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## Determining the Difficulties Experienced by Patients in Activities of Daily Living After Appendectomy: A Prospective Observational Study<sup>1</sup>

### Apendektomi Sonrası Hastaların Günlük Yaşam Aktivitelerinde Yaşadıkları Güçlüklerin Belirlenmesi: Prospektif Gözlemsel Bir Çalışma

Gamze BOZKUL<sup>2</sup> , Hülya BULUT<sup>3</sup> 

**Yazarların ORCID numaraları / ORCID IDs of the authors:**  
G.B. 0000-0002-7509-9741; H.B. 0000-0001-8241-989X

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<sup>2</sup>Tarsus University, Faculty of Health Sciences, Nursing Department, Mersin

<sup>3</sup>Gazi University, Faculty of Nursing, Nursing Department, Ankara

**Sorumlu yazar / Corresponding author:** Gamze BOZKUL,  
E-posta: gamze.bozkul@gmail.com

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#### ABSTRACT

**Introduction:** Appendectomies are among the most frequently performed emergency surgical procedures and patients often encounter difficulties in performing activities of daily living.

**Aim:** The aim of this study was to determine the difficulties experienced by patients after appendectomy.

**Method:** A total of 60 patients who underwent an appendectomy were included in the study was conducted. The data of the study were collected using Personal Information Form and the Effect of the Surgery on the Patients' Daily Life Activities form. Descriptive statistical methods, Mann Whitney U, and Friedman tests were used to evaluate the data.

**Results:** After appendectomy surgery, patients experienced difficulties in performing activities of daily living and these difficulties were higher in the first two weeks but decreased statistically significantly over time ( $p < 0.05$ ). Postoperative nausea and vomiting  $0.53 \pm 1.2$ , pain during mobilization  $4.07 \pm 1.41$ , loss of appetite  $0.7 \pm 1.26$ , discomfort at the wound site  $1.47 \pm 1.78$ , and the desire to hide the wound  $0.4 \pm 1.07$  were more common in the female patients than in the male patients after the appendectomy. In addition, patients who underwent open appendectomy experienced more postoperative difficulty ( $p < 0.05$ ).

**Conclusion:** From the results of the study, the patients undergoing appendectomy experienced difficulties. It is recommended that patients who have undergone an appendectomy be followed up by phone and provided counseling after discharge in order to prevent the potential difficulties they may experience.

**Keywords:** Appendectomy; difficulty; nursing; postoperative period.

#### ÖZ

**Giriş:** Apendektomiler en sık uygulanan acil cerrahi prosedürler arasındadır ve hastalar günlük yaşam aktivitelerini yerine getirmede sıklıkla güçlüklerle karşılaşır.

**Amaç:** Bu çalışmanın amacı hastaların apendektomi ameliyatı sonrası yaşadıkları güçlükleri belirlemektir.

**Yöntem:** Çalışmaya apendektomi geçiren toplam 60 hasta dahil edildi. Çalışmanın verileri Hasta Tanıtıcı Bilgiler Formu ve Ameliyatın Hastaların Günlük Yaşam Aktiviteleri Üzerindeki Etkisi Formu kullanılarak toplandı. Verilerin değerlendirilmesinde tanımlayıcı istatistiksel yöntemler, Mann Whitney U ve Friedman testleri kullanıldı.

**Bulgular:** Apendektomi ameliyatı sonrası hastalar günlük yaşam aktivitelerini gerçekleştirirken güçlük yaşamıştır ve bu güçlükler ilk iki hafta daha yüksekken zaman içinde istatistiksel olarak anlamlı şekilde azalmıştır ( $p < 0,05$ ). Apendektomi ameliyatı sonrasında bulantı ve kusma  $0,53 \pm 1,2$ , mobilizasyon sırasında ağrı  $4,07 \pm 1,41$ , iştahsızlık  $0,7 \pm 1,26$ , yara yerinde rahatsızlık  $1,47 \pm 1,78$  ve yarayı gizleme isteği  $0,4 \pm 1,07$  kadın hastalarda erkek hastalara kıyasla daha yaygındır. Ayrıca, açık apendektomi geçiren hastalar ameliyat sonrası daha fazla güçlük yaşamıştır ( $p < 0,05$ ).

**Sonuç:** Çalışmanın sonuçlarına göre, apendektomi geçiren hastalar güçlükler yaşamıştır. Apendektomi geçiren hastaların yaşayabilecekleri olası güçlükleri önlemek için taburcu olduktan sonra telefonla takip edilmeleri ve danışmanlık verilmesi önerilmektedir.

**Anahtar Kelimeler:** Apendektomi; hemşirelik; postoperatif dönem; zorluk



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## Introduction

Appendicitis is the most common cause of acute abdominal the surgery; incidence is approximately 233/100,000 people per year. In the United States, 250,000 diagnoses of appendicitis per year with the most frequently performed abdominal surgery is appendectomy (Addiss, Shaffer, Fowler & Tauxe, 1999). Kırman et al. (2022) in their study examined 37,196 acute appendicitis cases in 10 hospitals and found that the incidence and incidence rate of acute appendicitis tended to increase over the years.

An appendectomy is the surgical removal of the appendix. It's a common emergency (Becker, Fichtner-Feigl & Schilling, 2018). Surgery that's performed to treat appendicitis, an inflammatory condition of the appendix, unlike other surgical procedures other than emergency surgery, individuals who require an appendectomy have no time to prepare for the surgery and thereby, experience more stress. In addition, after going through this unexpected surgery, patients are discharged home within a short period of time following the surgery, which creates a sense of uncertainty in them about what to expect in terms of the healing process.

After an appendectomy, it is common for patients to experience problems in performing their daily activities, and their quality of life tends to decrease (Bozkul & Bulut, 2018; Kalas, Akhtar, Khan & Altaf, 2019; Alsoueni, Mohammed, Nawar & Ali, 2020). The relevant literature shows that the difficulties experienced by patients after undergoing an appendectomy include pain (Alsoueni et al., 2020), movement problems (Kumar, Jalan, Patowary & Shrestha, 2016), and postoperative nausea and vomiting (Haripriya & Baghel, 2020).

There are many studies in the literature that have addressed the postoperative problems experienced by patients who have undergone abdominal surgery and their effects on daily life activities. The reported problems experienced include pain and discomfort at the wound site, especially when coughing and taking deep breaths, pain when walking/moving, postoperative nausea and vomiting, loss of appetite, fatigue, difficulty engaging in various activities, like walking, climbing stairs (Aydoğdu & Yılmaz, 2020), feeling troubled with incision site (Rafiq & Khan, 2016), communication, personal cleaning-clothing, sex life, sleep (Zümrüt Acar & Yıldız Fındık, 2021).

Although appendectomy is a simple surgical operation, patients experience complications even if they have different rates in the postoperative period. This condition negatively affects the quality of daily life activities of people in the postoperative period. Koumarelas et al. (2014), in their study to determine the quality of life after appendectomy and to examine the factors affecting it, significant improvements were encountered in the generic and physical function indices 15 days after surgery. However, this study design, similar to ours, does not aim to compare surgical techniques in the patient group who will undergo appendectomy surgery. Studies on appendectomy in the literature largely involve comparison of the surgical methods. In these studies, limited postoperative complications were compared according to the surgical method (Koumarelas et al., 2014; Çelik & Erbil, 2019; Kalas et al., 2019; Alsoueni et al., 2020; Deshmukh & Pawar,

2020; Haripriya & Baghel, 2020). In the literature review, there were no studies found that had been conducted in Turkey or other countries that specifically determined the difficulties experienced affecting their daily lives in the postoperative period by patients who underwent an appendectomy. This study, therefore, aims to identify the difficulties experienced in the postoperative period by patients who have had an appendectomy for the purpose of reducing and resolving these difficulties. Moreover, the results of this study will contribute to the nursing literature by providing important information that can be applied to shorten the period of time it takes for patients to return to their normal daily lives.

In this study, appendectomy was chosen because it is one of the most urgent and frequently performed surgical interventions, there is no surgical preparation as in all emergencies, and the patients are discharged early in the postoperative period.

## Aim

The aim of this study was to determine the difficulties patients experience after undergoing an appendectomy.

## Research Question

The research questions of this study are;

- "What are the difficulties experienced by patients who underwent appendectomy surgery within 30 days after surgery?"

- "How is the change in the difficulties experienced by patients who underwent appendectomy surgery within 30 days after surgery?"

## Method

### Study Design

This study was conducted using a prospective observational research design. We adopted a prospective observational design to evaluate the difficulties experienced by patients in activities of daily living after appendectomy.

### Setting

The study population consisted of patients who underwent appendectomy in the General Surgery services of a hospital in 2021.

### Research Population and Sample

The population of the study consisted of patients who had an appendectomy in the General Surgery services of a hospital in 2021. The study sample included patients who had an appendectomy at the General Surgery Clinics between February 1, 2021 and May 31, 2021 and were 18 years of age and older, had no cognitive disorders and/or mental disabilities, could understand and speak Turkish, were not pregnant, had no positive Covid-19 test, and agreed to voluntarily participate in the study were included in the study. It is thought that the number of patients and the number of surgeries decreased due to the fact that the hospital where the study was conducted is one of the Covid-19 centers.

Depending on the decrease in the number of appendectomy

operations, power analysis was performed when the number of patients participating in the study was 60, and the power level was found to be 100% with a 5% margin of error and an effect size of  $2.53 \pm 0.80$  over the pain parameter in the operation area at 5 different times in 60 patients, and the study was completed with 60 patients. Patients who had both open and laparoscopic appendectomy surgery techniques were included in the study. All appendectomy surgeries were performed under general anesthesia. Antiemetics is used for postoperative nausea and vomiting, and paracetamol is used for postoperative pain in the hospital where the research was conducted. Written discharge training is not given to the patients in the hospital where the study was conducted, verbal information is provided. No formal education is given about the difficulties that patients will experience while being discharged. After discharge, patients are informed that they should apply to the hospital where they were operated in case of emergency.

### Data Collection Tools

The data of the study were collected using a personal information form and the Effect of the Surgery on the Patients' Daily Life Activities form, both of which were prepared by the researcher based on the literature (Karahan, Kav, Abbasoğlu, Doğan & Tepe, 2010; Atasayar & Guler Demir, 2019; Licari et al., 2019; Aydoğdu & Yılmaz, 2020).

The personal information form includes 12 questions on the patients' sociodemographic, type of surgery, chronic diseases, previous surgeries and difficulties experienced after undergoing an appendectomy.

The Effect of the Surgery on the Patients' Daily Life Activities form includes 30 questions on the difficulties experienced by patients in the postoperative period under the headings of pain, nutrition, daily activity, movement/mobilization, social life, sleep, and body image.

The parameters of "taking a bath, going up and down stairs, doing heavy housework, exercising, driving, going to work, performing social activities" having difficulty were not evaluated on the day of discharge of the patients. In addition, there are differences in the parameter "going to work". Although an average of 7-10 days were reported after appendectomy in our country, the evaluation changed according to the start of the sample group's work. These difficulties experienced were evaluated using a numerical scale, where the patients' level of difficulty in each parameter is evaluated on a scale of 0 ("I had no difficulty") to 10 ("I had the worst possible difficulty").

Opinions from experts in the field of surgical diseases nursing were received prior to the study to confirm the content and clarity of the forms to be used in the research. A pilot study was conducted from February 1 - 28, 2021 with 10 patients who underwent an appendectomy in order to assess the comprehensibility of the forms revised forms based on the opinions of five experts. The results of the pilot study indicated that no changes to the data collection forms were necessary; therefore, the data derived from the patients in the pilot study were included in the study analysis.

### Ethical Consideration

The study was conducted in accordance with the Principles of the Declaration of Helsinki. Prior to conducting the research, institutional permission (numbered E.22075), permission from the Department of General Surgery (numbered E.20920) and Gazi University Measurement and Evaluation Ethics Sub-Working Group ethical approval (Date: 14.07.2020 and Issue: E.73235) were obtained. The patients were informed about the aim of the study and they provided verbal and written consent to participate.

### Data Collection

Before conducting the study, the purpose of the study was explained to the patients ( $n = 60$ ), and their verbal and written consent to participate was obtained. The data of the study were collected by the researcher in two stages.

In the first stage, observing the clinical infection prevention instructions, the researcher filled out the personal information form and the Effect of the Surgery on the Patients' Daily Life Activities form face-to-face with the patients who met the inclusion criteria in their assigned rooms on the day of discharge.

In the second stage, using the contact information provided by the patients during the face-to-face interviews conducted with them, the patients were contacted by phone in the 1st, 2nd, 3rd and 4th weeks after the surgery to re-evaluate the difficulties they reported to have experienced according to their responses to the Effect of the Surgery on the Patients' Daily Life Activities form.

The first face-to-face interview with the patients when they were discharged took an average of 25-30 minutes, and the phone interview with the patients in the 1st and 2nd weeks after the surgery lasted for an average of 10-15 minutes. Due to the decrease in the problems experienced by the patients in the 3rd and 4th weeks after the surgery, the duration of phone calls decreased and the interviews lasted 5-10 minutes on average. During phone follow-ups, the researcher directed patients to health institutions when necessary (postoperative complications such as wound infection, pathology results, etc.). No patient was hospitalized again.

### Data Analysis

The data obtained from the data collection forms were transferred to the computer environment by the researcher. Statistical analysis of the data was carried out using SPSS 23.0 (Statistical Package for the Social Sciences) software.

To evaluate the study data, frequency distribution (number, percentage) was used to present the categorical variables, while mean, standard deviation, median, and 1st and 3rd quartile values were used to present the numerical variables. The data were not normally distributed; therefore, non-parametric tests were used. Kolmogorov Smirnov test was used to show that it is not normally distributed. Differences between the groups were analyzed using the Mann Whitney U test. The changes over time were analyzed using the Friedman test. A value of  $p < 0.05$  was accepted as statistical significance.

## Results

### Descriptive Characteristics

The descriptive characteristics of the patients are given in Table 1, where it shows that the mean age of the patients was 33.80 ± 12.57, 50% were female, 76.7% had graduated from high school or higher education, 70% were of normal weight, 55% were actively employed in a job, 31.7% had had a surgery before, and 91.7% stayed in the hospital for 1 day after the operation.

Furthermore, 75% of the patients underwent appendectomy using the laparoscopic method, while the rest (25%) underwent appendectomy using the open method.

### Postoperative Difficulties Experienced by the Patients in 30 Days After Surgery

Table 2 shows the postoperative difficulties experienced by the patients and the changes in these difficulties over time. The patients were found to have experienced postoperative problems corresponding to all the items evaluated on Table 2.

The mean ± sd values associated with the exercising 0.22 ± 0.94 (1st week) and driving 0.08 ± 0.41 difficulties, decrease in sleep time 0.65 ± 1.48 (on the day of discharge), and desire to hide the wound site 0.28 ± 0.99 (2nd week), that the patients reported after undergoing an appendectomy did not statistically significantly differ over time ( $p > 0.05$ ).

However, the mean ± sd values associated with pain experienced at the surgical site 4.58 ± 1.39 (on the day of discharge), 2.73 ± 1.04 (1st week), 1.8 ± 0.9 (2nd week), 0.77 ± 0.91 (3rd week), during movement in bed 3.73 ± 1.46 (on the day of discharge), 1.83 ± 1.43 (1st week), while self-dressing 2.77 ± 1.86, during mobilization 3.68 ± 1.55 (on the day of discharge), 1.8 ± 1.25 (1st week) and when performing personal hygiene 1.02 ± 1.67 (on the day of discharge), postoperative nausea and vomiting 0.62 ± 1.56 (on the day of discharge), loss of appetite 0.98 ± 1.73 (on the day of discharge), eating 0.15 ± 0.82 (on the day of discharge), brushing teeth 0.63 ± 1.46 (on the day of discharge), combing hair 0.63 ± 1.52 (on the day of discharge), bathing 0.62 ± 1.3 (1st week), self-dressing 2.63 ± 1.96, going to the toilet 0.95 ± 1.62 (on the day of discharge), moving in bed 3.35 ± 1.34 (on the day of discharge), 1.67 ± 1.36 (1st week), mobilization 3.5 ± 1.35 (on the day of discharge), 1.68 ± 1.19 (1st week), going up and down stairs 0.35 ± 0.84 (1st week), doing heavy housework 0.62 ± 1.38 (1st week), going to work 0.15 ± 0.62 (1st week), performing social activities 0.37 ± 0.94 (1st week), falling asleep 0.3 ± 1.06 (on the day of discharge), and waking up from sleep 1.18 ± 1.73 (on the day of discharge) and with longer sleep durations 0.63 ± 1.58 (on the day of discharge) and disturbed by wound mark 1.3 ± 1.69 (1st week) statistically significantly decreased over time ( $p < 0.05$ ).

### Difficulties Experienced by the Patients According to Gender After Appendectomy

Table 3 shows the evaluation of the patients according to their descriptive characteristics and the difficulties they experienced. Postoperative nausea and vomiting 0.53 ± 1.2 (1st week), pain during mobilization 4.07 ± 1.41 (on the day of discharge), loss of appetite 0.7 ± 1.26 (1st week), disturbed by wound mark 1.47 ±

**Table 1: Descriptive Characteristics of the Patients (n = 60)**

	M ± SD	Med
<b>Age (years)</b>	33.80 ± 12.57	30.5
	<b>n</b>	<b>%</b>
<b>Gender</b>		
Female	30	50.0
Male	30	50.0
<b>Educational level</b>		
Non-literate	4	6.6
Primary school	10	16.7
High school and university	46	76.7
<b>Body mass index</b>		
Underweight	1	1.6
Normal weight	42	70.0
Overweight	13	21.7
Obese	4	6.7
<b>Employment status</b>		
Employed	33	55.0
Unemployed	27	45.0
<b>Living situation</b>		
Live alone	8	13.3
Live with someone	52	86.7
<b>Income level</b>		
Income is equal to expenses	50	83.3
Income is higher than expenses	10	16.7
<b>History of a previous operation</b>		
Yes	19	31.7
No	41	68.3
<b>Chronic diseases</b>		
Yes	41	68.3
No		
<b>Duration of hospital stay (day)</b>		
1	55	91.7
2 and over	5	8.3
<b>Operation type</b>		
Open	15	25.0
Laparoscopic	45	75.0

M: Mean; SD: Standard Deviation; Med: Median.

1.78 (3rd week) and the desire to hide the wound site 0.4 ± 1.07 (1st week) were more common in the female patients than in the male patients after the appendectomy.

### Difficulties Experienced by the Patients According to Operation Type After Appendectomy

The patients who underwent an open appendectomy tended to have more pain at the wound site 6.33 ± 1.06 (on the day of discharge), 0.8 ± 0.86 (4th week), during movement in bed 4.33 ± 1.91 (on the day of discharge), 0.33 ± 0.82 (4th week), self-dressing 4.87 ± 1.64 (on the day of discharge), 0.47 ± 0.99 (3rd week)

**Table 2: Distribution of the Difficulties Experienced by the Patients on the Day of Discharge and in the 1st, 2nd, 3rd and 4th Week After Appendectomy (n = 60)**

Difficulties	On the day of discharge M ± SD Med (Quartile Value)	1st week M ± SD Med (Quartile Value)	2nd week M ± SD Med (Quartile Value)	3rd week M ± SD Med (Quartile Value)	4th week M ± SD Med (Quartile Value)	Statistical analysis p <sup>†</sup>
<b>Pain</b>						
At the surgical site	4.58 ± 1.39 4 (4-5)	2.73 ± 1.04 3 (2-3)	1.8 ± 0.9 2 (1-2)	0.77 ± 0.911 (0-1)	0.33 ± 0.660 (0-0.5)	0.000*
While moving in bed	3.73 ± 1.46 3 (3-5)	1.83 ± 1.43 2 (1-3)	0.78 ± 1.12 0 (0-1)	0.28 ± 0.74 0 (0-0)	0.12 ± 0.560 (0-0)	0.000*
During mobilization	3.68 ± 1.55 3 (3-4)	1.8 ± 1.25 2 (1-3)	0.7 ± 0.94 0 (0-1)	0.17 ± 0.56 0 (0-0)	0.05 ± 0.22 0 (0-0)	0.000*
While getting dressed	2.77 ± 1.86 3 (2-4)	0.85 ± 1.29 0 (0-2)	0.3 ± 0.85 0 (0-0)	0.12 ± 0.52 0 (0-0)	0.02 ± 0.13 0 (0-0)	0.000*
While performing personal hygiene	1.02 ± 1.67 0 (0-2)	0.18 ± 0.62 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0.000*
<b>Nutrition</b>						
Eating	0.15 ± 0.82 0 (0-0)	0.13 ± 0.47 0 (0-0)	0.03 ± 0.18 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0.024*
Postoperative nausea and vomiting	0.62 ± 1.56 0 (0-0)	0.3 ± 0.91 0 (0-0)	0.23 ± 0.77 0 (0-0)	0.07 ± 0.36 0 (0-0)	0 ± 0 0 (0-0)	0.001*
Loss of appetite	0.98 ± 1.73 0 (0-2)	0.4 ± 0.98 0 (0-0)	0.1 ± 0.4 0 (0-0)	0.07 ± 0.36 0 (0-0)	0 ± 0 0 (0-0)	0.000*
<b>Daily Activity</b>						
Brushing teeth	0.63 ± 1.46 0 (0-0)	0.08 ± 0.33 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0.000*
Combing hair	0.63 ± 1.52 0 (0-0)	0.08 ± 0.33 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0.000*
Taking a bath	‡	0.62 ± 1.3 0 (0-0)	0.1 ± 0.44 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0.000*
Self-dressing	2.63 ± 1.96 2 (2-4)	0.58 ± 1.06 0 (0-1)	0.22 ± 0.67 0 (0-0)	0.08 ± 0.38 0 (0-0)	0 ± 0 0 (0-0)	0.000*
Going to the toilet	0.95 ± 1.62 0 (0-2)	0.2 ± 0.71 0 (0-0)	0.03 ± 0.26 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0.000*
<b>Movement / Mobilization</b>						
Movement in bed	3.35 ± 1.34 3 (3-4)	1.67 ± 1.36 2 (0.5-2.5)	0.77 ± 1.01 0 (0-1)	0.23 ± 0.67 0 (0-0)	0.08 ± 0.42 0 (0-0)	0.000*
Mobilization	3.5 ± 1.35 3 (3-4)	1.68 ± 1.19 2 (1-2)	0.68 ± 0.97 0 (0-1)	0.23 ± 0.65 0 (0-0)	0.07 ± 0.31 0 (0-0)	0.000*
Going up and down stairs	‡	0.35 ± 0.84 0 (0-0)	0.12 ± 0.49 0 (0-0)	0.05 ± 0.29 0 (0-0)	0.05 ± 0.39 0 (0-0)	0.000*
Doing heavy housework	‡	0.62 ± 1.38 0 (0-0)	0.8 ± 1.46 0 (0-1)	0.48 ± 1.03 0 (0-0)	0.33 ± 0.9 0 (0-0)	0.000*
Exercising	0.05 ± 0.39 0 (0-0)	0.22 ± 0.94 0 (0-0)	0.23 ± 0.89 0 (0-0)	0.12 ± 0.52 0 (0-0)	0 ± 0 0 (0-0)	0.050
<b>Social Life</b>						
Driving (n = 24)	‡	0.08 ± 0.41 0 (0-0)	0 ± 0 0 (0-0)	0 (0-0)	0 ± 0 0 (0-0)	0.406
Going to work (n = 33)	‡	0.15 ± 0.62 0 (0-0)	1.12 ± 1.76 0 (0-2)	0.48 ± 1.3 0 (0-0)	0.09 ± 0.52 0 (0-0)	0.000*
Performing social activities	‡	0.37 ± 0.94 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0.000*
<b>Sleep</b>						
Falling asleep	0.3 ± 1.06 0 (0-0)	0.13 ± 0.47 0 (0-0)	0.02 ± 0.13 0 (0-0)	0 ± 0 0 (0-0)	0 ± 0 0 (0-0)	0.010*
Waking up frequently	1.18 ± 1.73 0 (0-3)	0.72 ± 1.46 0 (0-0)	0.37 ± 0.97 0 (0-0)	0.3 ± 0.98 0 (0-0)	0.17 ± 0.67 0 (0-0)	0.000*
Decrease in sleep time	0.65 ± 1.48 0 (0-0)	0.58 ± 1.36 0 (0-0)	0.28 ± 0.9 0 (0-0)	0.43 ± 1.16 0 (0-0)	0.25 ± 0.73 0 (0-0)	0.054
Increase in sleep time	0.63 ± 1.58 0 (0-0)	0.45 ± 1.25 0 (0-0)	0.18 ± 0.79 0 (0-0)	0.17 ± 0.67 0 (0-0)	0.13 ± 0.62 0 (0-0)	0.009*
<b>Body Image</b>						
Disturbed by wound mark	0.43 ± 1.39 0 (0-0)	1.3 ± 1.69 0 (0-2)	1.33 ± 1.73 0 (0-3)	0.95 ± 1.58 0 (0-2)	0.75 ± 1.36 0 (0-1)	0.000*
Desire to hide wound site	0.05 ± 0.39 0 (0-0)	0.2 ± 0.78 0 (0-0)	0.28 ± 0.99 0 (0-0)	0.17 ± 0.67 0 (0-0)	0.12 ± 0.52 0 (0-0)	0.086

M: Mean; Med: Median; SD: Standard Deviation; †p:Friedman test; ‡The patients were not evaluated because they could not perform this activity on the day of discharge; \*p &lt; 0.05.

**Table 3: Distribution of the Difficulties Experienced by the Patients on Gender After Appendectomy (n = 60)**

Gender	Postoperative nausea and vomiting		Loss of appetite	Pain during mobilization	Disturbed by wound mark				Desire to hide wound site
	1st week M ± SD Med (Quartile Value)	2nd week M ± SD Med (Quartile Value)	1st week M ± SD Med (Quartile Value)	On the day of discharge M ± SD Med (Quartile Value)	1st week M ± SD Med (Quartile Value)	2nd week M ± SD Med (Quartile Value)	3rd week M ± SD Med (Quartile Value)	4th week M ± SD Med (Quartile Value)	1st week M ± SD Med (Quartile Value)
Woman	0.53 ± 1.2 0(0-0)	0.47 ± 1.04 0(0-0)	0.7 ± 1.26 0(0-1)	4.07 ± 1.41 4(3-4)	2.03 ± 1.83 2(0-3)	1.97 ± 1.9 2(0-3)	1.47 ± 1.78 0(0-3)	1.23 ± 1.65 0(0-3)	0.4 ± 1.07 0(0-0)
Man	0.07 ± 0.37 0(0-0)	0 ± 0 0(0-0)	0.1 ± 0.4 0(0-0)	3.3 ± 1.6 3(2-4)	0.57 ± 1.17 0(0-0)	0.7 ± 1.29 0(0-2)	0.43 ± 1.17 0(0-0)	0.27 ± 0.74 0(0-0)	0 ± 0 0(0-0)
<b>Statistical Analysis p<sup>§</sup></b>	0.044*	0.011*	0.017*	0.016*	0.000*	0.004*	0.007*	0.007*	0.040*

M: Mean; Med: Median; SD: Standard Deviation; §: Mann Whitney U test; \*p < 0.05

and mobilization  $5.27 \pm 1.67$  (on the day of discharge),  $0.6 \pm 0.99$  (4th week) and had more difficulties taking a bath  $1.53 \pm 1.81$  (1st week), self-dressing  $4.33 \pm 2.16$  (on the day of discharge),  $0.33 \pm 0.72$  (3rd week), going to the toilet  $1.87 \pm 2.29$  (on the day of discharge), moving in bed  $4.33 \pm 1.91$  (on the day of discharge),  $0.33 \pm 0.82$  (4th week), mobilization  $4.6 \pm 1.64$  (on the day of discharge),  $0.27 \pm 0.59$  (4th week) and going to work  $1.86 \pm 2.34$  (3rd week), disturbed by wound mark  $2.33 \pm 1.99$  (1st week) and they also woke up more frequently during night sleep  $2.33 \pm 1.88$  (on the day of discharge) ( $p < 0.05$ ).

## Discussion

It is known that most operated patients have some difficulties/experiences both in the hospital in the early postoperative period and at home in the post-discharge period. Since appendectomies by their nature are emergency surgical interventions, this patient group cannot receive effective preoperative nursing care and is not prepared for the operation process.

The short hospital stay of the patients after the operation also creates a basis for them to have difficulties at home. Surgery, whether major or minor, is an invasive procedure and affects the individual both physiologically, psychologically and socially (Powell et al., 2016). However, each surgical procedure may affect the life of the individual differently depending on its characteristics and location. Although there are studies examining the problems of patients undergoing abdominal surgery in the literature (Rafiq & Khan, 2016; Aydoğdu & Yılmaz, 2020; Seok et al., 2021), studies on the most common appendectomy surgery in abdominal surgery generally compare the surgical methods (Kumar et al., 2016; Alsoueni et al., 2020; Haripriya & Baghel, 2020). In this study, it was determined that patients who underwent appendectomy had difficulties affecting their daily living activities similar to those who underwent other abdominal surgery, and these difficulties decreased over time. The results from this study can serve as a good resource for the discharge planning of patients who undergo an appendectomy.

In the literature, only the study by Koumarelas et al. (2014) was found similar to our study's methods. Therefore, in discussion of our study, minor abdominal surgeries study such as hernia repair, cholecystectomy, laparoscopic gynecological surgeries were used.

At the same time, since the studies involving appendectomy surgery in the literature were mostly carried out according to the surgical method, these studies constituted the majority of the studies used in the current study.

Pain at the incision site is one of the most common complaints of patients who have undergone appendectomy (Ribeiro et al., 2014). The present study found that patients experienced pain at the incision site while moving in bed, during mobilization, while dressing, and while performing personal hygiene, but that their pain levels decreased significantly over time. In addition, patients who underwent appendectomy using the open method had higher levels of postoperative appendectomy pain than those who underwent appendectomy using the laparoscopic method. Similar to this study's results, two other studies in the literature reported that the level of pain experienced by patients after an open appendectomy is higher than that experienced after a laparoscopic appendectomy (Kalas et al., 2019; Alsoueni et al., 2020). Patients commonly experience pain at the incision site after minor and moderate surgical interventions, such as hernia repair, cholecystectomy, minor abdominal gynecological surgery, appendectomy etc. (Subramanian, Ramasamy, Ng, Chinna & Rosli, 2016; Best et al., 2018; Kehlet, 2018; Aydoğdu & Yılmaz, 2020). Due to this pain, patients undergoing these surgeries had difficulty turning from one side to the other in the bed, getting out of bed, and being mobile (Das & Deshpande, 2017; Aydoğdu & Yılmaz, 2020; Cachemaille et al., 2020; Svensson-Raskh, Schandl, Holdar, Fagevik Olsén & Nygren-Bonnier, 2020). The resulting inactivity from this pain causes a decrease in bowel movements, coughing difficulty, and, consequently, atelectasis (van Boekel et al., 2019; Kokotovic, Berkfors, Gögenur, Ekeloef & Burcharth, 2021). Therefore, as in all surgical interventions, when patients are discharged home after appendectomy, pain management should be reviewed, and patients should be educated on this issue.

It is not unusual for patients to experience difficulties in doing their daily activities as a result of the postoperative pain associated with appendectomies, particularly the pain at the incision site located in the abdominal region. A review of the literature showed that after outpatient surgery, patients have difficulties taking baths (Aydoğdu & Yılmaz, 2020), self-dressing (Karahan et al., 2010; Aydoğdu &

Yılmaz, 2020), going to the toilet (Karahan et al., 2010), and performing personal care (Nilsson, Jaensson, Dahlberg & Hugelius, 2019). As stated earlier, patients who underwent an open appendectomy were found to have more difficulties in performing daily life activities compared to those whose appendectomy was performed using the laparoscopic method.

In this study, patients experienced postoperative nausea and vomiting and loss of appetite in the postoperative period, but these problem decreased significantly over time. Previous studies have also found that, patients experience postoperative nausea and vomiting (Khadilkar, Panditrao & Inturi, 2020; Melese Ayele, 2021) and loss of appetite (Melese Ayele, 2021) In this study, postoperative nausea and vomiting, and loss of appetite were more common in the female patients. The relevant literature supports these findings, showing that female sex is a risk factor for post-appendectomy nausea and vomiting (Salazar-Parra et al., 2020; Melese Ayele, 2021). Postoperative nausea and vomiting not only cause dissatisfaction and discomfort in the patient but also affect their nutrition and fluid intake, which in turn, leads to fluid-electrolyte disorders and thus, prolongs of the healing process (Hofmann, Murray, Beck & Homann, 2017). Therefore, nurses should inform patients about this potential problem for side effects and advise them on the use of pharmacological and non-pharmacological methods to treat them, if necessary.

In the current study, the social life of the patients who underwent an appendectomy was affected in the postoperative period, and the 25% of patients who underwent an open appendectomy had more difficulty going to work. Previous studies have found that patients whose appendectomy was performed using the laparoscopic method were able to return to work faster (average 7-21 days) compared to that of patients whose surgery was performed using the open method (average 12- 33days) (Biondi et al., 2016).

The present study further found that the patients had problems with waking up frequently at night, difficulty falling asleep, and either decreased or increased sleep duration. Similar to the current study, Urbach, Harnish & Long (2005) reported in their study that 33% of the patients had difficulty falling asleep after abdominal surgery, while 62% of them woke up frequently. Postoperative sleep quality has been shown to be relatively low compared to that of preoperative quality of sleep (Su & Wang, 2018; Rampes, Ma, Divecha, Alam & Ma, 2019). Sleep quality is important in the early postoperative period insofar as patients need a good sleep for them to regain their health and to improve wound healing (Su & Wang, 2018). That is why it is crucial that that healthcare personnel advise patients on this issue before the patients are discharged.

In this study, the level of discomfort due to the postoperative wounds was found to be higher in the female patients and in the patients who had open appendectomy. The literature emphasizes that female sex is one of the factors that affects patients' postoperative satisfaction, particularly insofar as it impacts body image (Rafiq & Khan, 2016). The patients' reported feelings of discomfort especially in the first week after the surgery could be attributed to the fact that the sutures were still visible as this time, as substantiated by the decrease in level of discomfort seen in subsequent measures.

The results of our study suggest that, patients experience difficulty

up to 2-3 weeks of postoperative at home. According to our study results and observations, patients did not receive adequate discharge training in the postoperative period. Therefore, patient-specific discharge training should be given.

### Limitations

The present study has two important limitations. First, as the aim of the study was to specifically examine the early difficulties experienced by the patients after discharge from hospital, follow-up was limited to only the first four postoperative weeks. Second, the study was able to be conducted in only one hospital and due to the Covid-19 pandemic.

### Conclusion

In this study, in which the postoperative difficulties experienced by patients who had an appendectomy were determined by conducting face-to-face interviews with them and performing a 1-month follow-up from the day of their discharge, it was observed that the difficulties they experienced decreased significantly over time. Considering the difficulties experienced by patients after undergoing an appendectomy, it would be beneficial to conduct discharge training and patient follow-ups. Determining the difficulties experienced by patients who have undergone appendectomy will ensure that all health personnel, especially nurses, are better equipped to reduce the difficulties experienced by patients and their relatives after discharge and to identify and prevent post-operative complications that may develop in the early period, both of which will have the effect of improve patient outcomes.

**Ethical Considerations:** Ethics committee approval was received for this study from the Gazi University Measurement and Evaluation Ethics Sub-Working Group (Date: 14.07.2020 and Issue No: E.73235).

**Authors Contribution:** Study Idea (Concept) and Design - GB, HB; Data Collection / Literature Review - GB, HB; Data Analysis and Interpretation - GB,HB; Preparation of the Article - GB,HB; Approval of the Final Version to be Published - GB,HB.

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### References

- Addiss, D.G., Shaffer, N., Fowler, B.S., & Tauxe, R.V. (1990). The epidemiology of appendicitis and appendectomy in the United States. *Am Journal Epidemiol*, 132, 910-925. doi:10.1093/oxfordjournals.aje.a115734.
- Alsoueni, H., Mohammed, M., Nawar, A., & Ali, A.A. (2020). Laparoscopic appendectomy versus open appendectomy in young female patients. *Benha Medical Journal*, 37(1), 271-284. doi:10.21608/bmfj.2020.85868
- Atasayar, S., & Guler Demir, S. (2019). Determination of the Problems Experienced by patients post-thyroidectomy. *Clinical Nursing Research*, 28(5),615-635. doi:10.1177/1054773817729074.

- Aydođdu, Ö., & Yılmaz, Ü.D. (2020). Patient's experiences and difficulties at home following day surgery. *Türkiye Klinikleri Journal Nursing Science*, 12(1), 1-9. doi: 10.5336/nurses.2019-66571.
- Becker, P., Fichtner-Feigl, S., & Schilling, D. (2018). Clinical management of appendicitis. *Visceral Medicine*, 34(6), 453-458. doi:10.1159/000494883.
- Best, J.T., Musgrave, B., Pratt, K., Hill, R., Evans, C., & Corbitt, D. (2018). The impact of scripted pain education on patient satisfaction in outpatient abdominal surgery patients. *Journal of Perianesthesia Nursing*, 33(4), 453-460. doi: 10.1016/j.jopan.2016.02.014.
- Biondi, A., Di Stefano, C., Ferrara, F., Bellia, A., Vacante, M., & Piazza, L. (2016). Laparoscopic versus open appendectomy: a retrospective cohort study assessing outcomes and cost-effectiveness. *World Journal Emergency Surgery*, 11(1), 44. doi:10.1186/s13017-016-0102-5.
- Bozkul, G., & Bulut, H. (2018). *Apendektomi Cerrahisi Uygulanan Hastanın Hemşirelik Bakımı: Olgu Sunumu*. 6. International 17. National Nursing Congress, Ankara, Turkey. (Poster Statement). 787. (in Turkish)
- Cachemaille, M., Grass, F., Fournier, N., Suter, M. R., Demartines, N., Hübner, M., Blanc C. (2020). Pain Intensity in the first 96 hours after abdominal surgery: A Prospective cohort study. *Pain Medicine*, 21(4), 803-813. doi:10.1093/pm/pnz156.
- Çelik, Y., & Erbil, O.A. (2019). Comparison of complications of open and laparoscopic appendectomy. *Laparoscopic Endoscopic Surgical Sciences*, 26(1), 5-10. doi: 10.14744/less.2019.06332
- Das, N.T., & Deshpande, C. (2017). Effects of intraperitoneal local anaesthetics bupivacaine and ropivacaine versus placebo on postoperative pain after laparoscopic cholecystectomy: A randomised double-blind study. *Journal Clinical Diagnostic Research*, 11(7), UC08-UC12. doi:10.7860/JCDR/2017/26162.10188.
- Deshmukh, S.N., & Pawar, A.P. (2020). Open versus laparoscopic appendectomy: A prospective comparative study. *International Surgical Journal*, 7, 1122-6. doi: 10.18203/2349-2902.isj20201383.
- HariPriya, A., & Baghel, A. (2020). A comparative study of laparoscopic appendectomy versus open appendectomy for the treatment of acute appendicitis. *Journal of Advanced Medical and Dental Sciences Research*, 8(12), 42-45. doi: 10.21276/jamdsr.
- Hofmann, D., Murray, C., Beck, J., & Homann, R. (2017). Acupressure in management of postoperative nausea and vomiting in high-risk ambulatory surgical patients. *Journal of Perianesthesia Nursing*, 32(4), 271-278. doi: 10.1016/j.jopan.2015.09.010.
- Kalas, G.L., Akhtar, N., Khan, A.H., & Altaf, A. (2019). Early post-operative pain in Laparoscopic appendectomy versus open appendectomy. *Pakistan Journal Surgical*, 35(3), 201-04.
- Karahan, A., Kav, S., Abbasođlu, A., Dođan, N., & Tepe, A. (2010). Patients' experiences and difficulties in the home environment following day surgery. *Hemşirelikte Araştırma ve Geliştirme Dergisi*, 12(3), 38-48.
- Kehlet, H. (2018). Postoperative pain, analgesia, and recovery-bed-fellows that cannot be ignored. *Pain*, 159 (1), 11-16. doi: 10.1097/j.pain.0000000000001243.
- Khadilkar, R., Panditrao, A.A., & Inturi, R. (2020). A comparative study of laparoscopic appendectomy versus open appendectomy. *International Surgical Journal*, 7, 138-43.
- Kırman, Ü.N., Keser, B.N., Akten, H., Çolapokulu, N., Sürek, A., Erçetin, C., ... Alimođlu, O. (2022). Acute appendicitis in İstanbul: An 8-year retrospective cohort study. *Medical Journal Bakirkoy*, 18, 21-24.
- Kokotovic, D., Berkfors, A., Gögenur, I., Ekeloef, S., & Burcharth, J. (2021). The effect of postoperative respiratory and mobilization interventions on postoperative complications following abdominal surgery: a systematic review and meta-analysis. *European Journal of Trauma and Emergency Surgery*, 47(4), 975-990. doi:10.1007/s00068-020-01522-x.
- Koumarelas, K., Theodoropoulos, G.E., Spyropoulos, B.G., Bramis, K., Manouras, A., & Zografos, G. (2014). A prospective longitudinal evaluation and affecting factors of health-related quality of life after appendectomy. *International Journal of Surgery*, 12(8), 848-857. doi:10.1016/j.ijsu.2014.06.015.
- Kumar, S., Jalan, A., Patowary, B.N., & Shrestha, S. (2016). Laparoscopic appendectomy versus open appendectomy for acute appendicitis: A prospective comparative study. *Kathmandu University Medical Journal*, 14(55), 244-248.
- Licari, L., Guercio, G., Campanella, S., Scerrino, G., Bonventre, S., Tutino, R., ... Salamone, G. (2019). Clinical and functional outcome after abdominal wall incisional hernia repair: Evaluation of quality-of-life improvement and comparison of assessment scales. *World Journal Surgical*, 43(8), 1914-1920. doi:10.1007/s00268-019-05003-0
- Melese Ayele, W. (2021). Prevalence of postoperative unfavorable outcome and associated factors in patients with appendicitis: A cross-sectional study. *Open Access Emergency Medicine*, 13, 169-176. doi:10.2147/OAEM.S305905.
- Nilsson, U., Jaensson, M., Dahlberg, K., & Hugelius, K. (2019). Postoperative recovery after general and regional anesthesia in patients undergoing day surgery: A mixed methods study. *Journal of Perianesthesia Nursing*, 34(3), 517-528. doi: 10.1016/j.jopan.2018.08.003.
- Powell, R., Scott, N. W., Manyande, A., Bruce, J., Vögele, C., Byrne-Davis, ... Johnston, M. (2016). Psychological preparation and postoperative outcomes for adults undergoing surgery under general anaesthesia. *The Cochrane Database of Systematic Reviews*, (5), CD008646. doi:10.1002/14651858.CD008646.pub2
- Rafiq, M.S., & Khan, M.M. (2016). Scar pain, cosmesis and patient satisfaction in laparoscopic and open cholecystectomy. *Journal of the College of Physicians and Surgeons Pakistan*, 26 (3), 216-219.
- Rampes, S., Ma, K., Divecha, Y.A., Alam, A., & Ma, D. (2019). Postoperative sleep disorders and their potential impacts on surgical outcomes. *Journal Biomedical Research*, 34(4), 271-280. doi:10.7555/JBR.33.20190054.
- Ribeiro, M.D.C., Simone, J.C.C., Ramiro, T.H.S., Santos, V.S., Nunes M.S., & Alves, J.A.B. (2014). Pain in patients undergoing appendectomy. *Revista Dor. São Paulo*, 15(3), 198-201. doi: 10.5935/1806-0013.20140043.
- Salazar-Parra M., Guzman-Ramirez B.G., Pintor-Belmontes K.J., Barbosa-Camacho, F. J., Bernal-Hernández, A., Cruz-Neri, ... Gonzalez-Ojeda A. (2020). Gender differences in postoperative pain, nausea and vomiting after elective laparoscopic cholecystectomy. *World Journal Surgery*, 44(12), 4070-4076. doi:10.1007/s00268-020-05744-3.
- Seok, Y., Suh, E.E., Yu, S.Y., Park, J., Park, H., & Lee, E. (2021). Effectiveness of integrated education to reduce postoperative nausea, vomiting, and dizziness after abdominal surgery under general anesthesia. *International Journal Environment Research and Public Health*, 18(11), 6124. doi:10.3390/ijerph18116124.
- Su, X., & Wang, D.X. (2018). Improve postoperative sleep: What can we do? *Current Opinion Anaesthesiology*, 31(1), 83-88. doi:10.1097/ACO.0000000000000538.
- Subramanian, P., Ramasamy, S., Ng, K.H., Chinna, K., & Rosli, R. (2016). Pain experience and satisfaction with postoperative pain control among surgical patients. *International Journal Nursing Practice*, 22(3), 232-238. doi:10.1111/ijn.12363.
- Svensson-Raskh, A., Schandl, A., Holdar, U., Fagevik Olsén, M., & Nygren-Bonnier M. (2020). "I have everything to win and nothing to lose": Patient experiences of mobilization out of bed immediately after abdominal surgery. *Physical Therapy*, 100(12), 2079-2089. doi:10.1093/ptj/pzaa168.
- Urbach, D.R., Harnish, J.L., & Long, G. (2005). Short-term health-related quality of life after abdominal surgery: a conceptual framework. *Surgical Innovation*, 12(3), 243-247. doi:10.1177/155335060501200310.
- van Boekel, R.L.M., Warlé, M.C., Nielen, R.G.C., Vissers, K. C. P., van der Sande, R., Bronkhorst, E.M., ... Steegers M.A.H. (2019). Relationship between postoperative pain and overall 30-day complications in a broad surgical population: An observational study. *Annals of Surgery*, 269(5), 856-865. doi:10.1097/SLA.00000000000002583.
- Zümrüt Acar, E. & Yıldız Findik, Ü. (2021). The problems of the patients that after surgery living at home and post-surgery patients problems at home on illness perception. *Journal of Ege University Nursing Faculty*, 37 (3), 197-206 . doi: 10.53490/eghehemsire.943140