

Sleep and Sleep Disorders in the Menopausal Transition



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KEYWORDS

- Menopause • Climacteric • Subjective sleep quality • Sleep architecture • Polysomnography
- Vasomotor symptoms • Depressive symptoms

KEY POINTS

- There is an increase in self-reported sleep disturbance, particularly nocturnal awakenings, across the menopausal transition. Symptoms are bothersome and impact quality of life, health, and productivity.
- Vasomotor symptoms (both self-reported and measured hot flashes and sweating) are critical symptoms associated with disrupted sleep in the menopausal transition.
- Associations between menopausal stage and/or hormone levels and polysomnographic measures are less consistent, and further longitudinal studies are required.
- Sleep disturbances may arise during the menopausal transition in association with primary sleep disorders (eg, sleep-disordered breathing). Women with sleep complaints should be evaluated and appropriately treated.
- Effective management strategies for menopausal sleep disturbances include hormone therapy, other pharmacologic treatments (eg, gabapentin), and cognitive behavioral therapy for insomnia.

INTRODUCTION

Sleep disturbances increase in prevalence during the menopausal transition, with the most common complaint being nighttime awakenings.^{1,2} Sleep disturbances impact health-related quality of life, work productivity, and health care utilization³ and can have long-term effects on health and well-being across several years of the menopausal transition. Here, the authors aim to provide an overview of

sleep disturbances in the context of the menopausal transition, considering self-reported and objectively measured indicators of sleep. The authors also consider factors that could mediate sleep disturbance, including female sex steroids, vasomotor symptoms (eg, hot flashes and sweating), aging, and stressful life events. Finally, they provide an overview of potential treatment options and their efficacy and highlight the need for further research. Understanding the causes as well as effective

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preventative and treatment strategies for menopausal sleep disturbances is essential for better health, quality of life, and work ability.

DEFINITION AND PHYSIOLOGY OF MENOPAUSE

Menopause (defined as the time of the final menstrual period) is a natural process in normal female aging, resulting from depletion of ovarian follicles, and occurs at a median age of 51 years,⁴ with the menopausal transition usually starting at about 47 years of age.⁵ The Stages of Reproductive Aging Workshop (STRAW +10) standardizes the division of a woman's late reproductive life, broadly grouping women into 3 categories (reproductive, menopausal transition, and postmenopause) further subdivided according to menstrual cycle length and regularity.⁶ Perimenopause encompasses the menopausal transition and the first year after the final menstrual period. The term *climacteric* may also be used to describe perimenopause and the part of the postmenopausal period in which climacteric symptoms occur.

Ovarian function begins to deteriorate, and function of the hypothalamic-pituitary-ovarian axis begins to change several years before menopause. These endocrinologic changes typically occur gradually and are not linear. Levels of follicle-stimulating hormone (FSH) increase overall and are typically 25 IU/L or greater in the late menopausal transition. In association with the fluctuation and gradual decline in estrogen (typically estradiol [E2]) across the menopausal transition, menopausal symptoms emerge and include vasomotor symptoms (hot flashes and sweating), sleep disturbances, and mood symptoms (Table 1).

Table 1
Typical menopausal symptoms and their prevalence in midlife women

Symptom	Prevalence (%)
Hot flashes and/or night sweats	36–87
Sleep problems	40–60
Mood symptoms	15–78
Weight gain	60–70
Muscle and/or joint pain	48–72
Palpitation	44–50
Headache	32–71
Memory impairment	41–44
Genitourinary symptoms	25–30
Sexual dysfunction	20–30

Data from Refs.^{7,28,41,141–145}

SLEEP QUALITY DURING THE MENOPAUSAL TRANSITION

Self-Reported Sleep Quality

Among menopausal symptoms, sleep disturbances are one of the most bothersome symptoms and are reported by 40% to 60% of menopausal women.⁷ There is convincing evidence from several cross-sectional^{8–12} and longitudinal^{13–16} studies that the prevalence of perceived sleep disturbances increases in the menopausal transition, even after controlling for age. A recent meta-analysis of cross-sectional data from 24 studies reported higher odds of experiencing sleep disturbance in perimenopause (1.60), postmenopause (1.67), and surgical menopause (2.17) relative to women who are premenopausal.¹⁷

The most common sleep-related complaint is nighttime awakenings.^{8,11,14,16} In their 7-year follow-up of 3045 women, the Study of Women's Health Across the Nation (SWAN) reported an increase in odds ratios (ORs) for difficulty staying asleep across the menopausal transition after adjusting for demographics and health-related factors.¹⁴ ORs also increased for difficulty falling asleep across the transition but decreased for early morning awakening from late perimenopause to postmenopause. Although most studies examined associations between sleep and menopausal stages based on bleeding patterns, some studies have investigated the association between FSH concentrations and self-reported sleep.^{14,16} Increasing FSH was associated with greater odds of waking up several times, whereas decreasing estrogen was associated with higher odds of difficulty falling and staying asleep in SWAN.¹⁴

Polysomnographic Studies

Even though the evidence for declining self-reported sleep quality across the menopausal transition is strong, polysomnographic (PSG) studies have generally not found a corresponding negative change in sleep architecture. PSG-derived measures of sleep do not necessarily reflect self-report sleep quality ratings,¹⁸ and the psychological state may influence sleep quality judgments by affecting the sleep appraisal process rather than sleep itself.¹⁹ Also, most PSG studies have been cross-sectional and included small samples, with few exceptions.^{12,20} Further, studies have varied in methodology, including definitions of menopausal stages, age ranges, assessment of the presence of sleep disorders like obstructive sleep apnea, and inclusion of an adaptation

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