

## The Relationship between Personality Characteristics and Sleep Quality in Menopausal Women Referred to Educational Gynecology Clinics of Mashhad, Mashhad, Iran

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### ARTICLE INFO

### ABSTRACT

*Article type:*  
Original article

*Article History:*  
Received: 20-May-2013  
Accepted: 10-Sep-2013

*Key words:*  
Menopause  
Personality  
Sleep

**Background & aim:** Postmenopausal women suffer from sleep problems due to night sweats and serotonin deficiency caused by estrogen deficiency. Considering that the cause of different reactions to menopausal symptoms including sleep disturbances has not been recognized, this study aimed to investigate the relationship between personality characteristics and sleep quality in postmenopausal women.

**Methods:** This correlational study was carried out on 400 postmenopausal women referred to gynecology clinics of university hospitals in Mashhad, Iran in 2012 who were selected conveniently. Study tools included NEO-FFI personality characteristics questionnaire (including 60 items) and Pittsburgh Sleep Quality Questionnaire. Data were analyzed with SPSS software (version 16) using Pearson and Spearman correlation coefficient and linear regression analysis.

**Results:** The mean age of menopausal women was 52.3±4.07 years. The mean score of menopausal age was 48.8±3.5 years and the duration of amenorrhea was 3.8±1.5 years. The highest and lowest score of personality characteristics was related to "openness to experience" and the "neuroticism", respectively. There was a direct correlation between extroversion and sleep quality (P=0.013).

**Conclusion:** Considering that extroverted women have a better quality of sleep, it is suggested that personality characteristics of women to be considered in the management protocols of sleep disturbances in post menopausal women.

► Please cite this paper as:

Azhari S, Ghorbani M, Esmaily HA, Ghanbari Hashem Abadi BA. Relationship between personality characteristics and sleep quality in menopausal women referred to educational Gynecology clinics of Mashhad. Journal of Midwifery and Reproductive Health. 2013; 1(1):26-32.

### Introduction

Menopause is not a sign of deterioration, but is a surprising phenomenon that could be considered as a sign of positive experience (1). The rate of estradiol and progesterone decreases several years before menopause despite having menstrual cycles with ovulation. Decrease of ovarian follicular activity degrades negative feedback inhibition of estradiol on Hypothalamic-Pituitary system and gradually increases Follicle Stimulating Hormone (FSH) (2). Therefore, the follicles with less response to FSH could stay in ovary, menopause occurred when remaining

follicles do not respond to high concentration of FSH (3). Transition from fertility to infertility is accompanying with more vasomotor responses, physical and emotional symptoms which could be lasted several years (4). The most common complication of estrogen deficiency is night flash or nocturnal sweating.

Consequently, sleep pattern is interrupted and resulted in fatigue, concentration problems, excitability, activity daily problems, mood disorders, anxiety and memory loss. Serotonin as an important factor for sleep decreases as

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well (3). About one-third of menopausal women experiences sleep disorders across the world which aggravate by aging and chronic illness by 69% (5). Sleep disorders in menopause women could be chronic or temporary. Most of them are manifested by problem in falling asleep, frequent waking up during night and difficulty in falling sleep again and light sleeps and early wake up (6). Sleep is one of the indispensable elements of human life; it is a combination of comfort and calmness due to stop in apparent senses of animals and humans. The aim of sleep is not clear, however, sleep deprivation could lead to harmful physical and emotional changes such as daily fatigue, cognitive ability defect, recovery delay and auditory and visual illusion. Sleep also decreases stress and anxiety. It helps energy restoring for better concentration (5). Some women suffering from flashing and severe sleep problems during their menopausal period, however the others have no reactions or react less, which do not paid more attention (1). Difference of symptomatic reaction of menopause in different people has not been realized (4). It is believed that of a most women are a lot in common for nature and incidence of menopause and these differences are not due to physiological factors, but due to different style communities and individual perception (1). No two individual are similar, so, no similar reaction could see from two humans in similar situation or similar psychological stimuli (6). Personality as a determining factor influences on all human behaviors personally and socially. Sometimes maladaptive behaviors cause individuals or their families face serious problems (7). Based on 5-factor personality theory by Casta and MoRay, personality includes five main elements of neuroticism, extroversion, openness to experience, agreeableness and conscientiousness (8). Each individual could behave different from others, with specific expectations, and have different abilities, behavioral skills and needs (9). According to the studies, people with neuroticism, probably experience social phobia, depression and consequently insomnia (5). Elavsky (2009) found that personality characteristics such as neuroticism, anxiety and paranoia are more accompany with menopausal syndrome (4). In personality domain, individual differences

should be considered and the aim is determining and defining them as much as possible (6). Menopausal women may need a variety of educational and interventional programs for treatment of menopausal complications and quality of life improvement due to their individual differences (4).

Browna (2009) showed that the higher score of neuroticism is accompanied by hot flashes, night sweat and sleep problems. With higher score of extroversion all complications decrease (10). Pimenta (2012) introduced level of education and mental problems as predictive factors for menopause occurrence (11). As better understanding of personality characteristics and individual differences let determining subgroups of menopausal women for additional intervention in order to quality of life improvement and sleep problems control (12). Considering the Iranian demographic feature with almost 5 million women at menopausal age (13) and physical and mental problems which individual and family face to, this study aimed to determine relationship between personality characteristics of menopausal women with their quality of sleep.

## Materials and Methods

This correlational study was conducted on 400 menopausal women referred to gynecology clinics of educational hospitals, Mashhad University of Medical Sciences Mashhad, Iran from 22nd Aug. to 23rd Dec. 2012.

Sample size was calculated by comparing mean formula at first, then a pilot study was performed on 50 menopausal women and sample size was determined according to the personality characteristics, as the maximum estimation was related to extroversion, it was considered as a basis for sample size estimation. It was calculated 329 by confidence interval of 95% and power of 80%. Then 20% increase was considered for non randomization method and final sample size was determined as 400. Inclusion criteria were age of 45-60 year, having last menstruation in 1-5 years, literacy of elementary level and normal menopause. Exclusion criteria were estrogen therapy for recent 3 months, spotting in recent year, smoking (drugs, cigarettes, hookah) and alcohol use, traumatic or stressful event in recent six

month, heavy exercises, taking drugs for decreasing menopausal complications, chronic illness, cancer, abnormal findings in breast exam and thyroid enlargement in physical examination.

Breast and thyroid examination were performed for women who met inclusion criteria and if there were abnormalities in the breast or thyroid gland enlargement, they were excluded from the study and referred to specialist. Exclusion criteria during study were incomplete recording (less than 60%) of daily night sweat questionnaires, having spotting during completing questionnaires and deplorable event during study. Women were free to withdraw from their participation in the study signing. After informed consent, subjects were selected by convenient sampling.

Blood pressure, weight and height were measured after inclusion in the study. Study tools included self-structured questionnaires for demographic data, obstetric and menstrual status and also effective factors on sleep. Pittsburg Quality of Sleep Index, visual analogue scale for anxiety and fatigue, daily record of night sweat and personality characteristics of NEO FFI also were completed.

Questionnaire of NEO FFI was graded based on 4-point Likerts scale (strongly disagree, disagree, agree and strongly agree) in which some questions were scored conversely. This questionnaire covered five dimensions of personality, neuroticism, extraversion, openness to experience, conscientiousness and agreement, which contains 60 questions (each personality characteristic was tested by 12 questions). The score of each personality characteristic was categorized by rate of very low, low, average, high and very high). Pittsburg Quality of Sleep Index studied quality of sleep in recent month. It had 9 questions and 7 components. Its score ranges was 0-21 and overall score was more than 5 which showed bad quality of sleep. Visual analogue scale for anxiety and fatigue included information on anxiety and fatigue of menopausal women. Subjects detected their anxiety and fatigue on the line, graded between 0-100 in recent month and daily record of night sweat was completed for two weeks and included number and severity of night seat. Females completed this

questionnaire after waking up every day. Content validity was used for confirming validity of all questionnaires: Ten faculty members of Mashhad school of Nursing and Midwifery renewed questionnaires and commented on them and then study tools modified based on their comments. Reliability of NEO FFI was confirmed by Haghshenas (2003) in Iran (14). He reported alpha Chronbach coefficients of 0.86, 0.77, 0.73, 0.68 and 0.81 for neuroticism, extraversion, openness to experience, agreeableness and conscientiousness, respectively.

Reliability of Pittsburg Quality of Sleep Index was confirmed by Moghadam (2012) in kerman ( $\alpha=0.77$ ) (15). Reliability of visual analog scale for anxiety and fatigue was confirmed by Abbasgi (2005) by inter-rater reliability. Test-retest was used for confirming reliability of daily record of night sweat ( $r=0.9$ ) (16).

Data were analyzed by SPSS version 16. Descriptive characteristics were reported by central parameters dispersion (mean and standard deviation) and frequency. For objectives of study, Pearson and Spearman correlation coefficient were used. General linear model was used to control confounding variable; Mann-Whitney U and Kruskal-wallis were used for relationship between demographic, obstetrics and Menstrual variables with sleep quality. Significant level was considered as  $P=0.05$ .

## Results

Women aged  $52.3\pm 4.07$  years old, with menopausal age of  $48.8\pm 3.5$  years and amenorrhea duration of  $3.5\pm 1.5$  years, gravidity of  $5.6\pm 2.8$  and number of children of  $4.6\pm 2.2$ .

Most women (65.7%) were in elementary level and 87.3 of women were married. Most of them (84%) were housewife and 67.9% reported enough income. 74.6% had  $BP\leq 140/90$  and 74.5% had  $BMI>25$ . The maximum score of personality dimensions was related to openness to experience (51) and minimum score to neuroticism (7). Most women were in average level of personality characteristics (Table 1). Most women (73%) experienced bad sleep quality (Table 2).

Pearson correlation test showed negative reverse significant correlation between overall score of sleep quality and extraversion

**Table 1.** Frequency distribution of surface personality characteristics of subjects

Dimensions of personality characteristics	Dimensions of personality characteristics				
	Neurotics	Agreeableness	Extraversion	Openness to experience	Conscientiousness
Levels	N (%)	N (%)	N (%)	N (%)	N (%)
Very Low	3 (0.8)	37 (9.3)	6 (1.5)	12 (3.0)	7 (1.8)
low	68 (17.0)	139 (34.8)	93 (23.3)	70 (17.5)	66 (16.5)
Medium	223 (55.8)	170 (42.5)	172 (43.0)	236 (59.0)	249 (62.3)
High	87 (21.8)	51 (12.8)	105 (26.3)	73 (18.3)	68 (17.0)
Very High	19 (4.8)	3 (0.8)	24 (6.0)	9 (2.3)	10 (2.5)
Total	400 (100.0)	400 (100.0)	400 (100.0)	400 (100.0)	400 (100.0)

**Table 2.** Frequency distribution of subjects according to the quality of sleep

Quality of sleep	N (%)
Good (score less than 5)	108 (27.0)
Bad (score higher than 5)	292 (73.0)
Total	400 (100.0)

**Table 3.** Correlation between sleep quality scores with dimensions of personality characteristics in subjects

Variable	(r)	(P)
Neurotics	0.088	0.080
Agreeableness	-0.019	0.699
Conscientiousness	-0.089	0.077
Extraversion	-0.124	0.013
Openness to experience	0.001	0.990

**Table 4.** Average scores sleep quality according to factors affecting on sleep in women

Variable	Pvalue	Type of test
Daily short sleep	0.023*	Mann-Whitney U
Short sleep duration per day (hours)	0.018*	Kruskal-Wallis
Status of bed	0.196	Kruskal-Wallis
Sleep of quality		
Tea at bedtime	0.018*	Mann-Whitney U
The amount of tea consumed at bedtime	0.993	Kruskal-Wallis
Sleep disturbance with a bang	0.189	Kruskal-Wallis
Sleep disturbance with the room light	0.959	Kruskal-Wallis

(P=0.013). Direct correlation was found between overall sleep quality score and neuroticism and openness to experience and reverse correlation was found between overall sleep quality and agreeableness and conscientiousness; however these correlations were not significant (Table 3).

Based on Mann-Whitney U test, there was a significant relationship between hypertension and extraversion scores (P=0.003), and also openness to experience (P=0.021). According to the Kruskal-Wallis test there was no statistically significant relationship (P>0.05) between the number of pregnancies, number of children and age of subjects with levels of neuroticism, agreeableness, extraversion, openness to experience and conscientiousness Mann-Whitney U test results showed that there is a significant relationship (P=0.014, P=0.027) between stress and fatigue with sleep quality of women Also Mann-Whitney U and the Kruskal-Wallis test indicated that among factors affecting sleep. There

is a significant relationship between daily short sleep, short sleep duration and drinking tea at bed time with sleep quality (Table 4).

## Discussion

Menopausal age in present study was 48.8 which were shorter than other studies. Elavsky (2012) reported that menopausal age was 50 years old (12). Mean age of menopause in the US is 51 years (17). Ayati (2008) reported mean age of 47.7 years for menopause in Iranian women (13).

Iranian National Health Study reported 49.6 years old for menopause in 2004 (18). It seems the probable reasons for different age of menopause in different communities could be due to different age range in various studies, perhaps age of perimenopause has been considered. Personality type, environmental conditions and workplace conditions, exposure to chemicals, pollutants and radiation, climate, nutrition and genetics could also be reasons for

this difference (16).

The other reason could be method of sampling which was convenient in present study.

Based on the findings, there was significant reverse correlation between overall score of sleep quality with extraversion. The higher extraversion score leads to lower sleep quality score. So the quality of sleep was improved. In present study no significant relationship was found between overall score of sleep quality with other dimensions of personality characteristic.

Extrovert people are sociable, energetic, kind and attentive (6). Based on Huron and Michell theory, they are away of passive techniques on stress management because of their braveness and warm and intimate communication with others. These people consider stressful events as a challenge and come over them by positive thinking and self-control (17). So, it is expected that extroverts experience calm life with less problems. The results of the present study confirm the above findings.

It would be expected that there was a significant relationship between neuroticism and quality of sleep, because these group of people tend to experience negative emotions such as fear, sadness, distress, anger, feeling of guilt and disgust. These people are anxious, nervous and restless (6). They consider stressful situations as threat. In this study, there was a direct relationship between neuroticism and overall score of sleep quality, however this relationship was not significant ( $P=0.080$ ). In the study of Browna (2009), the higher score of neuroticism accompanied with higher score of sleep disorders (10). Research plan and studied variables of his study are similar to the present study, however, two studies applied different questionnaires to measure personality. He used short form of NEO questionnaire, but in this study long version was used which is more careful. The mean score of neuroticism in present study was  $21.6\pm 5.6$  and mean of overall sleep quality in neuroticisms was  $3.1\pm 0.7$ . They were  $5.1\pm 0.2$  and  $25.2\pm 4.2$  in Browana study. The difference could be as a result of using different questionnaires for sleep disorders and personality. Results of this study were in agreement with Elavsky's (2009) findings (4).

The only difference was related to non significant reverse relationship of extroversion and sleep quality in his study.

It seems that the difference could be due to using different questionnaires for personality and sleep quality. In this study Pittsburgh and NEO FFI were used where as Elavsky (2009) Applied pool and Green questionnaires (4). In the present study significant relationship was found between level of anxiety and fatigue with sleep quality, i.e. level of anxiety in women with bad quality of sleep was  $57.5\pm 22.2$ , while it was  $50.8\pm 22.7$  in women with good quality of sleep. Level of fatigue in former group was  $60.2\pm 21.7$ , while in the lather group was  $53.3\pm 26$ . Confounding variables for sleep quality were level of anxiety and night sweat due to flashing; however general linear model showed that except night sweat which had predictive effect on quality of sleep, level of anxiety and fatigue were not predictive.

The results of the present study showed that there was a significant relationship between daily naps, nap duration and drinking tea at bed time with quality of sleep. The longer daily nap leads to lower quality of sleep, consequently the score of sleep quality increased. General linear model showed duration of daily nap as a predictive variable for sleep quality. In this study the score of neuroticism increased with level of education of women and their husbands, level of socioeconomic class, level of anxiety and fatigue. Based on the view point of Atkinson and Heligard, personality is a certain thinking style which determines the way of adaptation of individuals with environment (19). Neurotic people are anxious, unstable, nervous and severely restless. So it is expected to be in lower levels of education and lower socioeconomic class. As they are nervous, anxious and results (6) it could be predicted that the level of fatigue and anxiety are high in these people. It is concluded that individual differences in personality plays an effective role in reporting sleep problems. Control and effective treatment of these differences could improve prognosis. Furthermore, psychological consultation as well as pharmaceutical treatment in women with sleep problems and providing proper state of health before and after menopause and considering them by health care providers could decrease sleep problems in



menopausal women and provide higher quality of life for post menopausal period.

Limitations of this study include individual differences, psychological state, examination-induced stress which influenced the way of answering questionnaires. For control of these conditions it was tried to complete questionnaires before stressful events and before examination in a calm situation. We could not control genetics, nervous system and endocrine system which influenced personality; however thyroid gland was controlled by examination.

### Conclusion

Extroverts women have healthy personality characteristics such as braveness, making warm and intimate communication, be energetic and kind. These characteristics could improve quality of sleep.

### Acknowledgements

This study is driven from MSc thesis approved by Mashhad University of Medical Sciences (MUMS) (code 910207). Authors offer their special thanks to MUMS Vice President for Research for financial support.

### Conflict of Interest

The authors declare no conflicts of interest.

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