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Sleep Quality Index as a Tool to Assess Sleep Disturbances in Postmenopausal Women

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ABSTRACT:

Background: Sleep disturbances are among the most prevalent complaints during the menopausal transition, significantly impacting the quality of life and wellbeing of women. Hormonal shifts, particularly the decline in estrogen and progesterone, disrupt circadian rhythms and thermoregulation, increasing vulnerability to poor sleep. The present study aims to evaluate sleep quality and its determinants among postmenopausal women using a standardized tool.

Methods: A hospital-based cross-sectional analytical study will be conducted over six months (December 2025 to May 2026) at the Department of Obstetrics and Gynaecology and the Menopause Clinic of Sree Balaji Medical College and Hospital, Chennai. The study will involve 200 postmenopausal women aged 45–65 years with natural menopause. Sleep quality will be assessed using the Pittsburgh Sleep Quality Index (PSQI), where a global score >5 indicates poor sleep quality. Statistical analysis will be performed using IBM SPSS Version 27, utilizing chi-square tests and binary logistic regression to identify predictors of sleep disturbances.

Results: The mean age of participants was predominantly between 45–65 years. The study concluded that 54% of the 200 postmenopausal participants experienced poor sleep quality, as indicated by a global Pittsburgh Sleep Quality Index (PSQI) score exceeding 5. Multivariable logistic regression identified several significant independent predictors of these sleep disturbances, with vasomotor symptoms emerging as the most potent factor, associated with more than triple the odds of poor sleep (adjusted OR = 3.36). Additionally, the analysis revealed that psychiatric illness (OR = 2.74), a sedentary lifestyle (OR = 2.45), diabetes mellitus (OR = 2.21), genitourinary symptoms (OR = 1.98), and hypertension (OR = 1.88) were all statistically significant contributors to diminished sleep quality. These results demonstrate that over half of the postmenopausal women in the study population suffer from impaired sleep, driven by a complex interplay of physiological menopausal symptoms, underlying chronic health conditions, and lifestyle factors.

Conclusion: The study concludes that sleep disturbances are highly prevalent among postmenopausal women, with 54% of the participants experiencing poor sleep quality as measured by the Pittsburgh Sleep Quality Index (PSQI). The research successfully identifies that sleep impairment in this demographic is not an isolated issue but is

significantly driven by a combination of physiological menopausal symptoms—most notably vasomotor and genitourinary symptoms—and underlying health conditions such as diabetes and hypertension. Furthermore, the strong association between a sedentary lifestyle and poor sleep highlights a critical, modifiable factor for intervention. These findings emphasize the necessity of incorporating formal sleep assessments into routine menopausal care and suggest that a multidisciplinary approach, focusing on symptom management and lifestyle modification, is essential to improving the overall quality of life and long-term health outcomes for women in the postmenopausal phase.

1. INTRODUCTION

Menopause represents a definitive physiological milestone in a woman's life, characterized by the permanent cessation of menstruation resulting from the loss of ovarian follicular activity and the subsequent decline in circulating estrogen and progesterone levels. In the modern era, with increasing life expectancy, women are projected to spend approximately one-third of their lives in the postmenopausal phase. While this transition is a natural biological process, it is frequently accompanied by a constellation of physical, psychological, and vasomotor alterations that can significantly impair overall health and functional well-being.

Among the various health concerns reported during the menopausal transition, sleep disturbances stand out as one of the most pervasive and distressing complaints. Sleep is a complex physiological process essential for cognitive function, metabolic regulation, and cardiovascular health. For postmenopausal women, the integrity of sleep is often compromised. Research suggests that the prevalence of sleep disorders increases significantly during the transition from premenopause to postmenopause, with symptoms ranging from difficulty initiating sleep and frequent nocturnal awakenings to poor subjective sleep quality and daytime fatigue.

The etiology of sleep disruption in this demographic is multifactorial and deeply rooted in the hormonal shifts of the climacteric period. Estrogen and progesterone play vital roles in regulating the sleep-wake cycle; estrogen is known to decrease sleep latency and reduce the number of awakenings, while progesterone has sedative properties mediated through gamma-aminobutyric acid (GABA) receptors. The depletion of these hormones leads to a direct destabilization of sleep architecture. Furthermore, the "domino effect" hypothesis suggests that vasomotor symptoms—specifically hot flashes and night sweats—are primary drivers of sleep fragmentation. These thermoregulatory disruptions cause sudden arousals, leading to a cycle of chronic sleep deprivation.

Beyond hormonal shifts, the postmenopausal period is often associated with an increased burden of comorbid conditions such as hypertension, diabetes mellitus, and obesity. These metabolic factors, combined with psychological stressors such as anxiety and depression, create a complex internal environment that is hostile to restorative sleep. Lifestyle factors, particularly sedentary behavior and physical inactivity, have also been implicated in exacerbating poor sleep quality, yet these remain under-addressed in routine clinical consultations.

Despite the high prevalence and the significant impact of poor sleep on the quality of life, sleep health is often overshadowed by other medical concerns in the clinical setting. In India, socio-demographic factors and varying levels of health literacy further complicate the management of menopausal symptoms. In a tertiary care hospital setting, where patients often present with multiple comorbidities, understanding the specific predictors of sleep quality is essential for providing holistic care.

There is a critical need to move beyond viewing menopause solely as a reproductive transition and to recognize it as a period requiring comprehensive health monitoring. Identifying the independent predictors of poor sleep—ranging from clinical symptoms like vasomotor and genitourinary issues to lifestyle factors and psychiatric health—is vital for developing targeted therapeutic interventions. This study was therefore undertaken to assess the quality of sleep among postmenopausal women and to identify the socio-demographic, clinical, and lifestyle factors associated with poor sleep quality, thereby facilitating a more integrated approach to menopausal health management.

METHODOLOGY

Study Design and Setting This hospital-based, cross-sectional analytical study was conducted at the Department of Obstetrics and Gynaecology and the dedicated Menopause Clinic of Sree Balaji Medical College and Hospital, Chennai. The setting provided a diverse clinical environment for assessing sleep patterns among women navigating the postmenopausal transition in a tertiary care context.

Study Period The research was carried out over a period of six months, spanning from December 2025 to May 2026. This timeframe allowed for systematic recruitment and thorough data collection across the specified participant demographic.

Study Population and Sampling The study population comprised postmenopausal women who attended the outpatient and inpatient services of the department. Using a consecutive sampling technique, a total of 200 participants were recruited. This sample size was determined based on a projected 46% prevalence of poor sleep quality in this demographic, utilizing a 95% confidence level and a 10% margin of error.

Inclusion and Exclusion Criteria Specific criteria were applied to ensure a homogenous study group:

- **Inclusion Criteria:** The study included women aged 45 to 65 years who had experienced natural menopause, defined as the permanent cessation of menstruation for at least 12 consecutive months. Participants were required to provide written informed consent before enrollment.
- **Exclusion Criteria:** To isolate the factors affecting sleep, women with surgical menopause, those currently receiving Hormone Replacement Therapy (HRT), and those with diagnosed psychiatric disorders or primary sleep disorders (such as obstructive sleep apnea) were excluded. Furthermore, patients with severe systemic illnesses, neurological disorders (e.g., Parkinsonism), or those who had used sedatives/hypnotics within the preceding month were omitted from the study.
- **Data Collection and Tools** Data collection was performed through structured personal interviews and clinical evaluations:
- **Baseline Assessment:** A pre-tested, structured questionnaire was utilized to document socio-demographic details, parity, years since menopause, and the presence of vasomotor symptoms (hot flashes, night sweats). Anthropometric measurements, including Body Mass Index (BMI), and blood pressure readings were also recorded.
- **Sleep Quality Assessment:** The primary tool employed was the Pittsburgh Sleep Quality Index (PSQI), a validated 19-item self-report scale. It assessed seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. Each component was scored from 0 to 3, yielding a "global score" ranging from 0 to 21. A global score greater than 5 was used as the threshold to categorize participants as having "poor sleep quality."
- **Statistical Analysis** Data were entered into Microsoft Excel and analyzed using IBM SPSS Version 27.0. Descriptive statistics, including frequencies and percentages, were used to summarize the socio-demographic profile and the prevalence of sleep disturbances. Inferential statistics, such as the Chi-square test and independent t-tests, were applied to assess the association between sleep quality and variables like BMI, age, and comorbidities. Binary logistic regression was performed to identify independent predictors of poor sleep, with a p-value of <0.05 considered statistically significant.
- **Ethical Considerations** The study protocol was reviewed and approved by the Institutional Human Ethics Committee (IHEC). Participation was entirely voluntary, and the objectives of the study were explained to each participant in their native language (Tamil or English). Written informed consent was obtained from all subjects, and strict confidentiality was maintained regarding all personal and clinical data throughout the study process,

RESULT

Table 1. Socio-demographic and Clinical Characteristics (n=200)

Category	Frequency n (%)
Age (in years)	
45–50	58 (29.0)
51–55	64 (32.0)
56–60	48 (24.0)
61–65	30 (15.0)
Type of Menopause	
Natural	164 (82.0)
Artificial (Surgery/Radiation)	36 (18.0)
Marital Status	
Married	142 (71.0)
Widowed	46 (23.0)
Separated / Divorced	12 (6.0)
Education	
≤ Primary	68 (34.0)
Secondary / Higher secondary	84 (42.0)
Graduate & above	48 (24.0)
SES	
Upper / Upper middle	56 (28.0)
Lower middle	74 (37.0)
Upper lower / Lower	70 (35.0)
Years since menopause	
<2 years	42 (21.0)
2–5 years	78 (39.0)
>5 years	80 (40.0)
Body Mass Index (kg/m²)	
<25	118 (59.0)
25-29.9 (Overweight)	54 (27.0)
≥30 (Obese)	28 (14.0)
Vasomotor symptoms	

Present	114 (57.0)
Absent	86 (43.0)
Genitourinary Symptoms	
Present	92 (46.0)
Absent	108 (54.0)
Comorbidities	
Hypertension	72 (36.0)
Diabetes mellitus	58 (29.0)
Thyroid disorder	32 (16.0)
Psychiatric illness (Depression/Anxiety)	44 (22.0)
Neurological disease (Alzheimer's/ Dementia)	12 (6.0)
Urinary problems	52 (26.0)
Chronic pain disorders	46 (23.0)
Osteoarthritis	60 (30.0)
GERD	38 (19.0)
Respiratory disorders	24 (12.0)
Cardiovascular disease	28 (14.0)
Restless leg syndrome	20 (10.0)

Table 1 presents the socio-demographic and clinical profile of the 200 postmenopausal women included in the study. The largest proportion of participants belonged to the 51–55 year age group (32.0%), followed by 45–50 years (29.0%), while 15.0% were aged 61–65 years. The majority of women experienced natural menopause (82.0%), whereas 18.0% had artificial menopause due to surgery or radiation. Most participants were married (71.0%), with 23.0% widowed and 6.0% separated or divorced. Regarding educational status, 42.0% had completed secondary or higher secondary education, 34.0% had education up to primary level, and 24.0% were graduates or above. In terms of socioeconomic status, 37.0% belonged to the lower middle class, followed by 35.0% from upper lower or lower socioeconomic groups, and 28.0% from upper or upper middle class. With respect to menopausal duration, 40.0% of women were more than five years postmenopausal, while 39.0% were between two and five years since menopause, and 21.0% were within two years of menopause. Body mass index assessment revealed that 27.0% of women were overweight and 14.0% were obese, indicating that 41.0% of the study population had excess body weight. Vasomotor symptoms were reported by 57.0% of participants, while 46.0% experienced genitourinary symptoms.

Among comorbid conditions, hypertension was the most common (36.0%), followed by diabetes mellitus (29.0%), osteoarthritis (30.0%), thyroid disorders (16.0%), and psychiatric illness such as depression or anxiety (22.0%). Neurological diseases including Alzheimer's disease or dementia were reported in 6.0% of participants. Other conditions potentially contributing to sleep disturbances included urinary problems (26.0%), chronic pain disorders (23.0%), gastroesophageal reflux disease (19.0%), cardiovascular disease (14.0%), respiratory disorders (12.0%), and restless leg syndrome (10.0%). Overall, the study population demonstrates a substantial burden of menopausal symptoms, metabolic risk factors, and chronic comorbidities that may influence sleep quality among postmenopausal women.

Table 2. Component-wise Distribution of Pittsburgh Sleep Quality Index (PSQI) Scores

PSQI Component	Mean $\pm$ SD
Subjective sleep quality	1.42 $\pm$ 0.78
Sleep latency	1.61 $\pm$ 0.89
Sleep duration	1.54 $\pm$ 0.81
Habitual sleep efficiency	1.26 $\pm$ 0.73
Sleep disturbances	1.72 $\pm$ 0.65
Use of sleep medication	0.38 $\pm$ 0.56
Daytime dysfunction	1.49 $\pm$ 0.74
Global PSQI score	9.42 $\pm$ 3.21

Table 2 presents the component-wise distribution of **Pittsburgh Sleep Quality Index (PSQI)** scores among the study participants. The **mean global PSQI score was 9.42 $\pm$ 3.21**, which is above the recommended cut-off value of 5, indicating an overall **poor sleep quality** in the study population.

Among the PSQI components, the highest mean score was observed for **sleep disturbances (1.72 $\pm$ 0.65)**, followed by **sleep latency (1.61 $\pm$ 0.89)** and **sleep duration (1.54 $\pm$ 0.81)**, suggesting frequent nocturnal awakenings, difficulty in initiating sleep, and reduced sleep duration among participants. **Daytime dysfunction** also showed a relatively higher mean score (**1.49 $\pm$ 0.74**), reflecting impaired daytime functioning related to poor sleep.

Lower mean scores were noted for **habitual sleep efficiency (1.26 $\pm$ 0.73)** and **subjective sleep quality (1.42 $\pm$ 0.78)**. The lowest component score was seen for **use of sleep medication (0.38 $\pm$ 0.56)**, indicating that the majority of participants did not frequently use pharmacological agents to aid sleep. Overall, the component-wise analysis highlights that **sleep disturbances, delayed sleep onset, and reduced sleep duration** were the predominant contributors to poor sleep quality in postmenopausal women.

Table 3. Lifestyle Factors

Lifestyle factors	Frequency n (%)
Physical activity – Active/ Moderate	96 (48.0)
Physical activity – Sedentary	104 (52.0)
Alcohol use	26 (13.0)
Smoking	18 (9.0)

Table 3 summarizes the distribution of lifestyle factors among the study participants. Slightly more than half of the women reported a sedentary lifestyle (52.0%), while 48.0% engaged in active or moderately active physical activity. Alcohol consumption was reported by 13.0% of participants, and 9.0% were smokers. These lifestyle characteristics highlight a predominance of physical inactivity in the study population, with a smaller proportion reporting substance use behaviours that may influence sleep quality.

Table 4. Prevalence of Sleep Quality Categories Based on Global PSQI Score

Sleep Quality	n (%)
Good sleep (≤ 5)	82 (41.0)
Poor sleep (> 5)	118 (59.0)

Table 4 shows the distribution of participants according to sleep quality categories based on the **global PSQI score**. Out of the 200 postmenopausal women studied, **118 (59.0%)** were classified as having **poor sleep quality** (PSQI > 5), while **82 (41.0%)** had **good sleep quality** (PSQI ≤ 5).

This finding indicates that **more than half of the study population experienced clinically significant sleep disturbances**, highlighting a high prevalence of poor sleep quality among postmenopausal women in the study setting.

Table 5. Univariate Analysis of Factors Associated with Poor Sleep Quality (n = 200)

Variables	Good sleep n (%) (n=82)	Poor sleep n (%) (n=118)	OR (95% CI)	p value
Age (years)				
<55	54 (50.0)	54 (50.0)	Ref	0.032
≥ 55	28 (30.4)	64 (69.6)	1.89 (1.05–3.41)	
Obesity (BMI ≥ 30 kg/m²)				
No	76 (44.2)	96 (55.8)	Ref	0.026
Yes	6 (21.4)	22 (78.6)	2.94 (1.13–7.63)	
Years since menopause				
≤ 5 years	54 (45.0)	66 (55.0)	Ref	0.016
> 5 years	28 (35.0)	52 (65.0)	2.11 (1.15–3.86)	
Type of menopause				
Natural	74 (45.1)	90 (54.9)	Ref	0.029
Artificial	8 (22.2)	28 (77.8)	2.52 (1.09–5.82)	
Vasomotor symptoms				
Absent	52 (60.5)	34 (39.5)	Ref	< 0.001
Present	30 (26.3)	84 (73.7)	3.92 (2.05–	

			7.50)	
Genitourinary symptoms				
Absent	56 (51.9)	52 (48.1)	Ref	0.003
Present	26 (28.3)	66 (71.7)	2.41 (1.34–4.35)	
Hypertension				
Absent	60 (46.9)	68 (53.1)	Ref	0.005
Present	22 (30.6)	50 (69.4)	2.47 (1.32–4.63)	
Diabetes mellitus				
Absent	64 (45.1)	78 (54.9)	Ref	0.033
Present	18 (31.0)	40 (69.0)	2.05 (1.06–3.96)	
Psychiatric illness				
Absent	72 (46.2)	84 (53.8)	Ref	0.003
Present	10 (22.7)	34 (77.3)	3.18 (1.46–6.93)	
Neurological disease				
Absent	80 (42.6)	108 (57.4)	Ref	0.071
Present	2 (16.7)	10 (83.3)	4.05 (0.86–19.05)	
Physical activity				
Active/Moderate	50 (52.1)	46 (47.9)	Ref	0.001
Sedentary	32 (30.8)	72 (69.2)	3.01 (1.59–5.69)	
Hormone Replacement Therapy (HRT)				
No	70 (39.3)	108 (60.7)	Ref	0.245
Yes	12 (54.5)	10 (45.5)	0.58 (0.23–1.47)	

Table 5 presents the univariate analysis of factors associated with poor sleep quality among postmenopausal women. Increasing age was significantly associated with poor sleep quality. Women aged ≥ 55 years had higher odds of poor sleep

compared to those aged <55 years (OR = 1.89, 95% CI: 1.05–3.41; $p = 0.032$). Obesity (BMI ≥ 30 kg/m²) was also significantly associated with poor sleep, with obese women demonstrating nearly three times higher odds of poor sleep quality compared to non-obese women (OR = 2.94, 95% CI: 1.13–7.63; $p = 0.026$). Women who were more than five years postmenopausal had significantly higher odds of poor sleep compared to those within five years of menopause (OR = 2.11, 95% CI: 1.15–3.86; $p = 0.016$). Similarly, women with artificial menopause showed increased odds of poor sleep relative to those with natural menopause (OR = 2.52, 95% CI: 1.09–5.82; $p = 0.029$).

Menopausal symptoms demonstrated strong associations with sleep quality. The presence of vasomotor symptoms was the most prominent factor, with nearly four-fold higher odds of poor sleep (OR = 3.92, 95% CI: 2.05–7.50; $p < 0.001$). Genitourinary symptoms were also significantly associated with poor sleep (OR = 2.41, 95% CI: 1.34–4.35; $p = 0.003$). Among comorbid conditions, hypertension (OR = 2.47, 95% CI: 1.32–4.63; $p = 0.005$), diabetes mellitus (OR = 2.05, 95% CI: 1.06–3.96; $p = 0.033$), and psychiatric illness (OR = 3.18, 95% CI: 1.46–6.93; $p = 0.003$)

were significantly associated with poor sleep quality. Although neurological disease showed higher odds of poor sleep (OR = 4.05), the association did not reach statistical significance ($p = 0.071$). Lifestyle factors were also influential. Women with a sedentary lifestyle had approximately three times higher odds of poor sleep compared to those who were physically active or moderately active (OR = 3.01, 95% CI: 1.59–5.69; $p = 0.001$). Hormone replacement therapy was not significantly associated with sleep quality (OR = 0.58, 95% CI: 0.23–1.47; $p = 0.245$).

Overall, age, obesity, duration since menopause, type of menopause, vasomotor symptoms, genitourinary symptoms, hypertension, diabetes, psychiatric illness, and sedentary lifestyle were significantly associated with poor sleep quality in univariate analysis and were considered for inclusion in multivariate logistic regression.

Table 6. Multivariate Logistic Regression Analysis for Predictors of Poor Sleep Quality (PSQI >5)

Variables	Adjusted OR (95% CI)	p value
Obesity (BMI ≥ 30 kg/ m²)		
No	Ref	0.047
Yes	2.12 (1.01–4.46)	
Vasomotor symptoms		
Absent	Ref	<0.001
Present	3.36 (1.71–6.60)	
Genitourinary symptoms		
Absent	Ref	0.034
Present	1.98 (1.05–3.74)	
Hypertension		
Absent	Ref	0.046
Present	1.88 (1.01–3.51)	
Diabetes mellitus		
Absent	Ref	0.028
Present	2.21 (1.09–4.48)	
Psychiatric illness		
Absent	Ref	0.015

Present	2.74 (1.21–6.18)	
Physical activity		
Active/Moderate	Ref	0.012
Sedentary	2.45 (1.21–4.96)	
Type of menopause		
Natural	Ref	0.099
Artificial	1.96 (0.88–4.37)	

Table 6 presents the results of multivariate logistic regression analysis identifying independent predictors of poor sleep quality (PSQI >5) among postmenopausal women after adjusting for potential confounding variables.

Obesity remained a significant independent predictor of poor sleep quality. Women with BMI ≥ 30 kg/m² had more than two-fold higher odds of poor sleep compared to non-obese women (adjusted OR = 2.12, 95% CI: 1.01–4.46; $p = 0.047$). The presence of vasomotor symptoms emerged as the strongest independent predictor in the model. Women reporting vasomotor symptoms had over three times higher odds of poor sleep compared to those without such symptoms (adjusted OR = 3.36, 95% CI: 1.71–6.60; $p < 0.001$). Genitourinary symptoms were also independently associated with poor sleep quality (adjusted OR = 1.98, 95% CI: 1.05–3.74; $p = 0.034$). Among comorbid conditions, hypertension (adjusted OR = 1.88, 95% CI: 1.01–3.51; $p = 0.046$) and diabetes mellitus (adjusted OR = 2.21, 95% CI: 1.09–4.48; $p = 0.028$) remained statistically significant predictors. Psychiatric illness was independently associated with poor sleep, with affected women having nearly three-fold higher odds of poor sleep quality (adjusted OR = 2.74, 95% CI: 1.21–6.18; $p = 0.015$).

Lifestyle factors also retained significance in the adjusted model. Women with a sedentary lifestyle had approximately 2.5 times higher odds of poor sleep compared to those who were physically active or moderately active (adjusted OR = 2.45, 95% CI: 1.21–4.96; $p = 0.012$). Although artificial menopause showed higher adjusted odds of poor sleep (adjusted OR = 1.96), the association did not reach statistical significance ($p = 0.099$). Overall, obesity, vasomotor symptoms, genitourinary symptoms, hypertension, diabetes mellitus, psychiatric illness, and sedentary lifestyle were identified as independent predictors of poor sleep quality among postmenopausal women.

DISCUSSION

The present study was conducted to evaluate the prevalence and predictors of sleep disturbances among postmenopausal women using the Pittsburgh Sleep Quality Index (PSQI). Sleep is a fundamental pillar of health, yet our findings indicate that it is significantly compromised during the menopausal transition. In this study of 200 women, the prevalence of poor sleep quality (PSQI > 5) was found to be 54%. This is notably higher than the initial projection of 46% and aligns with global trends where sleep complaints are reported by 40% to 60% of postmenopausal women. Our findings are consistent with studies by Taavoni et al., which highlighted a high burden of sleep disturbances in this demographic, often linked to the complex interplay of hormonal, physical, and psychosocial factors.

Vasomotor and Genitourinary Symptoms The most significant finding in our study was the strong association between vasomotor symptoms (VMS) and poor sleep quality. Women experiencing hot flashes and night sweats had over three times the odds of reporting poor sleep (OR

= 3.36, $p < 0.001$). This confirms the "thermoregulatory hypothesis," where nocturnal VMS trigger awakenings and fragmentation of sleep architecture. Similarly, genitourinary symptoms were independently associated with poor sleep (OR = 1.98), likely due to nocturia and physical discomfort leading to frequent sleep interruptions.

Comorbidities and Health Status Our results demonstrate that chronic health conditions significantly exacerbate sleep difficulties. Hypertension (OR = 1.88) and Diabetes Mellitus (OR = 2.21) remained significant predictors of poor sleep in the adjusted model. These findings suggest a bidirectional relationship: chronic pain or metabolic instability can disrupt sleep, while poor sleep can, in turn, worsen cardiovascular and metabolic health. Furthermore, psychiatric illness emerged

as a potent predictor (OR = 2.74), reinforcing the known link between anxiety/depressive symptoms and insomnia during menopause.

Lifestyle and Demographic Factors A sedentary lifestyle was associated with a 2.5-fold increase in the odds of poor sleep quality. This supports the growing body of evidence suggesting that physical activity can improve sleep efficiency and reduce sleep latency in older adults. Interestingly, while women with artificial menopause (surgical or radiation-induced) showed higher odds of sleep disturbances (OR = 1.96) compared to natural menopause, the association did not reach statistical significance in this specific cohort, potentially due to the smaller sample size of the artificial menopause group (18%).

Comparison with Other Studies Similar to the findings of Ayrim et al., our study observed that as Body Mass Index (BMI) increases, sleep quality tends to decline, particularly among those categorized as obese. While the Ashwini SS study focused on awareness of HRT, the current study highlights the physiological and lifestyle reality of the menopausal transition, emphasizing that sleep quality is a multi-dimensional issue requiring more than just hormonal consideration.

Limitations The study is limited by its cross-sectional design, which precludes the establishment of temporal causality between sleep and its predictors. Additionally, as the data were collected in a tertiary care hospital setting, the findings may reflect a population with more symptomatic complaints than the general community.

CONCLUSION

The study concludes that sleep disturbances are highly prevalent among postmenopausal women, affecting more than half of the study population (54%). The Pittsburgh Sleep Quality Index (PSQI) proved to be an effective and sensitive tool for identifying these disturbances in a clinical setting.

The presence of vasomotor symptoms, comorbid conditions like diabetes and hypertension, and a sedentary lifestyle were identified as the primary drivers of poor sleep quality. These findings underscore the need for a holistic approach to menopausal care. It is recommended that:

- **Routine Screening:** PSQI assessments should be integrated into routine menopausal clinics to identify at-risk women early.
- **Multidisciplinary Management:** Treatment should extend beyond hormonal therapy to include the management of comorbidities and psychiatric wellbeing.
- **Lifestyle Intervention:** Counseling on physical activity and sleep hygiene should be a standard component of postmenopausal health education.

By addressing sleep quality as a core component of menopausal health, clinicians can significantly improve the overall quality of life and long-term health outcomes for women in this life stage.

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