



Vasomotor symptoms and the impact of sleep disturbance associated with menopause among peri- and postmenopausal women in Europe

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Pauline Maki has received compensation as a member of the scientific advisory board of Astellas and Bayer. She serves as a member of the scientific advisory board and has/had equity in Estrigenix, Midi Health, and Re-spin. She has received compensation from AbbVie and Pfizer for consulting. She has received speaking fees and travel support from Mithra. All her research is supported by the National Institutes of Health.

1. University of Illinois, Chicago, IL, USA; 2. Bayer AG, Berlin, Germany; 3. Oracle Life Sciences, Austin, USA; 4. Bayer PLC, Reading, UK; 5. Bayer, Sao Paulo, Brazil; 6. Bayer, Whippany, USA

CONFLICT OF INTEREST DISCLOSURE

Commercial interest: Astellas, Bayer

What was received: Fees

For what role: Advisory board member

Commercial interest: Estrigenix, Midi Health, Re-spin

What was received: Equity

For what role: Advisory board member and has/had equity

Commercial interest: AbbVie, Pfizer

What was received: Fees

For what role: Consulting

Commercial interest: Mithra

What was received: Fees

For what role: Speaking fees and travel support



Introduction



Sleep disturbance and **vasomotor symptoms (VMS)** are among the most common and bothersome symptoms in menopausal women^{1,2}

These symptoms **frequently co-occur but can also occur independently**; only around one-third of night-time awakenings are accompanied by an episode of VMS, but over 75% of VMS are associated with an awakening³

Sleep disturbance and VMS can negatively impact a woman's mood and well-being, resulting in **reduced quality of life (QoL)**^{4,5}

This real-world study evaluated the association of sleep disturbance with QoL among peri- and postmenopausal women with and without VMS

QoL, quality of life; VMS, vasomotor symptoms.

1. DePree B, et al. *Menopause* 2023;30:70–9; 2. Nappi RE, et al. *Menopause* 2021;28:875–82; 3. Maki P, et al. *Menopause* 2024;31:724–33; 4. Utian WH. *Health Qual Life Outcomes* 2005;3:47; 5. Sarrel P, et al. *Menopause* 2015;22:260–6.



Methods



Data were analyzed from **peri- and postmenopausal women** aged 40–65 years who completed the internet-based National Health & Wellness Survey in the UK, Spain, Italy, Germany, and France in either 2017 or 2020 (the most recent years with available data from sleep-related patient-reported outcome measurements).



Women were categorized as perimenopausal if their **menstrual bleeding** ceased ≤ 12 months ago or was irregular (in frequency, duration, or flow heaviness); and postmenopausal if their menstrual bleeding ceased > 12 months ago.



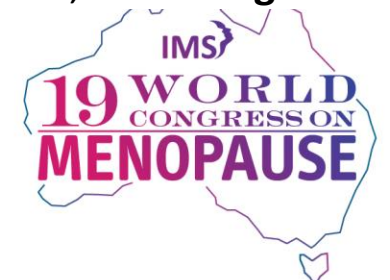
Women were then categorized by the **presence or absence of VMS**, defined as those reporting hot flashes or night sweats in the past 12 months. Subsequently, they were categorized by the **presence or absence of sleep disturbance considered to be menopause-associated**, defined based on self-reported sleep difficulties or sleep symptoms occurring at least weekly, including difficulty falling asleep, night-time awakenings, and daytime somnolence.



QoL was assessed using the **12-Item Short Form Survey v2 (SF-12v2) mental and physical component** scores and **EuroQol (EQ) Visual Analogue Scale (VAS)** on a scale of 0–100, as well as **EQ-5D-5L** on a scale of 0–1, where **higher scores meant better QoL**.



Linear regression models compared **differences in QoL measures** between women with neither VMS nor sleep disturbance and women with both or either symptom alone.



Results: Baseline demographics

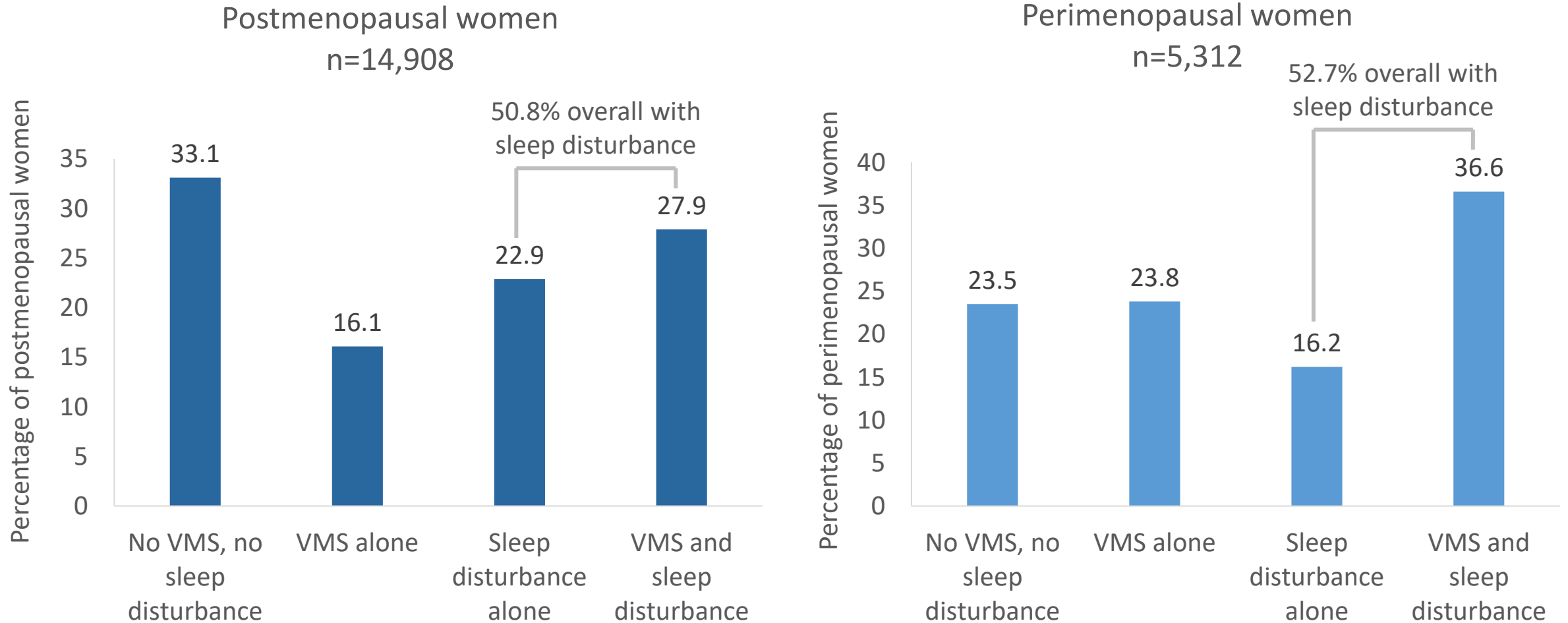
		Postmenopausal		Perimenopausal	
		n=14,908		n=5,312	
		mean	SD	mean	SD
Age, years		57.06	5.75	48.61	4.60
Body mass index, kg/m²		26.20	5.99	26.11	6.37
		n	%	n	%
Country	France	4,074	27.3%	1,314	24.7%
	Germany	3,787	25.4%	1,091	20.5%
	UK	3,600	24.1%	1,224	23.0%
	Italy	1,935	13.0%	955	18.0%
	Spain	1,512	10.1%	728	13.7%
Insurance coverage	No	1,190	8.0%	530	10.0%
	Yes	13,718	92.0%	4,782	90.0%
Smoking status	Current	4,306	28.9%	1,522	28.7%
	Former	4,198	28.2%	1,381	26.0%
	Never	6,404	43.0%	2,409	45.4%
Alcohol use	None	4,310	28.9%	1,483	27.9%
	Less than daily	9,834	66.0%	3,607	67.9%
	Daily	764	5.1%	222	4.2%

SD, standard deviation; UK, United Kingdom.



Results: Study population

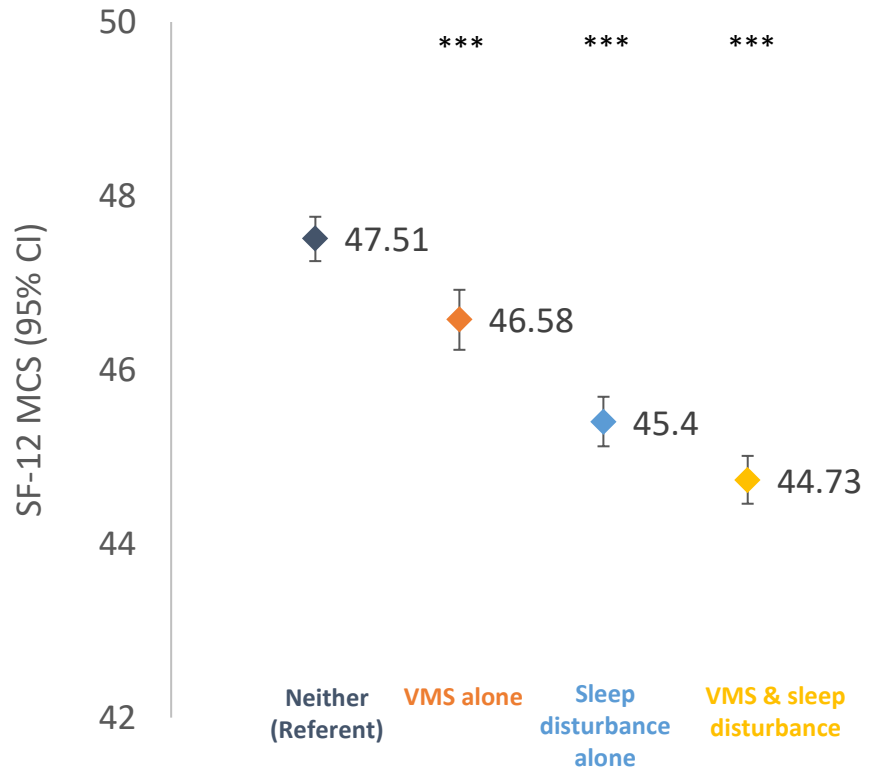
The prevalence of sleep disturbance was high overall in both peri- and postmenopausal women. It was higher in those with VMS



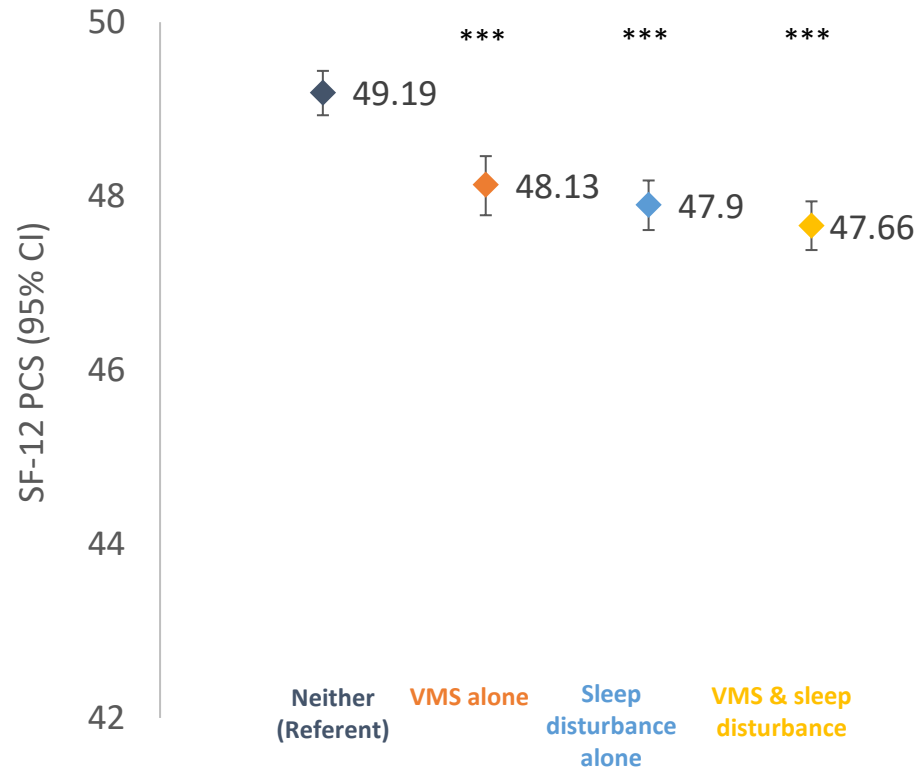
Results: QoL in postmenopausal women based on SF-12v2 mental and physical component scores

All groups with VMS and/or sleep disturbance had lower scores than those without

SF-12v2 mental component scores in postmenopausal women



SF-12v2 physical component scores in postmenopausal women



*** p<0.001
p-values represent comparisons to women with neither VMS nor sleep disturbance (referent group)

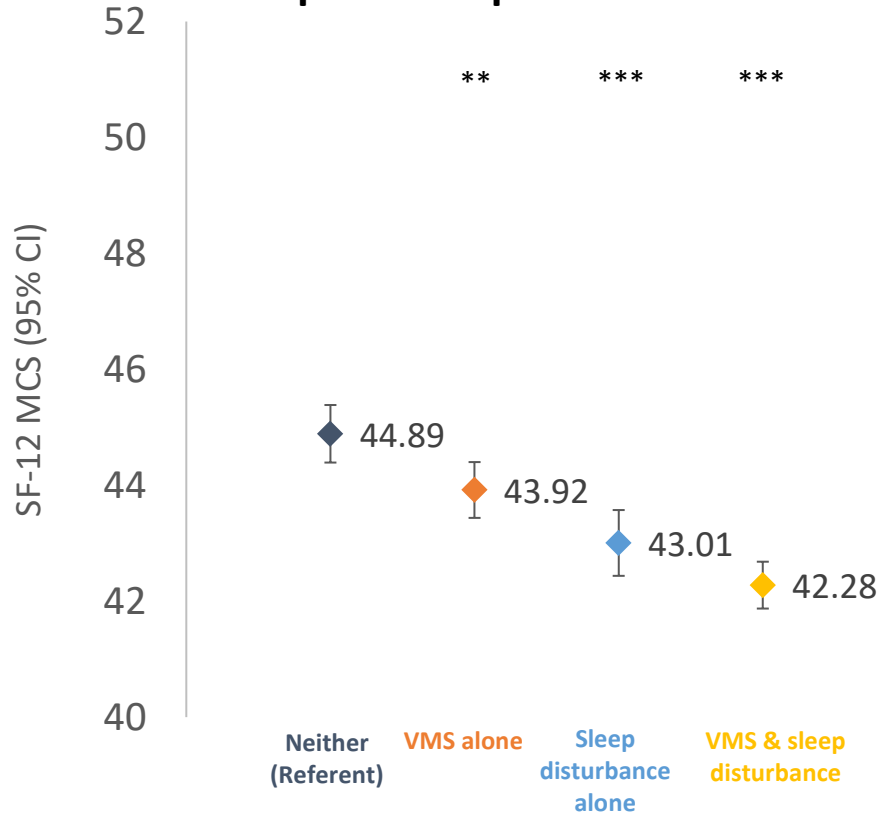
Non-overlapping confidence intervals indicate statistical significance in difference between the groups



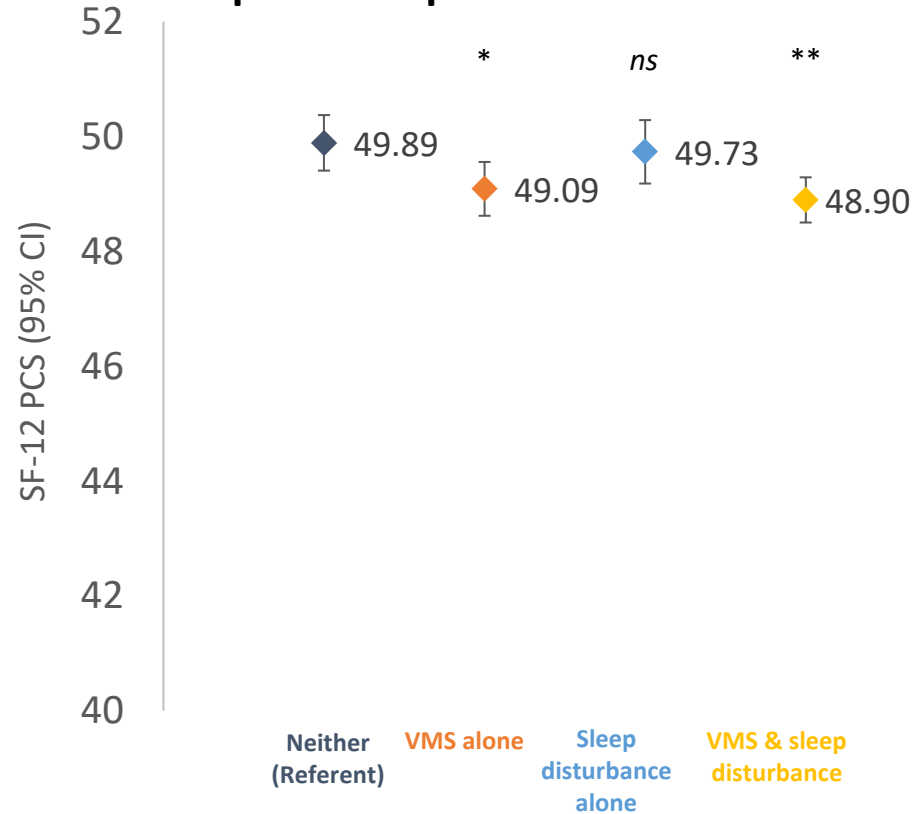
Results: QoL in perimenopausal women based on SF-12v2 mental and physical component scores

QoL scores were lower in those with VMS and sleep disturbance

SF-12v2 mental component scores in perimenopausal women

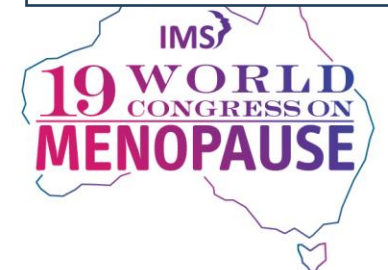


SF-12v2 physical component scores in perimenopausal women



*** p<0.001
 ** p<0.01
 * p<0.05
 p-values represent comparisons to women with neither VMS nor sleep disturbance (referent group)

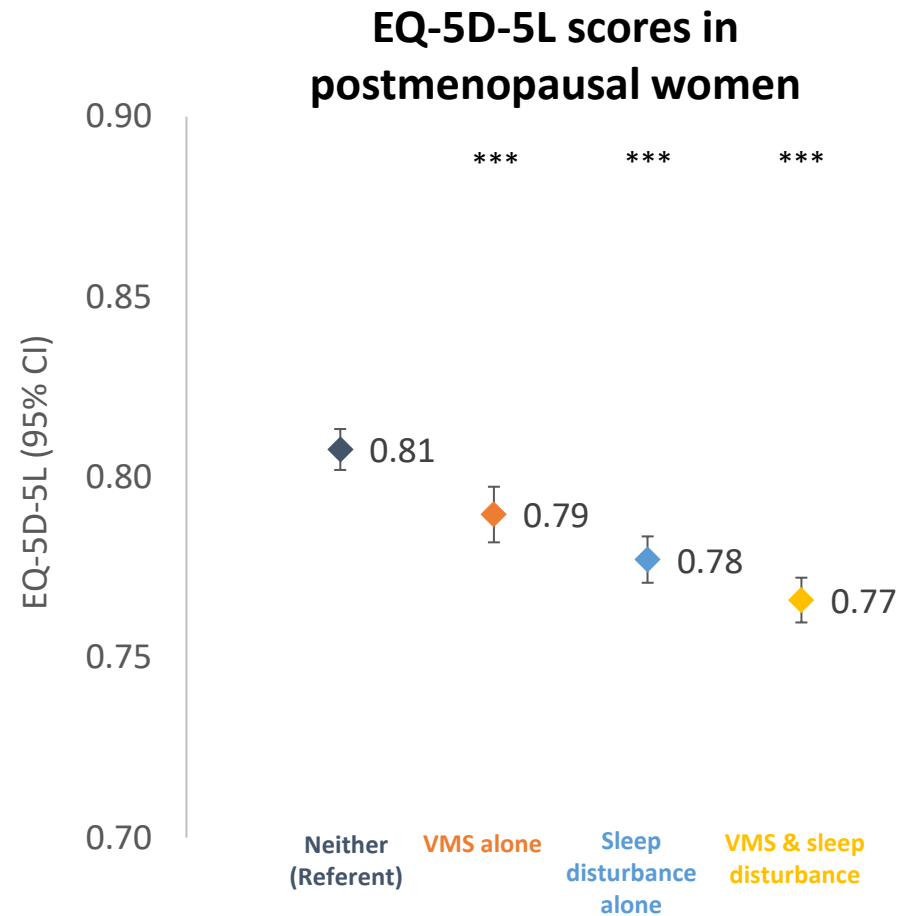
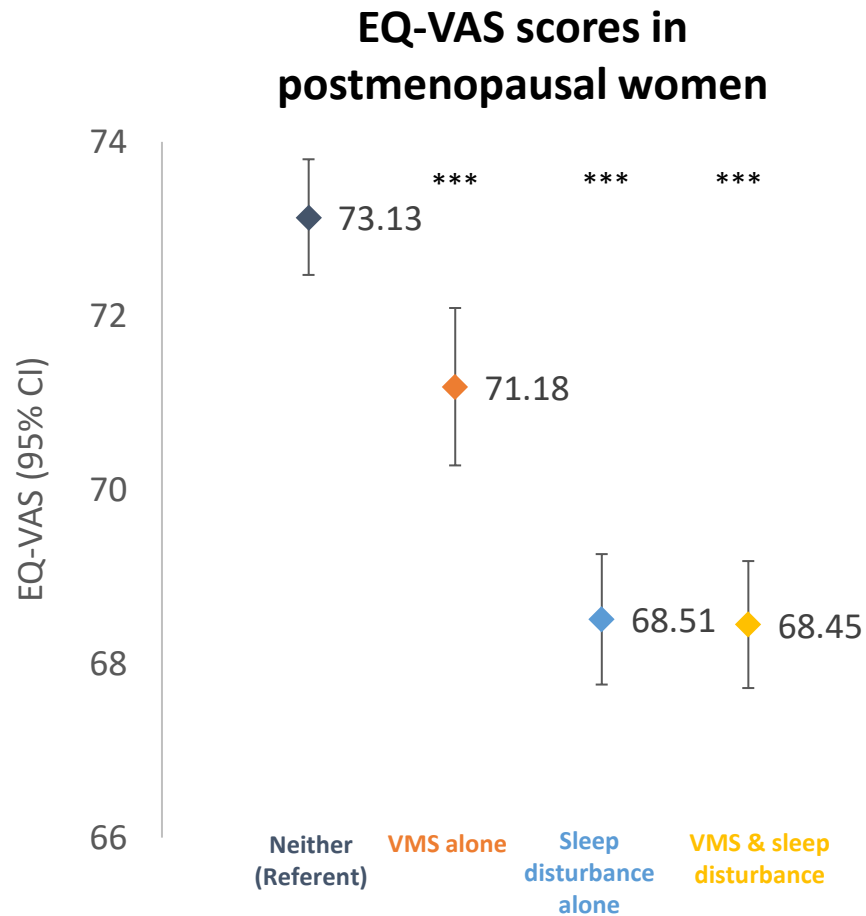
Non-overlapping confidence intervals indicate statistical significance in difference between the groups



CI, confidence interval; MCS, mental component score; ns, not significant; PCS, physical component score; QoL, quality of life; SF-12, 12-Item Short Form Survey; VMS, vasomotor symptoms.

Results: QoL in postmenopausal women based on EQ-VAS and EQ-5D-5L

All groups with VMS and/or sleep disturbance had lower scores than those without



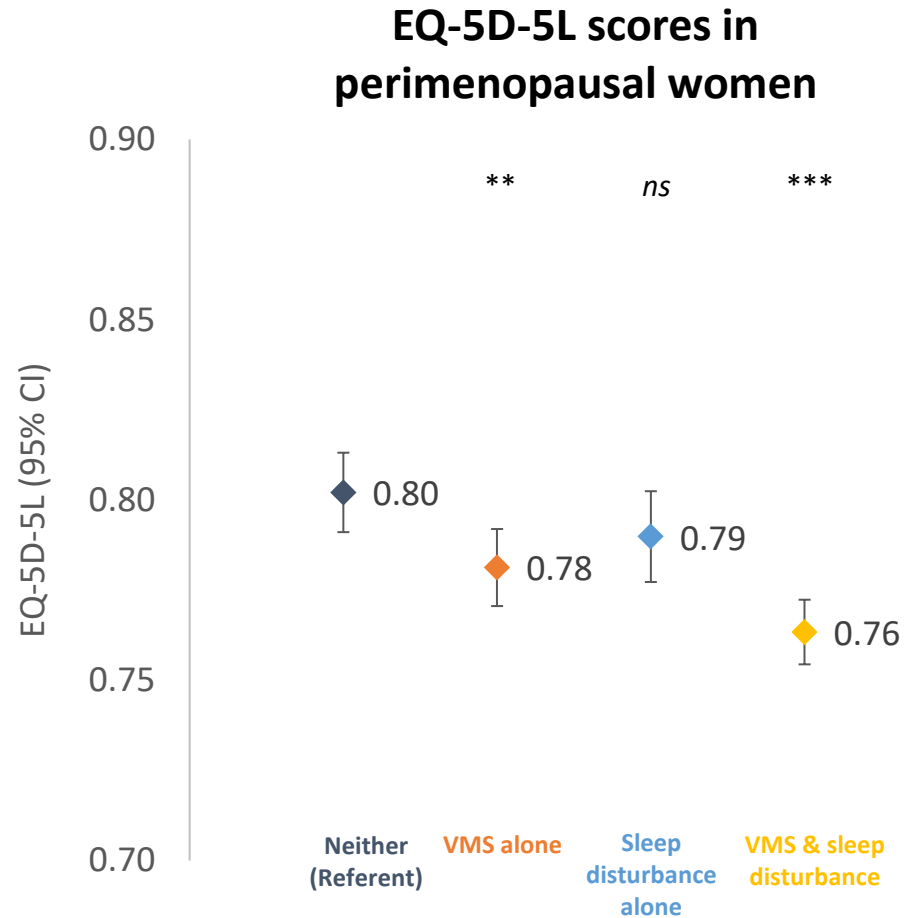
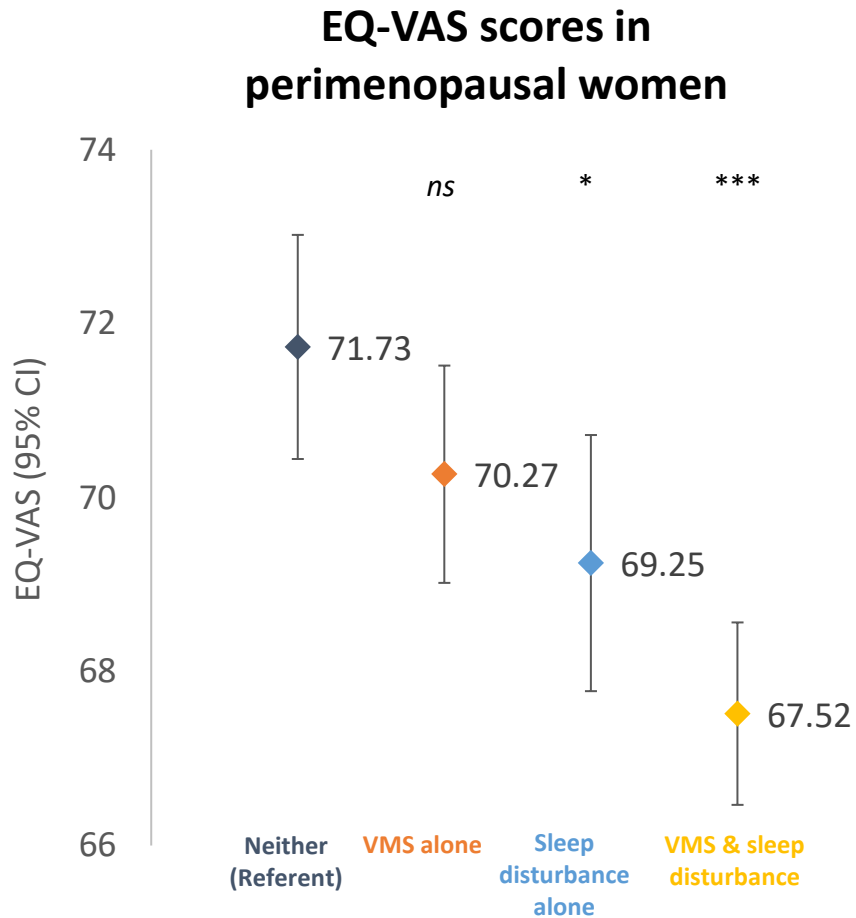
*** $p < 0.001$
 p-values represent comparisons to women with neither VMS nor sleep disturbance (referent group)

Non-overlapping confidence intervals indicate statistical significance in difference between the groups



Results: QoL in perimenopausal women based on EQ-VAS and EQ-5D-5L

QoL scores were lower in those with VMS and sleep disturbance



*** p<0.001
 ** p<0.01
 * p<0.05
 p-values represent comparisons to women with neither VMS nor sleep disturbance (referent group)

Non-overlapping confidence intervals indicate statistical significance in difference between the groups



Conclusions

The prevalence of sleep disturbance was high overall, regardless of the presence or absence of VMS.



Sleep disturbance was reported frequently by both perimenopausal and postmenopausal women, regardless of VMS status. It was **more common in women with VMS**.



Sleep disturbance and VMS were associated with lower QoL scores. This association was stronger with sleep disturbance. Sleep disturbance may be a larger driver of QoL than VMS.



Limitations of the study included its cross-sectional survey design, potential for recall bias, and lack of longitudinal data to assess associations with menopausal symptoms over time.



Sleep disturbance should be properly recognized and promptly addressed to mitigate **potential negative impacts on women's QoL** during peri- and postmenopause.