

Effect of Pruritus on Sleep Quality in Individuals Undergoing Hemodialysis

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ABSTRACT

Objective: This study was conducted to evaluate uremic pruritus levels and sleep quality in individuals undergoing hemodialysis treatment and to determine the relationship between variables.

Methods: This descriptive study was conducted with 219 patients who underwent hemodialysis in State Hospital, University Hospital hemodialysis units and a private dialysis center and met the study criteria. Research data were collected using the Introductory Information Form, 5-D Pruritus Scale and Pittsburg Sleep Quality Index. In the analysis of the data, Kruskal-Wallis T test, Perason correlation analysis were used.

Results: In the study, the 5-D Pruritus Scale mean score of the patients was 12.70 ± 3.35 points, and the Pittsburg Sleep Quality Index score was 12.82 ± 2.42 . A positive, moderately significant ($r = .509$, $p < 0.05$) relationship was found between the mean scores of the two scales. It was determined that patients with unbearable itching, who defined itching prognosis as bad, stated that itching affected their daily activities and experienced widespread itching had worse sleep quality ($p < 0.05$).

Conclusions: Patients undergoing hemodialysis experience moderate itching and their sleep quality is generally poor. However, there is a moderate relationship between itching and sleep quality.

Keywords: Hemodialysis, Pruritus, Sleep Quality

1. INTRODUCTION

Chronic Kidney Failure is a serious health problem that is common in the world and in Turkey due to its changing etiology, complex treatments and high economic costs (1). It is thought that approximately 100 million people in the world are affected by this disease, in other words, one out of every six adults has Chronic Kidney Failure (CKF) (2).

The problems experienced by CKF patients are generally seen as either the signs and symptoms of the disease that causes kidney failure or the signs and symptoms of the affected system. Fluid-electrolyte imbalances, nausea, vomiting, anemia, nutritional problems, pulmonary edema, signs and symptoms of cardiovascular diseases and uremic skin changes are frequently observed in patients. Skin problems related to CKF are xerosis, nail changes, seborrheic keratosis, pigmentation changes and uremic pruritus (3,4).

It is stated that the prevalence of itching associated with Chronic Kidney Failure in the world is between 30% and 50% (4,5). In a study conducted with peritoneal dialysis (PD) and hemodialysis (HD) patients, it was determined that 62.6% of PD patients and 48.3% of HD patients experienced uremic pruritus (6). In the study conducted by Du et al. (2016) using

the Visual Analog Scale (VAS) to question itching in patients with end-stage kidney failure 78% of the patients stated that they experienced itching (7). In a study conducted with 194 patients based on two hemodialysis units in Turkey, this rate was found to be 54.1% (8).

Although uremic pruritus is not a life-threatening problem itself, it affects the quality of life and daily life activities of the patients, causes anxiety, depression, physical and mental fatigue and negatively changes the patient's adaptation to the disease (9,10,11). One of the important daily activities affected by itching is sleep. Sleep is one of the indispensable activities in human life, which is among the basic needs in nursing theories and is considered an important component of health that affects the quality of life and well-being of the individual (12). In a study conducted in Japan with 18.801 HD patients, the rate of uremic pruritus was found to be 42%, and it was reported that itching affected sleep quality and quality of life (13). In the study conducted by Akyol et al. with CKF patients, the rate of itching among the factors that prevent falling asleep was found to be 43.9% (1).

Although uremic pruritus is an irritating symptom for patients with kidney failure, studies on its general definition and its effect on patients are limited (9,14,15). When these studies in the literature are evaluated, it is seen that uremic pruritus is often evaluated using one-dimensional scales, visual/numerical scales or questionnaire questions compiled by researchers from the literature. In this context, it is thought that the dimension of questioning the effects of itching on the individual is insufficient in studies. In this study, a comprehensive scale was used to question the itching levels of the patients in terms of duration, degree, direction, limitation of activities and distribution to body parts. The questions generally focus on the itching dimensions of the last two weeks and one month, avoiding the question of instant itching. In this context, it is thought that the planned study is important in terms of investigating the effects of itching symptoms in individuals with CKF in detail and examining its effect on sleep quality, which is an important daily life activity.

2. METHODS

2.1. Study Design and Sample

The study was designed as a descriptive study. The universe of the study consisted of 250 individuals who received hemodialysis treatment in the hemodialysis units of the University and State Hospital and in Private Dialysis Center. However, 12 individuals out of 250 did not want to participate in the study voluntarily. Moreover, 31 individuals who did not meet the inclusion criteria were not included in the study and the study was conducted with 219 individuals. The criteria for inclusion in the study were being on hemodialysis treatment for one year, being 18 years of age or older, and having no cognitive impairment or communication obstacle. In the study, it was aimed to reach all individuals who are receiving hemodialysis treatment in Sivas center and comply with the criteria, but the mentioned institutions gave permission to our study.

2.2. Data Collection Tools

Personel Information Form: This form, prepared by the researcher, consists of 14 questions questioning the sociodemographic characteristics of the patients and their knowledge about the disease.

5-D Pruritus Scale: The scale was developed by Elman et al. in 2010 (16). The scale consists of 5 dimensions and 8 variables: the duration of the itch, its degree, its direction, its effect on daily daily activities, and its distribution on the body. The total score of the scale ranges from a minimum of 5 points (no itching) to a maximum of 25 points (itching at the highest degree). The validity and reliability study of the scale for Turkey was conducted by Altınok Ersoy (2017) (10). In this study, the Cronbach's Alpha coefficient of the scale was determined as 0.806.

Pittsburgh Sleep Quality Index (PSQI): PSQI, developed by Buysse et al. in 1989, is a scale that provides information about sleep quality and the type and degree of sleep disorder in the last month (17). In the scale consisting of 24 questions in total, 19 questions

are answered by the person, while 5 questions are filled by the person's bedmate. With 19 questions answered by the individual, 7 sub-dimensions are evaluated: subjective sleep quality, sleep latency, sleep duration, habitual sleep activity, sleep disturbance, usage of sleeping pills, and daytime dysfunction. Each item in the scale takes a value between 0 (no distress) and 3 (serious distress) points. The sum of the scores for the seven sub-dimensions gives the total PSQI score. The score of each sub-dimension ranges from 0 to 3. The total PSQI score varies between 0 and 21. The sleep quality of those with a total score of 5 or less is considered "good", and those with more than 5 points are evaluated as "bad". The Turkish validity and reliability study of the scale was conducted by Agargün et al. (1996) (18). In this study, the Cronbach's Alpha coefficient of the scale was determined as 0.732.

2.3. Procedure

Patients who met the sampling criteria in the dialysis unit and center where the study was conducted were informed about the study and the patients who accepted to participate in the study were evaluated. The data on the individuals were collected in a suitable interview room in the specified hemodialysis units, after filling the informed consent form of the individuals, and by making face-to-face interviews in the form of questions and answers. The average survey application time took between 10-15 minutes.

2.4. Ethical Considerations

This study was conducted in compliance with the principles of the Declaration of Helsinki. The permission for the study was received from the Chief Physician's Office at a University Research and Training Hospital, and approval was obtained from the Clinical Research Ethics Board at University (Decision no. 2019-04/31). Additionally, by complying with the principle of voluntary participation, written consent was obtained from the patients who were included in the study. Written permission was obtained from all institutions where the study would be conducted.

2.5. Data Analysis

The data were analyzed by using the SPSS 16.0 software (SPSS, Inc., Chicago, IL, USA). In the statistical analysis of the study, the mean value was taken, the Kolmogorov-Smirnov Z test was used to test the normal distribution of the scale means and the Kruskal-Wallis test was applied. To determine the relationship between itching and sleep quality, Pearson's correlation analysis was utilized. The statistically significant level was accepted as $p < 0.05$.

3. RESULTS

3.1. Patients' characteristics

It was determined that of the individuals undergoing hemodialysis treatment, 52.1% were male, 60.7% were over 61 years old, 75.3% were married, 62.6% were primary school graduates, 47.9% were housewives, 39.3% were

retired, almost all (96.8%) did not work. When the clinical characteristics of the individuals undergoing hemodialysis treatment were examined, it was determined that 58% of the individuals had dialysis treatment for 1-5 years, 25.6% for 6-10 years, 16.4% for more than 10 years and 98.6% of them had hemodialysis 3 times a week.

3.2. Patients' itching Levels

In Table 1, which includes the 5-D Itch Pruritus total score and its components, 37.4% of the individuals stated that they experienced itching for 6-12 hours a day, nearly half (45.7%) had moderate itching, 50.2% months their itching was better compared to the last two, but still persisted, and 50.7% itching occasionally affected their life activities. More than half of the individuals (75.8%) stated that they had itching in the 0-5 area in the evaluation to determine the distribution of itching. The mean score of the 5-D scale was determined as 12.70±3.35.

Table 1. 5-D Pruritus Scale total score average and distribution of components of the individuals treated with hemodialysis (n:219)

Components of the 5-D Itch Scale	n	%	Mean ±sd (Min-max)
Duration (past 2 week)			
Less than 6 h/day (1 point)	64	29.2	2.26±1.19
6–12 h/day (2 point)	82	37.4	(1-5)
12–18 h/day (3 point)	42	19.2	
18-24 h/day (4 point)	12	5.5	
All day (5 point)	19	8.7	
Degree (past 2 week)			
Mild (2 point)	60	27.3	3.09±0.90
Moderate (3 point)	100	45.7	(2-5)
Severe (4 point)	38	17.4	
Unbearable (5 point)	21	9.6	
Direction (last 2 weeks compared to last month)			
Completely resolved (1 point)	20	9.1	2.40±0.79
Much better, but still present (2 point)	110	50.2	(1-5)
Little bit better, but still present (3 point)	72	32.9	
Unchanged (4 point)	14	6.4	
Getting worse (5 point)	3	1.4	
Disability			
Didn't affect at all (1 point)	7	3.2	2.61±0.66
Rarely affected (2 points)	86	39.3	(1-4)
Occasionally affected (3 points)	111	50.7	
Frequently affected (4 points)	15	6.8	
Always impressed (5 points)	0	0.0	
Distribution			
0-5 part (1\2 point)	166	75.8	2.40±0.84
6-10 part (3 point)	33	15.1	(2-5)
11-13 part (4 point)	4	1.8	
14-16 part (5 p point)	16	7.3	
5-D Itch Scale total score			12.70±3.35 (6-25)

3.3. Patients' itching Levels

PSQI mean scores of individuals who underwent hemodialysis treatment were given in Table 2. When the table is examined, it is seen that the mean PSQI scale sub-dimension mean scores were respectively sleep quality was 2.13±.59, sleep latency 2.82±.47, sleep latency 2.63±.64, habitual sleep activity 2.30±.92, sleep disturbance 1.61±.52, sleeping pill usage 0.41±.91, and daytime dysfunction 1.05±.58. PSQI total score average was determined as 12.82±2.42.

Table 2. Distribution of PSQI scores of the individuals treated with hemodialysis (n:219)

Components of PSQI	Mean± Sd	Minimum	Maximum
Sleep quality	2.13±.59	0	3
Sleep latency	2.82±.47	0	3
Sleep duration	2.63±.64	0	3
Habitual sleep efficiency	2.30±.92	0	3
Sleep disturbance	1.61±.52	1	3
Use of sleeping medication	0.41±.91	0	3
Daytime dysfunction	1.05±.58	0	3
PSQI total score	12.82±2.42	3	19

PSQI, Pittsburgh Sleep Quality Index

3.4. Correlation Between Itching and Sleep Levels of Patients

The correlation between the 5-D Pruritus Scale and the PSQI score averages of the individuals undergoing hemodialysis treatment was given in Table 3. When the table was examined, a positive, moderate, significant correlation was found between the Pruritus Scale scores and subjective sleep quality ($r=0.526$, $p=0.001$), usage of sleeping pill ($r=0.530$, $p=0.001$), daytime dysfunction ($r=0.590$, $p=0.005$) and PSQI total scores ($r=0.509$, $p=0.002$).

Table 3. Correlation of 5-D Pruritus Scale and PSQI scores of individuals treated with hemodialysis

Components of PSQI	5-D Itch Scale	
	r	p
Sleep quality	0,526	0,001
Sleep latency	0,039	0,569
Sleep duration	0,011	0,874
Habitual sleep efficiency	0,003	0,963
Sleep disturbance	0,024	0,719
Use of sleeping medication	0,530	0,001
Daytime dysfunction	0,590	0,005
PSQI total score	0,509	0,002

PSQI, Pittsburgh Sleep Quality Index

The comparison of 5-D Pruritus Scale components and the average PSQI total score of individuals who underwent hemodialysis treatment was given in Table 4. According to the table, it is seen that the sleep quality of the patients who described the itching degree as unbearable, who defined the itching prognosis as worse compared to the previous month, and who described generalized itching in the body parts in general, were significantly worse than the PSQI. Furthermore,

it was determined that individuals who stated that itching did not affect their daily activities had significantly higher sleep quality.

Table 4. Comparison of 5-D Pruritus Scale components and PSQI total scores of individuals treated with hemodialysis

Components of the 5-D Itch Scale	PSQI		Test
	Ort	Sd	
Duration (past 2 week)			
Less than 6 h a day	12.39	2.59	KW:3.488 P:0.480
6–12 h/day	13.03	2.03	
12–18 h/day	12.83	2.36	
18-24 h/day	12.33	3.14	
All day	13.57	2.91	
Degree (past 2 week)			
Mild	12.53	1.76	KW:13.879 P:0.003
Moderate	12.61	2.31	
Severe	12.81	3.13	
Unbearable	14.61*	2.47	
Direction (last 2 weeks compared to last month)			
Completely resolved	11.80	3.50	KW:10.509 P:0.033
Much better, but still present	12.07	2.00	
Little bit better, but still present	12.85	2.37	
Unchanged	13.02	3.04	
Getting worse	16.66*	2.08	
Disability			
Didn't affect at all	9.00*	3.51	KW:12.018 P:0.007
Rarely affected	12.67	2.24	
Occasionally affected	13.11	2.23	
Frequently affected	13.20	2.83	
Distribution			
0-5 part	12.48	2.26	KW:8.126 P:0.043
6-10 part	12.69	2.84	
11-13 part	14.00	2.94	
14-16 part	14.43*	2.52	

* Different group

PSQI, Pittsburgh Sleep Quality Index

4. DISCUSSION

4.1. Discussion of 5-D Pruritus Scale and PSQI Scores in Individuals Undergoing Hemodialysis

CKF is a serious health problem with increasing frequency all over the world, and it significantly affects the quality of life and daily life activities due to the symptoms it causes. Among these symptoms, itching is accepted as a symptom that should be evaluated in detail.

In this study using the 5-D Pruritus Scale, the mean scale score of the patients was determined as 12.70 ± 3.35 (min=5, max=25). According to the result obtained in this context, it can be said that the individuals in the study sample experienced moderate itching. In the study where Ersoy and Akyar (2017) made an evaluation with the same scale, the mean value of the scale was determined as 13.97 ± 4.11 (10). The result of this study conducted in Turkey was close to the finding we obtained. In the study of Güder et al. (2012) in

which skin changes were examined with 100 hemodialysis patients, it was found that the rate of uremic pruritus was 49% (19). Du et al. (2016), in their study using the Visual Analog Scale (VAS) to question itching in ESKF patients, stated that 78% of the patients experienced itching (7). In the study conducted by Ko et al. (2014) with 173 hemodialysis patients, this rate was found to be 34.8% (20). In another study involving individuals who received hemodialysis and peritoneal dialysis, the itching rate of HD patients was found to be 62% (6). When the studies in Turkey and the world literature are evaluated (5,9,10), the rates are different, but itching is a common symptom that should be at the basis of nursing care because of the feeling of discomfort, especially in patients with CKF and dialysis treatment. It can be said that besides determining this symptom only as a rate, the evaluation of its dimensions is also important in terms of symptom management.

In the study, the duration of itching was evaluated and it was determined that 37.4% of the patients in the sample experienced itching for 6-12 hours a day. In the sample group in which the validity and reliability study of the 5-D Pruritus Scale was conducted for Turkey, the rate of patients experiencing itching for 6-12 hours a day was found to be 40.3% (10). In both studies, it is observed that nearly half of the sample experienced itching for 6-12 hours. Considering that patients experienced itching in almost half of their daily life, it can be said that this symptom negatively affected the daily activities of individuals.

In the study, almost half of the patients (45.7%) described the degree of itching as moderate, and 27.0% as severe and unbearable. In the study of Ersoy and Akyar (2017), the rate of patients experiencing moderate itching was 40.3%, and the rate of patients experiencing severe and unbearable itching was 29.3% (10). In another study conducted in Turkey, the rate of moderate and severe uremic pruritus was reported at a rate of 42% (21). In different studies conducted with hemodialysis patients outside Turkey, the rate of patients experiencing severe itching was found to be 37.7% and 29% (22,23). When the findings are evaluated, it is seen that the patients generally experienced moderate and severe itching. This finding again emphasized the degree of itching in patients and showed that it should be focused on itching by healthcare personnel and caregivers. In the study, itching degree mean score was determined as 3.09 ± 0.90 (min=2, max=5). In a study conducted by Shavit et al. (2012) on twelve patients with uremic pruritus, the itching level of the patients was evaluated with VAS and the value was found to be 9.7 ± 0.9 (min=0, max=10) (24). In the study comparing three different dialysis methods, it was found that the itching rate seen in HD patients was 24%, while it was found that the itching rate in HD patients increased in the following sessions (15). When these rates were evaluated, it was determined that an irritating symptom such as itching was experienced intensely both in duration and in degree. When the findings are evaluated, it becomes more important to evaluate this symptom in more detail in patients and to plan and implement

nursing interventions that offer a holistic approach to how to cope with itching and adaptation to this symptom.

In the study, half of the patients (50.7%) stated that itching occasionally affected their life activities. When the findings regarding the duration and degree of itching are evaluated, it is inevitable that the symptom will affect daily activities. In similar studies, it was determined that dermatological symptoms such as itching affect daily activities, school/work life and personal relationships negatively (21,25). Itching is an irritating situation. It is thought that when it is felt continuously and at a certain level during the day, it may affect the daily performance, social life and work/school environment of the person. Although the findings obtained determined the presence of itching, it shows that a comprehensive evaluation with its various dimensions is important. It is thought that this study conducted with this feature will contribute to other studies on uremic pruritus in hemodialysis patients.

In addition to the psychological changes observed in patients, with problems caused by additional diseases, physiological changes, and complications after dialysis, sleep disorders occur in patients. In our study, the mean PSQI score was 12.82 ± 2.42 , and it was concluded that there were serious disturbances in sleep quality in patients who had hemodialysis. In the study of Indrarini et al. (2019), the sleep quality of patients with ESKF was found to be poor in 94.3% of the patients (26). Shen and He (2015) found this rate as 69.1% (27). In the study of Sert et al. (2015), poor sleep quality was found at 81.5% in individuals who underwent hemodialysis, and it was found that sleep disorders negatively affected the quality of life by reducing self-care power (28). Sleep is an important daily life activity and affects an individual's quality of life and well-being. It is reported that changes in sleep structure such as periodic leg movements during sleep, sudden awakenings, pain, dietary restrictions, fatigue, dyspnea, cramp and obstructive sleep apnea (OSA) can be observed in dialysis patients and these conditions will affect the sleep process (29). However, it is also accepted that patients with ESKF tend to sleep due to abnormal cellular interleukin production, and hemodialysis causes sleep problems by eliminating these substances that cause sleep (1).

In a study conducted by Elder et al. (2008) with the inclusion of seven countries, the rate of sleep disturbance in hemodialysis patients was determined to be 49%, and it was stated that the rate of morbidity increased with the increase in the rate of sleep disturbance (30). In the study of Ricardo et al. (2017), it was found that low GFR values are associated with sleep disorders (31). When the results obtained from the study and the literature findings are evaluated, it can be said that the sleep quality of the patients who underwent hemodialysis was negatively affected by the disease and the treatment process. Sleep is an important daily life activity within the scope of nursing service and affects the illness process and well-being of the patients. Therefore, it is important to identify sleep disorders and their causes and

to plan nursing interventions to increase sleep quality in the specified patient group.

4.2. Discussion of Findings Regarding the Relationship Between Itching and Sleep Quality in Individuals Undergoing Hemodialysis

Although itching is an important problem on its own, it causes negative experiences on the patient with its effect on other systems. The most common problem is the change in sleep patterns that patients complain of itching (1,13,14). In the study, a positive, moderate, and significant relationship was found between the 5-D Pruritus Scale score and PSQI total score and the components of subjective sleep quality, sleeping medication, and daytime dysfunction. In a study conducted by Akyol et al. (2017) with 198 hemodialysis patients, factors affecting sleep were asked and itching was found to be at a rate of 46% (1). In the study of Ko et al. (2014), the rate of uremic pruritus was found to be 34.8%, and it was concluded that hemodialysis patients with sleep disorders had higher pruritus VAS scores (20). In a study conducted with 18,801 hemodialysis patients in Japan, the rate of uremic pruritus was found to be 42%, and it was reported that itching affects sleep quality and quality of life and increases the risk of depression (13). Min et al. (2016) found the rate of itching as 45% in patients who underwent hemodialysis and peritoneal dialysis, and found that the sleep time of the patients experiencing itching decreased and they woke up frequently (6). Similarly, in the study of Ersoy and Akyar (2017), it was determined that itching delayed falling asleep by 50.8% and caused occasional awakenings from sleep (10). In general, it is reported that the rate of sleep disturbance due to itching associated with CKF varies between 28% and 90% (14,32).

5. CONCLUSION

In this study, which was conducted to determine the effect of itching on sleep quality in individuals undergoing hemodialysis treatment, the mean score of the 5-D Pruritus Scale was 12.70 ± 3.35 and the total PSQI mean score was 12.70 ± 3.35 . In the study, a positive, moderate, significant relationship was found between the 5-D Pruritus Scale and subjective sleep quality, usage of sleeping pill, daytime dysfunction and PSQI Scale. Furthermore, as a result of the comparison of the 5-D Pruritus Scale and PSQI mean scores, it was determined that the sleep quality of the patients who described the itching degree as unbearable, defined the itching prognosis as worse compared to the previous month, and who described generalized itching in their body parts was significantly worse than the PSQI.

In line with these results, comprehensive and routine evaluation of itching in individuals undergoing hemodialysis treatment, close monitoring of sleep, determination of other factors affecting sleep, planning interventional studies to reduce itching and improve sleep quality in individuals undergoing hemodialysis treatment, by taking a holistic approach to patients, to continue the necessary training and

counseling to patients and their relatives in order to alleviate all their symptoms can be recommended.

Limitations

CKF is a disease that has high mortality and morbidity rates and a condition where the desired goals in treatment cannot be reached despite the developments in treatment methods. The findings of this study are valuable in terms of discussing sleep quality in CKF and influential factors such as pruritis. However, there were some limitations in the study. Firstly, the study was carried out with relatively small samples and it is an important limitation that its results may only be generalised for its of population. Secondly, a cross-sectional study design is limited in establishing a causal association between sleep quality and pruritis. In order to be able to show causality, future longitudinal prospective studies are needed.

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