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Research Article / Araştırma

The relationship between the fatigue level of patients with blood and blood product transfusion and sleep hygiene

Kan ve kan ürünü transfüzyonu olan hastaların yorgunluk düzeyi ile uyku hijyeni arasındaki ilişki

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ABSTRACT

Aim: This study was conducted to determine the relationship between the fatigue level of patients with blood and blood product transfusion and sleep hygiene. **Materials and Methods:** The descriptive study was conducted with 210 individuals receiving blood and blood product transfusion treatment living in the XX XX Family Health Center region between February and August 2022. The sample group was selected from the population using the random sampling method. Survey Form, Fatigue (FACIT-F) Scale, and Sleep Hygiene Index (UHI) were used to collect the data of the study. **Results**: In the study, a significant difference was found between patients' perceived income level, perceived health level, diagnosis of disease, smoking status and severity of fatigue ($p<0.05$). In the study, a significant relationship was found between the patients' marital status, perceived income level, disease diagnosis, smoking status, age and sleep hygiene ($p<0.05$). **Conclusions**: In the study, a statistically significant relationship was found between the fatigue level of the patients and their sleep hygiene.

ÖZ

Amaç: Bu çalışma, kan ve kan ürünü transfüzyonu yapılan hastaların yorgunluk düzeyi ile uyku hijyeni arasındaki ilişkiyi belirlemek amacıyla yapılmıştır. **Gereç-Yöntem:** Tanımlayıcı tipte olan bu çalışma, XX XX Aile Sağlığı Merkezi bölgesinde yaşayan kan ve kan ürünleri transfüzyonu tedavisi alan 210 birey ile Şubat-Ağustos 2022 tarihleri arasında yapılmıştır. Örneklem grubu, rastgele örnekleme yöntemi kullanılarak evrenden seçilmiştir. Çalışmanın verilerin toplanmasında, Tanıtıcı Anket Formu, Yorgunluk (FACIT-F) Ölçeği ve Uyku Hijyeni Ölçeği kullanılmıştır. **Bulgular**: Bu araştırmada hastaların algılanan gelir düzeyi, algılanan sağlık düzeyi, hastalık tanısı, sigara içme durumu ve yorgunluk şiddeti arasında anlamlı bir ilişki bulundu ($p<0,05$). Araştırmada hastaların medeni durumu, algılanan gelir düzeyi, hastalık tanısı, sigara içme durumu, yaş ve uyku hijyeni arasında anlamlı ilişki bulundu ($p<0,05$). **Sonuçlar**: Çalışmada hastaların yorgunluk düzeyi ile uyku hijyeni arasında istatistiksel olarak anlamlı bir ilişki bulunmuştur.

ARTICLE INFO/MAKALE BİLGİSİ

Key Words: Blood and Blood Products, Fatigue, Nursing, Sleep Hygiene, Transfusion

Anahtar Kelimeler: Kan ve Kan Ürünleri, Yorgunluk, Hemşirelik, Uyku Hijyeni, Transfüzyon

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INTRODUCTION

Anemia is when the hemoglobin protein in the blood falls below the normal level or the number of red blood cells decreases. Hemoglobin is necessary to carry oxygen, and in its deficiency, the oxygen carrying capacity of the blood to the body tissues decreases. In this case, symptoms such as fatigue and weakness can be seen. Nutritional deficiencies, especially iron deficiency, are among the most common causes of anemia, but other causes are also effective. It is estimated that one-third of women of reproductive age worldwide, especially in the 15-49 age group, are anemic (1). According to the WHO 2019 data, the rate in this population is 29.8% in Turkey (2). It is stated that iron deficiency anemia is an important public health problem in our country (3).

Millions of patients all over the world need blood and blood products transfusion (4,5). Blood transfusion is defined as the introduction of whole blood or one of

the blood products into the circulatory system (6). It is essential for a wide variety of health problems, including anemia, complications during pregnancy and childbirth, severe accidental trauma, and surgical procedures (7). One of the purposes of transfusion is to improve oxygenation in tissues (8). Blood products are prepared from whole blood with special processes (6). Effective, quality and safe blood and blood product transfusion contributes to the recovery and rescue of millions of people each year (9).

Fatigue is more often the self-reported assessment of the patient. Being more fatigability indicates more fatigue at any given level of activity (10). In a study by Prochaska et al., minimum hemoglobin level (HGB) was found to be strongly associated with fatigue (11). In a study conducted by Dağ and Kıyak with patients with iron deficiency anemia, it was found that the fatigue score average of the patients was 6.21±1.65 and slightly above the average (12). Sleep hygiene can be defined as practices developed to facilitate falling asleep and improve sleep quality (13,14). It should be evaluated by measuring the behaviors and environmental variables that are thought to cause poor sleep quality (13). In a study conducted by Dağ and Kıyak, it was found that 29.8% of the patients had sleep problems all the time and 45.4% occasionally. In the same study, it was found that the fatigue of those who always had sleep problems was significantly higher than those who did not have sleep problems (12).

As a result, patients who need blood and blood products transfusion may experience higher fatigue due to low hemoglobin levels in the blood. At the same time, these patients may experience inadequate sleep hygiene. In patients, fatigue and inadequate sleep hygiene may cause disruptions in daily living activities. These factors can reduce patients' quality of life. For this reason, it may be important to determine the relationship between the fatigue level and sleep hygiene status of patients receiving blood and blood products transfusions, in order to use and improve the results.

The aim of this study is to determine the relationship between the level of fatigue and sleep hygiene of the patients who were transfused with blood and blood products.

MATERIAL AND METHODS

The descriptive study was conducted in XX XX Family Health Center region between February and August 2022. The population of the study consisted of patients receiving treatment in the blood and blood products transfusion living in the XX XX Family Health Center (FHC) region. The sample of the study consisted of 210 patients who were determined by power analysis with a 95% confidence interval, an error level of 0.05, a population representation power of 0.95 and an effect size of 0.25. The sample group was selected from the population using the random sampling method.

Inclusion Criteria

- Being open to communication and cooperation
- Volunteering to participate in the study
- Be an adult aged 18 or over
- Receiving blood and blood product therapy

Data Collection Tools

Survey Form: A questionnaire consisting of questions about the socio-demographic characteristics of the patients and the treatment of blood and blood products was prepared. It aims to collect data on gender discrimination, age, perceived income level, educational status, and comorbidities.

Fatigue (FACIT-F) Scale: The FACIT-F Scale is a measurement tool that subjectively evaluates fatigue in the last week and consists of 13 statements. The scale has a five-point Likert scale of 0 = not at all, 1 = very little, 2 = a little, 3 = a lot, and 4 = a lot. 11 items (1-6, 9-13) of the scale contain reverse expressions. The 7th and 8th items of the scale are calculated straight. The scores that can be obtained from the scale range from 0 to 52. A high total score on the scale indicates a high degree of fatigue. Perceived fatigue is reported to be clinically severe if the score from the scale is 30 or less (15). The scale Cronbach's alpha coefficient was found to be 0.98 (16). In this study, the Cronbach's alpha coefficient for the FACIT-F Scale was calculated as 0.94.

Sleep Hygiene Index (UHI): Mastin et al. (2006).23 Its Turkish validity and reliability were determined by Özdemir et al. (13,14). UHI is used to evaluate environmental behaviors that affect sleep hygiene. Participants are asked how often they repeat certain behaviors. (always = 5, often = 4, sometimes = 3, rarely = 2, never = 1). The scores of the parameters are summed to evaluate sleep hygiene. The score that can be obtained on the scale is between 13 and 65. A higher score indicates worse sleep hygiene. Respondents' "always" or "often" answers to each question describe poor sleep hygiene. In Özdemir's study, the Cronbach Alpha value of the scale was found to be 0.70. In our study, the Cronbach's alpha coefficient of the scale was found to be 0.76.

Data Collecting

The data of this study was collected during working hours on weekdays between February and August 2022.

The datas was collected from patients receiving blood and blood product treatment living in the XX Family Health Center region. The study datas, the face-to-face interview technique was collected. Each interview lasted approximately 15-20 minutes.

Evaluation of Data

The data were analyzed using the SPSS package program. Descriptive statistics; number-percentage, standard deviation, median, mean, minimum-maximum. The Kolmogorov-Smirnov test was used to assess whether the continuous variables fit the normal distribution. Mann Whitney U test, Student's t test, and Kruskal Wallis test were used to compare three or more groups. Relationships between continuous variables with normal distribution were examined using the Pearson correlation test. Confidence interval was accepted as 95% ($p<0.05$) in statistical analysis.

Ethical Principles of Study

The study was started after the necessary permissions were obtained from the institution where the study was conducted and the Ethics Committee of XX University Non-Interventional Clinical Research. Research protocol code: 2022/55. Verbal consent was obtained from the patients before the questionnaire forms were administered.

RESULTS

Demographic characteristics of patients receiving blood and blood product therapy are shown in Table 1.

In the study, a significant relationship was found between the patients' perceived income level, perceived health level, diagnosis of disease, smoking status and severity of fatigue ($p<0.05$). No significant correlation was found between patients' gender, marital status, education level, presence of other chronic diseases, employment status, age, disease duration, hemoglobin value and fatigue level ($p>0.005$).

In the study, a significant relationship was found between the patients' marital status, perceived income level, disease diagnosis, smoking status, age and sleep hygiene ($p<0.05$). No significant correlation was found between the patients' gender, education level, perceived health level, presence of other chronic diseases,

Table 1. Socio-demographic characteristics of the patients (n=210)

Introductory features	n	%
Gender		
Female	195	92.9
Male	15	7.1
Marital status		
Married	174	82.9
Single/Divorced	36	17.1
Level of education		
Illiterate	6	39.0
Literate	18	21.0
Primary education	82	28.6
High school	44	
University	60	
Perceived income level		
Good	49	23.3
Middle	155	73.8
Bad	6	2.9
Perceived health level		
Good	34	16.2
Middle	156	74.3
Bad	20	9.5
Disease diagnosis		
Anemia	184	87.6
Iron deficiency anemia	16	7.6
Immunodeficiency	10	4.8
Presence of other chronic diseases		
Yes	163	77.6
No	47	22.4
Smoking		
Yes	44	21.0
No	166	79.0
Working status		
Yes	57	27.1
No	153	72.9
Average age	40.34±11.36	
Disease duration	4.17±4.72	
Hemoglobin value	8.74±1.89	

employment status, age and duration of illness, and sleep hygiene (p>0.005).

In the study, a statistically significant relationship was found between the fatigue level of the patients and their sleep hygiene (r=0.475, p=0.000). (Table 3).

DISCUSSION

There is no study in the literature to determine the relationship between the fatigue level of patients with blood and blood product transfusion and sleep hygiene. Therefore, the research has been discussed with limited

Introductory features	n	FACIT-Scale	p	SHI	p
Gender					
Female	195	29.09±9.95	MannW= 1197.00 p=.241	26.35±6.80	MannW= 1346.00 p=.607
Male	15	24.60±12.98		25.26±5.44	
Marital status					
Married	174	29.23±9.23	t=.679 p=.498	25.68±6.53	t=-2.860 **p=.005**
Single/Divorced	36	28.05±10.70		29.13±6.88	
Level of education					
Illiterate	6	33.50±5.71	KW=4.859 p=.302	23.00±4.77	KW=6.047 p=.196
Literate	18	27.16±5.66		26.22±4.18	
Primary education	82	27.79±9.97		25.52±6.90	
High school	44	30.20±11.19		28.34±7.62	
University	60	29.98±8.44		26.13±6.28	
Perceived income level					
Good	49	25.59±11.60	KW=10.418 **p=.005**	23.36±5.80	KW=11.400 **p=.003**
Middle	155	29.42±9.62		27.04±6.60	
Bad	6	38.00±3.52		30.16±9.66	
Perceived health level					
Good	34	21.02±7.98	KW=36.483 **p=.000**	25.08±7.89	KW=3.777 p=.151
Middle	156	29.37±9.91		26.19±6.42	
Bad	20	37.30±7.16		28.95±6.31	
Disease diagnosis					
Anemia	184	28.98±9.63	KW=8.704 **p=.013**	26.34±6.72	KW=4.967 p=.083
Iron deficiency anemia	16	32.68±12.39		28.06±5.62	
Immunodeficiency	10	18.60±11.89		22.20±7.02	
Disease of other chronic diseases					
Yes	163	28.74±10.00	t=.-043 p=.942	26.33±7.05	t=.246 p=.806
No	47	28.74±11.09		26.06±5.39	
Smoking					
Yes	44	32.95±11.29	t=3.110 **p=.002**	29.34±6.26	t=3.498 **p=.001**
No	166	27.66±9.66		25.46±6.60	
Working status					
Yes	57	28.82±9.53	t=.361 p=.719	26.05±6.93	t=-.294 p=.769
No	153	28.88±9.49		26.35±6.64	
Average age	40.34±11.36		r=.124 p=.074		r=-.216** **p=.002**
Disease duration	4.17±4.72		r=-.018 p=.800		r=-.084 p=.800
Hemoglobin value	8.74±1.89		r=.007 p=.914		r=.007 p=.914

Table. 3. Relationship between fatigue level of patients and sleep hygiene

Korelasyon test sonuçları	p	FACIT-F Scale	Sleep Hygiene Index
FACIT-F Scale	r p	1	.475** **.000**
Sleep Hygiene Index	r p	.475** **.000**	1

literature. The effect of blood transfusion on fatigue is important according to the initial fatigue level of the patients. Because the severity of fatigue of the patients shows the physiological load of their anemia. Patients with high levels of fatigue are more likely to benefit and feel less tired after a blood transfusion. Since there are many pathophysiological mechanisms of anemia, patients with different clinical characteristics (age, gender, comorbidities, etc.) may have different levels of fatigue even if the Hb levels are the same (11).

In the study, a significant difference was found between the patients' perceived income level and their perceived health level and fatigue level. Accordingly, it was determined that patients with poor health and income levels had worse fatigue levels.

In the study, it was determined that there was a significant relationship between the diagnosis of the disease and fatigue, but there was no significant relationship between the Hb value and fatigue. Fatigue levels were found to be higher in those diagnosed with immunodeficiency. Spencer et al. found a relationship between anemia and fatigue (17).

Prochaska et al.'s fatigue levels of patients who received blood transfusion during hospitalization and had hemoglobin <10 g/dl were evaluated during hospitalization and 7 days after discharge. Accordingly, it was determined that there was no difference between fatigue during hospitalization and fatigue at 7 days after discharge. In addition, no relationship was found between Hb level and fatigue in this study (10).

In the study of Brown et al., the fatigue levels of palliative care patients before and after blood transfusion were examined. Accordingly, responses were obtained that there was a significant difference between blood transfusion and fatigue, and that there was a good improvement in fatigue (18).

In a study on patients with anemia; There was no difference between demographic characteristics and FACT scores of patients with and without blood transfusion. However, among patients with high levels of fatigue and Hb<8g/dL, patients with blood transfusions showed clinical improvement in their fatigue compared to those without blood transfusions (19).

In the study, a significant difference was found between the smoking status of the patients and the level of fatigue. It was determined that the fatigue levels of smokers were worse.

Peirano et al. They suggested that changes in neurotransmitter metabolism due to iron deficiency, psychological condition or a possible restless legs syndrome (RLS) negatively affect sleep (20).

In the study, a significant difference was found between the marital status of the patients and their sleep hygiene. Accordingly, it was determined that the sleep hygiene of single/divorced individuals was worse. In studies conducted in different groups in the literature; In patients with MI, the sleep quality of single patients was found to be worse than that of married patients. In a study conducted by Grandner et al. in healthy adults, it was found that sleep disorders were more common in widowed/divorced and never-married individuals (21).

In the study, a significant difference was found between the perceived income status of the patients and their sleep hygiene. Accordingly, it was determined that the sleep hygiene of individuals who perceived their income status as bad was worse.

In the study, a significant difference was found between smoking status and sleep hygiene. According to this, it was determined that the sleep hygiene of the smokers was worse. In the study of Özdemir et al., in which they examined the effect of anemia on sleep quality in women aged 15-49, a significant relationship was found between smoking and sleep quality. It has been determined that smokers have poor sleep quality (22). Dugas et al.'s association of nicotine addiction with poor sleep quality supports our findings (23).

In the study, a significant difference was found between the age of the patients and their sleep hygiene. Accordingly, it was determined that sleep hygiene was worse as age progressed. In the study of Çölbay et al. on hemodialysis patients; There was a weak but significant relationship between age, female gender, hemoglobin and poor sleep quality (24).

In the study, a statistically significant relationship was found between the fatigue level of the patients and their sleep hygiene (Table 3). In his study on patients with iron deficiency anemia, Dağ and Kıyak; It was found that 29.8% of the patients always had sleep problems, and the difference between sleep problem and fatigue and energy score averages was statistically significant (12). In a study evaluating the effect of sleep quality on fatigue of healthy individuals aged 20-64 in the city center of Edirne, it was determined that as sleep quality deteriorates, the level of fatigue that individuals feel increases (25). It is thought that it is important to take initiatives to increase the sleep hygiene of patients undergoing blood and blood product transfusion (12).

In the study of Özdemir et al., in which they examined the effect of anemia on sleep quality in women aged 15-49, a relationship was found between general mood and sleep quality. It was determined that those with bad mood had poor sleep quality (22).

CONCLUSION

In the study, a significant difference was determined between the socio-demographic characteristics, fatigue level and sleep hygiene of the patients with blood and blood product transfusion. In the study, a statistically significant relationship was found between the fatigue level of the patients and their sleep hygiene. The symptoms experienced by the patients with blood and blood products transfusion should be followed and holistic care should be given accordingly.

Educating patients with blood and blood products transfusion about behaviors and factors that may cause poor sleep hygiene and increased fatigue levels can increase patients' awareness of fatigue and sleep hygiene. In addition, further research should be conducted covering the factors that cause fatigue and poor sleep hygiene behaviors of patients, the interventions that can be applied to improve this condition, and the effectiveness of these interventions.

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Declarations

Ethical approval The responsible Ethics Committees approved the present study. All authors state their compliance with the Code of Ethics of the World Medical Association (the 1964 Declaration of Helsinki and its later amendments)

Consent to participate All participants were properly instructed and gave online their informed consent to participate.

Consent for publication All participants were properly instructed that data gained in the present study will be used for publication in an anonymous form and gave online their informed consent for publication.

Conflıct of interest

No conflict of interest has been declared by the authors.

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