ORIGINAL ARTICLE

Association of Sleep Quality with Socio-Demographic Characteristics in Elderly Referred to Health Centers in Qazvin, Iran

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ABSTRACT

Background and aim: Sleep disorders are not innately harmful to quality of life, they can induce or complicate physical and mental sicknesses and increase the risk of mortality. The aim of this study was to determine the association of sleep quality components with socio-demographic characteristics in elderly people in Qazvin, Iran.

Materials and Methods: This descriptive cross-sectional study was performed on 400 elderly patients referred to health centers in Qazvin. Data were collected by using a demographic questionnaire and the Pittsburgh sleep quality index (PSQI). Data were analyzed by SPSS 19 software, descriptive and inferential statistics (Mann-Whitney, Chi-square, logistic regression).

Results: The prevalence of poor sleep quality was 80%. Statistically significant difference were observed between total global PSQI score and economic condition ($p < 0.03$) and had chronic physical disease ($P < 0.001$). Highest component scores was sleep latency (1.55 ± 1.06) and lowest was habitual sleep efficiency (0.16 ± 0.57). Older women had worse sleep quality compared with older men ($P < 0.05$). Multivariate logistic regression model indicated that female sex is associated with greater tendency towards poor sleep quality ($OR = 1.78$, 95% $CI = 1.08 - 2.94$, $P = 0.022$).

Conclusion: This study provides evidences that poor sleep quality was high among the elderly of Qazvin. It seems sleep quality assessment of older adults is necessary to identify the factors affecting sleep quality and to adopt appropriate measures and strategies to eliminate or reduce the effect of these factors.

Keywords: elderly, sleep quality, community health centers

INTRODUCTION

Sleep is a basic need of human being because it assists the body to relax and repair, maintain appropriate circadian rhythm and preserve energy for daily living (Azri et al., 2016). Insufficient sleep can increase fatigue and

unrestrained daytime sleepiness. Sleep complications have an adverse effect on mental and physical health, impair the quality of life and increase the healthcare expenses. Quality of sleep will finally influence energy, emotional balance and health. Therefore, poor sleep quality and sleep disorders such as insomnia can undermine the quality of life (Azri et al., 2016). As a result of aging, changes such as decreased efficiency and total sleep time and increased superficial sleep take place, thereby influencing the quantity and quality of sleep (Mendoza-Meléndez et al., 2016).

Sleep disorders in old age are prevalent and have been known (Wu, Tung-Ping Su, Chin-Lung Fang, & Mei Yeh Chang, 2012). Approximately 50% of the adults aged

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>65 are sleep disorders and have been reported at least one chronic sleep complaint, the most common being inability to stay asleep at night (Chein & Chen, 2015, Landry, Best, & Ambrose, 2015, Smyth, 2008). So that, Park et al. reported 60% of the elderly had poor sleep quality (Park, Yoo, & Bae, 2013). Sleep disorders in the elderly can be caused by various reason, such as medical disorders, atypical sleep-wake patterns, reduced amount of sleep or poor sleep quality. it should be noted that so Sleep disorders have resulted in the poor quality of life , including induced or complicate physical and mental sicknesses and increase the risk of mortality (Smagula, Stone, Fabio, & Cauley, 2016);besides Poor sleep quality in old age is caused by environment, chronic disease, pain and sleep disturbance and too contributes cardiac illness, depression, falls and accidents. Recent findings show sleep quality plays a key role in maintaining cognitive function in elderly (Landry, Best, & Ambrose, 2015). Therefore, it is highly important to consider sleep quality and to identify sleep disorders among the elderly.

Knowledge the quality of sleep in the elderly and identification of the factors affecting it will be helpful to adopt appropriate strategies to wipe out or decrease the impact of these factors. However, there is very little, inadequate and indecisive data regarding sleep quality and sleep quality predictors among older people with different levels of cognitive functioning in an institution in Iran. Hence, this study was conducted to determine the association of sleep quality components and socio-demographic characteristics in elderly people in Qazvin, Iran.

METHOD

This descriptive survey was performed on a representative sample of community-based individuals aged 60 years and older in Qazvin city, Iran. For calculating sample size were applied the following formula:

$$n = \frac{(Z_{1-\alpha/2})^2 * P(1-P)}{d^2} = \frac{4 * 0.5(1-0.5)}{(0.05)^2} = \frac{1}{0.0025} = 400$$

In this formula Considering p as prevalence of sleep problems (49.4%)(10) (Nazifi et al., 2014); Test

confidence and test power are considered respectively; 95% and 0.05, the least number of the samples was estimated 400 were selected by multistage cluster random sampling method based on the number of elderly population in an urban health center. Participants aged 60 years or over (Noroozian, 2012) , ability for verbal communication to response the questions and without a history of cognitive and mental diseases and disability were included to the study; so written informed consent was gained from all participants. For data gathering all participants were interviewed face to face by trained two nurses at health center. Those who older participants were not available for interview at their home for another appointment. Because elderly people have at least one chronic disease such as arthritis, high blood pressure, Diabetes, cardiovascular diseases, Musculoskeletal disorders, Neurological diseases, sensory disorders and ... (Barry, 2000), (Pishkar Mofrad, Jahantigh, Arbabisarjou, 2015) Chronic disease of the participants were recorded using medical disease list. The scale applied to measure sleep quality was the Pittsburgh sleep quality index (PSQI) (Smyth, 2008; Nazifi et al., 2014). The PSQI is a validated tool that contains 19 questions on multiple dimensions that assess sleep quality and problems in the past month. This questionnaire consist of seven components score on a 0-3 scale: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication and day time dysfunction. The sum of scores of the above seven component scores presents a global PSQI score with a scope of 0-21 points. A lower global PSQI score showed good sleep quality and a global score PSQI score higher than 5 was defined as poor sleep quality (Buysse et al., 1991).

Data were recorded as mean $\pm$ standard deviation (SD) or number (percent). The PSQI factors were compared between male and females using Mann Whitney U test. Chi-square test was used for analysis of categorical variables. A logistic regression analysis was used to examine the association of sleep status and demographic variables. P-values less than 0.05 were considered as statistically significant.

RESULTS

Of 400 older participants, 194 (48.5%) were males and 206 (51.5%) were females. Mean age was 67.48 ± 7.09 years, The majority of the subjects were in the 60-65 age groups, married (71.5%); Among the participant, 51.8% were living with wife, and. Only 18% had received a high school education or above. Most (84.5%) of the subjects had a chronic physical disease. With regard to economic condition, 87.8% were Independent.

The total global PSQI score was 7.11 ± 3.04 . The prevalence of poor sleep was 80%. Mean of sleep duration was 5.81 ± 1.61 hours in males and 5.79 ± 1.76 in females. Comparison of the sleep qualities of the older subjects and their socio-demographic characteristic are presented in table 1. Statistically significant difference were observed between total global PSQI score and economic condition ($p < 0.03$) and had chronic physical disease ($P < 0.001$). There was no statistically significant

difference between the total global PSQI score and age, education, marital status living status and duration of menopause.

Total PSQI scores and its seven components of the study subjects by sex are shown in table 2; as shown in the table highest component scores was sleep latency (1.55 ± 1.06) and lowest was Habitual sleep efficiency (0.16 ± 0.57). Women older had worse sleep quality compared with older men ($P < 0.05$). No significant differences were found between males and females in sleep duration, habitual sleep efficiency, sleep disturbances and use of sleep medication. Female older had longer sleep latency, and more day time dysfunction. Multivariate logistic regression model indicated that female sex is associated with greater tendency towards poor sleep quality (OR=1.78, 95% CI=1.08-2.94, $P=0.022$), no association was found between age, education, disease or living condition and poor sleep quality (table 1) (table 2).

Table 1: Mean Scores of PSQI according to demographic variables of the elderly subjects

	Total PSQI Score		P-Value
	n (%)	Mean $\pm$ SD	
Marital status *			
Single	114 (28.5)	7.33 $\pm$ 3.67	0.10
Married	286 (71.5)	6.51 $\pm$ 3.18	
Age *		7.01 $\pm$ 3	
60-65	206 (51.5)		0.45
66-70	94 (23.5)	6.87 $\pm$ 3.01	
71-75	47 (11.8)	7.82 $\pm$ 3.21	
76-80	27 (6.8)	7.66 $\pm$ 2.98	
>80	26 (6.5)	6.88 $\pm$ 3.12	
Education *			
Illiterate	121 (30.2)	7.28 $\pm$ 2.97	1.67
Primary	154 (38.6)	7.47 $\pm$ 2.94	
High school	53 (13.2)	7.04 $\pm$ 3.81	
Academic	72 (18)	6.45 $\pm$ 3.03	
Living condition *			
Alone	57 (14.2)	7.80 $\pm$ 3.59	0.44
With wife	207 (51.8)	6.92 $\pm$ 2.83	
With children	133 (33.2)	7.13 $\pm$ 3.09	
With relatives	3 (0.8)	6 $\pm$ 0.0	
Disease **			
Yes	338 (84.5)	7.35 $\pm$ 3.04	<0.001
NO	62 (15.5)	5.77 $\pm$ 2.63	
Economic situation**			
Independent	351 (87.8)	7 $\pm$ 3.04	0.03
Dependent upon others	49 (12.2)	7.91 $\pm$ 2.92	

*Kruskal Wallis Test, **Mann Whitney

Table 2. Total PSQI scores and seven component scores of the elderly subjects by sex

Component	Total	Men	Women	Z value	P-value
Subjective sleep quality	1.10±0.69	1.05±0.72	1.15±0.65	-1.579	0.114
Sleep latency	1.55±1.06	1.45±1.04	1.64±1.06	-1.753	0.080
Sleep duration	1.74±0.97	1.71±0.98	1.77±0.97	-.666	0.505
Habitual sleep efficiency	0.16±0.57	0.15±0.56	0.16±0.58	-.322	0.747
Sleep disturbances	1.43±0.57	1.40±0.57	1.45±0.58	-.745	0.457
Use of sleep medication	0.51±1.06	0.50±1.05	0.53±1.07	-.395	0.693
Daytime dysfunction	0.59±0.81	0.52±0.77	0.67±0.85	-1.867	0.062
Total PSQI	7.11±3.04	6.80±2.98	7.39±3.07	-1.903	0.057

DISCUSSION

Sleep complications have an adverse effect on mental and physical health, impair the quality of life and increase the healthcare expenses (Azri et al., 2016). This study evaluated the sleep quality of the elderly of Qazvin, Iran.

The findings showed 80% of the elderly had poor sleep quality. These results were in line with the findings of Park et al. (Park, Yoo, & Bae, 2013), Oliviera et al (Oliviera Araújo & Ceolim, 2010) and Azri et al (Azri et al., 2016), indicating 64.3% of the Korean elderly, 63.1% of the Brazilian elderly and the Indonesian elderly had poor sleep quality, respectively (Azri et al., 2016). However, Niu et al reported that 33.7% of the Chinese elderly had poor sleep quality (Niu et al., 2016). King Lee et al. (Lee et al., 2015) and Wu et al. (Wu, Tung-Ping Su, Chin-Lung Fang, & Mei Yeh Chang, 2012). Reported 37.6% and 49% of the elderly had poor sleep quality, respectively, which was much lower than the results of the present study in terms of the incidence of poor sleep quality. It seems poor sleep quality is quite prevalent in the elderly of Qazvin, Iran. It should be noted that physiologic changes due to aging affect the sleep quality of the elderly negatively. Yet, the contradictory results of studies can be associated with the self-report data collection method and uncontrollable psychological conditions of the elderly while completing the questionnaires.

The results of the current study showed that the elderly in the subgroup "Sleep latency" had maximum level of mean sleep quality and those in the subgroup "Habitual sleep efficiency" had minimum level of mean sleep quality. In their study, Park et al reported maximum level of mean sleep quality for the component scores "sleep latency" and

"sleep duration" and minimum level of mean sleep quality for the component scores "use of sleep medication"; Further, the obtained results indicated that the sleep quality of the elderly was reduced with aging, but no statistically significant difference was observed, confirming the results of Niu et al (Niu et al., 2016), Kiejna et al (Kiejna, Rymaszewska, Wojtyniak, & Stokwizewski, 2004) and Wu et al (Wu, Tung-Ping Su, Chin-Lung Fang, & Mei Yeh Chang, 2012). The findings of Park et al. for the Korean elderly (Park, Yoo, & Bae, 2013) and those of Jeong Park (Jeong Park, 2017) was conflict. The findings also demonstrated a significant difference between men and women in total global PSQI score, sleep quality being poorer in women than in men. This was in agreement with the results of Smagula et al (9) (Smagula, Stone, Fabio, & Cauley, 2016), Wu et al (Wu, Tung-Ping Su, Chin-Lung Fang, & Mei Yeh Chang, 2012) and Niu et al (Niu et al., 2016). However, the study of Park et al. on the Korean elderly population showed no significant relationship between gender and sleep quality (Park, Yoo, & Bae, 2013).

Moreover, the results indicated a significant difference between sleep quality and chronic disease status of the elderly, so that with an increase in chronic diseases in the elderly, their sleep quality was worsened, which was in line with the findings of Hsiu (Hsiu & Lin, 2005), Niu et al (Niu et al., 2016) and Wu et al (Wu, Tung-Ping Su, Chin-Lung Fang, & Mei Yeh Chang, 2012). Further, Park et al stated that chronic disease in the elderly was a predictor of their sleep quality (Park, Yoo, & Bae, 2013). Furthermore, the findings of the present study showed a significant association between sleep quality and economic status of the elderly; people with higher income had a better sleep quality. It is quite evident that

higher income is a factor that reduces the mental and psychological concerns of the elderly. Adams (Adams, 2006), Friedman (Friedman et al., 2007) and Smagula (Smagula, Stone, Fabio, & Cauley, 2016) emphasized the positive effect of income on solving the sleep disorders.

Our results indicated that the elderly with lower education had poorer sleep quality, but there was no significant difference between education status of the elderly and their sleep quality. Yet, the cross-sectional study of Niu et al on 1010 Chinese elderly showed a significant relationship between education level and sleep quality al (Niu et al., 2016). It should be noted that the positive effect of education on sleep quality has been formerly reported by various researchers. (Jeong Park, 2017, Wu, Tung-Ping Su, Chin-Lung Fang, & Mei Yeh Chang, 2012; Kiejna, Rymaszewska, Wojtyniak, & Stokwizewski, 2004; Moore, Adler, Williams, & Jackson; 2002).

The current results also showed no significant difference between marital status of the elderly and their sleep quality, confirming the findings of Wu et al (Wu, Tung-Ping Su, Chin-Lung Fang, & Mei Yeh Chang, 2012), Park et al (Park, Yoo, & Bae, 2013) and Smagula (Smagula, Stone, Fabio, & Cauley, 2016). It is noteworthy that married people are supported by their families, but the single ones are deprived of this kind of support, which consequently causes stress and sleep problems. Meanwhile, divorce is one of the risk factors involved in sleep disorders (Lee et al., 2015). Additionally, the findings revealed no significant difference between sleep quality and duration of menopause among the female elderly. However, Hsiu et al (Hsiu & Lin, 2005) reported menopause played a key role in structural changes of

elderly women's sleep, and they suffered sleep disorder after menopause.

The self-report of the questionnaire regarding the elderly's sleep quality was one of the limitations of this study, as a result of which the psychological and uncontrollable factors could affect their responses. Small sample size was another limitation, which could undermine the generalizability of the findings. Further research with larger sample size in all healthcare centers of Qazvin province can help to generalize the obtained results.

CONCLUSION

The results were indicative of poor sleep quality among the elderly of Qazvin province, Iran. Since sleep is one of the basic needs of human being, any disorder in sleep causes mental problems and loss of personal abilities (Smagula, Stone, Fabio, & Cauley, 2016), it seems necessary to identify the factors affecting sleep quality among the elderly and to adopt appropriate measures and strategies to eliminate or reduce the effect of these factors. It should be noted that planning to face the challenges of poor sleep quality in the elderly is a vital step to be taken, and lack of planning and policymaking in this regard will result in serious social, economic and health problems for the society in the near future. Since promotion of sleep hygiene in the elderly is potentially important, special programs are recommended to be developed to enhance the social participation, improve medical and health services and present counselling services to the elderly population.

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