



Relationship Between Quality of Life and Sleep Quality in Resident and Nonresident Seniors in Shahroud City, Iran

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Abstract

Background: Poor quality of life (QOL) can affect sleep quality in seniors due to its wide impact on the daily functioning of individuals. The place of residence is also considered one of the important factors in the physical and mental health of seniors.

Objectives: This study aimed to determine the relationship between QOL and sleep quality in resident and nonresident seniors in Shahroud City.

Methods: This descriptive-analytical study was performed on 232 nonresident and 78 resident seniors in Shahroud City, Iran, in 2019. The participants were selected using the convenience sampling method. Data collection tools included a demographic survey, the Pittsburgh Sleep Quality Index (PSQI), and the 36-Item Short-Form Health Survey (SF-36). After data collection, data analysis was performed using ANOVA, Pearson correlation, and independent *t*-test in SPSS version 19.

Results: There was a significant relationship between QOL (dimensions and total score) and all sleep quality dimensions ($P < 0.05$) except for sleep efficiency ($P = 0.214$) and sleep disorder with mental dimension of QOL ($P = 0.092$). There was no significant difference in sleep quality between resident and nonresident seniors except for the variables of sleep duration and use of sleeping pills ($P = 0.34$). There was also a significant difference in the QOL of the seniors in terms of age ($P < 0.001$), sex ($P = 0.021$), marital status ($P < 0.001$), lifestyle ($P < 0.001$), education ($P < 0.001$), and income adequacy ($P = 0.023$).

Conclusions: Considering the strong relationship between QOL and sleep quality, implementing interventions (such as proper nutrition education, hot showers, etc.) aimed at improving sleep quality can positively affect QOL. It is also suggested to consider individual effective factors (such as more family support) to improve QOL.

Keywords: Seniors, Sleep Quality, Quality of Life, Nursing Home

1. Background

The aging of the world population is the most important medical and social problem, and projections show that in 2050, there will be more people aged 60 years than 10 - 24 years (2.1 billion vs. 2.0 billion) (1). As a developing country, Iran will face an excessive increase in its elderly population in the future, as it is expected that the Iranian elderly population will increase from 8.24% in 2011 to 10% in 2022 (2). Various physical and mental problems and diseases will occur in seniors with increasing age (3). Quality of life (QOL) is considered one

of the health indicators and criteria of the elderly (4, 5). Socioeconomic problems and numerous changes that occur physiologically in old age can lead to poor QOL (6, 7).

According to some studies, services that improve seniors' health by teaching a healthy lifestyle and providing preventive services can improve QOL and prevent disease progression and disability. On the one hand, they will have a significant effect on delaying their arrival in nursing home centers, and on the other hand, they will help their caregivers. Therefore, implementing

interventions is very important to improve QOL (8, 9). Living with family members is essential to maintain the QOL of seniors, as it brings them security and a sense of love and familiarity. In addition, when the family lacks the resources and time to deal with the aging-related consequences for seniors, it can be very harmful and negatively affect QOL. Therefore, if seniors do not have family ties or financial circumstances to hire the services of a private caregiver, a long-term stay in a nursing home is the only option that makes the person dependent on all or part of the care provided by caregivers in the institution (10-12).

To evaluate seniors' QOL in nursing homes, it is necessary to consider some studies that highlight the positive aspects of these institutions, such as adhering to medication, improving social life, reducing depressive symptoms, and participating in leisure movement activities. However, some other studies showed the poor QOL of resident seniors and their dissatisfaction with the inability to make decisions, live a monotonous life, loss of physical and mental independence, eating disorders, and sleep disorders.

In recent decades, QOL has become an important outcome measure to assess the quality of health care. In older adults, sleep disorders may lead to impaired daily functioning, physical and mental problems, and personal suffering, all of which can reduce their QOL. Sleep is one of the basic human needs. The sleep pattern changes throughout life; thus, changes in circadian rhythms and sleep stabilization of seniors lead to sleep disorders and poor sleep quality (13, 14). Changes in sleep quality and circadian rhythms cause sleep disorders in seniors as they age. Chronic insomnia is the most common sleep problem in seniors due to poor sleep quality (15, 16).

However, it should be noted that both the sleep pattern and QOL can be affected by cultural factors; thus, the prevalence of sleep problems and its relationship with QOL should be investigated in different sociocultural settings (17, 18). QOL in old age is not an exclusive, biological, or psychological trait of an individual but is the product of interaction between people living in a changing society. Comparing QOL between resident and nonresident seniors to determine the impact of a 24-hour presence in a particular center on their health-related issues is necessary to make society aware of the need to prepare the country for the more humane care of seniors (8, 19, 20).

2. Objectives

Considering the foregoing and a few relevant studies, the present study aimed to provide more evidence and

determine the relationship between sleep quality and QOL in resident and nonresident seniors in Shahroud City.

3. Methods

This cross-sectional study was conducted on seniors in Shahroud City, Iran, in 2019. A total of 232 nonresident and 78 resident seniors were selected purposively and based on the inclusion criteria. Inclusion criteria were an absence of known chronic physical and mental illness, age over 60 years, and ability to communicate. Written informed consent was obtained from all participants.

Data collection tools included a demographic survey, the Pittsburgh Sleep Quality Index (PSQI), and the 36-Item Short-Form Health Survey (SF-36). PSQI is the most appropriate tool to measure sleep quality in seniors, with a total mean range of 0 to 21. The higher the score, the worse the sleep quality. A score higher than 6 indicates poor sleep quality. PSQI reliability for Iranian seniors has been reported to range from 0.78 to 0.82 (21). Also, SF-36 validity has been investigated in the study by Montazeri et al. (2005) in Iran (22). This questionnaire consists of 36 independent questions in both physical and mental dimensions and includes items such as physical functioning, bodily pain, role limitations due to physical health problems, general health perceptions, energy, social functioning, role limitations due to emotional problems, and mental health. The possible score range is 0 to 100, where 0 is the worst, and 100 is the best situation on this scale.

4. Results

The mean \pm SD of the seniors' age was 66.85 ± 4.71 years in both groups. A comparison of the characteristics of resident and nonresident seniors is presented in Table 1.

The overall mean score of QOL in physical and mental dimensions and the total score in the studied seniors were moderate (above 50). Also, the mean score of total sleep quality indicated an undesirable level (above 6) of sleep quality in both groups. There was no significant difference between the scores of different sleep variables and the total score of the 2 groups except for the variables of sleep duration and use of sleeping pills (Table 2).

The results of the Pearson correlation coefficient test showed a significant relationship between dimensions and total score of QOL with all dimensions of sleep quality (except for the dimensions of sleep efficiency, $P = 0.214$) and sleep disorders with mental dimension of QOL ($P = 0.092$) (Table 3).

Regarding the demographic and disease-related characteristics of patients, there was also a significant

Table 1. Demographic Characteristics of Resident and Nonresident Seniors

| Variables | Elderly Group, No. (%) | | P-Value |
|------------------------|------------------------|------------------|---------|
| | Nonresident Seniors | Resident Seniors | |
| Sex | | | 0.70 |
| Man | 105 (45.25) | 38 (48.75) | |
| Female | 127 (54.7) | 40 (51.28) | |
| Age | | | 0.06 |
| 70 ≥ | 132 (56.89) | 49 (62.80) | |
| 70 < | 100 (43.11) | 29 (37.20) | |
| Education | | | 0.76 |
| Associate degree | 196 (84.4) | 73 (93.93) | |
| Master of sciences | 36 (15.5) | 5 (6.41) | |
| Marital status | | | 0.69 |
| Married | 175 (75.4) | 41 (52.5) | |
| Widow/widower | 57 (24.5) | 37 (47.4) | |
| Employment | | | 0.34 |
| Employed | 31 (13.3) | 17 (21.7) | |
| Retired | 201 (86.63) | 61 (78.2) | |
| Mobility status | | | 0.23 |
| Regular exercise | 72 (31.03) | 19 (24.35) | |
| Normal mobility | 132 (56.89) | 49 (62.8) | |
| Immobility | 28 (12.06) | 10 (12.8) | |

Table 2. Comparison of Sleep Quality Between Resident and Nonresident Seniors

| Variable | Groups, Mean ± SD | | P-Value |
|-------------------------------------|-------------------|---------------------|---------|
| | Resident Seniors | Nonresident Seniors | |
| Aspect of sleep quality | | | |
| Delay in falling asleep | 1.89 ± 1.38 | 1.67 ± 1.56 | 0.321 |
| Sleep duration | 1.82 ± 1.36 | 1.37 ± 1.14 | 0.041 |
| Sleep efficiency | 0.32 ± 0.29 | 0.34 ± 0.31 | 0.912 |
| Consumption of sleeping pills | 1.12 ± 0.95 | 0.83 ± 0.54 | 0.028 |
| Sleep disorder | 1.58 ± 0.59 | 1.42 ± 0.62 | 0.582 |
| Improper performance during the day | 1.04 ± 0.86 | 1.51 ± 0.94 | 0.118 |
| Quality of sleep | 1.34 ± 0.79 | 1.32 ± 0.85 | 0.896 |
| Total score | 9.11 ± 4.82 | 8.61 ± 4.23 | 0.298 |

difference in the QOL of patients in terms of age, sex, marital status, lifestyle, education, and income adequacy (Table 4).

5. Discussion

The present study investigated the relationship between QOL and sleep quality dimensions in seniors.

The results revealed that the overall sleep quality score in both resident and nonresident seniors was unfavorable, and there was no significant difference between the 2 groups in terms of various sleep variables with the total score except for the variables of sleep duration and use of sleeping pills. Li et al. (2013) showed that in China, 49.7% of seniors have poor sleep quality (23). Aunjitsakul et al. (2018) reported sleep complaints in 74% of male seniors

Table 3. Relationship Between Sleep Quality and Quality of Life in the Participants

| Sleep Quality | Life Quality | | |
|-------------------------------------|-------------------------|-------------------------|-------------------------|
| | Mentally | Physically | Total Score |
| Delay in falling asleep | $r = -0.425, P < 0.001$ | $r = -0.372, P < 0.001$ | $r = -0.324, P < 0.001$ |
| Sleep duration | $r = 0.315, P = 0.11$ | $r = 0.232, P = 0.021$ | $r = 2.44, P = 0.018$ |
| Sleep efficiency | $r = -0.095, P = 0.151$ | $r = -0.142, P = 0.311$ | $r = -0.131, P = 0.214$ |
| Consumption of sleeping pills | $r = -0.246, P < 0.001$ | $r = -0.251, P = 0.013$ | $r = -0.219, P < 0.001$ |
| Sleep disorder | $r = -0.370, P = 0.092$ | $r = -0.432, P = 0.031$ | $r = -0.345, P = 0.041$ |
| Improper performance during the day | $r = -0.216, P < 0.001$ | $r = -0.165, P < 0.001$ | $r = -0.224, P < 0.001$ |
| Quality of sleep | $r = -0.501, P < 0.001$ | $r = -0.532, P < 0.001$ | $r = -0.524, P < 0.001$ |
| Total score | $r = -0.185, P < 0.001$ | $r = -0.261, P < 0.001$ | $r = -0.172, P < 0.001$ |

Table 4. Relationship Between Quality of Life and Individual Characteristics in the Elderly

| Individual Characteristics | P-Value | Mean \pm SD | No. (%) |
|----------------------------|--------------------|-------------------|------------|
| Age | $< 0.001^a$ | | |
| 70 \geq | | 56.18 \pm 16.72 | 190 (80.9) |
| > 70 | | 49.51 \pm 16.76 | 45 (19.1) |
| Sex | 0.021 ^a | | |
| Man | | 54.21 \pm 16.74 | 107 (45.5) |
| Female | | 50.31 \pm 16.76 | 128 (54.5) |
| Marital status | $< 0.001^a$ | | |
| Married | | 57.18 \pm 16.21 | 117 (75.3) |
| Widow/widower | | 48.51 \pm 16.52 | 58 (24.7) |
| Style of life | $< 0.001^b$ | | |
| Married | | 57.18 \pm 16.71 | 88 (37.5) |
| with children | | 58.29 \pm 16.73 | 115 (48.9) |
| Single | | 50.51 \pm 16.75 | 32 (13.6) |
| Education | $< 0.001^b$ | | |
| Elementary | | 48.75 \pm 16.74 | 112 (47.7) |
| Guidance school | | 55.26 \pm 16.72 | 35 (14.9) |
| Associate degree | | 59.14 \pm 16.64 | 37 (15.7) |
| Income | 0.02 ^a | | |
| Sufficient | | 56.19 \pm 16.75 | 135 (57.4) |
| Insufficient | | 54.51 \pm 16.71 | 100 (42.6) |

^a Independent samples test^b One-way analysis of variance

and 79% of female seniors (24). Štefan et al. (2018) also showed that 46.6% of resident seniors had sleep problems (25). The results of another study showed low and equal sleep quality in resident and nonresident seniors, and both groups had poor QOL (26).

The effect of place of residence on the mental health and sleep quality of the seniors is such that the average

scores of mental disorders in the resident seniors are significantly higher than the nonresident seniors (27). The monotonous and unfriendly atmosphere of life in the nursing home, along with the lack or reduction of emotional support received from the family members, can affect the quality of their sleep by predisposing them to mental disorders. On the other hand, the

lack of emotional family support of resident seniors and subsequent depression are among the factors affecting the sleep quality of seniors, which is consistent with this finding. As individuals age, changes occur in sleep quality and circadian rhythm, and these changes can lead to sleep disorders (28).

Overall, seniors have been shown to be more susceptible to physical and mental illness than seniors living with family members (29). Zhang et al. (2019) reported a positive relationship between poor sleep quality and physical health, mental disorders, and QOL (30).

According to our results, the QOL of the seniors was at a moderate level. In this regard, Farhadi et al. (2011) also reported poor QOL for seniors (31). Konig et al. (2010) also showed that 68.8% of seniors have problems in at least one aspect of QOL (32). According to many previous studies, it can be concluded that the seniors' QOL is affected by many factors (such as the level of education, lifestyle, and economic status), and differences in the seniors of different study populations can be affected by these factors. Health habits and behaviors of seniors, the incidence of chronic diseases, nutritional status, physical activity, and access to health services can play a decisive role in various dimensions of health in this age group. According to the literature, resident seniors have a lower QOL score (33).

The present study demonstrated a significant relationship between QOL (physical and mental dimensions and total score) and all dimensions of sleep quality (except sleep efficiency). Moradi et al. (2015) also reported a significant direct correlation and relationship between sleep quality and different dimensions of QOL (34). Safa et al. (2015) also found a direct and significant relationship between sleep quality and most aspects of the QOL of seniors, showing that people with poor sleep quality have poor QOL (28). Their results are consistent with our results. Another study showed that QOL significantly affected the physical and mental components of sleep quality (35). Previous studies have also shown many factors contributing to poor sleep quality among seniors, including social and demographic factors (such as age, marital status, marriage, level of education) (36) and lifestyle factors (such as physical activity and anxiety and depression) (37), which all should also be considered.

Regarding individual factors affecting the seniors' QOL, the results of the present study showed a significant difference in QOL between people aged less and more than 70 years. Habibi et al. (2012) found no statistically significant relationship between QOL and age, but with increasing age, the average QOL decreased (38). The

results of other studies also show a significant inverse relationship between age and QOL (39). Obviously, the incidence of disabilities is more pronounced in older ages and appears as a decline in physical activity, increased physical limitations, and, ultimately, a decrease in QOL.

Regarding the relationship between sex and QOL, the present study showed a significant difference in QOL between male and female seniors. Quality of life was significantly higher in men than in women. In this regard, Habibi et al. (2012) showed that the QOL of men was significantly higher than the average QOL of women (38). Other relevant studies have shown that the QOL score is higher in male seniors than in female seniors (28, 40). These results are consistent with our results. However, Li et al. did not refer to the sex variable as an effective factor in the QOL of seniors (23).

Regarding the effect of the variable of education level, the results showed a significant difference in QOL between seniors with elementary education and those with middle school education, as well as between these groups and those holding diplomas and above. Quality of life also increases significantly with an increase in educational level in different stages. In this regard, Habibi et al. (2012) showed a statistically direct significant relationship between QOL and education level (38). This indicates that education is effective in having a healthy elderly life and can have a positive effect on the health status of this age group.

Regarding marital status, the results showed that the QOL of married seniors was significantly higher than that of seniors with a deceased spouse. Also, the QOL was significantly higher in the seniors who lived with their spouse or children than in those who lived alone. Dong et al. (2018) showed that in China, sleep problems were more common in adults over 45 years of age. They also showed that single, unmarried people who had low personal income or had any chronic illness were more likely to have poor sleep quality (41).

Farhadi et al. (2011) found that married seniors had more vitality and mental health than seniors without a spouse (31). Alipour et al. reported a significant difference in QOL scores between married and single seniors, showing that married seniors have a higher QOL (40). Gau et al. (2011) showed that in Taiwan, married seniors also had a better QOL than single seniors (42). The results of a study in 2020 showed that the seniors who live with their families had higher mental health and standard of living (43). Considering that loneliness and isolation can be considered as one of the potential health threats in old age, family support will have a positive effect on the health status of this age group (44). Studies have also shown that married people have better physical and emotional

conditions than other people and regularly monitor each other's health (45).

Regarding the relationship between QOL and economic status, our findings showed a higher QOL in seniors with sufficient income. A positive relationship between economic status and QOL has also been demonstrated in various studies. In this regard, it can be stated that the economy is an important and influential factor in the QOL and health of individuals, and economic hardships and livelihood problems can threaten their health by putting pressure on their physical and mental conditions.

The present study showed a strong relationship between QOL and different dimensions of sleep quality. Due to the prevalence of sleep disorders in old age, it becomes more important to pay attention to this problem. Interventions such as aromatherapy, massage, dietary improvements, and taking hot showers can be effective in improving sleep quality. The QOL of seniors can also be improved by considering some individual factors, such as educating the family to provide more support and increase awareness of this age group regarding health-related issues. The role of the seniors' relatives, especially their spouses, can be very important in this regard; based on the results of the present study and numerous studies, it can be concluded that encouraging families to support seniors as much as possible and live with them can play a decisive role in improving their sleep quality and health status.

One of the limitations of the present study is its small sample size. Therefore, it is suggested that future studies be performed on a larger sample size. Qualitative studies are also recommended to further clarify the challenges and problems of sleep quality and QOL in seniors.

5.1. Conclusions

Considering the strong relationship between QOL and sleep quality and some individual factors, there is a need to improve the sleep status of seniors using various methods, such as proper nutrition training, hot showers, etc, to improve their QOL. It is also suggested to consider individual effective factors (such as more support from family members) as a useful strategy to improve the QOL of this age group.

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Footnotes

Authors' Contribution: Study concept and design: Elahe Bahonar and Mahdi Sadeghi; acquisition of data: Mahdi Sadeghi; analysis and interpretation of data: Mohammad Abbasi; drafting of the manuscript: Mohammad Abbasi, Mahdi Sadeghi, and Ahmad Mahdizadeh; critical revision of the manuscript for important intellectual content: Zinab Dabirian and Ahmad Mahdizadeh; statistical analysis: Milad Elyasi and Zinab Dabirian; administrative, technical, and material support: Mahdi Sadeghi; study supervision: Zinab Dabirian.

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Data Reproducibility: The dataset presented in the study is available on request from the corresponding author during submission or after publication. The data are not publicly available due to ethical considerations.

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