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## Research Article

### Relationship Between Sleep Quality and Comfort Levels in Hemodialysis Patients: A Descriptive and Correlational Study

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**Relationship Between Sleep Quality and Comfort Level in Hemodialysis Patients: A Descriptive and Correlational Study**

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**Abstract**

**Aim:** The aim of the research is to determine the sleep quality and comfort levels of individuals receiving hemodialysis treatment and the relationship between these two variables.

**Methods:** This research was conducted with 126 individuals who received hemodialysis treatment between December 2021 and January 2022. Data were collected using a Patient Information Form, the Pittsburgh Sleep Quality Index (PSQI), and the Hemodialysis Comfort Scale (HCS). Reliability analysis, descriptive statistics, independent groups t-test, ANOVA variance analysis, Pearson correlation analysis, and linear regression analysis were employed to analyze the data. In this research,  $p < 0.05$  was considered significant.

**Results:** In this research, individuals scored  $13.17 \pm 3.20$  on the PSQI and  $31.35 \pm 6.26$  on the HCS, and a negative and low-level significant correlation was determined between the PSQI score and the HCS score.

**Conclusion:** The results of the research determined that there was a negative and low-level significant relationship between sleep quality level and hemodialysis comfort level, and that poor sleep quality had a reducing effect on comfort during hemodialysis treatment.

**Keywords:** Hemodialysis, sleep quality, comfort, nursing

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**Hemodiyaliz Hastalarında Uyku Kalitesi ile Konfor Düzeyi Arasındaki İlişki: Tanımlayıcı ve İlişkisel Bir Çalışma**

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**Öz**

**Amaç:** Çalışmanın amacı, hemodiyaliz tedavisi alan bireylerin uyku kaliteleri, konfor düzeyleri ve bu iki değişkenin arasındaki ilişkinin belirlenmesidir.

**Yöntem:** Çalışma, Aralık 2021-Ocak 2022 tarihleri arasında hemodiyaliz tedavisi alan 126 hasta ile yapıldı. Verilerin toplanmasında Hasta Tanıtım Formu, Pittsburgh Uyku Kalitesi İndeksi (PUKİ) ve Hemodiyaliz Konfor Ölçeği (HKÖ) kullanıldı. Veriler güvenilirlik analizi, tanımlayıcı istatistikler, bağımsız gruplarda t testi, ANOVA Varyans analizi, Pearson Korelasyon Analizi ve Lineer Regresyon analizi ile değerlendirildi. Çalışmada,  $p < 0,05$  anlamlı kabul edildi.

**Bulgular:** Çalışmada, hastaların PUKİ'nden  $13,17 \pm 3,20$  ve HKÖ'den  $31,35 \pm 6,26$  puan aldığı, PUKİ puanı ile HKÖ puanı arasında negatif yönde ve düşük düzeyde anlamlı ilişki belirlendi.

**Sonuç:** Çalışmanın sonucu, uyku kalitesi düzeyi ile hemodiyaliz konfor düzeyi arasında negatif yönde ve düşük düzeyde anlamlı ilişki olduğunu, uyku kalitesinin kötü olmasının hemodiyaliz tedavisi sürecindeki konforu azaltıcı bir etkisinin olduğunu belirledi.

**Anahtar kelimeler:** Hemodiyaliz, uyku kalitesi, konfor, hemşirelik

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## **INTRODUCTION**

The incidence of chronic renal disease (CKD) is gradually increasing. Since many systems in the body are affected by CKD, it is necessary to take protective measures, slow down the progression if the disease develops, and treat it appropriately (Taş, Cengiz, Erdem, Karataş & Kaya, 2011). The renal replacement therapy (RRT) method frequently preferred in the treatment of CKD is hemodialysis (HD) (Demir Dikmen, 2020). While symptoms resulting from kidney failure can be controlled with HD treatment, dependence on an HD machine and the outcomes of the treatment process lead to different problems (Şanlıtürk, Ovayolu & Kes, 2018). One of the problems is sleep disorder, and its prevalence is higher in individuals diagnosed with CKD than in the general population, ranging from 40 to 80% (Durmaz Akyol, Yurdusever, Temizkan Kırkayak, Sifil & Ecdar, 2017). It has been stated that sleep problems, such as insomnia, daytime sleepiness, restless leg syndrome, and sleep apnea syndrome, are high in patients with end-stage renal failure (Durmaz Akyol, Yurdusever, Temizkan Kırkayak, Sifil & Ecdar, 2017; Şanlıtürk, Ovayolu & Kes, 2018). It has been reported that the prevalence of sleep problems in dialysis patients is between 50 and 83% (Durmaz Akyol, Yurdusever, Temizkan Kırkayak, Sifil & Ecdar, 2017).

Problems that occur during HD can negatively affect patients' physical and psychological conditions, daily living activities, quality of life, and general comfort levels (Akgöz & Arslan, 2017; Demir Dikmen, 2020; Turgay, Özdemir Eler, Ökdem & Kaya, 2020a). Comfort, which is a multidimensional concept, refers to the relaxation of individuals (Çınar Yücel, 2011; Terzi & Kaya, 2017). The pain symptom experienced by patients receiving HD treatment reduces adjustment to HD treatment and negatively affects comfort levels. Fatigue, on the other hand, impacts the HD patient's daily living activities, self-care agency, and therefore comfort. Having to constantly commute between home and a dialysis center to receive treatment, restriction of movements during HD sessions, decreased individual independence due to HD treatment, and deterioration in social relations and work adjustment are some of the many factors that negatively influence patients' daily comfort. In a study by Turgay et al., it was determined that the comfort levels of patients receiving HD treatment were moderate (Turgay, Özdemir Eler, Ökdem & Akgün Çıtak, 2020b). One of the functions of nursing is to ensure individuals' comfort. Therefore, patients' need for comfort should be determined correctly, appropriate nursing interventions should be planned and implemented, and as a result of all these, the individual's comfort should be expected to increase (Çınar Yücel, 2011; Terzi & Kaya, 2017; Turgay, Özdemir Eler, Ökdem & Kaya, 2020a).

Comfort in nursing care is included in the nursing diagnosis as deterioration of comfort. It has been stated that one of the nursing sub-diagnoses of impaired comfort is impaired sleep pattern (Orkun & Çınar Yücel, 2017). Based on comfort and sleep, two important concepts that many theorists focus on, some studies have been found in the literature on the examination of sleep quality or comfort levels of different patient groups (Kacaroğlu Vicdan, 2018; Önler & Yılmaz, 2018; Yılmaz et al., 2018). Although the concepts of sleep quality and comfort in HD patients have been discussed in the literature, no studies have been found that demonstrate the relationship between these concepts. Therefore, this study is original. This study, unlike others, aims to determine the mutual impact of sleep quality and comfort. By determining the mutual influence of these two variables, it will be possible to increase patients' sleep quality and comfort levels.

## **METHODS**

### **Purpose and Type of Research**

A descriptive and correlational design was used to determine the relationship between sleep quality and comfort levels of HD patients.

### **Population and Sample of the Study**

The data of the research were collected at Kayseri City Hospital, Kayseri State Hospital, and a private dialysis center between December 2021 and January 2022. The population of the research consisted of 338 patients who were on HD treatment in three dialysis centers. The inclusion criteria for the study were being on hemodialysis for at least 6 months, being over 18 years of age, having no communication problems, having no psychiatric disorders, volunteering to participate in the study, not having participated in the pre-application, and completing the data collection tools completely. A total of 212 patients were not included in the study since 13 had been on dialysis for less than six months, three were under the age of 18, 11 had psychiatric disorders, 46 had communication problems due to inadequate Turkish literacy, 122 did not agree to participate in the study, and 17 were included in the preliminary application. The sample was calculated as 114 subjects in power analysis (power of the test  $p=0.9385429-93.8\%$ ), and the study was completed with 126 patients.

### **Data Collection and Analysis**

A "Patient Identification Form," the "Pittsburgh Sleep Quality Index (PSQI)," and the "Hemodialysis Comfort Scale (HCS)" were used to collect research data.

The Turkish validity and reliability study of the PSQI was conducted by Ağargün et al., in 1996, and the Cronbach's alpha internal consistency coefficient of the scale was 0.80 (Ağargün, Kara

& Anlar, 1996). Cronbach's alpha reliability coefficient of the scale in this study was calculated as 0.71.

The HCS was developed by Orak et al., in 2017, and its validity and reliability were conducted, and the Cronbach's alpha internal consistency coefficient of the scale was 0.87 (Orak, Pakyüz & Kartal, 2017). Cronbach's alpha reliability coefficient of the scale in this study was calculated as 0.85.

Data collection forms were collected by the researchers through face-to-face interviews with the patients.

Descriptive data were evaluated with number, percentage distribution, mean, minimum and maximum values, and standard deviation. The Shapiro-Wilk test was used to test the normality of the data, which was found to have a normal distribution. The t-test and ANOVA, which are parametric tests, were used in the analysis. The Tukey post hoc test and Tamhane's T2 test were employed to examine the difference between the groups in the variance analysis. The homogeneity of the groups was examined with the Levene test. In the study, Pearson correlation coefficient analysis was utilized to determine the relationship between PSQI and HCS, and linear regression analysis was used to find out whether the variables affected each other. The significance level was accepted as  $p < 0.05$ .

## RESULTS

It was determined that 54% of the patients were female, the mean age was  $57.12 \pm 13.33$ , 60.3% of them were married, 34.1% were literate, 82.5% were unemployed, 20.6% smoked, and 1.6% used alcohol. The mean duration of diagnosis with renal failure was  $11.50 \pm 8.29$  years. It was determined that 81.7% of patients had been on hemodialysis for more than a year, 100% had a hemodialysis session of four hours, 95.2% received HD twice a week, and that 42.1% were on hemodialysis in a private center.

**Table 1. Patients' Mean Scores on the PSQI, HCS and Sub-dimensions and Sleep Quality Levels**

The scale	N	Number of items	Min.	Max.	Median	Mean±Sd
PSQI Total	126	24	5,0	21,0	13,00	13.17±3.20
HCS Total	126	9	14.0	45.0	31.00	31.35±6.26
HCS Coping sub-dimension	126	6	9.0	30.0	18.50	18.34±5.19
HCS Relaxation sub-dimension	126	3	3.0	15.0	15.00	13.01±2.90
<b>Sleep quality levels</b>				<b>n</b>	<b>%</b>	
Good				-	0.0	
Poor				126	100.0	
PSQI: Pittsburgh Sleep Quality Index, HCS: Hemodialysis Comfort Scale, Min: Minimum, Max: Maximum, and SD: Standard deviation						

Patients' mean PSQI score was  $13.17 \pm 3.20$ , and 100% of them had poor sleep quality. Their mean HCS score was  $31.35 \pm 6.26$  on the total scale,  $18.34 \pm 5.19$  on the coping sub-dimension, and  $13.01 \pm 2.90$  on the relaxation sub-dimension (Table 1).

**Table 2. The Relationship between the Mean Scores of Patients on the PSQI and HCS and Its Sub-dimensions**

HCS and sub-dimensions		PSQI Total
HCS total	$r^a$	-0.297*
	$p$	<b>0.001</b>
Coping sub-dimension	$r^a$	-0.322**
	$p$	<b>p&lt;0.001</b>
Relaxation sub-dimension	$r^a$	-0.065
	$p$	0.467

PSQI: Pittsburgh Sleep Quality Index, HCS: Hemodialysis Comfort Scale, a: Pearson correlation analysis, \* $p<0.001$ , \*\* $p<0.005$ .

There was a low-level, statistically significant negative relationship between patients' mean scores on the total PSQI and the total HCS ( $r=-0.297$ ;  $p<0.005$ ) and between the total PSQI score and the coping sub-dimension score of the HCS ( $r=0.32$ ;  $p<0.001$ ). The relationship between the total PSQI score and the relaxation sub-dimension score of the HCS was found to be low, negative, and statistically insignificant ( $r=-0.065$ ) ( $p>0.05$ ) (Table 2).

**Table 3. The Effect of Patients' Sleep Quality on Comfort Levels**

Variable	B	Standard Error	Beta	t	p
<b>PSQI Total</b>	<b>Constant</b>	17.154	1.499	11.444	0.000
PSQI Total	-0.028	0.095	-0.055	-0.297	0.767
Coping	-0.169	0.114	-0.273	-1.475	0.143

**$R=0.323$ ,  $R^2=0.104$ ,  $F(2, 123)=7.165$ ,  $p=0.001$ \***

PSQI: Pittsburgh Sleep Quality Index, HCS: Hemodialysis Comfort Scale

It was determined that there was a significant relationship between the sleep quality and comfort level of patients ( $R=0.323$ ,  $R^2=0.104$ ,  $F(2, 123)=7.165$ ,  $p=0.001$ ). The sleep quality and comfort level of HD patients explained 10.4% of the total variance. In the study, the poor sleep quality of HD patients reduced comfort by -0.028 times, but this effect was not significant ( $p>0.05$ ) (Table 3).

## DISCUSSION

Sleep problems are frequently encountered in patients on HD treatment for various reasons (Sert et al., 2015), which lead to deterioration in sleep quality (Çölbay et al., 2007). Studies have shown that patients receiving HD treatment have poor sleep quality (Edalat Nejad & Qlich-Khani, 2013; Eslami, Rabii, Hayri, Rashidi Nooshabadi & Mesudi, 2014; Çölbay et al.,

2007; Hüzmeli, Candan, Şeker Koçkara, Akkaya & Kayataş, 2014; Otaghi, Bastami, Borji, Tayebi & Azami, 2016; Özçelik, 2011; Parvan, Lakdizaji, Roshangar & Mostofi, 2013; Sert et al., 2015). It was determined that all patients receiving HD treatment in this study had poor sleep quality (Table 1). The decrease in sleep quality leads to a decrease in energy levels and mental acuity and daytime sleepiness and negatively affects general health and well-being (Çölbay et al., 2007; Durmaz Akyol, Yıldırım & Fadiloğlu, 2008). This result of the study revealed that the sleep quality of HD patients needed improving to protect them from the negative effects of poor sleep quality.

Comfort is used synonymously with the word ease and is expressed as the state of not experiencing distress (Yönem Amaç & Çam, 2019). Patients' comfort is a basic need that determines their functionality, quality of life, and health care outcomes (Auyezkhankyzy, Gulbinien & Riklikiene, 2022). It has been stated that patients with high comfort levels recover quickly and can better cope with stressors during the disease process (Kütmeç Yılmaz, 2020). There is a decrease in the quality of life and deterioration in comfort in patients experiencing HD-related symptoms, and it is known that patients who have CKD and receive HD treatment are prone to exhibit impaired comfort (Turgay, Özdemir Eler, Ökdem & Akgün Çıtak, 2020b). Some studies have shown that the comfort levels of patients receiving HD treatment are high (Çalışkan & Çınar Pakyüz, 2019), medium (Alkın Demir & Özer, 2022; Demir Dikmen & Aslan, 2020; Turgay, Özdemir Eler, Ökdem & Kaya, 2020a; Turgay, Özdemir Eler, Ökdem & Akgün Çıtak, 2020b; Şentürk, 2021), and low (Tabiee, Momeni & Saadatjo, 2017). In this study, it was determined that the comfort of patients receiving HD treatment was at a good level (Table 1). It is thought that the comfort levels in literature differ from each other due to the multi-component structure of the concept of comfort and the different individual and cultural characteristics of the sample groups.

Sleep quality refers to feeling relaxed and energetic when waking up (Cici, 2014; Kacaroğlu Vicdan, 2018). It is affected by many factors including physical, environmental, and psychological ones (Cici, 2014). The concept of comfort refers to convenience, and it consists of physical, psychospiritual, environmental, and sociocultural dimensions. It is affected by many factors (Karabacak & Coşkun Potur, 2017). It has been stated that there is an interaction between sleep and comfort, which is affected by many different variables and dimensions (Ünlü, 2014). Comfort is also impaired due to various stressors, such as anxiety about illness, fear of the unknown due to surgery, and hospitalization. The comfort levels of patients whose anxiety levels are reduced, whose knowledge gap is eliminated, and who are provided with quality sleep in a way that recovery-oriented communication is established and environmental

factors are regulated will increase (Arabacıoğlu, 2021). In this study, it was determined that there was a significant relationship between the patients' sleep quality and comfort levels (Table 3). This study highlighted that there was an interaction between sleep quality and comfort levels, and that this finding of the study revealed that poor sleep quality reduced comfort. In the literature, studies conducted on different patient groups have indicated that as patients' comfort scores improve, their sleep quality also increases, and there is a relationship between comfort and sleep quality (Kaplan & Özakgöl, 2025; Bagheri et al., 2024; Yılmaz & Karabulut, 2022).

### **Limitations**

This study has some limitations. First, since there is no sleep quality scale specific to HD patients, it was evaluated with the general sleep scale, the PSQI. Second, the data collection forms were filled out in a face-to-face interview while the patients were connected to the dialysis machine. Blood pressure may decrease during HD, and since hypotension contributes to the development of perception and cognitive disorders, it may have caused situations such as a delay in answering questions and difficulty in perceiving the questions. Third, the study was conducted in three dialysis centers, so the results of the study can only be generalized to these patients.

### **CONCLUSION**

The result of the research indicated that all HD patients had poor sleep quality, comfort was at a good level, and the decrease in sleep quality significantly reduced comfort levels. In line with these results, it can be suggested that the symptoms affecting the sleep quality and comfort of patients receiving HD treatment and their sleep quality and comfort levels should be questioned at regular intervals, risk factors should be evaluated, and necessary interventions should be performed. Also, in-service training programs should be organized for nurses on improving patient care and increasing patients' sleep quality and comfort with evidence-based care practices, nurses should evaluate risk factors regarding the symptoms affecting the sleep quality level of patients and plan the necessary interventions, and similar studies should be conducted with a larger sample group of HD patients to generalize the research results and effectiveness.

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### **Conflict of Interest**

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling,

expertise, working conditions, shareholding and similar situations in any firm have been declared.

**Ethical Considerations:** The approval of the Nevşehir Hacı Bektaş Veli University Non-Interventional Ethics Committee (decision number: 268, date: 14.07.2021) and institutional permission of the institutions where the research would be conducted (Kayseri Provincial Health Directorate, decision number: E-93079172-703.01, date: 12.10.2021; Kayseri City Hospital, decision number: 53, date: 17.08.2021; Private Dialysis Center, date: 01.12.2021) were obtained. In addition, the individuals were informed about the purpose of the research, and their written and verbal consent was obtained.

**Author Contributions:** Idea and design:DYB, ŞDG, ZK; Data collection: DYB; Data analysis and interpretation: DYB, ŞDG; Article writing: DYB, ŞDG; Critical review:DYB, ŞDG, ZK.

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