Clinical and Experimental Health Sciences

The Effect of Sleep Quality on Happiness in Elderly Individuals

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ABSTRACT

Objective: Sleep problems are commonly seen in elderly people. This study was planned to determine the effect of sleep quality on happiness in elderly people.

Method: The study was conducted with 306 elderly people. Data were collected with Personal information form, Pittsburgh Sleep Quality Index and Oxford Happiness Questionnaire-Short Form.

Results: The mean sleep quality score of the elderly people was 7.91±3.65. The mean happiness score of the elderly people was 24.00±4.88. There was a relationship between sleep quality scores and happiness scores of elderly people (r=-0.44; p< .001). Sleep quality was a predictor of approximately 20% of the happiness level of elderly people (β=-.442; p< .001).

Conclusion: This study reveals that sleep quality is poor in elderly people and it is one of the predictor of happiness. Nurses caring for elderly people should implement initiatives to ensure the sleep hygiene of elderly people.

Keywords: Elderly, sleep quality, happiness, nursing

1. INTRODUCTION

One of the basic and vital needs for protecting and maintaining health is sleep. Sleep is effective on mental functions such as emotion, thought, behavior, memory and physical functions such as circulation and digestion. Unfortunately, some goals, such as high status and income, lead to sleep being ignored today (1,2). However, studies on sleep draw attention to the fact that inadequate or poor quality sleep is one of the major health problems, that quality sleep is associated with subjective well-being, and that quality of life decreases as sleep quality decreases (1-6).

Although sleep is necessary for the health of all age groups, there are changes in sleep duration depending on age. The amount of sleep required decreases from childhood to adulthood. There is a change in circadian rhythm and sleep-wake phases with aging and that elderly people cannot adequately produce sleep due to some physiological reasons. Additionally, medical and psychiatric disorders, medication side effect, primary sleep disorders, behavioral habits disrupt sleep quality in the elderly (7). It is showed by studies that chronic health problems lead to sleep problems in the elderly. Thichumpa et al. (2018) reported in their study that moderate depression reduces sleep quality in the elderly (8). Qin et al. (2022) found in a study in which they followed elderly individuals for 2 years that high body mass index, physical health problems and depression lead to poor sleep quality (9). Zhang et al. (2022) proved that sleep quality is an important mediator between chronic diseases and depressive symptoms (10). On the other hand, there is a misconception in society that sleep problems are a natural consequence of aging. This situation causes sleep quality in elderly people to be underestimated and sleep problems to be ignored (1,2). However, poor sleep quality and daytime sleepiness increase fatigue in elderly people and negatively affect daily living (11,12). Researches suggests that sleep problems lead to serious negative physical, social and mental consequences in elderly people (1,13-15).

Today, successful aging policies aim to ensure that elderly people go through the aging process more happily, positively and satisfied with their lives. Health conditions play an important role in the successful aging (16). It has been known that physical or mental health problems reduce the happiness of people (17-19). A study conducted with people over the age of 65 shows that elderly people who do not feel “well” physically and mentally have low levels of happiness. Similarly, elderly people with low social support have low levels of happiness (20). The other study conducted with people over the age of 60 found that anxiety, social phobia, depression, disability and frailty

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increased unhappiness (21). It has been determined that health is the first important factor in the perception of happiness of 82 percent of elderly people in Turkey (22).

Detection and treatment of sleep problems in elderly people is important in terms of maintaining both their physical and mental health. In order for elderly people to have an active, healthy and successful old age, it is necessary to maintain that their healthy lifestyle habits like adequate sleep. Nurses are primary health care personnel who will support elderly people in this regard.

Although there are studies on sleep problems of elderly people in nursing literature, the relationship between sleep quality and perception of happiness has not been adequately evaluated. In this study, it was aimed to examine the effect of sleep quality on happiness in elderly people. The data to be obtained will contribute the practices in elderly care nursing and aging policies

Research questions;

What is the sleep quality level of the elderly people?

What is the happiness level of the elderly people?

Is there a relationship between sleep quality and happiness levels of the elderly people?

Does sleep quality affect happiness in elderly people?

2. METHODS

2.1. Study Design

This study is cross-sectional and correlational design.

2.2. Sample and Setting

This study was conducted with face-to-face interviews with elderly people in their home between November 2021-January 2022. The universe of the study consists of people aged 60 and over living in a city province. The elderly population of city in 2020 is 98.066 people (23). The sample size of the study was determined as a minimum of 267 people using the Raosoft Sample Size Calculation Program (α=0.05, β=0.90) (http://www.raosoft.com/samplesize.html). The sample consisted of 306 elderly people who volunteered to participate in the study. People with a psychiatric diagnosis, those using psychotropic medication, those experiencing chronic pain, those experiencing loss in the last 6 months, and those with communication problems were excluded from the study.

2.3. Instruments

Personal information form: It consists of a total of ten questions developed by the researchers questioning the socio-demographic characteristics of elderly people.

Pittsburgh Sleep Quality Index (PSQI): It was improved by Buysse et al. (1989) to determine sleep quality, sleep disturbance and severity. PSQI evaluates sleep quality in the last one month. 19 questions of the 24-question are answered by the patient himself/herself and the scoring of the scale is based on these questions. The other 5 questions are answered by the patient's spouse or chum and are used only for clinical information and are not included in the rating. The scale has 7 sub-dimensions. These are sleep quality, daytime dysfunction, sleep latency, habitual sleep efficiency, sleep disturbance, use of sleep medication, sleep duration. Each sub-dimension is rated between 0-3, and the total scale score is calculated with the total of the sub-dimension scores. Scores that can be received from the scale change between 0-21. High scores signify poor sleep quality, and a total score bigger than 5 is interpreted as "poor sleep quality". The Cronbach's alpha value of the original scale was 0.83 (24). The Turkish validity and reliability study of the scale was executed by Ağargün et al. (1996) and Cronbach's alpha value was detected to be 0.80 (25). Cronbach's alpha value was found to be 0.80 in this study.

Oxford Happiness Questionnaire-Short Form (OHQ-SF): The scale was initially enhanced by Argyle, Martin and Crossland (1989) as a 4-point likert-type scale with 29 items (26). The scale was later revised by Hills and Argyle (2002) and transformed into a 6-point Likert-type Oxford Happiness Questionnaire, and an 8-item brief form of the scale was also developed in the same study (27). The Cronbach's alpha coefficient of the original version of the OHQ-SF was calculated as 0.76 (28). The unidimensional scale was adapted into Turkish by Doğan and Akıncı-Çötok (2011) and was designed as 7 questions in 5-point Likert type. The minimal score that can be obtained in the Turkish version of the scale is 7, and the supreme score is 35. High scores obtained from the scale signify a high level of happiness. The Cronbach's alpha coefficient of the Turkish version of the OHQ-SF was detected to be 0.74 (29). Cronbach's alpha value was found to be 0.75 in this study.

2.4. Statistical Analysis

Statistical analysis of the data was done with SPSS 22.0 package program (IBM Inc., Chicago, IL, USA). The suitability of the data to normal distribution was tested by Kolmogrov-Smirnov test, kurtosis and skewness values. Descriptive statistical methods and comparative analysis methods were used in the evaluation. Student t test and One Way Anova test was used for group benchmarking of normally distributed quantitative data. The relationships between variables were analyzed with Pearson Correlation Analysis for normally distributed data and Spearman's Correlation Analysis for non-normally distributed data. Simple linear regression analysis was applied to determine whether sleep quality was a predictor of "happiness". Statistical significance was putatived as $p<.05$.

2.5. Ethical Statement

Approval for this study was received by the Non-Interventional Clinical Research Ethics Committee of Medical Faculty of one university with reference number 28/09/2021 (2021.236.09.22). Since the participants were not under any institutional care and the interviews were conducted in their own homes, institutional permission was not required. The participants were informed about the research and their written informed consent was received showing that they voluntarily participated in the study.

3. RESULTS

Table 1 presents the descriptive characteristics of the participants. The mean age of the participants was 69.81±7.02 years, 54.2% were female and 77.5% were married. 53% of the participants were retired and 65.7% had an middle socioeconomic level. Slightly more than half of them had at least one chronic disease and were taking medication.

Table 1. *Descriptive characteristics of the elderly people (n=306)*

Variables		n	%
Age (X±SD=69.81±7.02) (min-max=60-98)	60-69	175	57.2
	70-79	91	29.7
	80 +	40	13.1
Gender	Female	166	54.2
	Male	140	45.8
Education status	Literate	51	16.7
	Primary and secondary	217	70.9
	High school and university	38	12.4
Marital status	Married	237	77.5
	Single	69	22.5
Children	Yes	289	94.4
	No	17	5.6
Employment status	Employed	17	5.6
	Retired	163	53.3
	Unemployed	126	41.2
Income status	Low	91	29.7
	Middle	201	65.7
	High	14	4.6
Status of living	Alone	56	18.3
	Living with family	250	81.7
Chronic Illness	Yes	169	55.2
	No	137	44.8
Drug use	Yes	165	53.9
	No	141	46.1

The mean OHQ-SF score of the elderly people was 24.00±4.88 and their happiness level was found to be moderate. The mean PSQI score of the elderly people was 7.91±3.65. According to the cut-off score of the scale, 82.7% of the elderly people had poor sleep quality. According to the PSQI subscale scores, the highest score was found in the sleep disturbance subscale (1.66±061) and the lowest score was found in the use of sleeping medication subscale (0.29±0.73) (Table 2).

Table 2. *Elderly People' Sleep Quality and Happiness Scores*

Variables	Mean	SD	Median	Minimum	Maximum
OHQ-SF	24.08	4.88	24.00	9	35
Total PSQI	7.91	3.65	7	2	20
PSQI-sleep quality	1.11	0.66	1	0	3
PSQI-sleep latency	1.30	0.89	1	0	3
PSQI-sleep duration	1.38	1.15	1	0	3
PSQI-habitual sleep efficiency	1.21	1.32	1	0	3
PSQI-sleep disturbance	1.66	0.61	2	0	3
PSQI-use of sleeping medication	0.29	0.73	0	0	3
PSQI-daytime dysfunction	0.92	0.86	1	0	3

**PSQI: Pittsburgh Sleep Quality Index; OHQ-SF: Oxford Happiness Questionnaire-Short Form*

In Table 3, happiness and sleep quality scores of elderly people were compared according to descriptive characteristics. A statistically significant difference was found in both sleep quality scores and happiness scores according to gender, working status, economic status, chronic illness and constant drug use (p<.05).

Table 3: *Happiness and sleep quality according to descriptive characteristics of elderly people*

	OHQ-SF		Total PSQI	
Variables	Mean± SD	Test/p	Mean± SD	Test/p
Age				
60-69	24.26±4.98	*F: 0.701*	7.76±3.65	*F: 1.866*
70-79	24.12±4.65	*p: .497*	7.73±3.61	*p: .156*
80 and over	23.25±4.99		8.95±3.68	
Gender				
Female	23.53±5.19	***t: – 2.189***	8.37±3.76	***t: 2.456***
Male	24.75±4.42	***p: .029***	7.35±3.45	***p: .015***
Education status				
Literate	22.64±4.86	*F: 2.834*	8.39±3.56	*F: 0.545*
Primary and secondary	24.30±4.72	*p: .060*	7.83±3.66	*p: .581*
High school and over	24.76±5.53		7.71±3.76	
Marital status				
Married	24.06±4.99	*t: – 0.165*	7.92±3.60	*t: 0.146*
Single	24.17±4.53	*p: .869*	7.85±3.84	*p: .884*
Children				
Yes	23.95±4.88	*t: – 1.923*	7.82±3.62	*t: – 1.815*
No	26.29±4.44	*p: .055*	9.47±3.92	*p: .071*
Status of living				
Alone	24.19±4.70	*t: 0.183*	7.76±4.06	*t: – 0.325*
With family	24.06±4.93	*p: .855*	7.94±3.56	*p: .745*
Employment status				
Employed (1)	24.52±4.54	***F: 3.112***	6.76±3.94	***F: 4.399***
Retired (2)	24.68±4.74	***p:.046 * 2>3***	7.48±3.51	***p: .013***
Unemployed (3)	23.26±5.02		8.61±3.70	****2<3***
Income status				
Low (1)	20.35±4.68	***F: 10.127***	10.07±4.10	***F: 5.181***
Middle (2)	23.64±4.44	***p:.000***	8.12±3.53	***p: .006***
High (3)	25.64±5.35	****1<2;1<3;2<3***	7.09±3.68	****1>3***
Chronic ilness				
Yes	23.23±4.95	***t: – 3.470***	8.55±3.93	***t:3.452***
No	25.14±4.60	***p: .001***	7.12±3.11	***p: .001***
Drug use				
Yes	23.17±4.99	***t: – 3.602***	8.59±3.95	***t:3.598***
No	25.15±4.55	***p: .000***	7.11±3.09	***p: .000***

*t:Student's t-test; F: One-Way ANOVA test; ; * Bonferroni test; OHQ-SF: Oxford Happiness Questionnaire Short Form; PSQI: Pittsburgh Sleep Quality Index*

Table 4 presents the happiness scores of the participants according to sleep quality. It was determined that the happiness level of elderly people with poor sleep quality was also lower (p<.01).

Table 4. *Happiness scores of elderly people according to sleep quality*

	n	%	OHQ-SF		
Sleep quality			Mean ± SD	**t***	**p**
PSQI < 5 (good sleep quality)	53	17.3	27.13±4.22	5.195	**p< .01**
PSQI > 5 (poor sleep quality)	253	82.7	23.45±4.78		

*OHQ-SF: Oxford Happiness Questionnaire Short Form; PSQI: Pittsburgh Sleep Quality Index; *t: Student's t-test*

Table 5 presents the relationship between sleep quality scores and happiness scores of elderly people (p<.01). According to PSQI, high scores from the scale indicate low sleep quality. In this study, it was found that as the sleep quality of elderly people increased, their happiness level also increased.

Table 5.Relationship *between sleep quality and happiness scores of elderly people*

		PSQI SQ	PSQI SL	PSQI SDu	PSQI SE	PSQI SDi	PSQI USM	PSQI DD	PSQI Total
OHQ-SF	r	-0.382*	-0.214*	-0.152*	-0.226*	-0.342*	-0.198**	-0.378*	-0.442*
	p	**.000**	**.000**	**.008**	**.000**	**.000**	**.000**	**.000**	**.000**

*OHQ-SF: Oxford Happiness Questionnaire Short Form; PSQI: Pittsburgh Sleep Quality Index *Pearson correlation **Spearman's correlation*

In addition, simple linear regression analysis was used to define the impact of sleep quality on happiness (Table 6). The model in the analysis was found to be significant (F=73.946; p<.001). As per the results of the analysis, it was found that sleep quality determined approximately 20% (R2=0.196) of the happiness level of elderly people (β=-.442; p<.001).

Table 6. *Effects of sleep quality on happiness*

Parameter	B	Std.error	Beta	t	p	95% CI	
Constant	28,764	0,599		48,030	p< .001	27,586	29,943
PSQI Total	-0,591	0.069	-0,442	-8,599	p< .001	-0,726	-0,456
R=0,442; R2=0,196; F=73,946; p< .001							

**PSQI: Pittsburgh Sleep Quality Index*

4. DISCUSSION

In this study, sleep quality of elderly people was evaluated with PSQI. According to the mean PSQI score (7.91±3.66), it can be said that the sleep quality of the elderly people participating in the study was poor. When other studies in this field are examined, it is seen that the mean PSQI score of the elderly is greater than 5 and therefore their sleep quality is evaluated as poor (8,10,30,31,32). In different studies, it is reported that there are sleep problems ranging from 30% to 70% among elderly people (8,9,12,32,33). In this study, when the PSQI cut-off score was considered, sleep quality was found to be poor in a large part of the elderly people, 82.7%. This result indicated that sleep problems in the elderly are more common than thought and should be taken into attention. Zhang et al. (2023) reported that 2.5% of elderly people had seriously sleep problems that required treatment (31). Thichumpa et al. (2018) reported that 9.4% of elderly people used sleeping pills (8). In our study, It was determined that the deterioration in sleep quality of elderly people was mostly in the sub-dimensions of sleep disturbance, sleep duration and sleep latency, respectively. The use of sleeping pills was low. This may indicate that although the majority of the elderly participating in this study have sleep problems, they do not take their sleep problems seriously and do not consult a physician.

According to the results we obtained from this study; it can be said that elderly people are moderately happy. In Turkey life satisfaction surveys, the highest happiness rates were obtained from the population over the age of 65. The life satisfaction level of elderly people in Turkey was determined to be 56-57% in the last few years (34). According to our study results, the happiness levels of elderly people are found to be at a moderate level, which supports the national results. Zhang et al. (2023), it is stated that the happiness rates of Chinese older adults are similar to our country (31). Similarly, in one study conducted in Brazil and the other study conducted in Turkey, the happiness level of elderly people was found to be moderate level and above (20,21). Today's elderly people are called the baby-boomer generation. This generation is known as a resilient group despite the difficulties they experienced when they were born and grew up. It is stated that this generation is more optimistic, calm, has low expectations and is therefore happier compared to other generations (35). The results of the study may be related to this situation.

In this study, the relationship between socio-demographic characteristics of elderly people and sleep quality and happiness was evaluated. It was found that female elderly people had worse sleep quality. Similar results with our study are found in the literature (8,9,13,36). In the present study, it was found that the sleep quality of the elderly who retired from a job and the elderly with good economic status was better. Similarly, Li et al. (2020) reported in their study that sleep quality was worse in the elderly with low income (13). Lack of income and financial difficulties may minds of the elderly busy and lead to sleep problems. It is also supported by other studies that chronic health problems lead to sleep problems in the elderly (8,9,10,36). In this study, sleep quality was devised to be worse in elderly people with chronic diseases and continuous medication use. This may be related to the fact that problems such as pain, drug intake or drug side effects cause sleep interruption.

The relationship between health and happiness is more clearly seen in the elderly population (17,21,37) According to the Turkey Satisfaction Survey (2023), it was found that health came first among the sources of happiness in elderly people (34). In addition, Zhang et al (2022) stated that chronic diseases increase depressive symptoms in the elderly (10). It is thought that reasons such as frequent health problems in the elderly and relatively limited access to treatment reduce the subjective well-being of the elderly (37,38). In this study, the presence of chronic disease was investigated without making a distinction between mental or physical health problems. The happiness levels of the elderly with chronic diseases and who constantly use medication for this reason are lower supports the literature.

In this study, the happiness level of female elderly was found to be lower. states that, happiness level of female elderly is lower and this may be due to the fact that mental problems are more common in female elderly. Unlike these data, there are also studies indicating that female elderly are happier or that the level of happiness does not differ according to gender (38,39). In the present study, it was found that the retired

elderly were happier than the elderly who were not involved in working life. Similarly, the elderly with better economic status were also happier. Retirement provides a regular income for the elderly to make a living. Being financially secure in old age may cause many needs such as receiving health care, nutrition, and paying bills and therefore to feel happier (38).

The relationship between health and happiness is more clearly seen in the elderly population (18,21,37). Zhang et al. (2022) stated that chronic diseases increase depressive symptoms in the elderly (10). That reasons such as frequent health problems and relatively limited access to treatment reduce the subjective well-being of the elderly (37,38). In this study, it was found that the happiness level of elderly with poor sleep quality was lower. Additionally, there was a correlation between sleep quality and happiness. It was also found that sleep quality was one of the determinants of happiness. In the literature; it is indicated that the happiness levels of the elderly with insomnia symptoms are lower and the life satisfaction of the elderly is directly affected by sleep quality (6,40). Reflections of sleep problems in elderly people can occur as depression and anxiety symptoms (8,41). Deterioration in sleep quality also increases the risk of cognitive dysfunction in the elderly (14). This situation negatively reflects on the daily life activities and social life of the elderly due to reasons such as loss of attention, interest and concentration and causes a decrease in the quality of life of the elderly people (42). Sleep quality can play a mediating role between different variables. It has also been found that sleep quality is a mediator between life satisfaction and mental health, as well as between chronic diseases and depressive symptoms (10,31).

The results of the study were evaluated only on the data of the elderly people who participated in the study. Sleep quality and happiness data are based on subjective evaluations of elderly people. On the other hand, other variables that may affect happiness in elderly people were not taken into account in this study.

Therefore, this research results cannot be generalised to all elderly people and care should be taken when interpreting data.

5. CONCLUSION

According to the data obtained from this study; sleep quality is low in elderly people. This situation is also reflected negatively in the happiness perceptions of elderly people. Today, concepts such as active aging, healthy aging, successful aging have started to be adopted in the field of elderly health. In this context, various approaches are applied to ensure that the elderly are happy, peaceful, healthy, independent and involved in social life. Evaluating the sleep quality of elderly people, improving sleep quality and providing treatment of sleep problems should be a part of these approaches. The process can be started by raising awareness of elderly people and caregivers about sleep quality and sleep hygiene. Nurses working in the field of elderly health should play the most important role in this regard.

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