it was better. The discrimination wasn't quite as bad but still had to contend with the good old boy system. That was the first six years of service. The next 14 years were very challenging as well as rewarding. I feel I have met my objectives for joining the military after all."

"I was in a male-dominated career field and I feel that I had to work twice as hard to be as good as my male counterparts. When working with other nations' military men, we did encounter problems. With military of Saudi Arabia, the men (pilots) would not speak to me and their crew would spit on me when I launched their jets. Being a veteran has given me a better sense of confidence and self-reliability."