



# Effects of Patients' Adjustment to Intestinal Ostomy on Sleep Quality: A Descriptive Cross-sectional Study

## Hastaların Bağırsak Ostomisine Uyumlarının Uyku Kalitesine Etkisi: Tanımlayıcı Kesitsel Bir Çalışma

İD Şahizer Eraydın<sup>1</sup>, İD İsmail Okan<sup>2</sup>, İD Ahmet Akbaş<sup>3</sup>

<sup>1</sup>Tokat Gaziosmanpaşa University Faculty of Health Sciences, Department of Nursing, Tokat, Turkey

<sup>2</sup>İstanbul Medeniyet University Faculty of Medicine, Department of General Surgery, İstanbul, Turkey

<sup>3</sup>Karadeniz Technical University Faculty of Medicine, Department of General Surgery, Trabzon, Turkey

### Abstract

**Objective:** Living with an ostomy affects the individual in many ways. The aim of the present study was to examine ostomy adaptability, sleep quality, and associated factors in patients with intestinal ostomy.

**Method:** This was a descriptive, cross-sectional study. The study was carried out with 45 adult patients who could perform ostomy care on their own. Study data were collected using an information form, the Pittsburgh sleep quality index, and the ostomy adjustment inventory. Obtained data were evaluated using descriptive statistical methods, variance analyses, student's t-test, correlation and regression analysis.

**Results:** The mean age of the patients was  $58.0 \pm 17.7$  years. Of them, 51% were male, 69% had a temporary ostomy, and 67% had a colostomy. The mean intestinal ostomy adjustment score of all patients was  $47.1 \pm 13.9$ . The average sleep quality score of all patients was  $7.8 \pm 4.1$ . Sleep quality scores between males and females were not significantly different ( $p=0.442$ ). Ostomy adjustment inventory scores were  $51.9 \pm 13.9$  in women and  $42.5 \pm 12.6$  in men ( $p=0.023$ ).

**Conclusion:** In our study, we found that patients with intestinal ostomy showed moderate adjustment to the ostomy and had poor sleep quality. It was observed that female patients had better compliance than male patients, and those who did not have ostomy problems had better compliance than those who did. The results of the present study are important in that they reveal that the patients who adapt well to ostomy may also experience sleep problems.

**Keywords:** Adaptability, intestinal ostomy, ostomy sleep quality

### Öz

**Amaç:** Ostomi ile yaşamak bireyi birçok açıdan etkilemektedir. Bu çalışmanın amacı, bağırsak ostomisi olan hastalarda ostomi adaptasyonunu, uyku kalitesini ve ilişkili faktörleri incelemektir.

**Yöntem:** Bu araştırma tanımlayıcı, kesitsel bir çalışmadır. Örneklemi ostomi bakımını kendisi yapabilen 45 yetişkin hasta oluşturmuştur. Çalışma verileri kişisel bilgi formu, Pittsburgh uyku kalitesi indeksi ve ostomi uyum envanteri kullanılarak toplanmıştır. Elde edilen veriler tanımlayıcı istatistiksel yöntemler, varyans analizi, student t-testi, korelasyon ve regresyon analizi kullanılarak değerlendirilmiştir.

**Bulgular:** Hastaların yaş ortalaması  $58,0 \pm 17,7$  yıldır ve hastaların %51'i erkekti, %69'una geçici ostomi ve %67'sine kolostomi yapılmıştır. Tüm hastaların ortalama bağırsak ostomi uyum skoru  $47,1 \pm 13,9$  ve ortalama uyku kalitesi puanı  $7,8 \pm 4,1$  idi. Cinsiyetler arasında uyku kalitesi puanları arasında anlamlı fark yoktur ( $p=0,442$ ). Ostomi uyum envanter puanı kadınlarda  $51,9 \pm 13,9$ , erkeklerde  $42,5 \pm 12,6$  puandır ( $p=0,023$ ).

**Sonuç:** Çalışmamızda bağırsak ostomisi olan hastaların ostomiye orta derecede uyum gösterdiği ve uyku kalitesinin kötü olduğu görüldü. Kadın hastaların erkek hastalara göre uyumunun daha iyi olduğu, ostomi sorunu olmayanların ise olanlara göre daha iyi uyum gösterdiği görüldü. Bu çalışmanın sonuçları, ostomiye iyi uyum sağlayan hastaların da uyku sorunları yaşayabileceğini ortaya koyması açısından önemlidir.

**Anahtar kelimeler:** Bağırsak ostomisi, ostomi uyumu, uyku kalitesi



**Address for Correspondence:** Şahizer Eraydın, Tokat Gaziosmanpaşa University Faculty of Health Sciences, Department of Nursing, Tokat, Turkey

**E-mail:** sahueraaydin@gmail.com **ORCID:** orcid.org/0000-0002-2948-9677

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## Introduction

The creation of an intestinal stoma is sometimes an inevitable necessity due to multiple reasons like cancers, chronic diseases, or traumas that affect the gastrointestinal system (1). The ostomy is created to remove the intestinal content through an aperture in the abdominal skin. This procedure requires the patient to use a fecal collector system (2,3). Among the main factors that negatively affect the life of individuals who underwent ostomy are the complications related to the ostomy itself and the surrounding tissues (2,4-6). They include problems such as bleeding, ischemia, necrosis, ostomy stenosis and retraction, prolapse, obstruction, parastomal herniation, fistula, perforation, and peristomal skin problems (1,3,5,7).

Patients may experience some psychological problems while getting used to their new bodies, with the newly created excretory pathway. As a result of ostomy surgery, individuals may experience many problems such as changes in excretion habits, lack of defecation and gas control, the presence of bad odor, dependence on an ostomy bag, change in body image perception, diminished self-respect, decreased or impaired sex life, feelings of shame, social isolation, negative feelings, loneliness, depression, and deterioration in social activities and working life (1-3). These problems could also be associated with the individual's self-care ability and the level of adaptability to ostomy (7).

Adaptation to ostomy is a continuous dynamic process in which the individual tries to deal with ostomy-related problems, alleviate negative emotions, and have control over life events caused by ostomy (8). The patient's adaptability to and acceptance of the ostomy can affect the type and incidence of ostomy complications (9). Due to the physical and mental burden effects it creates, intestinal ostomy negatively affects the daily life activities of patients and reduces their quality of life (10). However, previous studies found that the quality of life in patients with ostomy was positively correlated with the adaptation to ostomy (7,10,11).

Adequate sleep and rest are considered indicators of overall health status (12,13). Insufficient sleep and rest, on the other hand, lead to impairments in neural transmission and concentration, slowing of reflexes, impaired judgment, less participation in daily life activities, and increased restlessness, thereby reducing the quality of life (13-16). It has been shown that ostomy patients experience sleep problems (17-20) and the sleep quality of the patients is impaired (19,20). Uemura et al. (17) identified sleep problems in patients with intestinal disorders. Sleep

quality of patients with ostomy also affects factors such as pain, treatment, and diagnosis. Patients with ostomy can be concerned about adverse situations such as bag rupture and leaking, contamination of clothes, bad odor, and sleeping in a position that might damage the ostomy and bag during sleeping unconsciousness (18,19). These concerns affect both deep sleep and sleep quality, which can ultimately result in insomnia.

However, to the best of our knowledge, there has been no research investigating the sleep quality and the ostomy adaptation process of ostomy patients simultaneously. The results of the present study, which examined the relationship between ostomy adaptation and sleep quality, are important in that they reveal that the patients who adapt well to ostomy may also experience sleep problems. These findings could guide patients with poor sleep quality and healthcare personnel who care for them.

**Aim:** The aim of this study was to investigate ostomy adaptation, sleep quality and related factors in patients with intestinal ostomy.

### Research Question

- 1- What is the level of ostomy compliance of ostomy patients?
- 2- What is the level of sleep quality of ostomy patients?
- 3- What is the level of compliance and sleep quality according to patients' ostomy characteristics?
- 4- What is the relationship between patients' ostomy compliance and sleep quality?

## Materials and Methods

### Study Design and Patients

The present study was conducted as a descriptive cross-sectional study at the General Surgery Department of Tokat Gaziosmanpaşa University Hospital. The inclusion criteria were defined as the patients who volunteered to participate in the research, who were adults between the ages of 20 and 80, who had an ostomy for more than two months, who were able to perform self-care of the ostomy, and who underwent ostomy surgery and ostomy treatment in the hospital where the research was conducted. The patients with emergency ostomy and temporary ostomy were also included.

### Data Collection

Patients with intestinal ostomy were informed about the purpose of the study and invited to participate. After

their verbal and written consent was obtained, patients participating in the study completed the questionnaire forms through face-to-face interviews conducted researchers. Clinical information was retrieved from hospital files.

### Data Collection Tools and Characteristics

The data of the study were collected using a questionnaire form, including demographic details, clinical information, life features and sleep quality, as well as the Pittsburgh sleep quality index (PSQI) and the ostomy adaptation inventory (OAI).

### Questionnaire Form

This form was developed based on the relevant literature (18-20). The form consists of two parts, and the first part includes questions regarding patients' socio-demographic features. The latter includes characteristics of questions related to their stoma and adaptation.

### The PSQI

Buyse et al. developed this scale in 1989 and Ağargün et al. (21) adapted it to Turkish in 1996. The scale's Cronbach's alpha reliability coefficient was 0.804. The PSQI evaluates sleep quality for the last month and includes 24 questions, 19 of which are self-answered. The last five questions should be answered by a spouse or roommate; these questions are only used for clinical knowledge, not for scoring. The PSQI has seven components: Subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. Each component was scored between 0 and 3. Higher scores represent negative outcomes. These seven components have a total scale score between 0 and 21. A total PSQI score of 5 or above indicates poor sleep quality (21). In the present study, the Cronbach's alpha value of the scale was 0.71.

### The OAI

This self-assessment scale, including 23 items, was developed by Simmons et al. (9) to determine patients' adaptation to ostomy. Karadag et al. (22) adapted this scale to Turkish. The scale's Cronbach's alpha value was 0.93. The OAI has four subdimensions: Acceptance, anxious preoccupation, social engagement and anger. Each item is evaluated using a five-point Likert scale ranging from 0-4: Strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree. A higher score for each item indicates a higher engagement. Of the items in the scale, 12, (2<sup>nd</sup>, 5<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup>, 13<sup>th</sup>, 16<sup>th</sup>, 17<sup>th</sup>, 18<sup>th</sup> and 21<sup>st</sup> items)

include negative statements and therefore are reverse-graded (9,22). In the present study, the Cronbach's alpha value of the scale was 0.85.

### Statistical Analysis

Statistical Package for Social Sciences (SPSS, version 22.0, IBM Corp., Armonk, NY, USA) was used for statistical analyses. Quantitative data conformity to the normal distribution was evaluated using a Shapiro-Wilk test. Obtained data were evaluated using descriptive statistical methods (mean, standard deviation, frequency, and percentage), variance analysis, Student's t-test, correlation, and regression. The significance level was set as  $p < 0.05$ . Based on the working hypotheses, the correlation between The OAI and The PSQI was examined, and a correlation coefficient of  $r = 0.527$  was calculated. Since it was a moderate correlation, the effect size was taken as 0.3. According to these values, post hoc power analysis (G\*Power 3.1.9.7) was applied, ( $n = 45$ ). As a result of the power analysis, the post hoc power of our study was found to be 65%.

### Ethical Consideration

Ethical consent was obtained from Tokat Gaziosmanpaşa University Scientific Ethics Committee (17-KEK-117, date: 01.08.2017) and written consent was obtained from the University Hospital. Written and verbal consent was obtained from all patients. The study complied with the Helsinki Declaration.

## Results

This study was conducted with 45 participants with a mean age of  $58.0 \pm 17.7$  years. Of all patients, 51% were male, 84.8% were married, and 93.3% were not employed (Table 1). OAI scores between genders were statistically different ( $51.9 \pm 13.9$  in women and  $42.5 \pm 12.6$  in men,  $p = 0.023$ ). The intestinal ostomy adjustment was better for women compared to men. Mean OAI scores of the patients were not associated with age ( $p = 0.062$ ), education level ( $p = 0.405$ ), marital status ( $p = 0.952$ ), residential area ( $p = 0.561$ ), or employment status ( $p = 0.084$ , Table 1). There was no difference between genders for PSQI scores ( $p = 0.442$ ). PSQI score was not associated with age ( $p = 0.186$ ), education level ( $p = 0.684$ ), marital status ( $p = 0.441$ ), residential area ( $p = 0.689$ ), or employment status ( $p = 0.933$ , Table 1).

The scale scores of the patients according to their intestinal ostomy characteristics are given in Table 2. The ostomy was due to rectal cancer in 53.3% and colon cancer in 28.9%. Ostomy was temporary in 68.9% and permanent in 31.1%.

66.7% of the ostomy patients had colostomy, while 24.4% had ileostomy. The duration of ostomy in the patients was ranging from 2 to 12 months, in 64.4%. Of all patients, 88.9% had problems around the ostomy such as peristomal skin problems (n=36), retraction in ostomy (n=2), prolapse (n=1), and bleeding (n=1) (Table 2). No difference was found in terms of the mean OAI total scale scores of the patients with respect to the reason for ostomy opening (p=0.947), ostomy duration (p=0.254), ostomy type (p=0.265), ostomy area (p=0.706), preoperative ostomy marking (p=0.709), or type of operation (p=0.604). There was a difference between average OAI scores, of the patients whether or not they had problems around the ostomy (44.8±12.8 and 65.6±7.5, respectively, p=0.001) (Table 2).

Average PSQI score of patients was not associated with the opening of the ostomy (p=0.692), ostomy duration (p=0.404), ostomy type (p=0.770), ostomy area (p=0.685), preoperative ostomy marking (p=0.583), and type of operation (p=0.669) (Table 2). The average PSQI score of patients experiencing problems around ostomy was 11.4±5.3, while patients who had no such problems had a score of 7.4±3.8 (p=0.044) (Table 2).

The average scores of scales and subscales are given in Table 3. Average OAI total scale score of the patients was 47.1±13.9. In terms of the subscales of the OAI scale, the average score was 16.5±6.9 for the acceptance subscale, 10.7±3.7 for the anxious preoccupation subscale, 9.4±3.8 for the social engagement subscale, and 4.5±2.3 for the

**Table 1. Patients' demographic characteristics and scale scores (n=45)**

		n (%)	Total PSQI Mean ± SD	Total OAI Mean ± SD
<b>Gender</b>	Female	22 (49)	8.36±2.52	51.90±13.92
	Male	23 (51)	7.39±2.86	42.56±12.66
		t <sup>‡</sup>	0.776	<b>2.357</b>
		p	0.442	<b>0.023*</b>
<b>Age (years)</b>	20-40	6 (13.3)	6.83±2.31	36.16±8.54
	41-60	20 (44.4)	9.15±3.63	51.20±16.71
	61-80	19 (42.2)	6.84±2.70	46.31±10.11
		F <sup>†</sup>	1.754	2.976
<b>Education</b>		p	0.186	0.062
	None	10 (22.2)	8.5±3.27	52.3±8.89
	Primary school	25 (55.6)	8±3.69	46.12±14.86
	Middle school and above	10 (22.2)	6.9±2.81	44.5±15.64
<b>Marital status</b>		F <sup>†</sup>	0.384	0.925
		p	0.684	0.405
	Married	38 (84.4)	7.65±2.99	47.07±12.96
	Single	7 (15.6)	9±4.29	47.42±19.82
<b>Residential area</b>		t <sup>‡</sup>	0.777	0.060
		p	0.441	0.952
	Village	8 (17.8)	9±3.12	49.12±16.99
	Districts	26 (57.8)	7.73±3.35	48.19±12.09
<b>Working</b>	City center	11 (24.5)	7.36±2.13	43.18±16.33
		F <sup>†</sup>	0.376	0.585
		p	0.689	0.561
	Yes	3 (6.7)	7.77±2.05	33.66±15.5
<b>Working</b>	No	42 (93.3)	7.88±3.27	48.09±13.54
		t <sup>‡</sup>	0.085	1.770
		p	0.933	0.084

†: Variance analysis, ‡: Student's t-test, \*: p<0.05, \*\*: p<0.001, PSQI: Pittsburgh sleep quality index, OAI: Ostomy adaptation inventory, SD: Standard deviation

anger subscale. The average PSQI score of the patients was  $7.8 \pm 4.1$ . There was a moderate correlation between the two scales ( $r=0.527$ ;  $p<0.001$ ) (Table 3). The relationship between the scales was examined by linear regression and was found to be 27% ( $R^2=0.277$ ;  $p=0.000$ ) (Table 4).

## Discussion

This study was conducted to determine patients' sleep quality and adaptation to an ostomy. The main results were that the patients had a moderate level of adaptation to the ostomy and high levels of sleep problems. Patients had moderate scores related to acceptance, anxious

**Table 2. Scale scores according to according to patients' intestinal ostomy characteristics**

Ostomy characteristics		n (%)	Total PSQI Mean $\pm$ SD	Total OAI Mean $\pm$ SD
<b>The reason for ostomy creation</b>	Colon cancer	13 (28.9)	$7.23 \pm 3.38$	$48.23 \pm 17.46$
	Rectum cancer	24 (53.3)	$7.87 \pm 2.46$	$46.66 \pm 13.78$
	Other <sup>†</sup>	8 (17.7)	$8.87 \pm 2.09$	$46.75 \pm 8.65$
		<b>F<sup>§</sup></b>	0.372	0.054
		<b>p</b>	0.692	0.947
<b>Ostomy duration</b>	2-12 months	29 (64.4)	$7.62 \pm 3.21$	$46.72 \pm 15.88$
	13-24 months	8 (17.8)	$9.62 \pm 3.65$	$53.62 \pm 7.92$
	25 months or more	8 (17.8)	$7 \pm 3.54$	$42.12 \pm 8.74$
		<b>F<sup>§</sup></b>	0.926	1.418
		<b>p</b>	0.404	0.254
<b>Ostomy type</b>	Temporary	31 (68.9)	$7.74 \pm 2.81$	$48.7 \pm 14.36$
	Permanent	14 (31.1)	$8.14 \pm 3.05$	$43.64 \pm 12.83$
		<b>t<sup>¶</sup></b>	0.295	1.130
		<b>p</b>	0.770	0.265
<b>Ostomy area</b>	Ileostomy	11 (24.4)	$7.63 \pm 2.12$	$50.18 \pm 8.07$
	Colostomy	30 (66.7)	$8.16 \pm 3.19$	$46 \pm 15.09$
	Loop colostomy	4 (8.9)	$6.25 \pm 2.99$	$47.25 \pm 19.85$
		<b>F<sup>§</sup></b>	0.382	0.350
		<b>p</b>	0.685	0.706
<b>Preoperative ostomy marking</b>	Yes	18 (40)	$7.38 \pm 3.03$	$46.16 \pm 12.11$
	No	27 (60)	$8.18 \pm 3.32$	$47.77 \pm 15.26$
		<b>t<sup>¶</sup></b>	0.622	0.375
		<b>p</b>	0.538	0.709
<b>Operation type</b>	Planned	34 (75.6)	$7.85 \pm 3.31$	$48.2 \pm 14.18$
	Urgent	11 (24.4)	$8.5 \pm 2.59$	$45.6 \pm 12.6$
		<b>t<sup>¶</sup></b>	0.431	0.523
		<b>p</b>	0.669	0.604
<b>Having problems on/around the ostomy</b>	Yes <sup>‡</sup>	40 (88.9)	$11.4 \pm 4.31$	$44.82 \pm 12.84$
	No	5 (11.1)	$7.42 \pm 2.87$	$65.6 \pm 7.5$
		<b>t<sup>¶</sup></b>	<b>2.078</b>	<b>3.518</b>
		<b>p</b>	<b>0.044*</b>	<b>0.001**</b>

<sup>†</sup>: Bladder tumors (2), injuring by weapon (2), paralytic ileus (2), rectal perforation (1) and peritoneal cancer (1), <sup>‡</sup>: Ostomy problems: peristomal skin problems (36), retraction in ostomy (2), prolapsus (1) and bleeding (1), <sup>§</sup>: Variance analysis, <sup>¶</sup>: Student's t-test, \*:  $p<0.05$ , \*\*:  $p<0.001$ , PSQI: Pittsburgh sleep quality index, OAI: Ostomy adaptation inventory, SD: Standard deviation



**Table 3. Mean PSQI, OAI, and subdimension scores and correlation**

	Mean $\pm$ SD	Min-max (min-max) <sup>†</sup>	r	p
<b>Total PSQI</b>	7.86 $\pm$ 4.18	1-19 (1-21) <sup>†</sup>	<b>0.527</b>	<b>0.000**</b>
<b>Total OAI</b>	47.13 $\pm$ 13.96	18-79 (0-92) <sup>†</sup>		
Acceptance	16.57 $\pm$ 6.89	8-32		
Anxiety	10.75 $\pm$ 3.77	1-18		
Social harmony	9.44 $\pm$ 3.87	0-16		
Anger	4.53 $\pm$ 2.30	0-8		

<sup>†</sup>: Minimum and maximum values of scales, r: Correlation, \*: p<0.05, \*\*: p<0.001, PSQI: Pittsburgh sleep quality index, OAI: Ostomy adaptation inventory, SD: Standard deviation

**Table 4. Regression analysis between scales**

Independent variable	Dependent variable	R <sup>2</sup>	F	$\beta$	t	p
<b>OAI</b>	<b>PSQI</b>	0.277	16.495	0.527	4.061	<b>0.000**</b>

R<sup>2</sup>: Regression analysis, F: Variance analysis, t: Student's t-test, \*: p<0.05, \*\*: p<0.001, PSQI: Pittsburgh sleep quality index, OAI: Ostomy adaptation inventory

preoccupation, social engagement, and adaptation to ostomy-related anger subscales. Most studies found patients' adaptation to ostomy to be of a moderate level (8,9,11,22-24). Creating an ostomy profoundly affects people's physical and psychosocial health, bowel function, and personal hygiene, sexual life, and body image (1,11). Considering all these factors, patients have a moderate level of ostomy compliance. Age, education level, employment status, and living place characteristics had no significant effect on the ostomy adaptation of the patients.

Gender was found to have an effect on stoma adaptation. Women had better stoma adaptation than men. This gender difference might be due to the socio-cultural characteristics and self-care abilities of women. Simmons et al. (9) found no difference between genders with regard to ostomy adaptation. Honkala and Berterö (25), in their qualitative study, found that females accepted ostomy but despite their gratitude, their lives were affected and changed radically. Their self-respect was reduced, and they felt weak, anxious and insecure (25). It could be concluded that due to the socio-cultural characteristics of women, their compliance with an ostomy is good, even though the creation of an intestinal ostomy affects women more emotionally than men.

Previous studies indicated that ostomy characteristics are significant for ostomy adaptation. Cheng et al. (26), Hu et al. (24) and Xian et al. (27), also stated that patients without a history of peristomal complications, no history of leakage with regular defecation, and better self-care ability were able to adapt better to an ostomy. Some studies mentioned that the factors that affect adaptation to ostomy include

acceptance of the ostomy by the spouse, antipathy against the ostomy, peristomal complications (24), awareness of the ostomy and ostomy care, ability to do self-care, being independent (7,26), adequate time for adaptation to a new way of life and a new way of excretion (28). Similarly, our study reported that patients who have no problems around the ostomy adapt well. In our study, when the ostomy characteristics and patient adaptation were examined, it was observed that peristomal complications affect adaptation with ostomy. Peristomal complications reduce the quality of life by affecting the patient both physically and psychologically. As a result, the patient's ostomy adaptation decreases.

In terms of the association of the ostomy characteristics with patient adaptation, the duration, area and type of ostomy, preoperative ostomy marking, operation type, and the reason for ostomy creation were not associated with adaptability in this study. Adapting to an intestinal ostomy may take patients an extended time after surgery since becoming integrated with their new bodies and getting used to physical changes are quite hard (7,8,29). Ostomy duration, one of the criteria of the patients participating in the study, was set at at least two months. This period was preferred for determining adaptability and sleep quality in the patient group since it is desired that problems in the early post-operative period decrease, the wound site heals, and patients take responsibility for ostomy care themselves (30).

The patients' mean sleep quality scale score was found close to eight. A scale score of five and over indicates an impairment in sleep quality (16,21). Ostomy patients

participating in the study had a diminished sleep quality and woke frequently at night. Sleep, one of the basic needs of life, is crucial for the maintenance of physiological and psychological wellness (23). Several studies indicated that sleep quality is impaired in patients with an ostomy (31,32). In these patients, tiredness and immune system problems may occur, and the ability to fight diseases and complications becomes weakened (18-20,31,32). Thus, some symptoms may occur due to sleep deprivation, which means that nurses and healthcare staff should evaluate patients' sleep needs more closely.

The patient's age, gender, education level, and place of residence were not associated with sleep quality. In addition, there was no statistical difference between the ostomy area, ostomy type, ostomy duration of the patients, operation type, the reason for ostomy creation, and the quality of sleep. The sleep quality was generally poor in all patients. In their studies, Vorbeck et al. (19), Ceylan and Vural (18), Furukawa and Morioka (20) Avci Işık et al. (31) and Wu et al. (32) also reported sleep disorders in ostomy patients. This study found that patients experiencing problems on and around the ostomy had worse sleep quality. This indicated that patients were sacrificing and relinquish their sleep to avoid ostomy problems. It can be stated that both the ostomy itself and the ostomy bag treatment impair sleep quality.

In this study, a moderate positive relationship was observed between ostomy compliance and the sleep quality of the patients, and sleep quality predicted ostomy compliance at a rate of 27%. This result indicated that about a quarter of adjustment problems were caused by sleep. The findings indicate that sleep quality affects ostomy adaptation by 27%, and ostomy adaptation is also influenced by other factors. Previous studies found that problems on and around the ostomy could negatively affect patients' quality of life and psychological state (24,26,27,33,34). Patients may have difficulty accepting an ostomy socially and psychologically if they have negative emotions toward the created ostomy. These problems increase anxiety and cause pain and discomfort, which can affect adaptation to the ostomy by ruining patients' comfort.

Nurses and other healthcare professionals should provide the necessary support for patients with ostomy to adapt to their condition. First, it is important to determine the factors that will affect adaptation to ostomy. Nurses provide the necessary training about the preoperative and postoperative periods for individuals with ostomy to adapt (35). Nurses try to ensure adaptation by providing

post-discharge care to patients with ostomy, information, consultancy services, ensuring continuity of care, building self-confidence in the patient, and empowering individuals to care for themselves (36). It is a time-consuming process for an individual to adapt to life with an ostomy. Individuals who are aware of the changes that ostomy will create in their body and their lifestyle and who can care for their ostomy will have an easier time adapting to life with an ostomy (35). Çevik et al. (37) determined that patients who had information about ostomy opening in the preoperative period had better adaptation to the ostomy than those who did not. Aminisani et al. (38) found that the compliance rate was higher in individuals who received adequate training on ostomy care than in those who did not. For this reason, patients should receive training on ostomy and be given social support. Nurses and other healthcare professionals need to evaluate the psychological and physiological dimensions of ostomy symptoms (39).

They must also assess the sleep needs of ostomy patients. Knowing the physiology of sleep and the factors that cause sleep problems will enable them to evaluate the sleep quality of their patients and to plan nursing care (40). Although patients could adjust to the ostomy, nurses should consider their sleep needs. According to the results of this study, nurses should be aware of the possibility of a relationship between ostomy adaptation and sleep quality, especially during follow-up of the patients, so that appropriate care can be provided.

### Study Limitations

A major limitation of this study was that the sample included 45 individuals from one institution. The cross-sectional data reflected the participants' attitudes within a specific period. Therefore, longitudinal and qualitative studies are required to substantiate the results.

## Conclusion

This study indicated that the sleep quality of the patients with intestinal ostomy was poor. Patients reported a moderate level of ostomy adaptation. Adaptation to the ostomy does not necessarily indicate better sleep quality. The results of the present study are important in that it revealed that the patients who adapt well to ostomy may also experience sleep problems.

### Ethics

**Ethics Committee Approval:** Ethical consent was obtained from Tokat Gaziosmanpaşa University Scientific Ethics

Committee (17-KEK-117, date: 01.08.2017) written consent was obtained from the University Hospital. The study complied with the Helsinki Declaration.

**Informed Consent:** Written and verbal consent was obtained from all patients.

## Footnotes

## Authorship Contributions

Concept: Ş.E., İ.O., A.A., Design: Ş.E., İ.O., A.A., Data Collection or Processing: Ş.E., İ.O., A.A., Analysis or Interpretation: Ş.E., İ.O., A.A., Literature Search: Ş.E., İ.O., A.A., Writing: Ş.E., İ.O., A.A.

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