Quality of Sleep and Its Related Factors in Postmenopausal Women in West Tehran

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Background: Sleep disturbance is common in menopausal women.
Objectives: This study aimed to measure the rate of self-reported sleep disturbance and to identify its associated factors in 50-60 year-old women.
Patients and Methods: This cross-sectional study included 700 healthy volunteer women aged 50 to 60 years, who were in postmenopausal period for at least 1 year. The participants were interviewed after obtaining informed consents. The study questionnaire covered two main aspects of personal characteristics and the Pittsburgh Sleep Quality Index (PSQI). Data was analyzed using SPSS 14 software.
Results: The frequency of sleep disturbance was 62.5%. A significant association was found between sleep disturbance and characteristics of occupation, education, financial status and husband's profession. There were no significant association between sleep disturbance and other personal characteristics, such as age, partner's age, number of children, family size and consumption of tea, coffee or cola.
Conclusion: Sleep disturbance is common in menopausal women. Appropriate interventions based on sleep-related personal characteristics should be performed to improve sleep quality, which is very important for maintaining the quality of life.

Keywords: Menopause; Sleep Quality; Related Factors

1. Background

Every year, millions of women enter their menopausal period. The World Health Organization estimated that 1.2 billion women would be 50 years or older by the year 2030 (1). Estrogen decline during menopause may cause various problems such as vasomotor instability, lowered psychometric functions, vaginal and urinary infections, and forgetfulness (2). Other symptoms include irregular menses, decreased fertility, vaginal dryness, (3) hot flashes, sleep disturbances (3, 4), mood swings, increased abdominal fat, hair thinning, and loss of breast fullness (3).

Sleep is an essential aspect of life (5) and insomnia is associated with negative health consequences including fatigue, impaired daytime function, reduced quality of life, and increased visits to healthcare providers (2, 6). Sleep disturbance is also one of the important symptoms observed during menopause (7) and is common and clinically important among elderly individuals (4, 8, 9).

Approximately one-third of the adult population complain symptoms of insomnia (10). Women tend to report sleep disturbances more often than men of the same age (11). Furthermore, insomnia is more common in people with chronic medical problems and observed in up to 69% of patients enrolled in primary care clinics (12).

Moreover, after menopause, prevalence of habitual snoring and obstructive sleep apnea syndrome increases in women (13). In contrast, a smaller percentage of adults report severe sleep problems (10%-15%), but the prevalence of severe chronic sleeping disorders increases to 25% among elderly (14). Kravitz reported that self-reported sleep difficulties increase during the menopausal transition (15). Furthermore, the overall prevalence of self-reported sleep difficulty was 38%, and in some studies, it was found to be the lowest in premenopausal group (31%) and the highest in surgical menopausal group (48%) (16). According to a study performed in West of Tehran, its rate in healthy menopause women was 70% (4). Besides, international surveys reported that approximately 30%-40% of adults would experience sleep disturbances in their lifetime (17, 18).

Young et al. indicated that objectively measured sleep quality does not diminish with menopause, but the association of menopause and sleep quality differs with respect to objective and subjective measures. These findings indicated that menopausal women were more dissatisfied with quality of sleep than premenopausal women (19). Various factors such as snoring, aging, hot

flashes, and night sweats could influence the quality of sleep during menopause (1).

2. Objectives

Based on the results of the aforementioned studies and due to the fact that sleep disturbance is one of the important symptoms observed during menopause and aging, this study was conducted to determine the rate of self-reported sleep disturbance in west of Tehran and its associated factors in 50-60-year-old women.

3. Patients and Methods

This was a cross-sectional study conducted at four selected clinics of Tehran University of Medical Sciences in west of Tehran, from March 2010 to June 2012. This study was the first phase of a research proposal entitled "The effect of valerian and lemon balm on the sleep quality in menopausal women, a randomized placebo-controlled clinical trial". In this phase, volunteer menopausal women were screened to find those with sleeping problems for entering the second stage of the study. The inclusion criteria were as follows:

(1) Generally healthy women aging 50-60 years, postmenopausal for at least 1 year, and not receiving hormone replacement therapy (HRT)

(2) Absence of a medical or psychiatric condition that could cause sleep disturbance

(3) Having a score of five or higher using the Pittsburgh Sleep Quality Index (PSQI).

Volunteers included 700 healthy menopause women, who were informed about the research and its purposes and requested to complete a questionnaire regarding their personal characteristics and PSQI. The aim of the study was explained to all participants qualified for the first phase of the study and written informed consents were obtained. The participants were interviewed using a questionnaire including three main sections of personal characteristics, perception towards sexual satisfaction and PSQI. Personal characteristics contained the following 15 items: age, partner's age, date of last menstruation, family size, number of children, number of children living with participants, educational, economic, marital, occupational and partner's occupational status, average rate of daily consumption of tea, coffee or cola beverages. Perception of sexual satisfaction was determined using the visual analogue scale (VAS, scale ranging from 0-10). The PSQI section was a self-rated questionnaire, which assessed sleep quality and disturbances over one month period. The questionnaire had 19 items used to generate seven composite scores. The composite scores provided information about subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, sleep medication use, and daytime dysfunction. Scores from the seven components were summed to yield a single PSQI score. When this single global PSQI score is greater than five, it is nearly 90% sensitive and specific to

Table 1. Demographic Characteristics of the Participants [a]

Variable	Value
Age, y	52.9 ± 3.3
50-52	462 (66)
53-55	98 (14)
≥ 56	140 (20)
Menopause age, y	47.4 ± 3.8
40-44	182 (26)
45-49	350 (50)
≥ 50	168 (24)
Age difference with partner, y	6.1 ± 4.2
0	14 (2)
1-4	252 (36)
5-9	168 (24)
10-14	140 (20)
No partner	126 (18)
Marital status	
Married	574 (82)
Single	126 (18)
Number of pregnancies	5 ± 2.05
0-2	98 (14)
3-4	238 (34)
5-6	238 (34)
≥ 7	126 (18)
Family size	4.4 ± 2.06
1-2	84 (12)
3-4	322 (46)
≥ 5	294 (42)
Number of children	4.8 ± 2.02
0-2	112 (16)
3-4	308 (44)
5-6	280 (40)
Number of married children	2.7 ± 2.09
0	70 (10)
1-2	350 (50)
3-4	196 (28)
≥ 5	84 (12)
Educational status	
Illiterate	336 (48)
Primary school	252 (36)
Secondary school	112 (16)
Occupational status	
Employed	28 (4)
Housewife	672 (96)
Economic status	
Good	98 (14)
Moderate	392 (56)
Bad	210 (30)
Husband's occupational status	
Worker	154 (22)
Employed	126 (18)
Retired	294 (42)
Other	126 (18)

[a] Data are presented as No. (%), Mean ± SD

diagnose "poor" sleep. The post-hoc cut off score of five on the PSQI produced a sensitivity of 89.6% and specificity of 86.5% in patients versus control subjects.

The sample size was calculated based on 80% power and 5% type one error, resulted in 700 subjects needed for the study. Therefore, the PSQI questionnaire was delivered to 700 volunteers who met the inclusion criteria. Data was analyzed using SPSS 14 software (). Descriptive statistics, including measures of mean and variance, were calculated for each volunteer's main outcomes. The inferential statistics such as Pearson correlation test, T-test, and One-way analysis of variance (ANOVA) were used to determine the correlation between the variables and sleep quality. The level of significance was $P < 0.05$. This study was approved by the Ethics Committee of Tehran University of Medical Science (TUMS), the oldest and largest medical sciences university of Iran. The Ethics Committee followed the progression of the research from the first step of designing the research proposal to the presentation of the final report.

4. Results

Demographic data obtained from the questionnaire were shown in Table 1. Regarding PSQI, which assesses sleep quality and sleep disturbances over one month period, the frequency of sleep disturbance was found to be 62.5% and the mean sleep scale score was 7.84 ± 4.4. Most women were in mild insomnia group and only 4.5% of them had severe insomnia (Table 2). Significant associations were found between sleep disturbance and occupation, education, husband's occupation, and economic status. There was no significant association between sleep disturbance and age, menopause age, age difference between spouses, number of children, family size and consumption of tea, coffee or cola beverages (Table 3).

Table 2. Frequency of Sleep Scale [a]

PSQI [b]	Value
0-4 (Safe)	262 (37.5)
5-9 (Mild insomnia)	224 (32)
10-14 (Moderate insomnia)	182 (26)
15-21 (Severe insomnia)	32 (4.5)

[a] Data are presented as No. (%)
[b] Pittsburgh Sleep Quality Index

Table 3. Associations Between Personal Characteristics and the Pittsburgh Sleep Quality Index (PSQI) [a]

Characteristics (Highest Group)	Value	Analysis [b]	P Value
Occupational status			
Housewife	672 (96)	T Test	0.004
Educational status			
Illiterate	336 (48)	ANOVA [b]	0.04
Husband's occupational status			
Retired	294 (42)	ANOVA	0.02
Economic status			
Moderate	392 (56)	ANOVA	0.000
Age, y			
50-52	462 (66)	Pearson	0.34
Menopause age, y			
45-49	350 (50)	Pearson	1.5
Age difference with partner, y			
1-4	252 (36)	Pearson	0.9
Marital status			
Married	574 (82)	ANOVA	0.32
Family size			
3-4	322 (46)	Pearson	3.8
Number of children			
3-4	308 (44)	Pearson	0.56
consumption of tea, coffee and cola			
2-3	322 (46)	Pearson	2.6

[a] Data are presented as No. (%)
[b] Analysis of variance

5. Discussion

This study investigated correlations between personal characteristics and self-reported sleep disturbance in 50-60 year-old menopausal women. Poor sleep quality is highly prevalent in menopausal women (7, 20). The most important factor impairing the quality of sleep in menopausal women is reduced hormone levels. Age is not the only factor associated with difficulty in sleeping (16). Moreover, unique hormonal and psychological changes in perimenopausal women have a significant effect on sleep disturbance (13). The present study showed no correlation between age and sleep quality. This may be because all the participants were postmenopausal aged 50-60 years, which was a limited range. This study showed a correlation between sleep quality and occupation of the participants, who were mostly housewives. Furthermore, a correlation was found between sleep quality and husband's occupation. This may be affected by unfavorable financial status leading to poor access to medical care services or additional family distress.

Ohayon et al. reported that a high level of education is associated with sleep difficulty (16) and Leshner et al. claimed that being less educated is associated with a higher prevalence of insomnia (21). Habte-Gabr et al. reported that individuals with lower education may have poor access to optimal medical care that may result in an overall poor health (22). This is expected to increase the risk of sleep disturbances (8). We found a correlation between lower educational status and sleep quality, similar to those of the aforementioned studies.

Leshner et al. indicated that lower income levels are associated with a higher prevalence of insomnia (21). In this study, economic status and sleep quality were found to be correlated. Personal characteristics with highest significant associations with sleep were economic and occupational status, husband's occupation and the level of education. The limitation of this study was its small sample size. Subsequent studies with larger sample size are recommended.

Since our investigation included 700 postmenopausal women, further studies with larger number of menopausal and andropausal subjects are needed to compare the results. We suggest medical staff to consider personal characteristics of menopausal women as well as the onset of their menopause, and conscious of the importance of sleep quality, to design correct planning and be involved in supervision of counseling by qualified professionals. This approach could help menopausal women prevent psychological and social damage caused by sleep disturbance.

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Authors' contributions

Simin Taavoni: preparing the study protocol and mon-

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