



EVALUATION OF CHANGE IN NUTRITION AFTER LAPAROSCOPIC CHOLECYSTECTOMY
LAPAROSKOPİK KOLESİSTEKTOMİ SONRASİBESLENMEDE DEĞİŞİMİN DEĞERLENDİRİLMESİ

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ABSTRACT

This prospective descriptive study was conducted to evaluate the changing nutritional habits of the patients who underwent laparoscopic cholecystectomy. The study was carried out on 76 patients between December 2019 and May 2021. The data were collected using Nutritional Habit Diagnosis Form by inter viewing the patients three months after surgery by telephone. While age and gender factors were found to affect nutritional habits after laparoscopic cholecystectomy, the rate of development of symptoms related to nutrition was statistically significant in female patients and active workers. At the first nutrition, patients with diarrhea had significantly more symptoms, while patients who lived regularly had significantly fewer symptoms. It was found that the symptoms increased with the consumption of processed meat products, full-fat cheese, vegetables such as onions, corn-peas, fruits such as oranges, snack foods, sauces such as mayonnaise-cream, and fried fatty foods. The study has demonstrated that it is important to question patients' preoperative nutritional habits and to provide training by nurses on their postoperative diet and risky foods that increase symptom development.

Keywords: Nutrition assessment, cholecystectomy, laparoscopy, gallstones

ÖZ

Bu prospektif tanımlayıcı çalışma, laparoskopik kole-sistektomi yapılan hastaların değişen beslenme alışkanlıklarını değerlendirmek amacıyla yapıldı. Çalışma Aralık 2019-Mayıs 2021 tarihleri arasında 76 hasta üzerinde gerçekleştirilmiştir. Veriler, ameliyattan üç ay sonra hastalarla telefonla görüşülerek 'Beslenme Alışkanlığı Tanılama Formu' kullanılarak toplanmıştır. Laparoskopik kole-sistektomi sonrası beslenme alışkanlıklarını yaş ve cinsiyet faktörlerinin etkilediği saptanırken, kadın hastalarda ve aktif çalışanlarda beslenmeye bağlı semptomların gelişme oranı istatistiksel olarak anlamlı farklılık gösterdi. İlk beslenmede, ishali olan hastalarda belirgin olarak daha fazla semptom görülürken, düzenli yaşayan hastalarda belirgin olarak daha az semptom görüldü. İşlenmiş et ürünleri, tam yağlı peynir, soğan, mısır-bezelye gibi sebzeler, portakal gibi meyveler, aperatif yiyecekler, mayonez-krema gibi soslar, kızarmış yağlı yiyeceklerin tüketimi ile semptomların arttığı bulundu. Çalışma, hastaların ameliyat öncesi beslenme alışkanlıklarının sorgulanmasının, hemşirelerin ameliyat sonrası diyetleri ve semptom gelişimini artıran riskli besinler konusunda eğitim vermelerinin önemli olduğunu göstermiştir.

Anahtar kelimeler: Beslenmenin değerlendirilmesi, kole-sistektomi, laparoskopi, safra taşı

INTRODUCTION

In patient with symptomatic gall stones, many studies demon stratethat cholecystectomy is one of the mostcommonly applied surgical procedures as the first option in the definitive treatment for removal of the gall bladder and that the number of cholecystectomy cases has increased (1-4). Cholecystectomy is also recommended to prevent the disease in a symptomatic gall stones (5).

However, problems such as pain, nausea, vomiting, gas, bloating, diarrhea and persistent pain in the right upper abdomen, reflux, indigestion, fatty food in tolerance, and heart burn are observed in the post-cholecystectomy period (6-8). It is reported that the lipid profile deteriorates, and weight gain increases after cholecystectomy (9).

In this regard, there is no standard guideline for nutrition after cholecystectomy. Only, it is seen in the literature that diet changes such as limiting fatin take, restricting excessive meal consumption, increasing fiber food intake, restricting the consumption of alcohol, caffeinated and carbonated drinks, chocolate, citrus type foods, fruit juices, coffee, vinegar sauce, onions, tomatoes, andspicyfoods; and decreasing meal portions can be made to prevent reflux(6).

Our review of literature has revealed that there are almost no studies on this subject in the worldand therefore we decided to examine absence or presence of a diversity in nutritional habits following cholecystectomy in our country (10).

On this subject, nostudies were found examining the differences in nutritional routines of patients who underwent laparoscopic cholecystectomy after surgical intervention. With this information, this study was conducted to evaluate changes after surgical intervention in the nutrition of patients who had laparoscopic cholecystectomy in general surgery clinics.

Research Questions

- 1) Do symptoms change after the first nutrition following laparoscopic cholecystectomy and after feeding in the third month?
- 2) Which symptoms were seen in patients according to food type?
- 3) What are the factors that increase the symptoms of patients after nutrition?

MATERIAL AND METHOD

Study Design

The study was a prospective descriptive study.

Sample

The study population consisted of patients who underwent cholecystectomy in two hospitals' general surgery services between December 2019 and May 2021. All the patients underwent laparoscopic cholecystectomy. Within the scope of the planned study, the calculation (d-value) method was performed to calculate the effect size to determine the sample size to be used in the 'evaluation of change in nutrition after laparoscopic cholecystectomy'. According to the study by Yalcintas (11), in which the effect size index d value was reported, for repeated measurements, a total of seventy participants was calculated with the G-powepackage program (version 3.1), in line with the specified criteria, with $d=0.35$, $\alpha=0.05$ (errormargin), $1-\beta=0.80$ (power). The

study was conducted with 76 people, considering the possible losses. The sample included 18-and-over- year-old patients who agreed to participate in the study and had had surgical intervention three months earlier. They were all contacted and had normal oral intake.

Data Collection

Data were collected from 76 patients. In the first stage, the information concerning the patients who underwent laparoscopic cholecystectomy was obtained. Patients who had surgical intervention three months previously were reached by phone. After obtaining written approval from the patients who were informed about the study, the Descriptive Characteristics Form (10,12,13) and the Nutritional Habit Diagnosis Form(6,12-14), which were created in the light of the literature, were answered by patients.

Data Collection Tools

Descriptive Characteristics Form: with this form prepared in the light of relevant literature consists of 27 items; thus, age, gender, height, weight, education level, marital status, employment status, number of pregnancies, chronic disease status, alcohol/cigarette habits, gallstone experiences, diet, and physical exercise status were examined. Also, it was questioned how long the gallstones had been present, whether there were individuals with removed gallbladder in the family, and whether there was a diet program followed (10,12,13).

Nutritional Habit Diagnosis Form: With this form, based on the literature, it was aimed to examine the physiological problems that occur against some foods consumed by individuals after laparoscopic cholecystectomy. In this form, when individuals were asked whether 17 different foods were consumed or not, there were 17 items asking about the symptoms experienced by the individuals when they consumed these foods. Each food was questioned by creating subheadings of nausea, vomiting, reflux, diarrhea, constipation, eructation, bloating, gas, pain, not consuming food, and no problems (6,12-14).

Statistical Analyses

SPSS (Statistical Package for the Social Sciences) 25.0 (IBMCorp., Armonk, NY, USA) program was used for statistical analysis in this study. Categorical variables were described by frequencies and percent ages. Mean and standard deviation were used to describe normally distributed continuous variables. Median was used to describe abnormally distributed variables. Kruskal Wallis H test and The Mann-Whitney U test were used to test the quantitative difference between the groups and Mc Nemar test was used to measure the difference between repeated measurements. Furthermore, Generalized Linear Model (Poisson Regression with log link) was used to determine the independent factors that increase the symptoms of the patients. The results were stated at the 95% confidence interval and the significance level was $p<0.05$.

Ethical Considerations

The data collection was initiated after obtaining the approval of Hospital Clinical Ethics Committee of the Medical Faculty Hospital of Istanbul University, (Protocol No: 1298/18, dated 13.11.2019) and the institutions. After obtaining approval to conduct the study, patients attending two general surgery clinics in our country were invited and they provided written informed consent. Be-

fore beginning the study, volunteers signed an informed consent form that explained the purpose of the study and informed them that their responses would be kept confidential. Participants were notified that the results might be published in an academic journal.

RESULTS

Patients' Characteristics

The median ages of 76 patients were 41(IQR, 41-51). It was determined that 72.4% of the patients were female, 82.9% were married, and 97.4% did not consume alcohol. A detailed description of the patients' demographics is presented in Table I.

Symptoms after Laparoscopic Cholecystectomy

It was observed that the incidence of diarrhea symptoms in the first feeding after cholecystectomy decreased from 56.6% (n=43) to 15.8% (n=12) ($p<0.001$) in the third month and the symptoms of constipation from 13.2% (n=10) to 3.9% (n=3) ($p=0.039$), which is a statistically significant difference in the third month (Table II).

Symptoms and Food Types

Symptoms by food types were divided into six sub-domains: meat, eggs, fatty seeds; milk and milk products; fruits and vegetables; oil and sugar; sauces; fries (Table III). In this table showed that the most consumed

type of food by the patients were nuts, peanuts in the first food group (72.4%); full fat cheese in the second food group (97.4%); tomatoe, apple and onion in the third food group (93.4%, 92.1%, 86.8%); snack type foods (biscuits, cakes, and similar snacks, ice cream, pudding, pies, and puddings) in the fourth food group (59.2%). It was determined that among all food groups, the least consumed food by the patients was sauces such as mayonnaise and cream with a ratio of 17.1% in the fifth food group, and the incidence of symptoms was 46.2% in this group. The rate of consumption in the sixth foods group by the patients was 46%, and the highest rate of symptoms was seen after the consumption of fried foods with a rate of 80% (Table III).

When the distribution of symptoms according to food types was observed, it was seen that the foods type with the highest rate of symptoms such as nausea (8.6%), diarrhea (20%), and pain (40%) were fried foods; the type of foods with the highest rate of bloating (37.9%) and gas (13.6%) were onions; the foods with the highest rate of vomiting (4.8%) were eggs; the foods with the highest incidence of reflux-related symptoms (14.9%) were oranges; the foods with the highest incidence of constipation (2.2% and 2.4%) were corn and peas, and the type of foods with the highest rate of eructation (12.9%) were meat and processed meat (Table III).

Table I. Characteristic of patients'(N=76)

Characteristic	Category	n	%	Median (IQR)
Age	Total	76	100	41(41-51)
	≤45 years	40	52.6	
	>45 years	36	47.4	
Gender	Female	55	72.4	
	Male	21	27.6	
BMI	Normal	22	28.9	
	Fat	24	31.6	
	Obese	30	39.5	
Marital status	Married	63	82.9	
	Single	13	17.1	
Working status	Yes	28	36.8	
	No	48	63.2	
Smoking	Yes	24	31.6	
	No	52	68.4	
Alcohol	Yes	2	2.6	
	No	74	97.4	
Gallbladder surgery in the family	Yes	33	43.4	
	No	43	56.6	

Note: n= sample, IQR (P₂₅-P₇₅): Inter Quantile Range

Table II. Changes in symptoms after the first nutrition following laparoscopic cholecystectomy and after nutrition in the third month

Symptom	1 st Nutrition		3 th Month Nutrition		P
	n	%	N	%	
Diarrhea	43	56.6	12	15.8	<0.001*
Constipation	10	13.2	3	3.9	0.039*
Nausea	10	13.2	15	19.7	0.332
Eructation	5	6.6	7	9.2	0.687
Bloating	42	55.3	46	60.5	0.523
Gas	31	40.8	24	31.6	0.281

Note: n= sample. *: $p<0.05$, Mc Nemar test.

Table III. Symptoms seen in patients by food type

Nutrients	Consumption(%)	Symptoms After Nutrition									
		n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)
		Vomiting	Reflux	Diarrhea	Constipation	Eructation	Bloating	Gas	Nausea Pain	No problem	
Meat, Eggs, Fatty Seeds											
Meat/processed meats	31(40.8)	2(6.5)	3(9.7)	3(9.7)	0(0.0)	4(12.9)	3(9.7)	2(6.5)	7(22.6)	11(35.5)	
Egg	42(55.3)	2(4.8)	0(0.0)	1(2.4)	0(0.0)	2(4.8)	4(9.5)	0(0.0)	9(21.4)	26(61.9)	
Nuts, peanuts	55(72.4)	3(5.5)	1(1.8)	2(3.6)	0(0.0)	1(1.8)	6(10.9)	2(3.6)	2(3.6)	42(76.4)	
Coffee	54(71.1)	2(3.7)	2(3.7)	0(0.0)	0(0.0)	2(3.7)	5(9.3)	0(0.0)	5(9.3)	39(72.2)	
Milk And Milk Products											
Full fat yogurt	73(96.1)	3(4.1)	3(4.1)	3(4.1)	0(0.0)	1(1.4)	7(9.6)	3(4.1)	2(2.7)	55(75.3)	
Full fat cheese	74(97.4)	5(6.8)	5(6.8)	5(6.8)	1(1.4)	1(1.4)	11(14.9)	5(6.8)	6(8.1)	42(56.8)	
Full fat milk	61(80.3)	2(3.3)	6(9.8)	8(13.0)	1(1.6)	1(1.6)	10(16.4)	3(4.9)	2(3.3)	35(57.4)	
Fruits And Vegetables											
Orange	67(88.2)	0(0.0)	10(14.9)	1(1.5)	0(0.0)	2(3.0)	12(17.9)	2(3.0)	3(4.5)	40(59.7)	
Apple	70(92.1)	0(0.0)	4(5.7)	1(1.4)	0(0.0)	3(4.3)	7(10.0)	2(2.9)	3(4.3)	52(74.3)	
Tomatoes	71(93.4)	1(1.4)	3(4.2)	1(1.4)	1(1.4)	2(2.8)	7(9.9)	2(2.8)	2(2.8)	57(80.3)	
Onion	66(86.8)	2(3.0)	4(6.1)	0(0.0)	1(1.5)	3(4.5)	25(37.9)	9(13.6)	10(15)	26(39.4)	
Corn	46(60.5)	0(0.0)	1(2.2)	2(4.3)	1(2.2)	4(8.7)	7(15.2)	0(0.0)	4(8.7)	27(58.7)	
Peas	41(53.9)	1(2.4)	0(0.0)	1(2.4)	1(2.4)	1(2.4)	6(14.6)	4(9.8)	1(2.4)	29(70.7)	
Oil And Sugar											
Butter, pure oils, margarine	39(51.3)	1(2.5)	0(0.0)	2(5.1)	0(0.0)	0(0.0)	4(10.3)	1(2.5)	5(12.8)	27(69.2)	
Biscuits, cakeetc, snacks, ice cream, custard pie, puddings	45(59.2)	2(4.4)	3(6.7)	3(6.7)	0(0.0)	1(2.2)	5(11.1)	1(2.2)	6(13.3)	28(62.2)	
Sauces											
Mayonnaise, like cream sauces	13(17.1)	0(0.0)	1(7.7)	2(15.0)	0(0.0)	0(0.0)	3(2.3)	0(0.0)	0(0.0)	7(53.8)	
Fries											
Fried foods	35(46)	3(8.6)	3(8.6)	7(20.0)	0(0.0)	0(0.0)	8(22.9)	1(2.9)	14(40)	7(20)	

Note: n= sample.

Symptoms According to Lifestyle and Nutritional Behavior

It was seen that patients who had diarrhea at the first feeding after surgery had greater number of statistically significantly symptoms ($Z=2.783$; $p=0.005$), and in general, patients with a regular lifestyle were found to have significantly fewer symptoms ($Z=2.328$; $p=0.020$) (Table IV).

Factors That Increase the Symptoms

Independent factors that increased the patients' symptoms after feeding at the third month were female gender status ($\beta=0.599$; $p=0.005$) and actively working at a job ($\beta=0.430$; $p=0.019$). (Table V).

DISCUSSION AND CONCLUSION

It is known that laparoscopic cholecystectomy is applied as a low-risk, minimally invasive operation that is widely applied in the treatment of biliary diseases (15-17). Gallstones are one of the common diseases of the gastrointestinal tract (18-20). Age, gender, race, lifestyle, family history of gallstones, number of pregnancies, drug use, systemic diseases, hormone levels, having chronic diseases such as diabetes, obesity, consuming a high-calorie diet, physical activity levels, and nutritional habits appears to be affected gallstone formation (10,21-

24). Further, it is known that genetical obesity and elevated Body Mass Index (BMI) are closely related to the formation of gall stones and they increase the risk (10,25,26). Age is a non-modifiable risk factor for cholecystitis. In our study, the average ages of the patients were similar to those in previous studies (Table I). In the study by Oner and Guneri (2012), the mean age was 52.6 ± 13.7 (27), it was 62.1 ± 14.3 in the study by Kosar et al. (2019) (28); and it was 60.1 in the study by Ozsoy et al. (2016). It is reported that there was a significant relationship between being over 40 years old and the presence of gallstone disease (29).

Female sex hormones are a prominent risk factor in the formation of gallbladder stones, and it is reported in the literature that the incidence of gallstones in women is higher than in men (30-32). In our study, the majority of the patients were women (Table I), and it was concluded that the rate of postoperative symptoms was also seen in the female gender, close to statistical significance ($Z=-1.822$; $p=0.068$) (Table V). In the study by Oner and Guneri (27), the incidence of gall stones was found to be 67% in women and 32% in men, while in the study by Ozden (2021) (33), they were 72.5% of and 27.5%, for women and men, respectively. It was concluded that the gender factor created a statistically sig-

Table IV. The Average number of symptoms in patients according to lifestyle and nutritional behavior characteristics after laparoscopic cholecystectomy

Variable	Category	n	Number of Symptoms Significant		
			Median (IQR)	Z	P
Postoperative diet	Yes	33	3(1-3)	-0.860	0.390
	No	43	2(1-3)		
Receiving postoperative nutrition education	Yes	44	2(1-3)	-0.631	0.528
	No	32	3(1-4)		
Diarrhea after 1 st nutrition after surgery	Yes	43	3(2-4)	-2.783	0.005 ^a
	No	33	2(1-3)		
Postoperative drug use	Yes	27	2(1-4)	-0.645	0.519
	No	49	2(1-3)		
Postoperative physical activity	Regular	29	2(1-3)	-0.203	0.839
	Irregular	47	3(1-3)		
Regular walking status after surgery	Yes	30	3(1-3)	-0.027	0.978
	No	46	2(1-3)		
Regularly engaging in sportive activities (football, basketball, etc.) after surgery	Yes	8	2(0-3)	-1.614	0.107
	No	68	3(1-3)		
Life style	Regular	55	2(1-3)	-2.328	0.020 ^b
	Sedantary	21	3(2-4)		

Note: n= sample. ^{a,b}: $p<0.05$; Z, Mann-Whitney U test; IQR (P_{25} - P_{75}): Inter Quantile Range.

Table V. Factors that increase the symptoms of patients after nutrition (Generalized Linear Model analysis results)

Variable	B	SE	95% CI (Lower-Upper)	Wald Chi-Square	p-value
Gender (Male=0; Female=1)	0.599	0.214	(0.180;1.019)	7.838	0.005 ^a
Actively working in a job (No=0; Yes=1)	0.430	0.183	(0.072;0.787)	5.538	0.019 ^b
Time after gallstones diagnosis (>6Month=1; ≤6Month=0)	0.179	0.184	(-0.183;0.540)	0.938	0.333
Diarrhea after 1 st feeding after surgery (No=0; Yes=1)	0.306	0.169	(-0.024;0.636)	3.295	0.070
Life style (Regular=0; Sedantary =1)	0.210	0.163	(-0.110;0.530)	1.660	0.198

Note: Dependent Variable= Number of symptoms; SE=Standard Error.^{a,b}: $p<0.05$, Generalized Linear Model, Probability Distribution=Poisson, Link Function=Log

nificant difference in gall stone formation.

It was found that the rate of diarrhea observed in the first feeding after cholecystectomy decreased in the third month ($p<0.001$) (Table II). Studies have shown that diarrhea is the most common symptom after cholecystectomy (34-36). Similar to our work the study by Yueh et al. in 2014 stated that diarrhea after cholecystectomy may develop due to colonic sequelae, that they expected the development of diarrhea in the patients within a week after surgery, and that diarrhea would decrease after three months as a result of the activation of some adaptive mechanisms (37).

In this study, as a result of the examination of the symptoms developing due to nutrition in the 3rd month after the surgery, although the least consumed food group was meat and processed meats (40.8%), the largest number of symptoms were seen after the consumption of these foods (64.5%), and burping (12.9%) was the symptom of this. it develops with the consumption of foods (Table III); In the milk and dairy products group, it was found that the greatest number of symptoms were seen after consumption of full-fat cheese (43.2%) (Table III). Shin et al. (2018) (39) also reported that most symptoms were observed after consumption of animal proteins, egg and cholesterol. The result that the most symptoms in the fruit and vegetable food group develop after onion consumption and it cause bloating and gassupports (Table III). This result is consistent with the study by Carvallo et al. in 2010 (40). However, our result that reflux is mostly observed after consumption of orange and constipation after consumption of corn and peas is in contrast with the result of Shin et al. (2018). Shin et al.'s study reported that vegetable consumption was negatively associated with the post-cholecystectomy syndrome (39). It is reported in the literature that diet changes can be made for the patients' problems, the consumption of alcohol, caffeinated and carbonated drinks, chocolate, citrus type of foods, fruit juices, coffee, vinegar sauce, onions, tomatoes, and spicy foods can be restricted to prevent reflux, dietary fiber intake can be increased, and meal portions can be decreased (6).

It was observed that the most consumed foods in the fat and sugar food group and causing symptom development were those in snack foods type (biscuits, cakes, and similar snacks, ice cream, pudding, pies, and puddings) (Table III). In the study by Shin et al. (2018), indigestion was observed in patients who consumed more bread than rice, and bread caused longer gastric emptying than rice and rice pudding (39). In our study, the increase in symptoms against snack foods can be attributed to the presence of gluten in these foods and the delay in gastric emptying with the occurrence of symptoms such as bloating, pain, and nausea due to the consumption of foods containing gluten (41,42). It was observed that the least consumed food among all food groups was sauces such as mayonnaise and cream, and nearly half of the patients who consumed them had symptoms (Table III). In the literature, it is reported that foods containing fat delay gastric emptying (43) and it is thought that symptoms may increase as a result of the consumption these foods, as the sauces examined in this study contain fats. It was determined that the foods in the fried food group

were consumed by nearly half of the patients, but among all food groups, the most post-consumption symptoms were seen after the consumption of these foods, and the food type with the highest rate of symptoms such as nausea, diarrhea, and pain was fried foods (Table III). In the literature, it is reported that the formation of gall stones increases with the consumption of fat and fried foods in the diet (8,43). In the diet after cholecystectomy, it is reported that fat intake can be limited to prevent the patients' problems (6). Analysis of the symptoms according to food types in this study revealed that the food in which vomiting was most common was eggs (Table III). In the study by Shin et al. (2018), it was reported that egg in tolerance develops after cholecystectomy, that eggs cause indigestion, and delay gastric emptying (39).

The result that more symptoms of statistical significance were seen in patients who had diarrhea at the first nutrition after surgery ($Z=2.783$; $p=0.005$) (Table IV) is consistent with the literature. In the study of Yueh et al. (2014) diarrhea was found to be higher in individuals who did not consume a low-fat diet, especially in the first week after surgery.

(37). The malabsorption of bile acids is seen as the cause of diarrhea after cholecystectomy, and it is reported that the absence of the gall bladder causes faster conversion and increase of bile acids, as well as shortened colonic transit times (39).

In this study, significantly fewer symptoms were observed in individuals with a regular lifestyle, similar to those in the literature ($Z=2.328$; $p=0.020$) (Table IV). It is known that sedentary life has adverse effects on human health, and the majority of individuals lead sedentary lives spending most of their time sitting, especially at home, work, and in transportation activities (44,45). In the study by Lietzmann et al. (1998) conducted with 828 male patients diagnosed with a symptomatic gall bladder, it was found that sedentary life is closely related to gallstones, that gallstones are seen less frequently in patients who watch television less than six hours a week compared to those who watch television for 40 hours a week, and that 30 minutes of physical activity five times a week reduces the risk of gallstone formation by 34% (46). In this study, fewer symptoms were observed in patients with a regular lifestyle ($n=55$), which is consistent with the literature.

Independent factors that increased the patients' symptoms after nutrition at the third month were female gender ($\beta=0.599$; $p=0.005$) and actively working at a job ($\beta=0.430$; $p=0.019$) (Table V) and symptom incidence is more common in women in various studies that these factors are consistent with the literature (5,7,33). In this study, the high rate of symptom incidence in actively working individuals. There is no study in the literature examining the employment status of individuals and their symptom development status after cholecystectomy. This can be attributed to the skipping meals due to workload and the consumption of more food due to the increased hunger feeling by consuming the evening meals at a later time.

The limitations of this study are that the study was carried out only in the general surgery clinics of two hospi-

tals in different cities where permission was granted, the study period was 18 months, and the number of cases decreased as a result of delayed of elective surgery cases due to the covid-19 pandemic that occurred in the world in this 18-month period.

This study is the first study on this subject in the field of nursing. Although there are a limited number of studies examining the nutritional habits of patients after laparoscopic cholecystectomy and the symptoms that develop in patients who consume certain food groups, in this study in which nutritional changes in patients at the third month after laparoscopic cholecystectomy were evaluated, it was concluded that while it is seen that age and gender factors affect nutritional habits, the development rate of symptoms related to nutrition was significantly higher in female patients and active workers. While more symptoms were seen in patients who had diarrhea at the first feeding after surgery, it was found that patients who had a regular lifestyle had significantly fewer symptoms. It was observed that the symptoms increased when the patients consumed processed meat products, full-fat cheese, onions, oranges, vegetables such as corn and peas, snack foods, sauces such as mayonnaise and cream, and fried fatty foods. In line with these results, it is recommended to question the preoperative nutritional habits of the patients in the nursing care and practices to be given to patients who have undergone laparoscopic cholecystectomy, and to provide training on special diets and risky foods that increase symptom development in cooperation with the dietitian in the postoperative period. In the literature, studies with a larger population are needed on this subject.

Conflict of Interest

The authors have no conflicts of interest to declare.

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