Healthcare Resource Utilization (HCRU) Among Women with Vasomotor Symptoms (VMS) With and Without Depression: A MEPS Analysis

HSD18

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Background

- Vasomotor symptoms (VMS), including hot flashes and night sweats, affect nearly 80% of midlife women and are commonly accompanied by depression (El Khoudary et al., 2019).
- Both conditions are associated with increased healthcare utilization, yet few nationally representative studies have evaluated how co-occurring VMS and depression influence outpatient, emergency department (ED), and inpatient service use (Gibson et al., 2025).

Objective

To assess the association between VMS with/without depression, and healthcare utilization among adult U.S. women using pooled 2017–2022 Medical Expenditure Panel Survey (MEPS) data.

Methodology

- Retrospective cross-sectional study using pooled 2017–2022 MEPS data. Women were categorized as VMS with depression (n=529), VMS without depression (n=268), or no VMS/no depression (n=21,245) based on ICD-10 codes and self-reported depression.
- Outcomes included outpatient visits, inpatient admissions, and ED visits. Survey-weighted regression models adjusted for demographic, socioeconomic, insurance, regional, and comorbidity factors.
- Linear regression was used for outpatient visits, while negative binomial regression was used for inpatient admissions and ED visits adjusting for several covariates.

Results

Model 1: Outpatient visits

Compared with women with no VMS/no depression:

- Women with VMS and depression had 4.80 additional outpatient visits annually (β = 4.80, 11.98 vs, 7.18 visits) compared to no VMS/no depression.
- Women with VMS without depression had 3.77 additional outpatient visits annually (β = 3.77, 10.95 vs. 7.18 visits) compared to no VMS/no depression.
- Women over age 55 had 1.75 additional outpatient visits annually.
- Each one-point increase in CCI score was associated with 1.20 additional outpatient visits annually.

Table 1: Adjusted Multivariable Model for Healthcare Annual Utilization

Variable	Outpatient Visits β (SE)	Inpatient Visits β (SE)	ER Visits β (SE)
Independent variables – Ref: With no VMS & no depression (N=21,245)			
VMS with Depression (N=529)	4.80*** (0.50)	-0.10 (0.17)	0.25* (0.11)
VMS without Depression (N=268)	3.77*** (0.66)	0.01 (0.22)	0.16 (0.17)
Covariates			
Age (Years) – Ref: <44yrs			
Greater than 55 years (Menopause)	1.75*** (0.23)	0.34*** (0.08)	-0.04 (0.06)
44 to 55 (Peri-Menopause)	-0.75** (0.22)	0.59*** (0.09)	-0.05 (0.06)
Race – Ref: Whites			
African American	-2.28*** (0.25)	-0.10 (0.07)	-0.13* (0.05)
Others/Unknown	-2.68*** (0.27)	-0.26** (0.10)	-0.16* (0.07)
Ethnicity- Ref: Hispanic			
Non-Hispanic	2.23*** (0.23)	-0.27** (0.08)	0.18* (0.06)
Education – Ref: Bachelor degree			
High school/GED	-0.60** (0.21)	0.11 (0.07)	0.29*** (0.06)
Higher than a bachelor's degree	1.14*** (0.22)	0.25** (0.08)	0.20** (0.06)
Less than high school	-2.44*** (0.32)	0.09 (0.10)	0.22** (0.07)
Poverty level – Ref: High income (>=400% FPL)			
Low income (<200% FPL)	-1.28*** (0.24)	0.19* (0.07)	0.43*** (0.06)
Middle income (200–399% FPL)	-0.80*** (0.19)	0.18* (0.07)	0.24*** (0.05)
Marital Status – Ref: Married			
Not married/Other	0.71*** (0.17)	-0.08 (0.05)	0.23*** (0.04)
Insurance Status – Ref: Private			
Public	0.43* (0.21)	0.22** (0.06)	0.26*** (0.04)
Uninsured	-2.54*** (0.34)	-1.37*** (0.19)	-0.82*** (0.11)
Region – Ref: Midwest			
Northeast	0.65* (0.26)	-0.12 (0.08)	-0.12 (0.06)
South	0.14 (0.21)	-0.38* (0.06)	-0.17** (0.05)
West	0.44 (0.24)	-0.43*** (0.08)	-0.37*** (0.06)
Employment Status – Ref: Employed			
Unemployed	1.51*** (0.18)	0.40*** (0.06)	0.12* (0.05)
Years – Ref: 2017			
2018	0.65* (0.24)	-0.13 (0.08)	0.03 (0.06)
2019	0.25 (0.24)	-0.04 (0.08)	-0.08 (0.06)
2020	-0.07 (0.27)	-0.17* (0.09)	-0.18** (0.07)
2021	0.71* (0.28)	-0.16 (0.09)	-0.13 (0.07)
2022	0.66* (0.28)	-0.18 (0.09)	-0.12 (0.01)
Health Severity Status			
CCI Score (continuous)	1.20*** (0.04)	0.12*** (0.01)	0.10*** (0.01)

Note.SE=standard error. Significant p values: *p<0.05,**p<0.001,***p<0.0001.

Results-Contd.

Model 2: Inpatient Admissions

Compared with women with no VMS/no depression

- Women with VMS, with or without depression, had no significant difference in inpatient admissions compared with women with no VMS/no depression.
- Women over age 55 and those with greater comorbidity burden had significantly more inpatient admissions annually.

Model 3: Emergency Department Visits

Compared with women with no VMS/no depression,

- Women with VMS and depression had approximately 17% higher rates (β = 0.26, 0.18 vs. 0.21 visits).
- Women with VMS without depression did not differ significantly.
- Additionally, low-income women had 54% higher ED visit rates, and
- Publicly insured women had 30% higher ED visit rates than their respective reference groups.

Policy Implications

- Policies should support integrated menopause and mental health care, including routine depression screening and coordinated care across primary care, gynecology, and behavioral health settings.
- Expanding insurance coverage, provider training, and access to menopause-related services may improve outcomes and reduce avoidable outpatient and ED utilization.

Conclusion

- The study found women with VMS and depression experience substantially greater healthcare utilization than women without either condition, particularly for outpatient services and emergency department visits.
- The findings suggest that integrated menopause and mental health care may improve symptom management, reduce fragmented care, and decrease avoidable healthcare utilization.