

Quality of Sleep and Daily Activity of the Elderly in Zanjan

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Background: Poor quality of sleep and daily activity in elderly people are associated with many physical and psychological problems that increase disability and need to use health services. The aim of this study was to determine the relationship between daily activities and quality of sleep in the elderly people.

Methods: This Study was a correlational-descriptive study on 390 elderly people in Zanjan in 2013. The sampling was done using a cluster and multistage method. Data were collected via face-to-face interview, using Pittsburgh Sleep Quality Index (PSQI) and a questionnaire on "activities of daily living (ADL)" and "instrumental activities of daily living (IADL)". Data analysis was performed using descriptive statistic including number, percentage, mean, standard deviation, and inferential statistical tests including Spearman's rank correlation coefficient, independent t-test and one-way analysis of variance.

Results: The mean score of ADL and IADL was 11.58 ± 0.81 (score range 0-14) and 11.23 ± 2.93 (score range 0-18), respectively. In addition, 85.7% of the subjects in the study had poor sleep quality and only 14.3% had good sleep quality. The results also indicated no significant relationship between the daily activities and quality of sleep in the elderly, while instrumental activities had a weak positive and significant correlation with their sleep quality ($P \leq 0.05$).

Conclusion: Although the elderly in this study have poor sleep quality, they are independent in performing ADL and IADL. Furthermore, there is a weak and direct correlation between sleep quality and instrumental activities of the old people. Improvement of activity in the elderly can improve their quality of sleep.

Keywords: Elderly, Daily Activities, Pittsburgh Sleep Quality Index

Introduction

As a vulnerable group, elderly people receive a lot of attention (1). The number of older people has increased in recent years due to improvement of sanitary conditions, reduction of mortality rate and increase of life expectancy (2), so that one in every 10 person in the world is older than 65 years (1). In 2009, the United Nations announced that the number of older people in the world is 750 million that will reach 2 billion by the year 2050 (3).

With the growth of population, the number of older people has increased in Iran (4,5). According to the latest report (2011) by the Statistical Center of Iran, the number of older people was reported to be about 6.3 million, which has increased to 8.2% of the total population from 6.6% in 1996. The number will add up to over 10% by 2021 (5), and about 27 million by 2050 (about 28%) (3).

Some studies indicate that a variety of problems that physiologically occur at older ages contributes to decline in quality of life among the elderly (6). Sleep is one of the components of humans' lives that undergoes some changes in terms of its quality and structure due to aging (7). The changes result in sleep disorder and related frequent complaints (8,9). The results of studies indicate that poor sleep quality ranks third in older people's problems following headache and digestive disorder, and is a reason for visiting physicians (10). According to a study, over 57% of older people reported sleep disorder, while only 12% reported no sleep problem (7). In some studies, this rate was reported to be up to 70% (8,11).

Immobilization is also a common problem in the elderly that affects health and sleep quality. Maintaining physical function is a key factor in successful aging (12). It is demonstrated that 25% of individuals are unable to perform their daily activities after retirement age (13). Moreover, results of a study indicated that 80% of the elderly are suffering from at least one chronic disease (14), causing several social, economic and health problems that may limit performing the daily activities (14,15).

Maintaining physical activity not only delays development of some chronic diseases, but

improves physical and psychological health of older people (16,17). For this reason, investigating the level of activity in the elderly is considered one of the best ways to assess their health.

Poor quality of sleep and inadequate daily activity in older people are associated with many physical and psychological problems including depression and cognitive disorder (17,18,19). It is also associated with damage to health, reduced-physical function, -quality of life, -daily performance (20) and -life satisfaction (21), as well as remarkable increase in health care costs [18,22]. All these intensify older people's inability and heighten their need for sanitary services (22-26). Improvement of sleep quality and daily activities in the elderly plays an important role in boosting mental and physical performance, life satisfaction, social performance and pain relief (19, 26). The results of some studies also suggest that increase in level of activities has a positive effect on older people's sleep quality.

Although many studies have been conducted on sleep quality and daily living activities among older people (6,20,29), no study was found that specifically dealt with relationship between sleep quality and daily activities. Thus, this study aimed to investigate the relationship between daily activities and quality of sleep in older people, living in the city of Zanjan.

Methods

This correlational-descriptive study was conducted in 2013, to determine the level of daily activity and quality of sleep as well as their relationship among the elderly in Zanjan. The study population consisted of all men and women aged ≥ 60 years living in Zanjan at the time of the study. Inclusion criteria included residence in Zanjan, mental alertness and ability to respond to questions. People with disabilities including walking difficulty, blindness and deafness were excluded from the study. Subjects were selected through multi-stage cluster sampling by randomly selecting some areas of the city and then randomly visiting two public places (mosques, parks, sport facilities and shopping centers) in each area. The researchers investigated the places under study for three months and

completed the study questionnaire via face-to-face interviews with eligible individuals. Overall, 390 individuals were enrolled in this study.

A questionnaire with three parts was used for data collection. The first part included personal and social characteristics of the subjects. The second part was "Pittsburgh Sleep Quality Index" (PSQI). This index is suitable for measuring sleep quality among the elderly, developed by J. Buysse that has been used in several studies in various countries (20, 30, 31). The index has 18 items that are classified into seven parts. Components of the questionnaire included subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, insomnia, use of sleeping medication and morning performance. The sum of mean scores for the seven parts constitutes the total score of the tool that ranges from zero to 21. Higher scores indicate poorer sleep quality and score of ≥ 6 indicates poor sleep quality (32). Validity of PSQI was reported to be 80% with reliability between 93 and 98% (33). The tool has been used many times in Iran, and its content validity and reliability have been confirmed (6).

Daily activities were assessed using a tool with two parts of ADL (activities of daily living) and IADL (instrumental activities of daily living). Daily routine activities included eating, dressing up and undressing, walking, checking appearance, bathing or taking shower, going to bed and getting out of bed and going to bathroom. IADL included ability to use phone, driving a relatively long distance, buying food and clothes, preparing meals, doing household chores, washing clothes, making minor repairs at home, taking medication and controlling income and expenditure. Responds included unable to do it, with little help and I do it independently, for which scores 0 to 2 were given. Scores were ranging between 0 and 14 for ADL and between 0 and 18 for IADL (19).

Validity of the questionnaires was assessed by content validity, and its reliability was measured by implementing it on 20 elderly persons using Cronbach's alpha. For the questionnaires "ADL", "IADL" and "PSQI", values of 0.87, 0.86, and 0.83 were obtained,

respectively. SPSS version 16 was used for data analysis. Mean and standard deviation (SD) along with number and percentages were used to describe personal-social characteristics, sleep quality and life activities. Spearman's rank correlation coefficient was used to evaluate the relationship between sleep quality and life activities. Independent T-test and one-way analysis of variance were utilized to examine the differences in the main variables based on social-personal characteristics. P-value of ≤ 0.05 was considered as the statistical significance level.

Results

The mean (SD) age of the participants was 68.59 ± 7.55 and the mean number of children was 5.75. Most participants (62.3%) were female, married (62.1%), illiterate (68.2%), homemaker (46.9%), with average economic status (49.7%). Moreover, 35.9% of the subjects were living with their spouse, 13.3% had a history of smoking and 57.2% had a history of chronic diseases. The overall rating of sleep quality in the subjects was 9.19 ± 2.80 . The results also showed that 58% had poor sleep quality and only 14.3% had good sleep quality (table 1).

Table 1: Mean and SD of scores of sleep quality in the elderly people of Zanjan based on the seven components

Items	Mean \pm SD
Subjective Sleep Quality	1.18 \pm 0.76
Sleep Latency	0.93 \pm 0.68
Sleep Duration	0.43 \pm 0.78
Habitual Sleep Efficiency	2.78 \pm 0.75
Sleep Disorder	1.19 \pm 0.44
Use of Sleeping Medication	1.27 \pm 1.26
Daytime Dysfunction	1.43 \pm 0.60
Sum of the Mean Scores	9.19 \pm 2.80

Furthermore, the quality of sleep in the subjects was significantly different based on gender and history of smoking and chronic diseases ($P < 0.001$). The results of one-way analysis of variance indicated that sleep quality of the subjects was significantly different based on marital status, level of education, employment status, economic status and family composition ($P < 0.001$). There were also significant differences in

terms of age (P= 0.02) and gender (P=0.04) in daily activities of the subjects. One-way analysis of variance showed significant differences in terms of marital status, level of education, employment status, economic status and family composition (P<0.001). Moreover, the results indicated that the IADL in the subjects weresignificantly different in terms of marital status, level of education, employment status, economic status and family composition (P<0.001).

Additionally, the results of Spearman's rank correlation test indicated that ADL had no significant association with the quality of sleep, while IADL had weaklypositive and significant association with the sleep quality of subjects (r=0.196, P<0.001). Only 77% of the older people who had good sleep quality were independent in performing instrumental activities (table 2 and 3).

Table 2: frequency distribution of older people in Zanjan based on performing daily and instrumental activities

ADL	I do it independently	With little help	Unable to do it
	Number (%)	Number (%)	Number (%)
Eating	388 (99.5)	20 (0.5)	0 (0)
Dressing and undressing	385 (98.7)	5 (1.3)	0 (0)
Walking	295 (75.6)	90 (23.1)	5 (1.3)
Good-looking bathing	378 (96.9)	11 (2.8)	1 (0.3)
Going to bed	359 (92.1)	31 (7.9)	0 (0)
Going to bathroom	389 (99.7)	1 (0.3)	0 (0)
	378 (96.9)	12 (3.1)	0 (0)

IADL	I do it independently	With little help	Unable to do it
	Number (%)	Number (%)	Number (%)
Ability to use phone	98 (50.8)	159 (40.8)	33 (8.5)
Traveling long distances shopping	53 (13.6)	49 (12.6)	288 (73.8)
Preparing food	238 (61.0)	136 (34.9)	16 (4.1)
Doing household chores	207 (53.1)	135 (34.6)	47 (12.1)
Washing clothes	237 (60.8)	145 (37.2)	8 (2.1)
Making minor repair	187 (47.9)	145 (37.2)	58 (14.9)
Taking medication	59 (15.1)	127 (32.6)	204 (52.3)
Controlling income and expenditure	191 (49.9)	188 (48.2)	10 (2.6)
	206 (52.8)	146 (37.4)	38 (9.7)

Table 3. Relationship between daily and instrumental activities and sleep quality in older people of Zanjan

Sleep quality	Daily activities of living	Desirable (≥ 6)	Undesirable (>6)	Test results
		Number (%)	Number (%)	
	Independent (11-14)	25 (96.2)	333 (91.5)	P =0.402 r=0.043
	Slightly dependent (7-10)	1 (0.3)	30 (8.2)	
	Totally dependent(0-6)	0 (0)	1 (0.3)	
	Overall	26 (6.6)	364 (93.4)	

Sleep quality	IADL	Desirable (≥ 6)	Undesirable (>6)	Test results
		Number (%)	Number (%)	
	Independent (14-18)	2 (7.7)	81 (22.3)	P<0.001 r=0.196
	Slightly dependent (9-13)	8 (30.8)	199 (54.7)	
	Totally dependent	16 (61.5)	84 (23.1)	
	Overall	26 (6.6)	364 (93.4)	

Discussion

The total score of the older people's sleep quality was 9.19%, indicating poor sleep quality in the subjects of this study. A cross-sectional study by Izadi et al. (2006) on sleep quality of older people hospitalized in Kashan's hospitals showed a mean total score of 7.2% (19). Although the mean score in the present study is greater than that in Izadi et al., the quality of sleep in both studies is undesirable.

The results indicated that most participants (85.7%) have poor sleep quality and only 14.3% of the subjects have desirable sleep quality. It was reported that over 57% of older people have sleep disorder, while only 12% had no problem sleeping. Moreover, 70% of the elderly in some studies reported sleep disorder, which is consistent with the results of the present study (7,8, 11). In Izadi et al. study, almost 50% of old hospitalized patients had poor sleep quality. The results of the present study indicates a higher prevalence for poor sleep quality compared to other studies. This difference may be due to different study environment and population, in a sense that the study population of Izadi et al. study consisted older people hospitalized who were likely to take some medications affecting their sleep quality. The quality and quantity of sleep stages 1 and 2 (the lightest periods of sleep) increases as a person ages, while it decreases in stage 3 and 4 (deepest periods of sleep), which ultimately result in sleep disorder and frequent complaints [34].

The mean score of ADL and IADL was 11.58% (score range 0-14) and 11.23% (score range 0-18), respectively. These results indicate independence of the elderly in this study. Habibi et al. study (2008) aimed to determine the relationship between quality of life and quality of sleep in the elderly in Tehran and reported the mean score of ADL and IADL as 13.54% and 14.20%, respectively that are relatively greater than the values obtained in this study [6]. This could be due to difference in sociocultural context of participants in both studies. Moreover, the results of a study of older people in Korea reported mean score of 16.2% for ADL and 9.9% for IADL (35).

The results indicated that most subjects (91.8%) were independent, 7.9% were slightly dependent, and 0.3% were totally dependent in performing ADL. Meanwhile, 25% of the subjects were independent, about 54% were slightly dependent and over 21% were totally dependent in performing IADL (table 5 and 6). The results of Habibi et al. (2008) also indicated that over 93% of older people were independent in performing ADL, which is in agreement with the results of the present study. In this regard, Staurant asserted that over 80% of individuals aged between 65 to 74 years have no difficulty in performing ADL (13). The results of a study in Turkey indicated that 22% and about 34% of older people are dependent in performing ADL and IADL, respectively (36). Moreover, the results of Hachihanoglu et al. (2011) indicated that 2% of older people were totally dependent in terms of doing ADL, 14.5% were slightly dependent, and the rest were independent (37). The difference in the results of the two studies may be due to different sampling techniques used, as the aforementioned study chose the participants from patients who were referred to a health center, while the participants of the present study were healthy individuals.

Habibi et al. (2008) reported that over 71% of older people were independent in terms of performing IADL, while only 10% were dependent, which is inconsistent with the results of our study.

The results indicated no significant relationship between daily activities and quality of sleep in older people, while IADL had a weak positive and significant correlation with the quality of sleep in these individuals ($P \leq 0.05$). Only 7.7% of the older people who had desirable sleep quality were independent in performing IADL. It is evident that any form of defect or disease that reduces patient's independent affects their sleep quality as well. The results of a study in Taiwan also indicated a significant association between physical activities and sleep quality of older people (38). However, since most subjects of the mentioned study had depression, movement disorders cannot be concluded as the only cause of sleep disorders in the elderly. In other words,

psychological problems may play a more important role in this regard. In our extensive literature review, no study was found on the relationship between daily and instrumental activities of daily living and quality of sleep

Conclusion

According to the results of this study and previous studies that examined sleep disorders, aging and state of older people's daily activities, it seems that sleep disorder is still the main complaint of the elderly. Although no clear significant relationship was found between sleep quality and daily activities of the elderly, it seems that the elderly who do not have a good night's sleep

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have less efficiency in performing activities during the day. Therefore, health managers and planners in the country should consider sleep problems in the elderly as a more important issue that affects their sleep quality, and are recommended to implement necessary interventions in this regard.

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