Factors Associated with Sleep Disorders in Geriatric Patients and Their Effect on Quality of Life: A Rehabilitation Unit Experience

Geriatrik Hastalarda Uyku Bozuklukları ile İlişkili Faktörler ve Yaşam Kalitesi Üzerine Etkileri: Bir Rehabilitasyon Ünitesi Deneyimi

Aslıhan Uzunkulaoğlu[1], Nuri Çetin[2], Oya Ümit Yemişçi[2], Sacide Nur Saraçgil Coşar[2], Sevgi İkbali Afşar[2]

[1]Ufuk University, School of Medicine, Department of Physical Medicine and Rehabilitation, Ankara, Turkey
[2]Başkent University, School of Medicine, Department of Physical Medicine and Rehabilitation, Ankara, Turkey

ABSTRACT

Objective: Sleep disorders in the elderly are linked to increased morbidity, decreased quality of life, impaired mood, difficulty in balance and increased need for caregivers. We aimed to determine the factors associated with sleep disorders, examine their effect on quality of life, and investigate the relationship between physical function, depression and psychopharmaceutical intake.

Methods: Sleep state of 100 patients over 65 years old were assessed with Medical Outcomes Study Sleep Scale (MOS-SS). Geriatric Depression Scale, Charlson Comorbidity Index and Short Form-36 Health Survey (SF-36) scores were measured.

Results: Sleep disorders were determined in 48% of the individuals. Patients with sleep disorders did not demonstrate a significant difference in terms of gender, marital status, way of life, mini mental test score, comorbidity, polypharmacy, and use of medications for sleep compared to patients without sleep disorders. In multivariate analysis only SF-36 mental health score was found statistically significant.

Conclusion: Poor sleep quality and inadequate sleep affect many of the measures of quality of life. We found a significantly lower SF-36 mental health scores in patients with sleep problems which may support that sleep is an important predictor of psychological well-being. Because of the multidisciplinary nature of sleep disorders, physicians should be aware of the patient's medical and psychiatric conditions. Further studies are required which examine the factors related with sleep and the relationship between sleep and quality of life.

Keywords: Geriatrics, sleep disorders, quality of life, rehabilitation

ÖZET

Amaç: Yaşlılıkta uyku bozuklukları artmış morbidite, azalmış yaşam kalitesi, duygu durumda bozulma, dengede zorluk ve bakıcı ihtiyacının artması ile ilişkilidir. Biz bu çalışmada uyku bozuklukları ile ilişkili faktörleri saptamayı, bunların yaşam kalitesi üzerine etkilerini incelemeyi, fiziksel fonksiyon, depresyon ve psikofarmasötik alımı arasındaki ilişkileri gözlemlemeyi amaçladık.

Yöntemler: 65 yaş üstü 100 hastanın uyku durumu Medical Outcomes Study Uyku Skalası (MOS-SS) ile değerlendirildi. Geriatrik Depresyon Ölçeği, Charlson Komorbidite İndeksi ve Kısa Form-36 sağlık anketi (KF-36) skorları ölçüldü.

Bulgular: Bireylerin %48'inde uyku bozukluğu saptandı. Uyku bozuklukları olan hastalar uyku bozukluğu olmayan hastalarla karşılaştırıldığında cinsiyet, medeni durum, yaşam şekli, mini mental test skoru, komorbidite, polifarmasi ve uyku için ilaç kullanımı açısından anlamlı bir farklılık saptanmadı. Çok değişkenli analizlerde sadece KF-36 mental sağlık skoru istatiksel olarak anlamlı saptandı.

Sonuçlar: Kötü uyku kalitesi ve yetersiz uyku yaşam kalitesinin birçok ölçütünü etkiler. Uyku problemi olan hastalarda anlamlı olarak daha düşük KF-36 mental sağlık skorları saptadık, bu durum uykunun psikolojik iyilik halinin önemli bir prediktörü olabileceğini destekleyebilir. Uyku bozukluklarının multidisipliner doğası nedeniyle, hekimler hastanın medikal ve psikiyatrik durumu açısından dikkatli olmalıdır. Uyku ile ilişkili faktörleri ve uyku ve yaşam kalitesi arasındaki ilişkiyi değerlendiren daha ileri çalışmalar gerekmektedir.

Anahtar sözcükler: Geriatri, uyku bozuklukları, yaşam kalitesi, rehabilitasyon

Introduction

Sleep disorders are multifactorial in elderly people. Sleep disturbance may be due to a primary sleep disorder such as obstructive sleep apnea, periodic limb movements during sleep and restless legs syndrome (RLS), or it may be secondary to medical illness and psychiatric conditions. Age is usually associated with increased frequency of sleep disorders, even if sleep problems are not a normal part of aging (1). Difficulty in initiating and maintaining sleep is common in the elderly, who often presents also day time drowsiness (2). In elderly population inadequate and ineffective sleep is related with increased morbidity and mortality, decreased quality of life, increased depression and anxiety disorders, difficulty in balance and ambulation and risk of falls (3). These symptoms create social and economic burdens for the health care system as well as the caregivers. Furthermore it has been suggested that excessive daytime sleeping is associated with less functional recovery with rehabilitation and evidence suggests that behavioral interventions can decrease daytime sleeping in institutional settings, therefore it is important to identify rehabilitation patients who suffer from this condition and who could benefit from intervention (4).

The clinical assessment of aging patients who have sleep complaints involves an in-depth multidisciplinary approach. The evaluation of a sleep disorder begins with obtaining a medical history focused on the chief complaint: the history of present illness, past sleep history, and past and present medication use (selective serotonin reuptake inhibitors, antipsychotics, cholinesterase inhibitors, anticholinergics) (5).

Based on this information our aim in this study was to determine the factors related with sleep disorders in geriatric patients, examine their effect on quality of life and investigate the relationship between physical function, depression and anxiety symptoms, psychological well-being and psychopharmaceutical intake.

Material and Methods

The study included 100 patients over 65 years old, who were admitted to a university affiliated inpatient rehabilitation center. Only patients whose mini mental state examination (MMSE) scores were greater than 11 and functional ambulation scale scores which were minimum 4 were included in the study. Patients who had severe stroke or any other neurological disorder, severe cognitive impairment and psychiatric disorder were excluded. Written consent was obtained from all the patients and the study was approved by the hospital's ethics committee and carried out according to the institutional guidelines and the principals of the Declaration of Helsinki.

The study was made by face to face interview at all steps. A complete medical history including demographic and clinical data was obtained from each patient. Use of multiple medications including diuretics, antidepressants and medications for sleep were questioned. Charlson Comorbidity Index was used to evaluate comorbid diseases in patients (6).

The Turkish adaptation of Medical Outcomes Study Sleep Scale (MOS-SS) was used for evaluating sleep and problems of sleep. This scale is a commonly used self-reported instrument for assessing sleep quality and quantity, which the answers are based on a retrospective assessment of sleep over the past 4 weeks. This measure evaluates important components of sleep such as the ability to fall asleep and maintain sleep, sleep quantity, and somnolence. This questionnaire yields a sleep problem index and consists of 12 items assessing six key constructs of sleep; sleep disturbance (having trouble falling asleep, duration to fall asleep, quietness of sleep, awakenings during sleep, and having trouble falling asleep again), daytime somnolence (drowsy during the day, having trouble staying awake during the day, taking naps), perceived sleep adequacy (getting enough sleep to feel rested on waking in the morning, getting amount of sleep needed), awakening short of breath or with headache, snoring, and sleep quantity. Sleep quantity is measured as the number of hours of sleep obtained per night and is translated into an optimal sleep score, where 7 to 8 hours of sleep is optimal. Score were calculated according to the guidelines recommended by the developers of the MOS-SS were higher scores indicated greater impairment (7).

Geriatric Depression Scale (GDS) was used to investigate the presence of depression in geriatric population. This scale includes items about decreased mood, decreased self-perception and motivation, orientation to the past

Uzunkulaoğlu A et al.
Sleep Disorders in Geriatric Patients

J PMR Sci 2016; 19: 7-13
FTR Bil Der 2016; 19: 7-13

rather than to the future, cognitive problems, obsessive character and agitation (8). The GDS includes 30 items evaluating the level of depressive symptoms and can be self-administered. Each item of the GDS is reported as 'Yes' or 'No' and examines past week. The cutoff score is 13/14. The study of reliability and validity of the Geriatric Depression Scale in Turkish population was made by Ertan et al. (9).

All the patients were assessed with the standardized mini mental state examination test (MMSE) consisting of 11 items which include the individual's orientation, attention, calculation, recall, language; and is grouped under these five main headings. Total score was 30 (10). Turkish validity and reliability study of this test was conducted by Kayatekin et al. in 1985 (11). A score of 25 to 30 suggests "normal", 19 to 24 "mild cognitive impairment" and scores below 19 suggest "dementia" (12). In our study we defined scores 25 to 30 as "normal" and belove 25 as "abnormal".

Quality of life (QoL) was evaluated with the Health Related Quality of Life Questionnaire Short Form Health Survey-36 (SF-36), a widely used generic index which has been validated in the Turkish population (13). It is composed of 36 items in eight domains: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health. The score from the subscales for this questionnaire range from 0 to 100, with 100 representing no deterioration in the quality of life (14).

Statistical Analysis

Data were analyzed using SPSS version 11.5 for Windows. Shapiro-Wilk test was used to test the normality of distribution for continuous variables. Descriptive statistics for continuous variables were shown as the mean±standard deviation or median (minimum–maximum) and for nominal variables, the number of cases and percentages (%) were cited.

The mean differences among groups were compared by Student's t test and median differences among groups were tested by Mann-Whitney U test. Nominal variables were evaluated by using Pearson's chi-squared or Fisher's exact chi-squared tests. Factors which were found to affect sleep according to univariate statistical analysis were examined by multivariate logistic regression analysis. Variables with p<0.20 in univariate analysis, were identified as a candidate risk factors and included in the regression model. Odds ratio (OR), 95% confidence interval (95 % CI) and significance level were calculated for each variable. A p-value < 0.05 was deemed to indicate statistical significance.

Results

The mean age of 100 geriatric patients included in the study was 74,06±0.69 years. Seventy-three of the patients (73%) were female and 27 (27%) were male. A total of forty- eight patients (48%) were using diuretics, 17 patients (17%) had antidepressant intake and 19 (19%) patients were using medication for sleep. Polypharmacy (medications more than 3) was seen in 40 patients (40%). Demographic characteristics of the patients are shown in Table 1.

Medical outcomes study scale scores revealed sleep problems in 48 patients (48%). Among the patients who had sleep disorders, statistically significant difference

Table 1. Demographic characteristics of patients and distribution of polypharmacy, antidepressant intake and medications for sleep.

Characteristics (n=100)	Mean ± SD (Median)	Number (%)
Age(year)	74,06± 0,69 (74,00)	
Gender		
Female		73 (73%)
Male		27 (27%)
Marital status		
Married		54 (54%)
Single		46 (46%)
Way of life		
Alone		29 (29%)
Nuclear family		71 (71%)
Education status		
Secondary school and under		53 (53%)
High school and over		47 (47%)
Polypharmacy		
Yes		40 (40%)
No		60 (60%)
Diuretics		
Yes		48 (48%)
No		52 (52%)
Antidepressant intake		
Yes		17 (17%)
No		83 (83%)
Use of medication for sleep		
Yes		19 (19%)
No		81 (81%)

SD: *Standard deviation*

Table 2. Distribution of GDS score, MMSE score and MOS-SS score.

Patients (n=100)	Number (%)
Geriatric depression scale score	
No depressive state	70 (70%)
Susceptibility for depression/in depression	30 (30%)
Mini mental state examination score	
Normal	61 (61%)
Pathological	39 (39%)
Medical outcomes study sleep scale score	
50 and over – normal	52 (52%)
<50- pathological	48 (48%)

GDS: *Geriatric depression scale,* **MMSE:** *Mini mental state examination,* **MOS-SS:** *Medical outcomes study sleep scale*

was found in all the domains of MOS-SS except snoring. According to the GDS scores, seventy patients (70%) were found as in ''no depressive state'' and 30 patients (30%) were found as ''susceptibility for depression/in depression''. Mini mental test examination scores were normal in 61 patients (61%) and pathological in 39 patients (39%). Distribution of GDS score, MMSE score and MOS-SS scores are shown in Table 2.

Univariate analysis of the factors thought to affect sleep revealed that gender (p=0.028), GDS score (p=0.016), SF-36 physical function score (p=0.002), SF-36 role limitation score (p=0.001), SF-36 pain score (p<0.001), SF-36 general health score (p=0.006), SF-36 vitality score (p<0.001), SF-36 social function score (p<0.001), SF-36 emotional score (p<0.035) and SF-36 mental health score (p<0.001) were found as statistically significant (p<0.05) (Table 3). On the other hand, univariate analysis revealed no statistically significant difference between individuals with and without sleep disorders in terms of marital status, way of life, MMSE, Charlson Comorbidity Index, polypharmacy, antidepressant intake and use of medications for sleep (p>0.05) (Table 3). However, multivariate statistical analysis of the parameters that were found to affect sleep in univariate analysis revealed that only SF-36 mental health scores were statistically different in patients with sleep disorders (p=0.002) (Table 4).

Discussion

Sleep disorders are common in the elderly and are found to be associated with functional impairment and QoL. In the National Sleep Foundation's (NSF) 2003 Sleep in America Poll, 46% of people aged 65 to 74 and 50% of those aged 75 to 84 reported one or more symptoms of insomnia (15). In our study sleep disorders

Table 3. Univariate analysis of risk factors in individuals who have sleep disorder according to logistic regression model.

Risk factor	OR (95% CI)	p value
Age	0,994 (0,939-1,053)	0,841
Gender	2,879 (1,118-7,414)	0,028*
Marital status	1,891 (0,853-4,194)	0,117
Way of life	0,447 (0,184-1,084)	0,075
Education	1,073 (0,489-2,356)	0,860
MMSE score	1,742 (0,774-3,921)	0,180
GDS score	3,000 (1,223-7,358)	0,016*
SF-36 physical function	0,977 (0,964-0,991)	0,002*
SF-36 role limitation	0,986 (0,977-0,994)	0,001*
SF-36 pain	0,963 (0,945-0,981)	<0,001*
SF-36 general health	0,970 (0,949-0,991)	0,006*
SF-36 vitality	0,965 (0,949-0,983)	<0,001*
SF-36 social function	0,966 (0,951-0,982)	<0,001*
SF-36 emotional	0,989 (0,980-0,999)	0,035*
SF-36 mental health	0,945 (0,921-0,969)	<0,001*
Charlson comorbidity index	1,104 (0,778-1,567)	0,580
Polypharmacy	1,351 (0,606-3,014)	0,463
Diuretic intake	1,167 (0,532-2,560)	0,701
Use of medication for sleep	1,257 (0,462-3,420)	0,654
Antidepressant intake	1,269 (0,446-3,610)	0,655

*p<0,05 **GDS:** *Geriatric Depression Scale,* **MMSE:** *Mini mental state examination,* **OR:** *Odds ratio,* **CI:** *Confidence interval*

Table 4. Multivariate analysis of risk factors in individuals who have sleep disorder according to logistic regression model.

Risk factor	OR (95% CI)	p value
GDS score	0,241 (0,049-1,201)	0,082
SF-36 pain	0,977 (0,954-1,000)	0,052
SF-36 social function	0,982 (0,962-1,003)	0,091
SF-36 mental health	0,943 (0,909-0,979)	0,002*
Gender	0,348 (0,115-1,053)	0,062

*p<0,05 **GDS:** *Geriatric Depression Scale,* **OR:** *Odds ratio,* **CI:** *Confidence interval*

were determined in %48 of individuals. The results of the studies on sleep-related gender differences are not clear, but insomnia symptoms were more frequent in elderly women (15-17). In a study involving 956 participants by Berg et al., sleep complaints were more frequent in elderly women; in contrast actigraphic sleep measures showed poorer sleep in men (18). Sex differences in sleep parameters in the elderly are partly explained by

Uzunkulaoğlu A et al.
Sleep Disorders in Geriatric Patients

J PMR Sci 2016; 19: 7-13
FTR Bil Der 2016; 19: 7-13

covariates that are related to both poor sleep and sex, such as sleep medication use and alcohol consumption. In our study there was difference between individuals with or without sleep disorder in terms of sex, but when evaluated in conjunction with other variables, this difference was not significant. This result can be explained by non-homogenous gender distribution in the sample and by the fact that the affect of gender on sleep quality can be influenced by many other factors (comorbid diseases, medications etc.) in the elderly.

Marriage and education status have protective effects on sleep quality in older age but many other factors can affect this. In a study which involves 15638 Chinese elders, Gu et al. found that marriage and education had no relationship with sleep quality. We observed similar results in our study (19).

Poor sleep has also been associated with cognitive impairment (20-22). Ohayon and Vecchierini conducted a study in elderly people in 2002 and found that those who slept ≤5 hours had a significantly poorer score than those who slept 7–8.5 hour on two of the six dimensions of the MacNair-R Cognitive Difficulties Scale; however, no association was found when cognitive function was evaluated using the MMSE (23). The study by Tworoger et al. in older women in the United States found that those who slept ≤5 hours had worse scores on various cognitive tests, including the MMSE (24). In contrast, Blackwell et al. did not find an association between sleep duration and the MMSE in older women in the United States, whereas Schmutte et al. found poorer verbal memory scores in American older men and women who slept for more than 9 hours (20, 25). In this study we evaluated cognitive state with MMSE and in order to answer the questions in the surveys properly we included patients whose MMSE score was greater than 11. We observed no significant relationship between cognitive state and sleep disorders. We do not have a conclusive explanation for the discrepancies between studies. Several factors may contribute to these results. The different characterizations of sleep duration, different methods for collecting data on cognitive function (by telephone or face to face interviews) and differences in the measurement of sleep duration may contribute to differing results of the studies. Also, in contrast with previous results (26-28) we found no significant affect of way of life on sleep quality. The main reason for this result may be the fact that none of the subjects in this study lived in nursing homes.

Medical and psychiatric disturbances are common in the elderly and these often require long-term medication. There are many studies that investigate the relationship between multiple drug use and sleep disturbance (29,

30). Some medications directly affect sleep and if taken early in the day, these medications can disrupt sleep patterns because of their sedative effects. For example taking long-acting sedative hypnotics, antihistamines and sedated antidepressant agents (amitriptyline, doxepin, trimipramine, trazodone, mirtazapine) early in the day, can result as excessive daytime sleepiness and napping. While corticosteroids, selective serotonin reuptake inhibitor group drugs, decongestants, inhaled and oral beta-agonists disrupt the quality of sleep by affecting the central nervous system; hypoglycemic agents, nicotine, alcohol and hypnotics with short half-life affect the continuity of sleep. Adjusting the dosage and time of receipt of such medications can cope with sleep problems they cause (31). We observed no statistical difference between individuals with and without sleep disorders in terms of drug use. Several factors can contribute to this result. First of all most of the patients may not know exactly what medications they use or they may develop tolerance as a result of long-term use of the same drugs. Secondly the study sample was relatively small considering that only 17 (17%) of the patients were using antidepressant drugs.

The association between sleep disturbances and depressive symptoms is complex, bidirectional in nature, and not thoroughly understood. In a study which involves 1204 patients 65 years and over, Kim et al. found that insomnia was common and often persistent in this population and it was closely and reciprocally related to depression and physical disorders (32). We observed statistical difference between individuals with and without sleep disorders in terms of depression but when evaluated with other factors; we found that depressive state was found not to be considered as an independent variable for sleep disorder. In our study, the sample size was smaller when compared to other studies that examined depression and sleep. Furthermore, depression was only evaluated only GDS. Evaluation with more objective measures might have revealed different results.

Sleep complaints can be a consequence or a symptom of another problem related to comorbidity. All sleep complaints do not change with the degree of comorbidity and some seemed more likely to be produced by a condition associated with the aging process than with morbidity. We found no statistical difference between individuals with and without sleep disorders in terms comorbidity. This may be explained by the fact that the study participants were relatively healthy with only one or two comorbid diseases. Similarly some studies have reported that returning to sleep after awakening, feeling daytime tiredness and waking up early in the morning did not differ with the degree of comorbidity (33).

Uzunkulaoğlu A et al.
Sleep Disorders in Geriatric Patients

J PMR Sci 2016; 19: 7-13
FTR Bil Der 2016; 19: 7-13

Sleep is one of the physiological requirements for a healthy life. Therefore, it is considered to be an important predictor of one's QoL and well-being (34). In a study which involves 63408 Australian adults, Magee et al. found that short and long sleep were found to be associated with poorer self-related health in adults aged 45–74 year (35). In a study which evaluated sleep patterns in 3907 rural elders, people who have long sleep durations were found to have worse subjective health perception and physical functioning than others (36). Faubel et al. conducted a prospective study in Spain between 2001 and 2003 and determined that extreme sleep durations ($\leq$ 5 or $\geq$ 10 hours) reported worse scores on the SF-36 physical and mental scales in 2001. However, after adjustment for potential confounders, they reported that this association lost statistical significance in men (37). Our results were consistent with this study. We found statistical difference between individuals with and without sleep disorders in terms of gender and SF-36 components, but when evaluated in conjunction with other variables these differences were not significant except for SF-36 mental health scores which were significantly lower in patients with sleep problems. This may support the hypothesis that sleep is an important predictor of psychological well-being. There are different reasons for these results. According to the variety of sleep problems, sleep components can be affected at different levels. There can be factors that affect both sleep and QoL. For example, restless leg syndrome affects directly QoL. This syndrome also decrease sleep quality and by this way also affects QoL indirectly. Another explanation is reverse interactions. Long-duration sleep could be an early symptom of disease; despite the analyses adjusted for the number of chronic diseases and for lifestyle habits that lead to chronic diseases, there could be undiagnosed subclinical diseases that alter health related QoL, and this might in turn affect sleep duration (37). The third explanation for the study relationship is that sleep duration, which has not been examined as an independent factor itself may be associated with worse QoL.

There are important limitations for this study. First of all this report was based on cross-sectional data so it is not feasible to establish a causal association between sleep disorders and QoL. The study sample size was smaller when compared to other studies that examined factors related with sleep quality. Furthermore, it only included patients attending to a rehabilitation center who suffered from pain. The participants were self-sufficient, none of them lived in nursing homes and relatively healthy with functional ambulation levels greater than 4, which may explain the reason why the physical components of QoL have not been affected. In addition, excessive daytime sleepiness which is thought to be related to QoL and cognitive state has not been questioned as an independent factor. Furthermore it has been suggested that self-report questionnaires may not accurately assess excessive daytime sleeping (4). Another limitation may be is that Turkish validity and reliability study of MOS-SS was not conducted in Turkish population.

In conclusion geriatric patients in a rehabilitation center with sleep disorders did not demonstrate a distinctive difference in terms of marital status, way of life, mini mental test score, comorbidity, polypharmacy, and use of medications for sleep compared to patients without sleep disorders. However SF-36 mental health scores were significantly lower in patients with sleep problems. The relationship between sleep disorders, comorbidity, polypharmacy and QoL should always be kept in mind in clinical practice and by all means special attention should be paid to elderly patients in terms of assessment and treatment. Further longitudinal studies of sleep disorders and health status are needed to establish the risk factors.

References

1. Isaia G, Corsinovi L, Bo M, et al. Insomnia among hospitalized elderly patients: prevalence, clinical characteristics and risk factors. Arch Gerontol Geriatr 2011;52:133-7.

2. Ramesh M, Roberts G. Use of night-time benzodiazepines in an elderly inpatient population. J Clin Pharm Ther 2002;27:93-97.

3. Tinetti ME, Williams CS. Falls, injuries due to falls and the risk of admission to a nursing home. N Engl J Med 1997;337:1279-84.

4. Skibitsky M, Edelen MO, Martin JL, et al. Can standardized sleep questionnaires be used to identify excessive daytime sleeping in older post-acute rehabilitation patients? J Am Med Dir Assoc 2012;13:127-35.

5. Misra S, Malow BA. Evaluation of sleep disturbances in older adults. Clin Geriatr Med 2008;24:15-26.

6. Charlson ME, Pompei P, Ales KL, et al. A new method of classifying prognostic comorbidity in longitudinal studies: Development and validation. J Chron Dis 1987;40:373-83.

7. Hays RD, Stewart AL. Sleep measures. In: Stewart AL, Ware JE, editors. Measuring functioning and well-being: the Medical Outcomes Study approach. Durham, NC: Duke University Press, 1992:235–259.

8. Yesavage JA, Brink TL, Rose TL, et al. Development and validation of a geriatric depression screening scale: a preliminary report. J Psychiatr Res 1983;17:37-49.

9. Ertan T, Eker E, Sar V. Geriatrik depresyon ölçeğinin Turk yaşlı nüfusunda geçerlilik ve güvenilirliği. Nöropsikiyatri Arşivi 1997;34:62-71.

Uzunkulaoğlu A et al.
Sleep Disorders in Geriatric Patients

J PMR Sci 2016; 19: 7-13
FTR Bil Der 2016; 19: 7-13

10. Molloy DW, Alemayehu E, Roberts R. Reliability of a standardized Mini-Mental State Examination compared with the traditional Mini-Mental State examination. Am J Psychiatry 1991;148:102-5.

11. Kayatekin MS, Ozturk MO, Savasir I. Kısa Kognitif Muayene (KKM) çizelgesinin güvenirlik ve geçerlilik çalışmaları. Düşünen Adam. Psikiyatri ve Nörolojik Bilimler Dergisi 1986;1:63-6.

12. Deborah B. Psychiatric rating scales. In: BJ Sadock, VA Sadock, editors. Comprehensive Textbook of Psychiatry, 2th Ed. vol. II, Philadelphia: Lippincott Williams& Wilkins, 2000:755-783.

13. Koçyiğit H, Fişek G, Ölmez N, et al. Kısa Form-36 (KF-36)'nın Türkçe versiyonunun güvenilirliği ve geçerliliği. Romatizmal hastalığı olan bir grup hasta ile çalışma. İlaç ve Tedavi Dergisi 1999;12:102–6.

14. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992;30:473-83.

15. National Sleep Foundation. 2003 Sleep in America Poll [online]. Available at http://sleepfoundation.org. Accessed 4 December 2003.

16. Foley DJ, Monjan AA, Brown SL, et al. Sleep complaints among elderly persons: an epidemiologic study of three communities. Sleep 1995;18:425–32.

17. Ancoli-Israel S, Martin JL. Insomnia and daytime napping in older adults. J Clin Sleep Med 2006;2:333–42.

18. Van den Berg JF, Miedema HM, Tulen JH, et al. Sex Differences in Subjective and Actigraphic Sleep Measures: A Population- Based Study of Elderly Persons. Sleep 2009;32:1367-75.

19. Danan Gu, Jessica Sautter, Robin Pipkin, et al. Sociodemographic and Health Correlates of Sleep Quality and Duration among Very Old Chinese. Sleep 2010;33:601-10.

20. Blackwell T, Yaffe K, Ancoli-Israel S, et al. Poor sleep is associated with impaired cognitive function in older women: the study of osteoporotic fractures. J Gerontol A Biol Sci Med Sci 61:405-10.

21. Dam TT, Ewing S, Ancoli-Israel S, et al. Association between sleep and physical function in older men: the osteoporotic fractures in men sleep study. J Am Geriatr Soc 2008;56:1665–73.

22. Cricco M, Simonsick EM, Foley DJ. The impact of insomnia on cognitive functioning in older adults. J Am Geriatr Soc 2001;49:1185–89.

23. Ohayon MM, Vecchierini MF. Daytime sleepiness and cognitive impairment in the elderly population. Arch Intern Med 2002;162:201-8.

24. Tworoger SS, Lee S, Schernhammer ES, et al. The association of self reported sleep duration, difficulty sleeping, and snoring with cognitive function in older women. Alzheimer Dis Assoc Disord 2006;20:41-8.

25. Schmutte T, Harris S, Levin R, et al. The relation between cognitive functioning and self-reported sleep complaints in nondemented older adults: results from the Bronx aging study. Behav Sleep Med 2007;5:39–56.

26. Jacobs JM, Cohen A, Hammerman-Rozenberg R, et al. Global sleep satisfaction of older people: the Jerusalem Cohort Study. J Am Geriatr Soc 2006;54:325-9.

27. Orhan FO, Tuncel D, Taş F, et al. Relationship between sleep quality and depression among elderly nursing home residents in Turkey. Sleep Breath 2012;16:1059-67.

28. Gumus BA, Engin E, Ozgur G. Evaluation of sleep pattern characteristics of the elderly without a cognitive disorder living in a nursing home. Turkish Journal of Geriatrics 2009;12:138-46.

29. Newman AB, Enright PL, Manolio TA, et al. Sleep disturbance, psychosocial correlates, and cardiovascular disease in 5201 older adults: The Cardiovascular Health Study. J Am Geriatr Soc 1997;45:1–7.

30. Giron MS, Forsell Y, Bernsten C, et al. Sleep problems in a very old population: drug use and clinical correlates. J Gerontol A Biol Sci Med Sci 2002;57:236-40.

31. Ancoli-Israel S, Ayalon L, Salzman C. Sleep in the elderly: normal variations and common sleep disorders. Harv Rev Psychiatry 2008;16:279-86.

32. Kim JM, Stewart R, Kim SW, et al. Insomnia, depression, and physical disorders in late life: a 2-year longitudinal community study in Koreans. Sleep 2009;32:1221-8.

33. Fagerström C, Hellström A. Sleep complaints and their association with comorbidity and health-related quality of life in an older population in Sweden. Aging Ment Health 2011;15:204-13.

34. Timur S, Sahin NH. Effects of sleep disturbance on the quality of life of Turkish menopausal women: A population-based study. Maturitas 2009;64:177–81.

35. Magee CA, Caputi P, Iverson DC. Relationships between self-rated health, quality of life and sleep duration in middle aged and elderly Australians. Sleep Med 2011;12:346-50.

36. Habte-Gabr E, Wallace RB, Colsher PL, et al. Sleep patterns in rural elders: demographic, health, and psychobehavioral correlates. J Clin Epidemiol 1991;44:5-13.

37. Faubel R, Lopez-Garcia E, Guallar-Castillón P, et al. Sleep duration and health-related quality of life among older adults: a population-based cohort in Spain. Sleep 2009;32:1059-68.