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Sleep problems in elderly patients with rheumatoid arthritis: Contributing factors and quality of life implications

Romatoid artritli yaşlı hastalarda uyku bozuklukları: Etkileyen faktörler ve yaşam kalitesine yansımaları

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Abstract

Objective: Sleep-related problems are common in rheumatoid arthritis (RA) patients of advanced age. This study aimed to identify factors contributing to poor sleep quality in elderly RA patients and assess their impact on quality of life.

Methods: This study included RA patients aged ≥65 years, admitted to a rheumatology clinic between May and September 2024, using a cross-sectional design. The Pittsburgh Sleep Quality index (PSQI) was used to evaluate sleep, while RA activity was measured via disease activity score 28-C-reactive protein (DAS28-CRP), and quality of life was assessed with the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core-30. A multivariate regression analysis was used to identify factors associated with poor sleep quality.

Results: The study included 77 elderly RA patients (mean age 70.8±4.9 years, 59.8% female). The median DAS28-CRP score was 4.3, and 75.3% were not in remission. A total of 50.65% of the patients had poor sleep quality (PSQI >5). In the multivariate analysis, age ≥75 years [odds ratio (OR)=8.23, 95% confidence interval (CI) (1.51-44.77), p=0.015], being single [OR=4.63, 95% CI (1.17-18.36), p=0.029], active RA [OR=5.65, 95% CI (1.44-19.99), p=0.035] and depression [OR=5.04, 95% CI (1.17-21.73), p=0.030] were associated with poor sleep quality. Physical, emotional, and role function scores as well as fatigue, pain, and insomnia symptoms were observed at worse levels in the group with poor sleep quality.

Conclusion: Our study emphasizes the significance of managing sleep disorders in elderly RA patients. Disease activity and psychosocial

Öz

Amaç: Romatoid artritli (RA) yaşlı hastalarda uyku ilişkili problemlere sık rastlanmaktadır. Bu çalışmanın amacı, yaşlı RA hastalarında kötü uyku kalitesine katkıda bulunan faktörleri belirlemek ve uyku kalitesiyle yaşam kaliteleri arasındaki ilişkiyi değerlendirmektir.

Yöntem: Bu kesitsel çalışmaya Mayıs ve Eylül 2024 arasında ayaktan bir üçüncü basamak romatoloji polikliniğinde değerlendirilen ≥65 yaş RA hastaları dahil edildi. Uyku kalitesi Pittsburgh Uyku Kalitesi indeksi (PSQI), RA hastalık aktivitesi hastalık aktivite skoru 28-C-reaktif protein (DAS28-CRP) ve yaşam kalitesi European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 ölçeği ile değerlendirildi. Kötü uyku kalitesiyle ilişkili faktörleri belirlemek için çok değişkenli regresyon analizi kullanıldı.

Bulgular: Çalışmaya ortalama yaşı 70,8 (±4,9) ve %59,8'i (n=46) kadın olan toplam 77 yaşlı RA hastası dahil edildi. Ortanca DAS28-CRP skoru 4,3'tü ve hastaların %75,3'ü remisyonda değildi. Hastaların %50,65'i kötü uyku kalitesine (PSQI >5) sahipti. Çok değişkenli analizde, ≥75 yaş [risk oranı (RO)=8,23, %95 güven aralığı (GA) (1,51-44,77), p=0,015], bekar olmak [RO=4,63, %95 GA (1,17-18,36), p=0,029], aktif RA [RO=5,65, %95 GA (1,44-19,99), p=0,035] ve depresyon [RO=5,04, %95 GA (1,17-21,73), p=0,030] kötü uyku kalitesiyle ilişkili olarak bulunmuştur. Fiziksel, duygusal ve rol fonksiyon skorları ile yorgunluk, ağrı ve insomnia semptomları kötü uyku kalitesine sahip grupta daha kötü düzeyde izlenmiştir.

Sonuç: Sonuçlarımız, yaşlı RA hastalarında uyku bozukluklarının yönetiminin önemini ortaya koymaktadır. Uyku sorunları, artan hastalık aktivitesi ve psikososyal durumla yakından bağlantılı olup,

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factors are closely linked to sleep problems, which can be addressed to improve sleep quality and overall quality of life.

Keywords: Rheumatoid arthritis, sleep quality, quality of life, disease activity, elderly patients

bu faktörlerin hasta değerlendirmelerinde dikkate alınması hem uyku kalitesini hem de genel yaşam kalitesini olumlu yönde etkileyebilir.

Anahtar Kelimeler: Romatoid artrit, uyku kalitesi, yaşam kalitesi, hastalık aktivitesi, yaşlı hastalar

Introduction

Rheumatoid arthritis (RA) is an autoimmune disorder arising from a complex interaction of genetic, hormonal, and environmental factors, leading to joint inflammation and damage.[1] Although RA's prevalence varies between 0.5% and 1%, it is observed to increase even more in the aging population. The pathophysiology of RA involves abnormal immune system activation that causes inflammation and damage to the joints. At the same time, the exacerbation of symptoms has often been associated with triggers such as infections, smoking, and hormonal changes.[2] The impact of these inflammatory processes on quality of life is particularly noticeable in elderly patients.

The immune system's optimal functioning and regulation of inflammatory responses are greatly influenced by sleep. It is common for RA, an inflammatory disease, to cause sleep disorders.[3] Signaling activation and cellular inflammasome expression may be inhibited in the presence of RA. Dysregulation of sleep-wake activity is caused by a disrupted inflammatory profile in RA patients, resulting in excessive inflammation and increased pain sensitivity.[4] Sleep disorders such as insomnia and restless legs syndrome are common in RA patients and can complicate disease management.[5,6]

Sleep disorders in RA patients can be caused by many factors, including disease activity, neuropsychiatric diseases, comorbidities, and medication use.[7] In particular, chronic pain, which is a feature of RA, has been shown to disrupt sleep continuity and reduce restorative sleep, contributing to a decrease in quality of life.[8] RA patients are increasingly experiencing psychological problems such as depression and anxiety, which can shorten of sleep duration, cause sleep disruptions, and complicate treatment processes.[9] In addition, while multiple drug use is known to be associated with sleep disorders, drugs used in the treatment of RA can also have negative effects on sleep. Corticosteroids can cause insomnia and restlessness, while biological agents can affect inflammatory processes and change sleep patterns.[10,11]

In conclusion, considering that sleep disorders in RA patients are multifactorial, the management of these disorders should be considered part of disease control. Improving the quality of life for RA patients can be achieved through awareness and appropriate approaches to this issue. This study aimed to evaluate the factors that influence sleep disorders in RA patients and the connection between sleep disorders and quality of life to emphasize the importance of considering these factors in managing the disease.

Materials and Methods

Study Design and Participants

This observational study was designed to evaluate the factors affecting sleep disorders in RA patients. This cross-sectional study included 109 RA patients aged ≥65 years who applied to the rheumatology outpatient clinic of a tertiary healthcare institution between May and September 2024. Twenty-eight individuals were excluded due to terminal diseases or acute intervention, use of assistive devices, staying in nursing homes, having auditory or visual sensory impairment, and communication disability. In addition, the mini-mental state assessment was applied for the cognitive evaluation of the patients, and 4 individuals who were evaluated as "cognitively impaired" with a score below 24 points were not included in the study. The participants were given written informed consent, and the study, which was conducted in accordance with the Declaration of Helsinki, was approved by the appropriate ethics committee. The study was approved by Dr. Abdurrahman Yurtaslan Ankara Oncology Training and Research Hospital Ethics Committee IRB (no.: 2024-05/64, date: 23.05.2024).

Clinical Features Associated with RA

RA diagnosis was determined and/or confirmed by a rheumatologist according to the criteria established by the American College of Rheumatology/European Association of Rheumatology.[12] The patient's history and electronic records were used to record their RA diagnosis and follow-up periods. Disease activity of RA was reviewed by disease activity score 28-C-reactive protein (DAS28-CRP), where a score of <2.6 is considered remission, while ≥2.6 is called active disease.[13] Furthermore, the drugs utilized by the patients in RA treatment have been analyzed in-depth and categorized as biological and conventional synthetic disease-modifying antirheumatic drugs and corticosteroids.

Evaluating the Characteristics of Sleep

All patients were asked in detail about their sleep difficulties. The Pittsburgh Sleep Quality index (PSQI) was chosen for sleep disturbance evaluation.[14] The PSQI scale

has 24 questions, 19 of which are self-assessment questions that examine the severity of certain sleep-related problems. The 18 items included in the scoring are grouped into 7 areas as "subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping pills, and daytime dysfunction" and a maximum of 21 points can be obtained from the test, with a score between 0-3 in these areas. A PSQI score of >5 is evaluated as "poor sleep quality".[14] A high index score indicates worse sleep quality.[14] Insomnia severity was determined by using the Insomnia Severity index (ISI). ISI is a scale that evaluates the severity of insomnia in 7 separate items out of a total of 28 points. Clinically insignificant insomnia ranges from 0-7 points, while lower threshold insomnia ranges from 8-14 points, and moderate clinical insomnia ranges from 15-21 points.

Data Collection and Other Measurements

Patients' socio-demographics (age, gender, marital status, education level, living partner, smoking status) and anthropometric data were recorded. The participants were assessed for other chronic diseases, and the burden of comorbidity was determined by using the Charlson Comorbidity index.[15] The medications used at the time of admission were examined in detail, and the use of 5 or more medications was defined as polypharmacy.[16]

To evaluate the patients' physical independence status, the 6-item Katz Activities of Daily Living scale for basic living activities and the 8-item Lawton-Brody Instrumental Activities of Daily Living scale for instrumental activities of daily living were used.[17,18] The Clinical Frailty scale (CFS) 24 was utilized to determine the frailty status of the individuals. Individuals with a CFS score of ≥4 were defined as "frail". The Global Pain scale and visual analog scale (VAS) was used to determine pain intensity, and the scores were recorded with two separate questions "global" and "joint".[19]

The 15-item Geriatric Depression scale 15 (GDS-15) was used for mood assesment.[20] A GDS-15 ≥6 was defined as "depression". The Generalized Anxiety Disorder-7 (GAD-7) scales was used to asses the anxiety.[21] A score of <5 is defined as minimal anxiety on this scale, while 5-9 is defined as mild, 10-14 as moderate, and ≥15 as severe anxiety. In our study, we defined those with a GAD-7 score of ≥5 as "anxiety". Furthermore, the European Organization for Research and Treatment of Cancer Quality-of-Life Questionnaire Core 30 (EORTC QLQ-C30) scale was utilized to measure quality of life. Evaluation was made in 3 categories: global health status, functional scales and symptom scales. Twenty-eight of the 30 questions were based on a four-point Likert-type scale, while the remaining two questions assessed global health status. The higher the score for functional scales and global health status, and the lower the score for symptom scales, the better the health status.[1]

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) version 24 (IBM SPSS Inc., Chicago, USA) was used to analyze all the data. The comparison of patients was made based on their PSQI status (≤5 *vs.* >5). Means, standard deviation, median, minimum, and maximum values were used to present numerical variables; while frequency and percentage were used to report categorical data. The Kolmogorov-Smirnov and Shapiro-Wilk tests were applied to assess data distribution. Parametric tests were preferred for data that followed a normal distribution, while non-parametric tests were used for data that did not. Numerical data were compared between groups using an independent sample t-test or Mann-Whitney U test. Independent sample t-test was used to compare numerical variables that followed normal distribution; while the Mann-Whitney U test was used to compare numerical variables that did not. Comparison of categorical data conducted through chi-square or Fisher's exact test. A multivariate regression analysis was performed to identify parameters associated with poor sleep, using variables (age, sex, marital status, RA disease activity, frailty, anxiety and depression) selected based on statistical significance (p=0.05) in univariate analysis. The Hosmer-Lemeshow test was used to assess the model's fit. Hazard ratios and their 95% confidence intervals (CI) were reported from the models in all evaluations, and statistical significance was accepted as $p<0.05$.

Results

Baseline Characteristics

A total of 77 patients aged ≥65 years with RA diagnosis (mean age 70.8±4.9 years), participated in our study. Of these, 59.7% of the patients were women, and 53.2% of the population were married. The mean duration of RA diagnosis was 4 years (2-30 years). The median DAS28-CRP score was 4.3 (2.0-7.1), and 75.3% of the patients were not in remission. Hypertension (46.3%), diabetes mellitus (19.5%), and cardiovascular disease (19.5%) were the three most common comorbidities. Polypharmacy was observed in 31 patients (40.3%). The most commonly used RA treatment agents were methotrexate (42.9%) and leflunomide (33.8%). The median overall VAS score was 3 (1-7), while 11.7% of the participants were assessed as frail. In terms of sleep disorder severity, more than half of the patients (59.7%) had "no clinically significant insomnia",

while only 3 patients (3.9%) had severe clinical insomnia. Anxiety was detected in 15 (19.5%) patients, and depression was detected in 25 (32.4%) (Table 1).

Evaluation of Sleep Quality

When evaluated with PSQI, the rate of patients with poor sleep quality (PSQI >5) was found to be 50.65% (n=39). The median PSQI score was 8 (6-14) in the (PSQI >5) group, while it was 3 (1-5) in the PSQI ≤5 group. According to ISI, moderate and severe insomnia were detected only in the PSQI >5 group. Those with poor sleep demonstrated significantly elevated DAS28-CRP scores (5.2 *vs.* 3.0, p<0.001), and a larger percentage were not in remission (92.3% *vs.* 57.9%, p<0.001). In addition, VAS, GAD-7, and GDS-15 scores were observed to be worse in this group than in the other group (p<0.001). A detailed evaluation of sleep quality is provided in Table 1. When adjusted for age, gender, marital status, RA disease activity, frailty, anxiety, and depression in multivariate regression analysis; age ≥75 years [odds ratio (OR)=8.23, 95% CI (1.51-44.77), p=0.015], being single [OR=4.63, CI (1.17-18.36), p=0.029], active RA [OR=5.65, CI (1.44-19.99), p=0.035], and depression [OR=5.04, CI (1.17-21.73), p=0.030] were associated with poor sleep quality (Figure 1).

Quality of Life Assessment

The quality-of-life data assessed with EORTC QLQ-C30 are given in Table 2. The average global health status score for the patients was 75 (16.7-100). The functional parameters most frequently affected were role function [66.7 (16.7-100)] and physical function [80.0 (13.3-100)], while the most frequently recorded symptoms were pain [33.3 (0-100)] and insomnia [33.3 (0-100)]. When compared according to sleep quality, physical, emotional, and role function scores were worse in the PSQI >5 group. Fatigue, pain, and insomnia were observed at higher levels in this group. No difference was found in terms of global health status and other quality of life subparameters.

Discussion

This cross-sectional study examined the factors that affect sleep quality in elderly RA patients and the effects of this condition on quality of life. Our study showed that 75.3% of patients had active RA, while 50.65% had impaired sleep quality. DAS28-CRP scores were found to be significantly higher in the PSQI >5 group as well. Multivariate regression indicated that poor sleep quality was independently associated with advanced age (≥75 years), being single, heightened disease activity, and depression. Patients with poor sleep quality had worse physical, emotional, and role functioning and more symptoms of fatigue, pain, and insomnia based on quality-of-life assessments. These findings emphasize that sleep quality and the factors that may affect it should be taken into consideration in the management of RA patients and that these may be related to quality of life.

The frequency of sleep disorders in RA patients and their relationship with remission status have been demostrated in previous studies in the literature.[22-25] Brahem et al.[22] found the frequency of sleep disorders measured with PSQI to be 51%, similar to ours, and this was found to be related to disease activity. In another study on RA, sleep disorders were detected in 65.3% of the total population, and a moderate correlation was found between disease activity and PSQI scores in this group.[23] Previous large-scale population studies have shown that, insomnia is common in RA patients, similar to our findings. In addition, improvement in sleep quality has been reported to have positive effects on quality of life.[7,24] In our study, RA disease activity was found to be independently associated with sleep disturbance at a rate of 5.65 (1.44-19.99) times. Chronic pain, fatigue, and discomfort resulting from chronic pain and ongoing inflammatory processes in RA, which can seriously impair sleep quality. Sleep problems may arise from increased levels of proinflammatory cytokines [tumor necrosis factor-alpha, interleukin (IL)-6, and IL-1] in the central nervous system. The sleep-wake cycle is directly affected by the activation of the hypothalamic-pituitary-adrenal axis by these inflammatory processes, which in turn increase cortisol levels and make it difficult to fall asleep. Sleep quality can be negatively impacted by the reduced mobility that occurs with increasing disease activity in RA patients. As a result, failure to achieve remission in RA patients is pivotal in the pathophysiology of sleep disorders, which can significantly reduce the life quality.

The relationship between RA patients and depression is influenced by the chronic nature of the disease and its associated challenges. The rate of depression detected in 32.4% of our patients is consistent with findings in the literature evaluating other elderly RA patients.[25,26] Depression risk may be elevated by specific medications used in the treatment of RA, such as corticosteroids. Furthermore, patients' mental health can be negatively impacted by long-term treatment, side effects, and the need for constant monitoring. The development of depression can be facilitated by the unpredictable and fluctuating course of RA, as well as the uncertainty and loss of control it causes in patients. Disease progression can result in a decline in patients' self-sufficiency and a fear of losing independence, which can lead to psychological pressure and depression. According to our research, depression was independently associated with sleep

Table 1. Sociodemographic and disease characteristics in terms of PSQI score

Characteristic	Overall (n=77)	PSQI ≤5 (n=38)	PSQI >5 (n=39)	p-value
Age, years, mean (SD)	70.8 (4.9)	70.8 (4.9)	70.8 (5.0)	0.980
65-74 years	59 (76.6)	28 (73.7)	31 (79.5)	0.547
≥75 years	18 (23.4)	10 (26.3)	8 (20.5)	
Gender, female, n (%)	46 (59.7)	21 (55.3)	25 (64.1)	0.429
Marital status, married, n (%)	41 (53.2)	29 (76.3)	12 (30.8)	**<0.001**
Education time, <5 years, n (%)	59 (76.6)	32 (84.2)	27 (69.2)	0.120
Living alone, n (%)	15 (19.5)	5 (13.2)	10 (25.6)	0.167
Current smokers, n (%)	9 (11.7)	3 (7.9)	6 (15.4)	0.306
BMI, kg/m^2, mean (SD)	25.9 (3.4)	25.7 (2.9)	26.2 (3.8)	0.527
Duration of RA, years, median (range)	4 (1-30)	4 (1-30)	4 (1-30)	0.939
DAS28-CRP, score, median (range)	4.3 (2.0-7.1)	3.0 (2.0-5.9)	5.2 (2.1-7.1)	**<0.001**
Active disease, n (%)	58 (75.3)	22 (57.9)	36 (92.3)	**<0.001**
Comorbidities, n (%)				
Hypertension	36 (46.8)	17 (44.7)	19 (48.7)	0.447
Diabetes mellitus	15 (19.5)	8 (21.5)	7 (18.4)	0.817
Cardiovascular disease	16 (19.5)	8 (21.5)	8 (20.5)	0.978
Cerebrovascular disease	4 (5.2)	3 (7.9)	1 (2.6)	0.292
Chronic obstructive pulmonary disease	9 (11.7)	3 (7.9)	6 (15.4)	0.306
Benign prostatic hyperplasia	14 (18.2)	7 (18.4)	7 (17.9)	0.957
CCI, score, median (range)	3 (2-7)	3 (2-4)	3 (2-7)	0.120
Number of drugs, median (range)	4 (2-8)	4 (2-8)	4 (2-8)	0.666
Polypharmacy, n (%)	31 (40.3)	15 (39.5)	16 (41.0)	0.890
RA treatment, n (%)				
csDMARDs				
Methotrexate	33 (42.9)	14 (36.8)	19 (48.7)	0.292
Leflunamide	26 (33.8)	15 (39.5)	11 (28.2)	0.296
Sulfsalazine	12 (15.6)	8 (21.1)	4 (10.3)	0.192
Hydroxychloroquine	10 (13.0)	5 (13.2)	5 (12.8)	0.965
bDMARDs	12 (15.6)	4 (10.5)	8 (20.5)	0.227
Corticosteroids	49 (63.6)	26 (68.4)	23 (59.0)	0.389
VAS, general score, median (range)	3 (1-7)	2 (1-6)	4 (1-7)	<0.001
VAS, joint score, median (range)	3 (1-9)	2 (1-7)	6 (1-9)	<0.001
ADL, median (range)	6 (4-6)	2 (4-6)	2 (4-6)	0.465
IADL, median (range)	5 (4-8)	5 (4-8)	5 (4-8)	0.484
CFS, median, (range)	2 (1-7)	3 (1-4)	6 (1-7)	0.001
Frail, CFS ≥4, n (%)	9 (11.7)	1 (2.6)	8 (20.5)	0.029
PSQI, score, median (range)	6 (1-14)	3 (1-5)	8 (6-14)	**<0.001**
ISI, score, median (range)	5 (0-24)	2.5 (0-10)	9 (2-24)	**<0.001**
Insomnia severity, n (%)				
No clinically significant insomnia	46 (59.7)	37 (97.4)	9 (23.1)	<0.001
Subthreshold insomnia	25 (32.5)	1 (2.6)	24 (61.5)	
Clinical insomnia (moderate)	3 (3.9)	-	3 (7.7)	
Clinical insomnia (severe)	3 (3.9)	-	3 (7.7)	
MMSE, score, mean (SD)	28.1 (1.9)	28.3 (1.7)	27.9 (2.2)	0.915
GAD-7, score, median (range)	2 (0-13)	1 (0-5)	3 (0-13)	**<0.001**
Anxiety, GAD-7 ≥5, n (%)	15 (19.5)	2 (5.3)	13 (33.3)	**0.002**
GDS-15, median (range)	3 (0-10)	2 (0-9)	4 (0-9)	**<0.001**
Depression, GDS-15 ≥6, n (%)	25 (32.4)	5 (13.2)	20 (51.3)	**<0.001**

ADL: Activities of daily living, BMI: Body mass index, CCI: Charlson Comorbidity index, CFS: Clinical Frailty scale, DAS28-CRP: Disease activity score 28-C-reactive protein, DMARDs: Disease-modifying antirheumatic drugs, GDS: Geriatric Depression scale, IADL: Instrumental activities of daily living, MMSE: Mini-Mental State Assessment, PSQI: Pittsburgh Sleep Quality index, SD: Standard deviation, VAS: Visual analogue scale

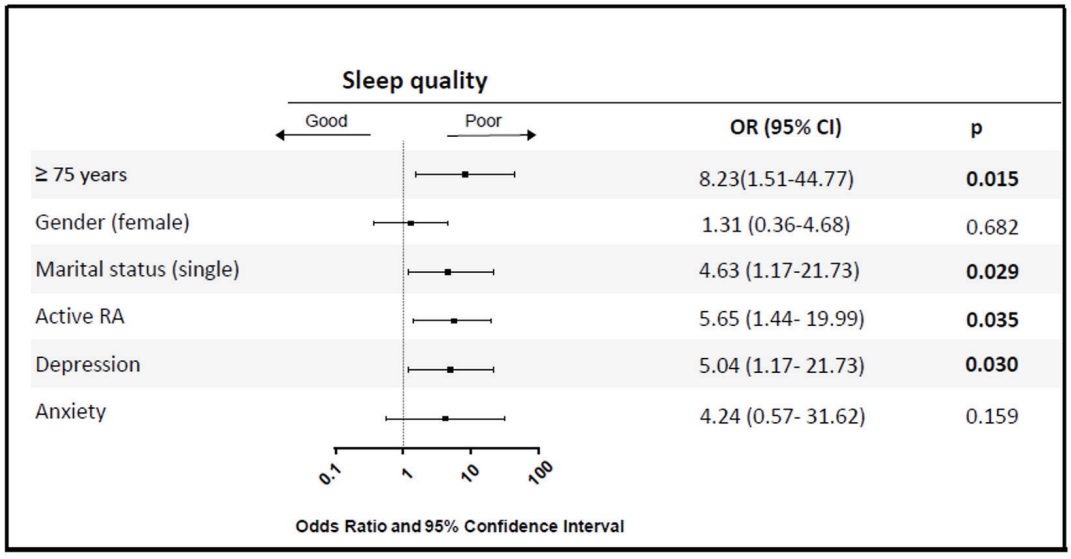

Figure 1. Forest plot of regression analysis on factors affecting sleep quality
Active RA: Patients with DAS score ≥2.6
Depression: Geriatric Depression scale-15 (GDS-15) was used for mood-related examination and a score ≥6 was defined as "depression".
Anxiety: Generalized anxiety disorder-7 (GAD-7) scales were used for anxiety examination. Those with a GAD-7 score of ≥5 defined as anxiety
CI: Confidence interval, DAS: Disease activity score, OR: Odds ratio, RA: Rheumatoid arthritis

Table 2. Comparison of EORTC subscales in terms of PSQI score

EORTC QLQ-30 parameters	Overall (n=77)	PSQI ≤5 (n=38)	PSQI >5 (n=39)	p-value
Global health status, median (range)	75.0 (16.7-100)	83.3 (16.7-100)	66.6 (16.7-100)	0.102
Functional scales, median (range)				
Physical function	80.0 (13.3-100)	80.0 (33.3-100)	73.3 (13.3-86.7)	**0.005**
Emotional function	83.3 (16.7-100)	87.5 (16.7-100)	75.0 (41.7-100)	**0.050**
Cognitive function	83.3 (33-100)	93 (50.0-100)	83.3 (33,3-100)	0.064
Role function	66.7 (16.7-100)	83.3 (16.7-100)	66.7 (16.7-100)	**<0.001**
Social function	83.3 (0-100)	100 (0-100)	83.3 (0-100)	0.081
Symptoms scales, median (range)				
Fatigue	22.2 (0-66.7)	11.1 (0-66.7)	22.2 (0-66.7)	**0.047**
Pain	33.3 (0-100)	33.3 (0-100)	66.7 (0-83.3)	**0.002**
Nausea and vomiting	0 (0-100)	0 (0-50.0)	0 (0-50.0)	0.430
Dyspnea	0 (0-100)	0 (0-66.7)	0 (0-100)	0.177
Loss of appetite	0 (0-33.3)	0 (0-33.3)	0 (0-33.3)	0.443
İnsomnia	33.3 (0-100)	0 (0-66.7)	66.7 (33.3-100)	**<0.001**
Diarrhea	0 (0-66.7)	0 (0-66.7)	0 (0-66.7)	0.257
Constipation	0 (0-33.3)	0 (0-33.3)	0 (0-33.3)	0.642
Financial difficulties	0 (0-66.7)	0 (0-33.3)	0 (0-66.7)	0.128

EORTC QLQ-30: European Organization for Research and Treatment of Cancer Quality-of-Life Questionnaire Core 30, PSQI: Pittsburgh Sleep Quality index

disorders at a rate of 5.04 (1.17-21.73) times. Depression is known to cause disruptions in sleep architecture, making it hard to fall asleep and negatively affecting sleep continuity.[27] Sleep disorders are exacerbated by imbalances in the serotonergic and dopaminergic neurotransmitter systems, which are linked to this condition. In the management of elderly RA patients, it is crucial to evaluate depressive symptoms as they have a significant impact on sleep quality through both biological and psychological mechanisms.

Aging plays a significant role in natural physiological that increase the likelihood of sleep disorders. Sleep quality may decline in older individuals due to disruptions in their circadian rhythm, decreased melatonin production, and increased physical discomfort. In addition, aging causes a decrease in sleep duration, shortened deep sleep stages, and increased night awakenings.[28,29] In our study, aging was independently associated with sleep disorders in the multivariate regression analysis, consistent with findings

reported in the literature. Additionally, it is noteworthy that single individuals are more prone to sleep disorders. According to the literature, married individuals have stronger social and emotional support, which are crucial for stress management.[30,31] Sleep patterns can be negatively impacted by social isolation and loneliness, which increase psychological stress and anxiety levels.

In our study, some notable differences were observed between the groups with and without sleep disorders in terms of the quality of life assessment of elderly RA patients using EORTC QLQ-C30. Contrary to expectations, no significant difference was observed regarding general health status. This may be due to patients' tendency to view their overall health perception from a broader perspective rather than focusing solely on symptoms. The patient's overall health perception may not always be directly affected by specific symptoms, as it may be thought. However, physical, emotional, and role functioning were significantly worse in patients with poor sleep quality. The deterioration in physical functionality can be explained by the negative effects of joint pain and movement restrictions on sleep quality. Increased pain at night and morning stiffness can disrupt patients' sleep patterns and negatively affect their daytime functions.[11] The deterioration in emotional functionality may be associated with high levels of depression and anxiety. The reduction in role functionality could be attributed to the fact that patients who struggle to meet their daily responsibilities may experience the effects of sleep disorders more profoundly. In symptom scales, significant differences were detected in the parameters "fatigue", "pain" and "insomnia" according to sleep disorder status. These findings are expected since these are parameters that have a significant effect on sleep disorders, especially within the symptomatic burden of RA.

Study Limitations

This study has some limitations. The cross-sectional design limits the ability to determine causality. The generalizability of the results is restricted by the small sample size and the study being conducted in a single center. Objective sleep measurements were not utilized, and sleep disturbances were assessed solely through subjective methods. In addition, since the scale used to assess quality of life was not specific to RA, it was not possible to examine all the symptoms specific to the disease in detail. Our study involved subjective assessment of sleep quality in RA patients. The use of objective methods such as polysomnography or actigraphy could increase the strength of the study's results. However, our study also has notable strengths. Quality of life and sleep disturbances in elderly RA patients were evaluated comprehensively, and the effects of sleep disturbances on the functional status and symptoms of the patients were examined in detail. Moreover, multivariate analyses revealed independent relationships between sleep disturbances. In this context, our study provides important findings that contribute to the literature.

Conclusion

This study is important in terms for identifying the factors affecting sleep quality in elderly RA patients and highlighting the effects of these disorders on the patients' quality of life. Managing disease activity alongside psychosocial and functional support can improve both sleep and quality of life outcomes. Incorporating specific strategies, like cognitive-behavioral therapy for insomnia and lifestyle modifications, such as establishing proper sleep hygiene practices, can alleviate insomnia and enhance sleep quality, resulting in better health outcomes. These findings indicate that sleep management in RA patients is a crucial component of disease management strategies.

Ethics

Ethics Committee Approval: The study was approved by Dr. Abdurrahman Yurtaslan Ankara Oncology Training and Research Hospital Ethics Committee IRB (no.: 2024-05/64, date: 23.05.2024).

Informed Consent: An informed consent form was obtained from all participants in the study.

Footnotes

Authorship Contributions

Concept: N.K.S., Design: N.K.S, H.S., Data Collection and Processing: N.K.S, H.S., Analysis or Interpretation: N.K.S, H.S., Literature Search: N.K.S, H.S., Writing: N.K.S.

Conflict of Interest: No conflict of interest was declared by the authors.

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