

SLEEP QUALITY AND ITS RELATED FACTORS IN MENOPAUSAL WOMEN IN DA NANG, VIETNAM

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ABSTRACT

Background: Sleep disturbance is one of the most prevalent health problems in menopausal women. It has a number of severe consequences not only for their physical but also psychosocial well-being and results in lower quality of life. This study was conducted with two objectives: Describe the sleep quality and investigate its related factors among menopausal women.

Methods: This is a cross-sectional descriptive study, conducted on 362 menopausal women in 13 wards of Hai Chau district, Da Nang city from February, 2017 to September, 2018.

Questionnaires included five parts: Demographics questions, perceived health status question, Zung Self-Rating Anxiety Scale, Zung Self-Rating Depression Scale and Pittsburgh Sleep Quality Index. Data were analysed using descriptive statistics and correlational statistics.

Results: The mean PSQI score was 8.7 ± 3.4 , only 18.2% of menopausal women had good sleep quality. Sleep quality (PSQI) of menopausal women has a strong positive correlation with age ($r = 0.57$, $p < 0.0001$), anxiety ($r = 0.51$, $p < 0.0001$), depression ($r = 0.51$, $p < 0.0001$), health perception ($r = 0.32$, $p < 0.0001$), a low positive correlation with hot flashes ($r = 0.17$, $p < 0.001$) and sweating ($r = 0.18$, $p < 0.001$). Sleep quality (PSQI) was negatively correlated with educational level ($r = -0.65$, $p < 0.0001$). In the multiple regression model, age, education level, health perception and depression predicted the sleep quality of menopausal women.

Conclusion: The sleep quality of menopausal women was low. There were some predictors of sleep quality: age, educational level, health perception and depression.

Key words: menopause, sleep quality, hot flashes, sweating, anxiety, depression.

I. BACKGROUND

Menopause is defined as a physiological phenomenon of woman with estrogen levels decline and marks the end of menstrual cycles, due to the physiological, natural and irreversible deterioration of ovarian activity. This affects a lot of organs in the body from the brain to the skin [1]. As a consequence, this leads to numerous physical and psychosocial changes. Among them, sleep disturbance is one of the most common health

problem of menopausal women including falling asleep difficulty, frequent waking up during the night and early getting in the morning [2]. If this happens for a long time, menopausal women will increase a quantity of health problems such as fatigue, obesity, cardiovascular diseases... and also a lot of psychosocial problems [3,4].

Sleep quality is determined by the satisfaction of one person about his sleep including quantitative

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aspects of sleep, such as sleep duration, sleep latency, or number of arousals, as well as more purely subjective aspects, such as “depth” or “restfulness” of sleep [5]. From related literature review, numerous studies concluded that the proportion of menopausal women who had sleep disturbance were quite high. Specifically, the results of Taavoni and colleagues indicated that up to 62.5% menopausal women had poor quality of sleep [6]. Similarly, another study also showed that there were 40 - 60% menopausal women had sleep disturbance [7]. Besides, there were also many studies about related factors of sleep quality. Most of them indicated that sleep quality of menopausal women was affected by numerous of factors including age, health perception, menopausal symptoms, and comorbidity [8 - 10]. Beside these physical factors, previous studies also concluded that there were some psychosocial factors related to sleep quality such as stress, anxiety, depression... [11, 12].

However, a review of literature showed that there were few studies about this topic in Vietnamese menopausal women, especially in Da Nang city. This study may be the first to describe the quality of sleep and its related factors among menopausal women in Da Nang, Vietnam.

II. MATERIALS AND METHODS

2.1. Participants

The participants were menopausal women (from 40 to 60 years old), who have been living in Hai Chau district, Da Nang city.

2.1.1. Inclusion criteria

- Menopausal woman (from 40 to 60 years old)
- Being able to communicate in Vietnamese
- Having no neuropsychiatric disorders

2.1.2. Exclusion criteria

- Woman who was taking hormone therapy

2.2. Method

2.2.1. Research design: This was a cross - sectional descriptive study which was conducted from 02/2017 to 09/2018.

2.2.2. Sample size estimation and sampling technique:

Sample size: The sample size was calculated by

using this formula: $n = [Z^2 (1 - \alpha/2) \times p (1-p)]/c^2$ with n was sample size; $Z (1 - \alpha/2) = 1.96$, for the level of confidence of 95%; $p = 0.375$, based on a result Taavoni et al, the proportion of menopausal women had good sleep quality was 37.5% [6]; margin of error $c = 0.05$. Thus, the sample size was 362 participants.

Sampling technique: In order to ensure the generalizability, we conducted sampling in all 13 wards of Hai Chau district with a convenient sampling technique.

2.2.3. Measurement and data collection

The researchers collected data during home visits between February and September 2017, using five interview questionnaires. Part 1: the general characteristics of participants, included 9 questions; Part 2: one question in the MOS20 was set to measure health perception. The question was written on a Likert scale, the higher the score, the higher the health status awareness [13]; Part 3: Zung Self - Rating Anxiety Scale was used to assess anxiety disorder of participants, consisted of 20 items. The level of anxiety was assessed based on the total score of 20 items from 20 to 80 points. The higher the score was, the more severe the anxiety was [14]; Part 4: Zung Self - Rating Depression Scale was the tool used to assess the level of depression. The tool included 20 items with a score ranging from 20 to 80 points. The higher the score indicated the more severe of depression [15]. Part 5: The Pittsburgh Sleep Quality Index questionnaire was used to assess the participants sleep quality. The original scale consisted of 19 self - assessment items, divided into 7 areas: Self - assessment: satisfaction of participant about sleep; Difficulty falling asleep: time to fall asleep; Sleep duration: hours of sleep per night; Sleep efficiency: the ratio of total sleep time to time in bed; Waking up in the night: number of times woken up by any reason; use of sleeping medication, and daytime dysfunction due to lack of sleep [5].

2.2.4. Data analysis

Descriptive statistics were used to describe characteristics of variables. Point Biserial,

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Spearman's rho, Pearson Product moment statistics and multiple regression were used to test the correlation between sleep quality and independent variables. A significant level was considered at $p < 0.05$.

2.3. Ethical consideration

The study was carried out after obtaining the approval of Danang University of Medicine and Pharmacy Technology under Decision No. 147/QD - ĐHKTYDDN. Prior to data collection, the researcher clearly explained the study to the participants, who then signed an informed consent form. Participants were guaranteed confidentiality. All completed forms were placed in sealed envelopes and stored in a secure place accessible only to the researcher. The data were used for this research purpose only and will be destroyed once the results are published.

III. RESULTS

3.1. The characteristics of participants

Table 1 showed that the mean age of participants was 49.22 (SD = 5.38). Most of menopausal women participating in the study were traders (48.5%) and officers (16.4%). For the educational level, up to 31.8% of participants were a high school and 22.1% were college, university, and graduate. The majority of participants were married (81%) and currently living with their family (53.5%) or husband (32.1%).

Table 1: Characteristics of the participants (n=362)

Characteristics		n	%
Age	40 - 44	69	19.1
	45 - 49	113	31.2
	50 - 54	95	26.2
	55 - 60	85	23.5
	40 - 44	69	19.1
	M = 49.22 SD = 5.38		
Occupation	Worker	31	7.7
	Trader	195	48.5
	Housewife	61	15.2
	Fisherman	9	2.2
	Officer	66	16.4

Education level	Primary school	81	22.3
	Secondary school	86	23.8
	High school	115	31.8
	College/ Undergraduate	62	17.1
	Graduate	18	5.0
Marital status	Married	326	81.0
	Single	22	5.5
	Divorced	6	1.5
	Widow	8	2.0
Living condition	Alone	18	4.5
	Spouse	129	32.1
	Family	215	53.5
Health perception	Excellent	3	0.7
	Very good	3	0.7
	Good	113	28.1
	Fair	226	56.2
	Poor	17	4.2

3.2. Sleep quality of menopausal women

Table 2 showed that the mean score of sleep quality was quite high, $M = 8.7$ (SD = 3.4). Most of the participants had poor sleep quality (296 women, 81.8%) of which 52 participants had very poor sleep quality, accounting for 14.4% (PSQI score ≥ 13 points).

Table 2: Sleep quality of participants

Sleep quality	n	%
Good sleep quality (PSQI ≤ 5)	66	18.2
Poor sleep quality (PSQI > 5)	296	81.8
+ Poor sleep quality	244	67.4
+ Very poor sleep quality (PSQI ≥ 13)	52	14.4
M= 8.7 SD= 3.4		

3.3. Factors related to sleep quality among menopause women

Table 3 revealed that sleep quality of menopausal women had a strong positive correlation with age ($r = 0.57$, $p < 0.0001$), anxiety ($r = 0.51$, $p < 0.0001$) and depression ($r = 0.51$, $p < 0.0001$), health

perception ($r = 0.32$, $p < 0.0001$), weak positive correlation with hot flashes ($r = 0.17$, $p < 0.001$) and sweating ($r = 0.18$, $p < 0.001$). Education level had a negative correlation with education level ($r = -0.65$, $p < 0.0001$).

Multiple linear regression was run to identify the association between sleep quality and all variables. The results revealed that age, education level, health perception, and depression were statistically significantly associated sleep quality ($p < 0.05$). Meanwhile, hot flashes, sweating, and anxiety were significant associated with sleep quality in bivariate analysis, but no longer significant in multivariate analysis (Table 4).

Table 3: The correlation between sleep quality and factors

Independent variables	Quality of sleep			P
	β	CI 95%		
Age	0.165	0.124	0.205	<0.001
Education level	-0.847	-1.051	- 0.643	<0.001
Health perception	1.970	1.598	2.342	<0.001
Hot flashes	0.347	-0.058	0.753	0.093
Sweating	0.144	-0.277	0.565	0.501
Anxiety	0.041	-0.006	0.088	0.087
Depression	0.055	0.020	0.090	0.002
F= 119.923; R2 =0.704; R2 adjusted= 0.698; p<0.05				

IV. DISCUSSION

4.1. Sleep quality of menopausal women

Because of many negative changes in both physical and psychosocial health, menopausal women often complain about sleep disturbance. In fact, they have many difficulties in falling asleep, maintaining sleep during the night because of frequent awake, hot or sweaty. The results from this study indicated that only 18.2% participants had good sleep with $PSQI \leq 5$ and up to 67.4% menopausal women

complaint about poor quality of sleep ($5 < PSQI < 13$). Noticeably, women who had very poor sleep accounted for 14.4% ($PSQI \geq 13$). This result can be explained by various reasons related to estradiol levels decrease, follicle stimulating hormone levels increase significantly and negative consequences of menopause period, not only physical changes but also psychosocial ones. In addition to changes in the genital organs such as vulvovaginal atrophy, vaginal dryness, thinning of the vaginal mucosa, smaller breasts, etc., women at this stage also have to suffer from vasomotor symptoms including night sweats, hot flashes and flushes. Moreover, in this transition period, some women have to cope with social function changes. In fact, several women in this study were single, divorced and widowed with 5.5%, 1.5% and 2%, respectively. Additionally, 18 menopausal women (4.5%) had to stay alone. All of these changes affected negatively to women and consequently led to some mental health problems. From these, sleep quality of menopausal women could decrease significantly.

This result was appropriate with study of Hung and colleagues on Chinese menopausal women. Similarly, Hung's study indicated that up to 73.1% participants had poor sleep quality ($PSQI = 8$) [16].

4.2. Factors associated with sleep quality of menopausal women

As noted above, age was positively and significantly related to sleep quality of menopausal women ($r = 0.57$, $p < 0.001$). The older women were, the poorer sleep quality they might have. This study's result is consistent with prior research of Sun and colleagues on menopausal women in Shanghai, China in 2013 [10]. This can be explained by aging process especially the degeneration of the brain with reduction in number of cells, blood flow, and metabolism in brain.

As can be observed in Table 3, there was a strong negative significant correlation between sleep quality and education ($r = -0.65$, $p < 0.0001$). Women who had higher education level tended to have lower PSQI, which meant higher sleep quality. This is consistent with the result of Kim and colleagues [17]. According to Nguyen Dinh Phuong

Thao, low education affects directly to awareness of women about menopause period [18]. Since then, they are susceptible to psychological effects, increasing anxiety and fatigue during this period. This can lead to difficulty falling asleep and staying asleep in menopausal women. Besides, with higher education, people seem to have better solving problem skill. They can overcome any troubles and difficulties easier, thereby reducing psychological stress and reducing the risk of sleep disorders.

Also consistent with the literature, this study found a moderate and significant positive relationship between participants' health perception and sleep quality ($r = 0.32$, $p < 0.0001$). It was illustrated that there was a strong correlation between health perception and psychological well-being. It means that people who have better health perception have better psychological status, since then, they have a comfortable and optimistic mentality, which positively affects the quality of sleep [19].

This study also found significant positive relationships between sleep quality and hot flashes and night sweat with $r = 0.17$ and $r = 0.18$, respectively ($p < 0.001$). Freedman et al. [20] investigated the mechanism of hot flashes and proposed that they are the result of the central nervous system's response to estrogen fluctuations. Hot flashes are triggered by a drop in estrogen levels, which are mediated by the central sympathetic nervous system. The etiology of hot flashes includes an increase in norepinephrine levels in the brain and a reduction in total estrogen levels. The brain's norepinephrine and 5-hydroxytryptamine (5-HT) levels are antagonistic. 5-HT is widely distributed in the brain and plays a role in the regulation of mood, sleep, and stress response. It is also linked to menopausal sleep disturbances, with insomniacs having a decreased central 5-HT concentration [21]. Such findings are consistent with studies such as those of Zhou (2021) [22], Thao (2017) [18], Sun (2014) [10], Xu (2016) [23].

The results indicated that anxiety and depression were significantly positively correlated with sleep quality ($r = 0.51$, $p < 0.001$). Voursoura et al. [24] showed that depression was associated with difficulty in falling asleep and early awakening. The

participants of this study aged from 40 to 60. With this age, women have to cope with compromised health status while they still have to suffer from work stress and family burden. This can easily contribute to anxiety and depression. Anxiety and depression produce hyper function of the hypothalamus - pituitary - adrenal axis (HPA axis) [25], increased sympathetic nerve excitability, and higher levels of norepinephrine and cortisol in the blood circulation, all of which cause patients to be aroused [26], reducing sleep quality. The findings imply that psychotherapy or medication therapy can assist middle-aged women with apparent anxiety and depression symptoms improve their anxiety and depression, as well as their sleep.

As can be seen from Table 4, multiple regression model with all seven factors produced $R^2 = 0.704$, $F = 11.92$, $p < 0.05$. After controlling for the other variables, age, health perception and depression had significant positive regression weights, indicating menopausal women with older ages, lower health perception and higher point of depression were expected to have higher PSQI or lower quality of sleep. Meanwhile, there was a significant negative weight, indicating participants with higher education level were expected to have lower PSQI score or better quality of sleep. Hot flashes, sweating and anxiety did not contribute to this model, although they were significant in bivariate analysis.

V. CONCLUSION

Sleep disturbance is a dominant concern of menopausal women and has numerous serious and negative consequences. The sleep quality of menopausal women was quite low with PSQI = 8.7 (SD = 3.4). This study also pointed out some predictors of sleep quality: age, educational level, health perception and depression. This supports the use of such factors to better identify menopausal women at risk of sleep disturbance, maximizing the most effective, targeted use of limited healthcare resources in Vietnam. Finally, combined with previous studies, the results of this study add to the menopause knowledge base and aid the search to find the predictors of menopausal women sleep quality and the best interventions.

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