Economic Impact of Vasomotor Symptoms and Depression on Healthcare Expenditures Among U.S. Women

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OBJECTIVES	Vasomotor symptoms (VMS) are common during the menopausal transition and frequently co-occur with depression, yet their independent and combined economic burden remains incompletely characterized. This study aims to assess the incremental annual healthcare cost of patients with VMS symptoms with and without depression vs. patients with no VMS nor depression.
METHODS	Medical Expenditure Panel Survey (MEPS) data from 2017 to 2022 were used in this study. Women were categorized into three groups: VMS without depression, VMS with depression, and no VMS/no depression. VMS and depression were identified using ICD-10 codes, and a MEPS self-administered questionnaire for depression. Mean annual total, outpatient, urgent care, and prescription healthcare expenditures were compared across groups. Multivariable generalized linear models with gamma distribution and log link estimated adjusted healthcare costs, controlling for sociodemographic characteristics, insurance status, and other covariates.
RESULTS	The sample included 22,042 women with no VMS or depression, 529 with VMS and depression, and 268 with VMS without depression. Women with VMS and depression had the highest annual healthcare expenditures compared with women without VMS or depression. In univariate analyses, women with VMS and

	depression had mean annual healthcare costs of approximately $9,953.93, while women with VMS without depression had costs of $9,845.61, compared with $5,919.66 among women without either condition. In multivariable analyses, women with VMS and depression had healthcare costs approximately 1.90 times higher than the reference group (β=0.64, SE=0.08, p<0.0001; $11,404 vs. $6,002). Those with VMS without depression faced costs approximately 55% higher (β = 0.44, SE = 0.10, p < 0.0001; $9,303 vs. $6,002). Outpatient costs were also significantly higher among women with VMS and depression (β=0.31, SE=0.05, p<0.0001), corresponding to approximately 36% higher outpatient costs over those with no VMS/no depression, respectively; $2,354 vs. $1,730), representing a 36% increase over those with no VMS/no depression. In women with VMS without depression, outpatient costs were also significantly increased (β = 0.32, SE = 0.07, p < 0.0001; $2,387 vs. $1730), reflecting a 38% rise compared to ref. Women with both vasomotor symptoms (VMS) and depression had prescription drug spending that was about 2.69 times higher than those without VMS or depression (β = 0.99, SE = 0.13, p < 0.0001; $3.452 vs $1,323). Women with VMS but no depression also had higher costs, approximately 2.10 times more than the reference group (β = 0.74, SE = 0.17, p < 0.0001, $2,778 vs. $1,323). Emergency department costs did not differ significantly between groups. Older age, unemployment, and higher comorbidity burden were also associated with increased healthcare costs.
CONCLUSIONS	Depression, along with vasomotor symptoms, is associated with substantial incremental healthcare expenditures, thus

	highlighting the need for comprehensive, value-based menopause care strategies that address both symptom burden and economic impact.