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ORIGINAL ARTICLE / ARAŞTIRMA YAZISI

Healthcare Services and Systems/Sağlık Hizmetleri ve Sistemleri

Quality of Sleep and Factors Affecting Sleep Quality in Hospitalized Patients in the Orthopedics and Traumatology Clinic

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Abstract

Purpose: In this study, our purpose was to determine the sleep quality and the factors affecting sleep quality of the hospitalized patients orthopedics and traumatology clinic.

Methods: This study was conducted as a descriptive study in a hospital between March 30 and June 16, 2022. The sample of the study consisted of 200 patients hospitalized in the orthopedics and traumatology clinic. The data of the study were collected through face-to-face interviews with the patients using the "Sociodemographic and Descriptive Characteristics Questionnaire" and the "Richard-Campbell Sleep Questionnaire".

Results: The average Richard-Campbell Sleep Questionnaire scores of the patients were determined to be 43.33±28.31. While there was no statistically significant difference ($p>0.05$) observed between the gender, preoperative or postoperative status, presence of noise, room lighting, room crowding, attached the body medical devices, treatment interventions during sleep hours, and Richard-Campbell Sleep Questionnaire score averages of the patients; a statistically significant difference was found in the Richard-Campbell Sleep Questionnaire score averages based on pain and medical diagnosis ($p<0.05$). It was found that the variation in Richard-Campbell Sleep Questionnaire scores attributed to patient's pain and diagnosis variables is 8% ($R2=0.082$). An increase of one unit in the presence of pain led to a decrease of 8.571 unit in sleep quality and the sleep quality of patients diagnosed with coxartrosis decreased by 12.298 units.

Conclusions: The patients' sleep quality was found to be below the moderate level, and it was observed that sleep quality was significantly affected by pain and diagnosis.

Keywords: Orthopedics, traumatology, patients, sleep quality, nursing

Özet

Amaç: Bu çalışmanın amacı; ortopedi ve travmatoloji kliniğinde yatan hastaların uyku kalitesini ve etkileyen faktörleri belirlemekti.

Yöntem: Bu çalışma, 30 Mart-16 Haziran 2022 tarihleri arasında bir hastanede tanımlayıcı bir çalışma olarak gerçekleştirildi. Çalışmanın örneklemini, ortopedi ve travmatoloji kliniğinde yatan 200 hasta oluşturdu. Çalışmanın verileri, hastalarla yüz yüze görüşme tekniğiyle "Sosyodemografik ve Tanımlayıcı Özellikler Anketi" ve "Richard-Campbell Uyku Anketi" kullanılarak toplandı.

Bulgular: Hastaların Richard-Campbell Uyku Anketi puan ortalamaları 43,33±28,31 olarak belirlendi. Hastaların cinsiyetleri, ameliyat öncesi veya sonrası durumları, gürültü varlığı, oda kalabalığı, vücuda bağlı tıbbi cihazlar, uyku saatlerinde tedavi girişimleri ve Richard-Campbell Uyku Anketi puan ortalamaları arasında istatistiksel olarak anlamlı bir fark ($p>0,05$) yok iken; ağrı ve tıbbi tanı, Richard-Campbell Uyku Anketi puan ortalamaları arasında istatistiksel olarak anlamlı bir fark vardı ($p<0,05$). Hastaların ağrı ve tanı değişkenlerinin, Richard-Campbell Uyku Anketi puanlarındaki değişimin %8'ini açıkladığı bulundu ($R2=0,082$). Ağrı varlığındaki bir birimlik artışın, uyku kalitesinde 8,571 birimlik azalmaya yol açtığı ve koksartroz tanısı alan hastalarda uyku kalitesinin 12,298 birim azaldığı belirlendi.

Sonuç: Hastaların uyku kalitesi orta seviyenin altında bulundu ve uyku kalitesinin ağrı ve tanı değişkeninden önemli ölçüde etkilendiği gözlendi.

Anahtar Kelimeler: Ortopedi, travmatoloji, hastalar, uyku kalitesi, hemşirelik

Introduction

Sleep is one of the essential daily life activities that affects individuals' quality of life and health, and is a physical requirement for all humans (1,2). Adequate sleep plays a significant role in healing, anabolic steroid production, and patient satisfaction. Furthermore, it contributes to overall well-being and optimal recovery (3). Adequate sleep also has an impact on sleep quality. Sleep quality is described as the efficiency of sleep, and it consists of components such as subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, and use of sleep medication. It is a factor that affects an individual's well-being, functional state, and quality of life (4,5).

There are many factors that influence an individual's sleep quality (5). Among these factors, difficulty in meeting sleep requirements is also present, particularly among hospitalized patients with health issues (1,6). The foreign environment of the hospital setting, pain, fear, frequent disruptions of the sleep cycle for treatment and care, visiting hours, and the side effects of medications used can lead to problems in patients' sleep patterns and quality (7,8). Poor sleep quality during hospitalization is associated with adverse health outcomes such as cardiometabolic complications and increased risk of delirium (9,10). In the study conducted by Şirin and Yüksel Deniz (5), it is indicated that 91% of patients experienced changes in their sleep patterns after being hospitalized, and 22% of the participating patients described their sleep quality as very poor. In a study by Alvetogt and Colten (11) aiming to examine the sleep status of individuals in the hospital, it is reported that patients couldn't sleep enough. In addition, it is known that in orthopedic and traumatology clinics, where patients suffering from pain are mostly treated, patients experience sleep problems, especially related to pain, both before and after surgical procedures (12, 13). In a study conducted by Kaya and Yılmaz (13), it was determined that 60.7% of total knee arthroplasty patients experienced sleep problems, and they had the most difficulty in falling asleep. In their study, Manning et al. (14). reported that patients experienced transient sleep disturbances in the early postoperative period following total joint arthroplasty. It has been reported that patients undergoing orthopedic surgery, especially during the first two nights postoperatively, experience a lack of REM sleep (10). In a study conducted by Vitale and colleagues (15), it was determined that the sleep quality of patients undergoing knee and hip arthroplasty significantly worsened on the first night after surgery compared to the night before the surgery, and high pain scores were associated with a decrease in overall sleep quality. Orthopedic and traumatology patients also experience sleep problems before surgery. Sleep problems can arise due to the psychological impact of trauma, pre-surgical physiological effects, or pain. In their study, Yang et al. (16) indicated that many orthopedic trauma patients have difficulty falling asleep easily and quickly, or staying asleep because of post-traumatic stress disorder. Studies examining sleep disturbances in patients undergoing rotator cuff repair surgery (17), total hip, and knee arthroplasty have shown a high prevalence of sleep disturbances before these surgeries (18). In a systematic review conducted by Kunze and colleagues (19), investigating the sleep quality of patients before and after arthroscopic rotator cuff repair surgery, it was reported that patients had significantly low sleep quality before the surgery. Poor sleep quality, when combined with surgical stress, can lead to an increase in catabolic activity and tissue breakdown, as well as a reduction in anabolic activity, thereby affecting postoperative recovery in patients. Therefore, good sleep quality is crucial for patients admitted to the orthopedic and traumatology clinic. The assessment of sleep quality and factors influencing it in orthopedic and traumatology patients is believed to be important for planning and implementing nursing interventions aimed at ensuring better sleep quality for patients. The aim of this research is to determine the sleep quality of patients admitted to the orthopedic and traumatology clinic and identify the factors influencing sleep quality.

Materials And Methods

Study population and sample

The research was conducted as a descriptive study. The population of the study consisted of patients hospitalized in the Orthopedics and Traumatology Clinic at a hospital located in the Central Anatolia region of Turkey, between March 30 and June 16, 2022. The research sample size was calculated using Cohen's standardized effect size and the G*Power 3.1.9.7 software. In the calculation, an independent samples t-test was employed, considering a Type I error rate of 0.05 and a Type II error rate of 0.20 (80% power), with a moderate effect size (0.50). Accordingly, a minimum of 128 participants were required for the study. To enhance the research power and account for potential sample losses, the final sample size reached 200 individuals. Therefore, the research sample comprised 200 patients. The study included patients who were 18 years of age and older, capable of communication, without a psychiatric diagnosis, without neurological or cognitive impairments, without a diagnosed sleep disorder, and hospitalized for a minimum of two days. Only those who voluntarily agreed to participate in the research were included. Patients were provided with information about the face-to-face research in their hospital rooms. Patients who volunteered to participate in the study were informed about the data collection tools and asked to respond to the survey and scale questions. It took approximately 15-20 minutes for patients to complete the questionnaire.

Data collection tools

The data of the study were collected using the "Sociodemographic and Descriptive Characteristics Form" and the "Richards-Campbell Sleep Questionnaire"

Sociodemographic and Descriptive Characteristics Form

The researchers prepared a 15 item questionnaire that includes sociodemographic information such as patients' age, gender, marital status, education level, and employment status, as well as clinical characteristics including patients' length of hospital stay, diagnosis, type of surgery, and pre/post-operative period. This questionnaire also includes questions related to factors influencing sleep.

Richards-Campbell Sleep Questionnaire (RCSQ)

The RCSQ was developed by Richards (20) in 1987. It consists of six items that assess the depth of nocturnal sleep, sleep onset latency, frequency of awakenings, time awake after sleep onset, sleep quality, and ambient noise level. Each item is evaluated on a visual analog scale ranging from 0 to 100. Scores between "0-25" on the scale indicate very poor sleep, while scores between "76-100" represent very good sleep. As the scores on the scale increase, patients' sleep quality improves. Its Turkish validity and reliability were established by Karaman Özlü and Özer (21).

Statistical Analysis

The IBM SPSS 25 software was used for data analysis. The normal distribution of numerical data was assessed using the Shapiro-Wilk test. Descriptive statistics such as frequency, percentage, mean, standard deviation, minimum, and maximum were employed to analyze the data. For binary group comparisons, the independent samples t-test was utilized, while for comparisons involving more than two groups, one-way ANOVA was used. The relationship between numerical variables and the scale score average was examined through correlation testing, and the impact of variables on the scale score average was determined using multiple linear regression analysis.

Ethical Considerations

In order to conduct the research, ethical approval was obtained from the XXXX University Faculty of Medicine Ethics Committee for Non-Drug and Non-Medical Device Research, with approval number 2022/006 issued on March 22, 2022. Permission was also obtained from the institution where the research was conducted. Patients were informed that they could withdraw from the study at any time, and consent was obtained from participants before their involvement in the research.

Limitations of the Study

There is a limitation in current study. This study was conducted in a single hospital by one orthopedic clinic team. As such, these findings may not represent other orthopedic clinic teams. Therefore, the results cannot be generalized to the entire population. It is recommended to plan prospective studies related to the subject in larger orthopedic clinics with a broader sample group and a greater variety of different diagnoses.

Results

The mean age of the participating patients was 55.62±17.92, with 55% being female, 76% married, and 54% having completed primary education. The average length of hospital stay for the patients was 3.07±3.09 days, with 30% admitted with a diagnosis of Gonarthrosis and 88% in the postoperative period. Among those in the postoperative period, 38% were on the first day after surgery. During the hospital stay, 76% of the patients reported not experiencing a restful sleep process while in the hospital, and 97% mentioned that they could not maintain their sleep habits in the hospital environment (Table 1).

TABLE 1: Sociodemographic and clinical characteristics of patients (n=200)

	Mean±SD (Min-Max)		
Age (year)	55.62±17.92 (19-91)		
Hospital stay duration	3.07±3.09 days		
		n	**%**
Gender	Female Male	111 89	55 45
Marital status	Married Single	152 48	76 24
Education status	Below primary school Primary school High school Bachelor and above	40 108 41 11	20 54 20 6
Surgery period	Before surgery After surgery	25 175	12 88
Day after surgery	0 day (Postop. 0) 1st day (Postop.1) 2nd day (Postop. 2) 3th day (Postop. 3) and above	33 67 35 40	19 38 20 23
Diagnosis	Lower extremity fracture Upper extremity fracture Coxarthrosis Gonarthrosis Diabetic foot Joint/bone infection Meniscus tear Others (Rotatar cuff tear, Hallux valgus)	31 33 23 59 5 6 19 24	16 15 12 30 3 3 10 11
Room features	Single room Double room	85 115	43 57
Perception of having slept well during the hospital stay	Yes No	49 151	24 76
Perception of continuing sleep habits in the hospital	Yes No	5 147	3 97

The average RCSQ scores of the participating patients were determined to be 43.33 ± 28.31. While there was no statistically significant difference (p>0.05) observed between the gender, preoperative or postoperative status, presence of noise, room lighting, room crowding, attached medical devices, treatment interventions during sleep hours, and RCSQ score averages of the participating patients; a statistically significant difference was found in the RCSQ score averages based on pain and medical diagnosis (p<0.05) (Table 2).

TABLE 2: Comparison of patients' sociodemographic, clinical characteristics and some factors related to sleep with mean scores of RCSQ (n=200)

		Mean±SD	Min.-Maks	
Richards – Campbell Sleep Questionnaire		43.33±28.1	0-100	
		Mean±SD	**&t**	**p**
Gender	Female Male	40.06±28.1 47.41±27.3	-1.83	0.06
Surgery period	Before surgery After surgery	48.92±30.82 42.53± 27.94	1.05	0.29
Presence of pain	Yes No	30.70±21.54 43.91±19.74	-2.58	0.01*
Presence of noise	Yes No	17± 13,07 32.40± 21.45	-1.23	0.21
Room crowding	Yes No	34.80± 10.63 32 ± 21.68	0.28	0.77
Room features	Single room Double room	45.33±31.74 41.86±25.53	0.85	0.39
Treatment during sleep hours	Yes No	13 ± 4.24 32.35 ±21.42	-1.27	0.20
Medical devices on the body	Yes No	35.45±22.67 31.64±21.27	0.70	0.48
Anxiety	Yes No	34.90±23.29 30.76±20.41	1.11	0.26
		Mean±SD	**+F**	**p**
Diagnosis	Lower extremity fracture Upper extremity fracture Coxarthrosis Gonarthrosis Diabetic foot Joint/bone infection Meniscus tear Others (rotatar cuff tear, Hallux valgus)	45.51± 28 47.36±26.13 20.39±16.38 39.56±36.65 14±13.83 41.16±15.66 60.78±23.10 59.08±33.49	6.27	0.00*

t: İndependent samples t-test; +F: One-way ANOVA; *p<0.05

When the relationship between age and RCSQ score average along with the duration of stay was examined; it was observed that there is a statistically significant, moderately strong, and negatively directed relationship between age and RCSQ score average (r= -.31; p=0.00). However, it was found that there is no statistically significant relationship between the duration of stay and RCSQ score average (r= .08; p=0.25) (Table 3).

TABLE 3: Relationship between age, hospital stay duration and RCSQ total mean scores of the patients (n=200)

	RCSQ Total Mean Scores	
	&r	p*
Age	-.31	0.00*
Hospital Stay Duration	.08	0.25

&r: Pearson's correlation coefficient; *p<0.05

In the advanced analysis conducted for the factors affecting the RCSQ score; the model for RCSQ is statistically significant and has satisfied the assumptions of multiple linear regression analysis (F=4.459; p=0.00). It was determined that pain and diagnosis variables which were included in the model were significant predictors of sleep quality (p<0.05). Acording to the established model, it was found that the variation in RCSQ scores attributed to patient's pain and diagnosis variables is 8% (R2=0.082). An increase of one unit in the presence of pain led to a decrease of 8.571 unit in sleep quality and the sleep quality of patients diagnosed with coxartrosis decreased by 12.298 units but there was no statistically significance effect on the RCSQ score due to the age variable (Table 4).

TABLE 4: The effect of variables on sleep quality score mean (n=200)

Sleep Quality	B	Se	Z β	t	P	95% Confidence Interval for β	
Richards – Campbell Sleep Questionnaire					0-100	Lower limit	Upper limit
Model							
Constant	49.430	4.303		11.488	0.00	40.928	57.932
Age	-.128	.099	-.106	-1.284	0.20	-.324	.069
Presence of pain	-8.571	4.683	-.148	-1.830	0.04	-17.825	.683
Diagnosis Coxarthrosis	-12.298	4.676	-.221	-2.630	0.00	-21.539	-3.058
Diagnosis Gonoarthrosis	.600	3.443	.015	.174	0.86	-6.202	7.403

Model Significance: F=4.459; p=0.00; R2=0.08
β: Regression coefficient, Se: Standard error, zβ: Standardized regression coefficient, R^2: Coefficient of determination. Bold sections indicate statistically significant results (p<0.05).

Discussion

In current study, it was determined that the sleep quality of orthopedic and traumatology patients hospitalized is below the moderate level (RCSQ score 43,33±28,1). The majority of the patients (76%) also indicated that they did not experience a restful sleep during their time in the hospital. In a study conducted by Esen Büyükyılmaz and colleagues (22), which examined the pain level and sleep quality of orthopedic and traumatology patients, it was reported that the patients experienced severe pain at night, leading to a low quality of sleep. In another study that evaluated the sleep quality of patients hospitalized in the orthopedic and traumatology clinic due to musculoskeletal injuries, it was shown that patients had a moderate level of pain, and this condition reduced their sleep quality (23). In a conducted study, it was determined that 60.7% of patients with gonarthrosis experienced sleep problems during their stay in the orthopedic ward. Among the patients who reported sleep problems, 56% had difficulty falling asleep, 4.4% woke up very early in the morning, 27.5% woke up frequently, and 12.1% mentioned that they couldn't sleep at all (13). In a study assessing the sleep quality of patients hospitalized in surgical clinics, it was indicated that the patients' total RCSQ score average was just below the midpoint of the scale (49.61±25.34), thus indicating a moderate level of sleep quality for the patients (24). The current study yields similar results to the literature. It can be stated that the sleep quality of orthopedic and traumatology patients is poor based on these results.

In the current study, factors such as age, gender, length of hospital stay, noise, room occupancy, single or double occupancy, pre- or post-operative status, anxiety, and medical devices attached to the body, treatment during

sleep hours were found not to affect sleep quality. However, as observed in the multiple linear regression analysis, pain and diagnosis were identified as factors influencing sleep quality. In a study investigating the sleep quality of patients in the early postoperative period, it was noted that patients complained about factors such as pain, poor room ventilation, medical devices attached to the body, treatments administered at sleep time, crowded room conditions, and surrounding noise. These factors were reported to affect sleep (25). In a review examining perioperative sleep disorders, it was reported that noise, light, pain, perioperative mental disorders, anxiety, surgery, and anesthesia influence sleep quality (26). It is observed that the findings of this study differ from the literature in terms of environmental factors. The reason for this is thought to be that orthopedic and traumatology patients, compared to general surgical patient groups, experience more frequent and intense pain, which may lead them to pay less attention to environmental factors. The findings of the study related to orthopedic and trauma patients are consistent with the current study findings, indicating a negative impact of pain on sleep quality. Especially in patients with osteoarthritis (gonarthrosis or coxarthrosis), a decrease in sleep quality is observed. In a study, it has been reported that the sleep quality of patients with osteoarthritis is significantly compromised due to pain (27). Particularly, the pain and symptoms arising from hip osteoarthritis (coxarthrosis) significantly affect sleep quality, which is quite common (28). In a study evaluating sleep disturbances and risk factors in total hip and knee arthroplasty based on an enhanced recovery after surgery concept, it has been demonstrated that pain and anxiety are significantly associated with postoperative sleep disturbance (29). In a study investigating the relationship between pain, anger levels, and sleep quality among patients hospitalized in the orthopedics and traumatology clinic due to musculoskeletal injuries, it was indicated that the patients had moderate levels of pain and that it decreased sleep quality (23). While these findings are consistent with similar studies, it is believed that particularly in the orthopedic and trauma clinic where pain is intense, there is a need for more effective pain management both before and in the early postoperative period.

Conclusion

The data obtained from the study revealed that a significant majority of patients experienced sleep problems during their stay in the orthopedic and trauma clinic. The patients' sleep quality was found to be below the moderate level, and it was observed that sleep quality was significantly affected by pain and diagnosis. The sleep quality score was lower for patients with coxarthrosis and gonarthrosis, as well as those with pain compared to those without. Based on these results, it is considered important to ensure effective pain management for achieving quality sleep in orthopedic patients. Therefore, for improving patients' sleep quality, it is recommended that pain be comprehensively assessed by orthopedic nurses, and appropriate interventions be planned. Additionally, evaluating patients' sleep quality and level using valid and reliable scales and collaborating with consultation-liaison psychiatric nurses when necessary is also suggested.

Declaration

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Ethical Approval: The ethics committee approval was received from the KTO Karatay University Faculty of Medicine Ethics Committee for Non-Drug and Non-Medical Device Research, on the date of March 22, 2022 with 2022/006 decision number.
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