

# Associations between sleep disturbance and/or vasomotor symptoms and health-related quality of life across the menopausal transition and early postmenopause

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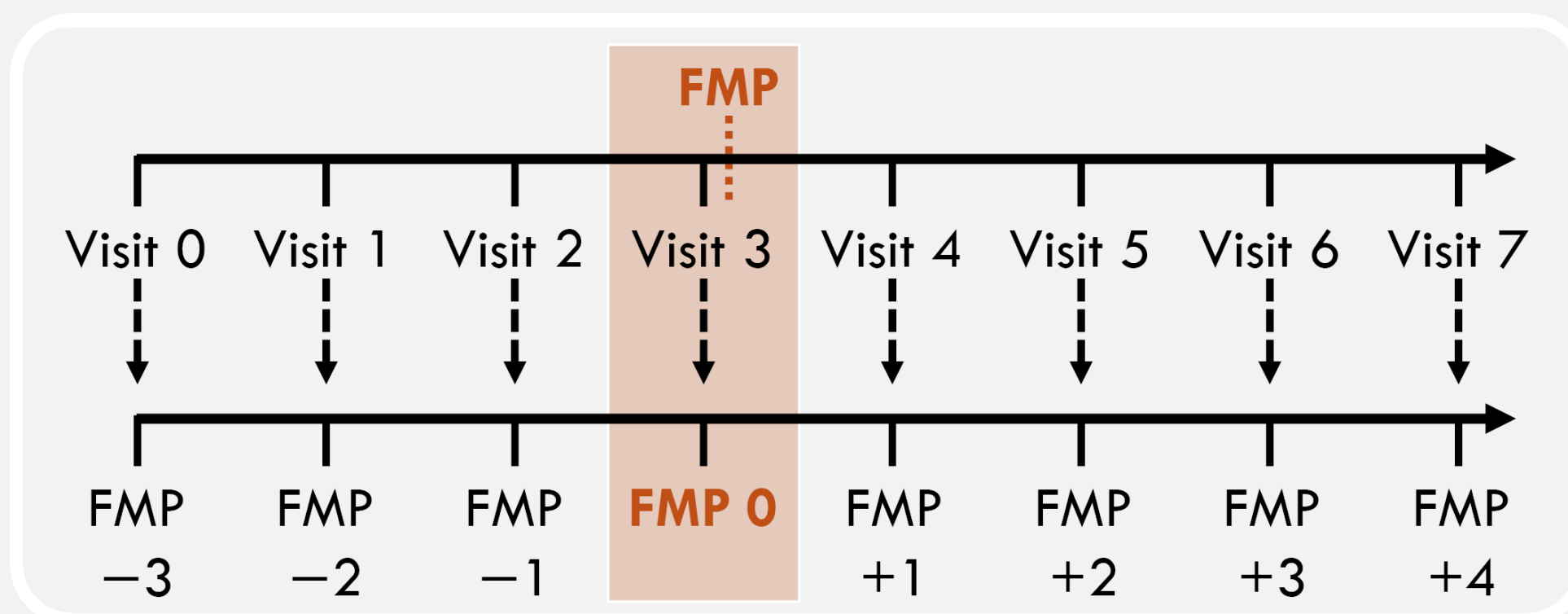
## OBJECTIVE

To determine associations between self-reported sleep disturbance and/or vasomotor symptoms (VMS), and health-related quality of life (HRQoL) in women across the menopausal transition and early postmenopause.

## METHODS

- » Data from the baseline and first publicly available 10 annual follow-up visits (1999–2008) of the Study of Women's Health Across the Nation (SWAN) nationwide US survey were used.
- » Survey responses from 2066 SWAN participants who had reached natural menopause were included.
- » The visit closest to women's final menstrual period (FMP) was reassigned as visit 0; visits 5 years on either side were re-labelled as FMP -5 to FMP +5 (Figure 1).

Figure 1. Reassignment of visit days around the FMP (example of a patient whose FMP was closest to visit 3)



FMP, final menstrual period.

### Sleep disturbance and VMS

- » Presence/absence of self-reported sleep disturbance and VMS was determined at each study visit:
  - » **Sleep disturbance:** waking up several times a night/trouble falling asleep/waking up earlier than planned on  $\geq 3$ –4 nights/week in the past 2 weeks.
  - » **VMS:** hot flashes/night sweats on  $\geq 1$ –5 days in the past 2 weeks.
- » Subsequently, at each visit, women were categorized into one of the four following groups: i) sleep disturbance only, ii) VMS only, iii) both sleep disturbance and VMS, or iv) neither symptom.

### Health-related QoL

- » HRQoL was determined from scores on three Short-Form Health Survey (SF-36) subscales at study visits:
  - » role limitations due to physical health (role-physical)
  - » role limitations due to emotional problems (role-emotional)
  - » energy/fatigue.
- » SF-36 scores range from 0–100, with higher scores equating to better HRQoL.

### Analysis

- » For each of the four symptom groups, mean scores at individual study visits on each of the three SF-36 subscales were calculated.
- » To evaluate associations between symptom groups and SF-36 HRQoL outcomes over time, mixed models for repeated measures were used, with the reference group being neither symptom. Models were adjusted for confounders and included an interaction term between symptoms and time.

## RESULTS

### Characteristics of the study cohort

- » Characteristics of participants who had reached natural menopause and included in the study cohort are shown in Table 1.

Table 1. Selected characteristics of the SWAN study cohort

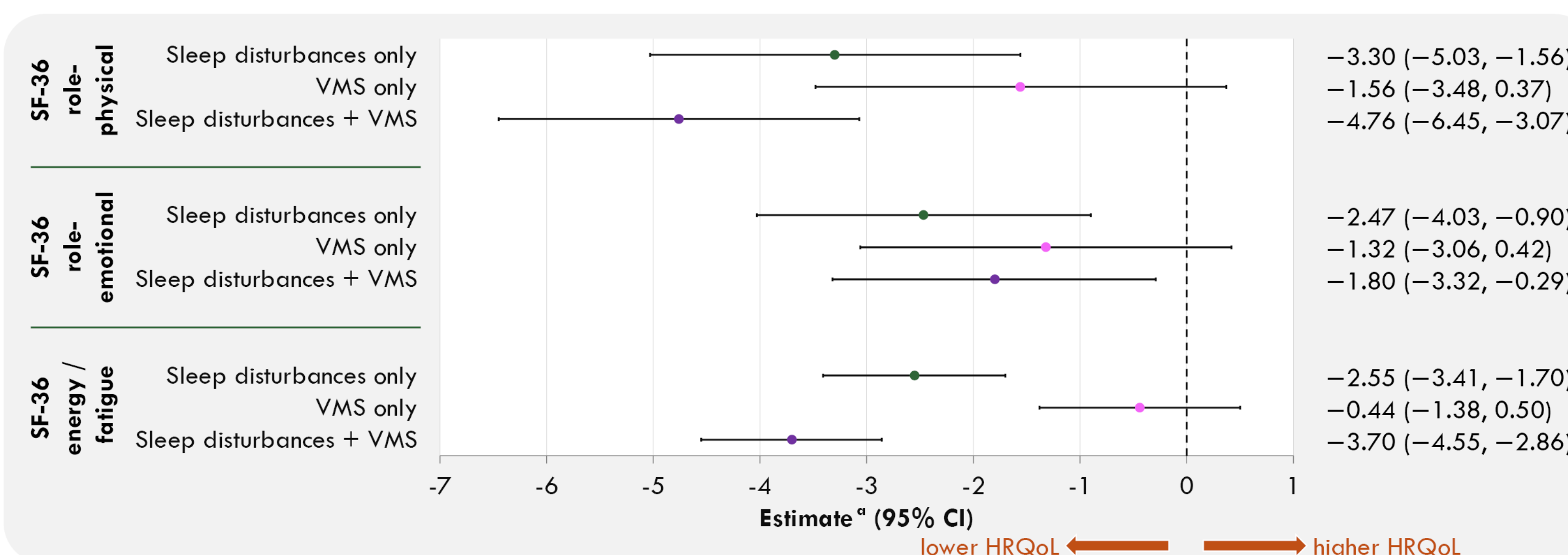
SWAN participants (N=2066)	
Mean ( $\pm$ SD) age at FMP visit, years	51.2 (2.6)
BMI <sup>a</sup> (kg/m <sup>2</sup> ), n (%)	
Underweight (<18.5)	33 (1.6)
Normal weight (18.5–24.9)	855 (41.4)
Overweight (25.0–29.9)	534 (25.9)
Obese ( $\geq 30$ )	621 (30.1)
Missing	23 (1.1)
Current smoker <sup>a</sup> , n (%)	877 (42.4)

<sup>a</sup>At the baseline visit. BMI, body mass index; FMP, final menstrual period; SD, standard deviation.

### Associations between sleep disturbance and/or VMS and HRQoL

- » For each SF-36 subscale, the presence of sleep disturbance (with/without VMS) was associated with lower HRQoL compared with having neither symptom (Figure 2).
- » For example, for role-physical, estimates (95% CIs) were:
  - » -3.30 (-5.03, -1.56) for sleep disturbance only
  - » -4.76 (-6.45, -3.07) for both symptoms.
- » For role-physical and energy/fatigue, the point estimates suggested lower HRQoL in women with both sleep disturbance and VMS than those with either symptom alone, when compared with neither symptom.
- » No interactions with time were seen in the model ( $p > 0.05$ ).

Figure 2. Difference in HRQoL scores between women with sleep disturbance and/or VMS and those with neither symptom (reference group)



<sup>a</sup>Adjusted for race, BMI, married/partner, income, employment status, college degree, score on the Center for Epidemiologic Studies Depression Scale, anxiety, smoking status, alcohol consumption, number of comorbidities, use of hormone therapy, testosterone levels, age at the FMP, and time in relation to the FMP, with an interaction term included between time and symptoms. BMI, body mass index; CI, confidence interval; FMP, final menstrual period; HRQoL, health-related quality of life; SF-36, 36-Item Short-Form Health Survey; VMS, vasomotor symptoms.

## CONCLUSIONS

Among SWAN participants, sleep disturbance was independently associated with lower HRQoL relating to role-physical, role-emotional, and energy/fatigue, with no change in these associations over time.

Our data also suggest that these associations might be stronger for role limitations due to physical health and energy/fatigue, when sleep disturbance co-occurred with VMS.

These results indicate a need for effective treatments to manage sleep disturbance and VMS in women transitioning to menopause to potentially help improve their HRQoL.

## ACKNOWLEDGEMENTS

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## DISCLOSURES

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