

RESEARCH ARTICLE

The Relationship Between Sleep and Quality of Life in Older People Living in Nursing Homes

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Abstract

Introduction: Sleep problems are more prevalent in older adults compared to the general population. This study aims to assess the relationship between sleep quality, sleep propensity and quality of life among nursing home residents.

Methods: A total of 107 nursing home residents who attended the geriatric outpatient clinic between May and July 2016 were included in the study. Demographic data and comorbidities were recorded. Sleep quality and sleepiness were evaluated using the Pittsburgh Sleep Quality Index (PSQI) and Stanford Sleepiness Scale (SSS), with higher scores indicating worse sleep quality and increased sleep propensity. Quality of life was measured using the SF-36 Quality of Life Scale. Statistical analyses were conducted using the Statistical Package for Social Sciences (SPSS) for Windows 21. Correlation analysis was performed using Spearman's rho, with statistical significance set at $p < 0.05$.

Results: Among the 107 participants, 67 (62.6%) were women. The mean score of PSQI in the study population was found to be 6.33 ± 4.03 . Of the participants, 65.3% were classified as having poor sleep quality. A positive and statistically significant correlation was observed between PSQI scores and all sub-dimensions of the SF-36 scale except pain. The correlation between the SSS and each sub-dimension of the SF-36 scale is statistically significant except pain and mental health status.

Conclusion: Our study demonstrates that poor sleep quality and daytime sleepiness are common among nursing home residents and are associated with lower quality of life. Dementia was identified as the most common comorbidity related to sleep problems. To improve the quality of life in nursing home residents, addressing sleep disturbances should be a key focus of care.

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Introduction

The older population is the fastest-growing demographic globally, with the World Health Organization defining old age as a period marked by a decreased ability to adapt to environmental factors.¹ Aging is commonly associated with changes in circadian rhythms and sleep homeostasis which contribute to alterations in sleep patterns.² The prevalence of sleep disturbances is notably higher in older adults compared to the general adult population, with over 50% of older individuals reporting sleep problems.³ A study conducted in Turkey further highlighted that the incidence of sleep disorders is significantly higher in older adults residing in nursing homes.⁴

Deterioration in sleep quality among older adults can have profound consequences on emotional, cognitive, and physical health. Poor sleep is linked to a range of negative outcomes, including emotional disturbances, mental health disorders, and a loss of motivation. Individuals who experience inadequate sleep often face physical, emotional, and cognitive decline.⁵ Additionally, poor sleep quality is closely associated with daytime sleepiness, fatigue, depression, anxiety, irritability, increased pain sensitivity, muscle tremors, and a decline in both mental functions and overall health status.⁶ Daytime sleepiness, also referred to as excessive sleep propensity, is characterized by difficulty maintaining wakefulness, which can result in feelings of drowsiness and the urge to nap.

Excessive daytime sleepiness can lead to a range of functional impairments and further exacerbate sleep problems, creating a cycle of poor sleep. The older people, particularly those aged 65 and older, are affected by poor sleep quality in nearly every biopsychosocial domain. Despite the widespread nature of these issues, there is a relative scarcity of studies focusing on sleep quality among nursing home residents in Türkiye.

Therefore, the aim of this study is to examine the correlation between sleep quality, sleep propensity, and quality of life among nursing home residents. By investigating the relationship between sleep disturbances and quality of life, this study seeks to provide insight into the challenges faced by individuals in institutional care settings and highlight the importance of addressing sleep issues to enhance their quality of life.

Material and Methods

Study Design

This cross-sectional study, conducted at the Geriatrics Outpatient Clinic of Ankara Ataturk Hospital (May-July 2016), included 107 older nursing home residents, selected from 300. Eligibility required being 65 or older, residing in the nursing home, and having sufficient cognitive function. Participants with advanced dementia were excluded. Written consent was obtained from literate, voluntary participants. Participants were grouped into three age categories: 65-74, 75-84, and 85+. Data on demographics, comorbidities, medications, and fall history were collected.

Sleep Quality Evaluation

The Pittsburgh Sleep Quality Index (PSQI) is a reliable, valid, and standardized tool used to assess sleep quality. It contains 24 questions, 19 of which are self-reported by the participant, while 5 are answered by a spouse or roommate for clinical purposes without affecting the overall score. A score of 5 or higher on the PSQI indicates poor sleep quality.⁷

The Stanford Sleepiness Scale (SSS) is a subjective measure of daytime sleepiness, evaluating the level of “fogginess” and the tendency to lose interest in staying awake. The scale ranges from 1 (mildest) to 7 (most severe), with a score above 3 indicating excessive daytime sleepiness or sleep propensity.⁸

Quality of Life Assessment

The 36-Item Short Form Health Survey (SF-36) is a widely used tool to assess health status and quality of life. It contains 36 items that cover two main dimensions (physical and mental health) and eight concepts: physical function, role limitations due to physical problems, pain, vitality, social function, role limitations due to emotional problems, mental health, and general health perception. Scores on the SF-36 range from 0 to 100, with higher scores reflecting better health-related quality of life.⁹

Statistical Evaluation

Descriptive statistics were calculated for all study variables. The normality of the data was assessed using the Shapiro-Wilk test. For comparing categorical variables, chi-square tests were used. The Spearman rho coefficient was employed for correlation analysis to assess relationships between sleep quality, sleepiness, and quality of life. A p-value of <0.05 was considered statistically significant. All analyses were performed using the Statistical Package for Social Sciences (SPSS) for Windows version 21.

Results

Of the study participants, 62.6% (n=67) were female, with a mean age of 82.40 ± 6.33 years. Tables 1 summarize demographic data and comorbidities.

Table 1: Descriptive Statistics of Participants

Variables	n (%)
Sex	
Female	67 (62.6%)
Male	40 (37.4%)
Educational Status	
Elementary School- No Education	36 (46.7%)
Middle School- High School	57 (53.3%)
Age Groups	
Group 1 (Age 65–74)	12 (11.2%)
Group 2 (Age 75–74)	58 (54.2%)
Group 3 (Age 85+)	37 (34.6%)
Number of Drugs*	5.98 ± 2.84
Comorbidities	
Fall	29 (27.9%)
Obesity	29 (27.9%)
Hypertension	82 (76.6%)
Coronary Artery Disease	37 (34.6%)
Diabetes Mellitus	83 (77.6%)
Cerebrovascular Accident	15 (14.0%)
Dementia	24 (22.4%)
Parkinson's Disease	10 (9.3%)
Depression	29 (27.1%)
Chronic Obstructive Pulmonary Disease	11 (10.3%)
Heart Failure	12 (11.2%)
Cancer	8 (7.5%)

* Number of drugs is presented as a mean \pm standard deviation

The mean score of PSQI in the study population was found to be 6.33 ± 4.03 . Of the participants, 65.3% were classified as having poor sleep quality. The individual subcomponents of the PSQI were also assessed, with the following mean scores: Subjective Sleep Quality: 0.99 ± 0.86 Sleep Latency: 1.66 ± 1.13 Sleep Duration: 0.91 ± 0.92 Sleep Efficiency: 0.67 ± 0.93 Sleep Disorders: 0.79 ± 0.57 Medication Use: 0.50 ± 1.05 Daytime Function: 0.82 ± 1.21 The subcomponent of sleep latency had the highest mean score, suggesting that difficulty in falling asleep was a prominent issue among participants. The median PSQI scores for the different age groups were as follows: Group 1: 6.00 Group 2: 6.00 Group 3: 5.00 No

statistically significant difference in the PSQI scores was observed across the age groups ($p = 0.433$), indicating that age did not significantly affect overall sleep quality. The median score on SSS was: Group 1: 6.00 Group 2: 2.00 Group 3: 3.00 The SSS scores showed a statistically significant difference between the age groups ($p = 0.009$), with advanced-age individuals (Group 3) having higher SSS scores than the other groups, suggesting greater sleep-related issues with increasing age.

When evaluating the relationship between comorbidities and sleep scales, dementia was significantly associated with the SSS score ($p = 0.026$), while cerebrovascular accidents and dementia were both significantly related to the PSQI score ($p = 0.004$ and $p = 0.015$, respectively). However, no significant relationship was found between polypharmacy or falls and the sleep scales.

The correlation between PSQI and each sub-dimension of the SF-36 scale is presented in Table 2. The strongest correlations were observed with Physical Function (0.522), Vitality (0.523), and General Health Status (0.480), all of which show significant associations with poorer sleep quality. The pain sub-dimension had a very weak negative correlation (-0.041) and was not statistically significant ($p=0.692$).

Table 2. Correlation analysis of PSQI with SF 36 scale sub-dimensions

Variables	Spearman's Rho Coefficient	p-value
Physical Function	0.522	<0.001
Physical Role	0.450	<0.001
General Health Status	0.480	<0.001
Vitality	0.523	<0.001
Social Function	0.437	<0.001
Emotional Function	0.476	<0.001
Mental Health Status	0.287	0.003
Pain	-0.041	0.692

The correlation between the SSS and each sub-dimension of the SF-36 scale is presented in Table 3. While Vitality (-0.349) and Physical Function (-0.307) showed the strongest negative correlations with SSS, both with p-values <0.01 Mental Health Status (-0.118) and pain (-0.038) showed very weak correlations and were not statistically significant ($p>0.05$).

Table 3. Correlation analysis of SSS with SF 36 scale sub-dimensions

Variables	Spearman's Rho Coefficient	p-value
Physical Function	-0.307	0.002
Physical Role	-0.136	0.174
General Health Status	-0.274	0.006
Vitality	-0.349	<0.001
Social Function	-0.242	0.015
Emotional Function	-0.248	0.012
Mental Health Status	-0.118	0.241
Pain	-0.038	0.354

Discussion

Our findings indicate that poor sleep quality and high sleep propensity are prevalent among older adults residing in nursing homes and are significantly associated with a lower quality of life. One of the strengths of our study is the use of two sleep scales simultaneously to evaluate individuals' sleep quality, which provides a comprehensive assessment of sleep disturbances in this population. With normal aging, sleep changes occur due to effects of an aging suprachiasmatic nucleus that leads to circadian rhythm changes. Along with many other physiological alterations in normal aging, sleep patterns change with aging, independent of many factors including medical comorbidity and medications. Our study supports the finding that sleep propensity tends to be higher in individuals over the age of 85, a group particularly vulnerable to sleep disturbances. Sleepiness may dramatically affect a patient's quality of life and is linked to changes in neurocognitive function, such as memory loss, impaired fine motor skills and abnormal executive function.¹⁰ Patients whose complaints appear consistent with normal aging need not be further investigated. Daytime napping may be normal or even beneficial, but excessive daytime sleepiness should not be considered normal in the healthy old people. Any patient who appears to be getting a reasonable amount of sleep who has difficulty staying awake should have further evaluation. Sleep disorders, dementia, depression, chronic diseases and medications may contribute this problem as people ages. In line with these observations, several studies have investigated the prevalence of sleep disorders among older adults. For example, a study by Chiu et al,¹¹ conducted in China, found that 75% of 1,034 older individuals reported sleep disturban-

ces. In another study of 400 nursing home residents in Iran, 83% were found to have poor sleep quality, and 29% experienced excessive daytime sleepiness.¹² Similarly, Çalık's study¹³ reported that 48% of older adults had poor sleep quality, while 77% experienced excessive daytime sleepiness. These findings underscore the widespread nature of sleep disturbances in aging populations and the importance of addressing sleep-related issues to improve quality of life in older individuals.

In our study, we found that the most significant factor contributing to sleep disorders among older adults was sleep onset latency. Contrary to common belief, which assumes that the ability to initiate sleep declines markedly with age, current evidence does not fully support this assumption. Research suggests that both sleep latency and the ability to return to sleep after nocturnal awakenings demonstrate only minimal increases after the age of 60 years. While sleep latency has been shown to increase with age, the magnitude of this change is modest, as indicated by results from two meta-analyses.^{14,15} In these studies, sleep latency remained relatively stable from childhood through adolescence, with a notable increase only occurring between young adults and older adults. A study by Fadiloğlu et al.³ conducted in a nursing home population found that 23% of older residents had difficulty falling asleep, 47% reported frequent awakenings after initially falling asleep, and 32% were able to fall back asleep after waking up.³ However, in contrast to these findings, our study identified sleep onset latency as the most prevalent sleep-related issue among the seniors. The discrepancy between our findings and those of previous studies may reflect differences in study design, population characteristics, or measurement methods.

The data obtained from the two scales used in our study indicate that poor sleep quality and daytime sleepiness have a negative impact on the quality of life of old individuals residing in nursing homes. A statistically significant correlation was observed between the quality of life scale and the PSQI scores across all sub-dimensions, with the exception of the pain. Similarly, a strong and statistically significant correlation was found between the SSS and the sub-dimensions of quality of life, with exceptions of mental health and pain. These findings suggest that while sleep disturbances significantly affect most aspects of quality of life, the relationship may be less

pronounced in the areas of pain and mental health. Many studies have found that mental health, physical illnesses, and quality of life may be related to sleep quality.¹⁶⁻¹⁹ This suggests that while sleep quality affects most domains of quality of life, pain and mental health may be influenced by additional factors beyond sleep disturbances, such as underlying chronic conditions, medication use, or psychosocial factors. Further research is needed to explore these relationships in more detail, including potential moderating or confounding variables that could explain the weaker associations observed.

When examining the relationship between comorbidities and sleep scales, dementia was significantly associated with the SSS score, while both cerebrovascular accidents and dementia were significantly related to the PSQI score. The significant association between dementia and both sleep scales highlights the complex interplay between cognitive decline and sleep disturbances. Studies estimate that between one-quarter and one half of older adults with dementias suffer from some form of sleep disruption.²⁰ Dementia is known to disrupt the sleep-wake cycle, contributing to poor sleep quality and increased daytime sleepiness. Additionally, cerebrovascular accidents, which often result in neurological deficits, may exacerbate sleep-related issues by affecting brain regions involved in regulating sleep patterns. Increasing daytime activity and physical exercise are known to enhance sleep in persons with dementia, as they may correct the circadian rhythm disturbances that these persons experience.²¹ This finding warrants further exploration into how these two conditions interact and contribute to the decline in both cognitive and physical health in affected individuals.

Interestingly, no significant relationship was observed between polypharmacy and the sleep scales, suggesting that medication use may not be the primary factor influencing sleep disturbances in this population. However, this does not rule out the potential role of specific medications, and further studies exploring the impact of individual drugs on sleep are warranted.

In our study, we observed that 29% of senior participants had experienced at least one fall within the past year. However, when examining the relationship between sleep disturbances and fall incidents, we found no statistically significant correlation. This lack of association may be explained by the relatively

high degree of independence among the study participants, as many were not severely limited in their mobility or daily functioning.

The strength of this study is its use of two validated sleep scales which provide a comprehensive evaluation of both sleep quality and daytime sleepiness. Another strength is the clear focus on a specific and vulnerable population allowing for targeted insights into the relationship between sleep disturbances and quality of life in older adults, with potential for improving care and interventions. Future research should consider larger, more diverse populations that include individuals with varying levels of physical and cognitive impairment.

Conclusions

In conclusion, addressing sleep problems should be a priority in the care of nursing home residents, particularly those with dementia and cerebrovascular accidents. By improving sleep hygiene and managing underlying medical conditions, healthcare providers can help improve the overall well-being of nursing home residents, ultimately enhancing their quality of life. Targeted interventions, such as individualized sleep management plans, may be beneficial in reducing the negative impact of sleep disturbances on old individuals' health and daily functioning.

Conflict of Interest: The authors declare no conflict of interest.

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Ethics:

Ethics committee approval was obtained from XXXX University Faculty of Medicine with decision number 215.

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