### Al-Mustaqbal Journal of Pharmaceutical and Medical Sciences

Volume 2 | Issue 3

Article 4

2024

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ISSN: 2959-8974 - e-ISSN: 3006-5909

#### **Recommended Citation**

Mousa, Haider Naiser and Hassan, Huda Baqir (2024) "Instruction Program for Patients with Cholecystectomy Regarding Nutritional Knowledge," *Al-Mustaqbal Journal of Pharmaceutical and Medical Sciences*: Vol. 2 : Iss. 3 , Article 4. Available at: https://doi.org/10.62846/3006-5909.1019

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#### **ORIGINAL STUDY**

# Instruction Program for Patients with Cholecystectomy Regarding Nutritional Knowledge

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#### ABSTRACT

The primary objective of this study is to assess the level of patients' understanding of the educational program following cholecystectomy. Additionally, the study attempts to determine the correlation between patients' knowledge and their socio-demographic factors. A quasi-experimental design study was conducted at AL Imam Sadiq Teaching Hospital. The study employed a non-probability selection method, namely selecting 30 patients for the study group and 30 patients for the control group. The instrument consists of 14 items. The validity of the questionnaire was assessed by a panel of 11 experts. The reliability of the questionnaire was determined by calculating the Alpha Correlation Coefficient to measure the instrument's internal consistency, resulting in a value of (number). The data was analyzed using descriptive and inferential statistical analysis methods. The study revealed that the patients' level of knowledge in the pre-test was 1.20 for the study group and 1.18 for the control group. In the post-test, the study group had a knowledge level of 1.79, while the control group had a level of 1.25. Furthermore, there was a significant statistical correlation between the patients' employment, level of education, and monthly income, and the effectiveness of the instruction program in improving patient knowledge. The instructional program had a beneficial impact on patients who underwent cholecystectomy, leading to a significant improvement in their dietary knowledge compared to both the case and control groups.

Keywords: Cholecystectomy, Instruction program, Nutritional knowledge, Socio-demographic characteristics

#### 1. Introduction

A cholecystectomy, or removal of the gallbladder, is a common surgical operation that can alleviate pain caused by gallstones or other problems. Due to the complicated alterations it brings to the digestive system, this procedure requires careful attention to postoperative care, especially feeding, although it is still quite popular. This detailed presentation will educate patients on all aspects of gallbladder removal procedures, including the significance of adhering to a certain post-operative diet. Furthermore, we will delve into the significance of patients comprehending the significance of an appropriate post-operative diet in mitigating risks and facilitating a seamless recuperation (Sanford [1]).

The Babil Governorate in Iraq performs over 500 cholecystectomy procedures annually. Inadequate dietary care is the cause of post-operative problems in about 30% of patients, or 150 people. There is a chance that you could gain or lose weight, experience gastrointestinal problems, or have trouble absorbing nutrients. These problems could be lessened if patients undergoing cholecystectomy were educated about their specific dietary requirements and limitations. Fewer hospital readmissions, decreased patient suffering episodes, and reduced healthcare spending are all possible benefits of this approach. It also

Received 8 June 2024; accepted 19 December 2024. Available online 30 December 2024

\* Corresponding author. E-mail addresses: haidar.musa2202m@conursing.uobaghdad.edu.iq (H. N. Mousa), dr.hudab@conursing.uobaghdad.edu.iq (H. B. Hassan).

https://doi.org/10.62846/3006-5909.1019 3006-5909/© 2024 Al-Mustaqbal University. This is an open-access article under the CC-BY 4.0 license (https://creativecommons.org/licenses/by/4.0/). empowers people to make informed nutritional decisions, which is crucial for their post-surgery health (Fisher et al., [2]).

Chelecystectomy is a remarkable surgical procedure regardless of whether it is performed laparoscopically or through open surgery. Typically, this operation is performed to treat gallstones, inflammation, or any other problem that affects the gallbladder's function. Thanks to less intrusive procedures like laparoscopy, this surgical process has seen a dramatic shift, with shorter recovery times, more patient comfort, and an increase in frequency (Litwin & Cahan [3]). Beneath the liver is the tiny gallbladder, which helps with the generation of digestive enzymes. In order to aid in the digestion of fats, this organ primarily stores and secretes bile, an important digestive fluid. Surgical removal of the gallbladder may be necessary due to inflammation, pain, and complications caused by gallstones, which are solid deposits that build up in the gallbladder.

Patients still have a distinct nutritional challenge after gallbladder surgery, even though the procedure has improved. A thorough understanding of the digestive system's operation is necessary prior to developing a post-cholecystectomy eating plan. Bile secretion into the digestive tract influences lipid digestion and absorption in the absence of a gallbladder. Because patients' digestive physiologies alter after surgery, they need to be extra careful when cooking, so personalized meal plans are essential (Madden et al., [4]).

Patients' results and the likelihood of problems following cholecystectomy are directly affected by their postoperative nutrition. It is important to be cautious with food selections to guarantee good healing and long-term health due to changes in the digestive environment. How Fat Metabolism and Assimilation Occur: Without it, the gallbladder can't control how much bile is ejected into the digestive system, so it flows unchecked and continuously. Because this alteration has such a profound effect on lipid digestion and absorption, it is essential to make dietary adjustments to prevent problems like steatorrhea (poor digestion) and nutritional deficiencies. Bile reflux treatment: After a cholecystectomy, bile reflux-the backflow of bile into the stomach and esophagus-is a potential complication. Improving one's nutrition and making specific dietary adjustments are important preventative measures in lowering this risk. It is normal to experience changes in bowel habits following cholecystectomy, including more frequent or even diarrhea. The most effective way to regulate bowel habits after surgery is to follow a high-fiber diet, drink plenty of water, and avoid foods that cause gastrointestinal pain. Raising People's Standard of Living: Diet after cholecystectomy has a greater impact on the patient's overall health than any immediate consequences. Sufficient nourishment facilitates recovery, increases vitality, and improves the body's capacity to adapt to physiological changes after surgery (Altomare, Rotelli & Palasciano [5]).

Understanding the complex world of nutrition after gallbladder removal requires the patient to actively participate. In order to prevent difficulties and enhance the healing process, it is necessary to have a full understanding of a diet that is customized to the altered digestive physiology. When patients have all the information they need, they may make informed decisions about their nutrition. Incorporating healthy fats into one's diet and controlling overall fat intake is a key component of successfully adjusting to altered gastrointestinal conditions. Finding Foods That Cause Allergic Reactions: Patients must be knowledgeable and vigilant in order to recognize and avoid foods that might aggravate symptoms or cause problems like bile reflux. Patients can make educated choices about their diets when they have this knowledge (Park et al., [6]).

The patient's realization of the benefits of a diet with the right proportions of nutrients emphasizes the need of balanced nutrition. The key to good digestion and staying hydrated is getting enough of the minerals, fiber, and water your body needs. As a vital component of patient education, lifestyle changes cover a wide range of topics, not limited to diet. The digestive health of patients after cholecystectomy can be improved by maintaining a healthy weight, exercising regularly, and not smoking. Inquiring About Professional Opinions: When patients have a thorough comprehension, they are more likely to seek out professional advice. Cao, Eslick, and Cox [7] state that nutritional counseling and collaboration with healthcare providers are essential components of effective post-cholecystectomy management.

#### 2. Method

The design used in this study is a quasiexperimental design - (two-group comparison), which attained through the pre and post-tests method for study sample. The study was carried out at Imam Sadiq Teaching Hospital (Specialized Center for Gastroenterology). at Babylon city in Iraq the participants in this study were the patients who post cholecystectomy operations in Babil Governorate in central Iraq A non-probability (purposive) sample. They numbered 60 patients divided to two groups 30 patients were included in the control group and 30 were included in the study group. The questionnaire was given through interviews with the patients and filling out the questionnaire by them to measure their level of knowledge about the diet post cholecystectomy. Samples were collected within two weeks, as the group. The control group collected data from them without giving them a instructional program. As for the study group, after collecting data from them, they were given a instructional program. After a month of pre-testing, a post-test was conducted to measure the impact of the counseling program on the patients' knowledge. Ethical approval for the study was obtained from the institutional review board started after obtaining formal permission from the required authorities, beginning with the approval of the Council of the Nursing College/University of Baghdad on 22/11/2023. The researcher provided an extensive summary of the study to the Iraqi Ministry of Planning (Central Statistical Organization), including the objectives and methods. The researcher provided a comprehensive overview of the study to the Babylon Health Directorate Training and Development Centre in order to acquire official authorization to conduct the study. The last stage involved obtaining permission to gather the data from AL imam Sadig teaching Hospital. The researcher ensured that ethical standards were followed by obtaining informed consent from all patients without revealing their identities. The study's objectives were clearly explained to each patient, and they were informed that the questionnaire findings would only be used for research purposes. Participants were also informed of their autonomy and right to decline participation. Both written and verbal consent were obtained from each study participant. The questionnaire was developed by the authors for the present study. The component of each variable revealed good internal consistency (Cronbach's alpha for knowledge = 0.757; was used as a study tool Pre and post-test after the implementation of the instructional program, which contains (14) questions related to the patients' knowledge related to Daily diet routine after gallbladder removal Correct answers are given a score of 2, while incorrect answers are given a score of 1, Data was analyzed by using the Statistical Package of Social Sciences (SPSS) version 26. in which descriptive and inferential statistic measures were employed. descriptive statistics were used to describe the demographic variables, including frequency (F), percentage (%), mean score, and standard deviation. in addition to descriptive analysis, inferential data analysis techniques are applied for nonparametric data, including the spearman correlation test, to find the correlation between patient's knowledge score and age. ANOVA test to find out the difference between demographic characteristics (age group, occupation, residency, material status, and monthly income) with awareness score. and data analyzed by use data analysis such as frequencies, percentages, Pearson correlation coefficient test, paired t-test and ANOVA test to measure the level of knowledge for case and control group and measure relationship between patient characteristic and level of knowledge about diet post cholecystectomy.

#### 3. Results and Discussion

Chapter four presents the findings of the data analysis systematically in tables. The results of the data analysis are in corresponding with the objectives of the study.

Table 1 shows that the high percent of the study sample for both case and control group was female which is accounted for (60.0%,56.7%) respectively. Regarding age, the results of the present study revealed that more than half of the studied patients for both groups between 51-60 years old which is accounted for (36.67%,26.7%) respectively. As regards educational level, this study showed that, most of the patients for both groups were secondary educated which is accounted for (36.67%, 30.00%) respectively. The majority of the study groups were married which of (70.0%, 63.3%) for case and control respectively. The high percent of both groups were free work, which of (50.0%, 43.34%) for case and control respectively. The majority of the both groups residency lives in rural area which is accounted for (66.7%,73.3%) respectively. In accordance to the level of socio-economic status, the high percent of case and control groups was low level of income, accounted for (50.0%, 73.3%) respectively.

Table 2 illustrated that the statistics of the study group were presented with a poor level of knowledge of all items of the pre-test for the case group. While presenting with a good level of knowledge of all items except one item from all items was a moderate level of knowledge at post test for case group.

Table 3 illustrated that the study sample presented a poor level of knowledge, for all items of knowledge of the pre-test for the control group, while the study sample presented a poor level of knowledge of all items of knowledge at the post- test for the control group. Therefore, there were no statistically significant differences between two periods (pre- and post-tests) of the control group in all items of the patient's knowledge toward daily diet routine after cholecystectomy, and this reflects that the patient Knowledge was not exposed to an instructional program.

Table 4 shows there were no statistically significant differences between the pre and the post-test of

		Case group (N	= 30)	Control group ( $N = 30$ )		
Variables	Classification	Frequency	%	Frequency	%	
Gender	Male	12	40.0	13	43.3	
	Female	18	60.0	13	56.7	
Age	28–18	3	10.00	4	20.0	
0	39–29	8	26.67	6	40.0	
	50-40	8	26.67	8	13.3	
	60–51	11	36.67	12	26.7	
Statistics	$Mean \pm SD$	$38.06 \pm 10.56$	5	$38.53 \pm 12.12$		
Level of education	Read and write	4	13.33	4	13.33	
	Primary school	2	6.67	4	13.33	
	Secondary school	11	36.67	9	30.00	
	Diploma	8	26.67	9	30.00	
	Bachelor's degree or above	5	16.67	4	13.33	
Marital status	Single	5	16.7	8	26.7	
	Married	21	70.0	19	63.3	
	Absolute	1	3.3	1	3.3	
	Widow	3	10.0	2	6.7	
Employments	Housewife	6	20.0	7	23.33	
	Employee	8	26.7	6	20.00	
	Student	1	3.3	4	13.33	
	Free work	15	50.0	13	43.34	
	Retired	0	0	0	0	
	Does not work	0	0	0	0	
Residency	Rural	20	66.7	22	73.3	
	Urban	10	33.3	8	26.7	
Socio-economic status	Low level	15	50.0	22	73.3	
	Middle level	4	13.3	2	6.7	
	High level	11	36.7	6	20.0	

Table 1. Distribution of the study sample by socio-demographic characteristics.

n = sample size, Freq. = Frequency, % = Percentages

patient Knowledge for control group at P value = 0.122, while there were statistically significant differences between the pre and the post-test of patient Knowledge for the study group at P value = 0.000, which proven that instructional program was effective on the case group.

Table 5 indicates that there were no significant differences in demographic characteristics (age group, marital status, residency, and income) of patients and the effectiveness of the instructional program on their knowledge. However, there were significant differences in demographic characteristics (level of education and occupation) of patients in the study group and the effectiveness of the instructional program on their knowledge, but only when the p-value was greater than 0.05 (post-test). Table 1. The patient's sociodemographic features are a variable that play a role in enhancing patient education, promoting adherence, boosting awareness of preventative actions, and lowering problems. The present study included of two groups: a case group and a control group. In the present study, the sociodemographic data revealed that a significant proportion of the study sample in both the case and control groups were female, accounting for 60.0% and 56.7% re-

spectively. The findings of the current study indicate that over half of the participants in both groups were between the ages of 51 and 60, accounting for 36.67% and 26.7% respectivelyRegarding educational attainment, the study found that 36.67 percent of patients in the first group and 30 percent of patients in the second group had finished secondary school. Married people made up the majority of the research participants in both the case and control groups, with married people accounting for 70.0% and 63.3% of the total, respectively. Fifty percent of the case group and 43.34 percent of the control group were working without paying for it. The vast majority of both groups-66.7% and 73.3% of the total, respectively-call rural areas home. Both the case group and the control group had low incomes, with 50.0% and 73.3% of those groups being low income, respectively.

Those between the ages of 51 and 60 made up more than half of the study's participants. The results of the study by Nidoni (2015), which examined the frequency of cholecystectomy in 180 patients from India, were supported by this information.Elderly people had a higher incidence of cholelithiasis and cholecystectomy, as reported by Nidoni et al. [8].

	Case group								
	Pretest					Posttest			
Knowledge item	Class	F	%	M.s	Ass	n	%	M.s	Ass
Increase soluble fiber in the diet	Incorrect	26	86.7	1.13	Р	6	20.0	1.80	G
	Correct	4	13.3			24	80.0		
The use of healthy unsaturated fats	Incorrect	24	80.0	1.20	Р	5	16.7	1.83	G
	Correct	6	20.0			25	83.3		
Use low-fat protein sources	Incorrect	23	76.7	1.23	Р	11	36.7	1.63	Μ
-	Correct	7	23.3			19	63.3		
Eating fruits and vegetables	Incorrect	23	76.7	1.23	Р	5	16.7	1.83	G
	Correct	7	23.3			25	83.3		
Choose lean meat	Incorrect	22	73.3	1.26	Р	7	23.3	1.76	G
	Correct	8	26.7			23	76.7		
Avoid processed foods	Incorrect	24	80.0	1.20	Р	6	20.0	1.80	G
•	Correct	8	20.0			24	80.0		
Avoid fatty meat	Incorrect	24	80.0	1.20	Р	5	16.7	1.83	G
•	Correct	8	20.0			25	83.3		
It is recommended to avoid full-fat dairy products after cholecystectomy	Incorrect	24	80.0	1.20	Р	6	20.0	1.80	G
	Correct	8	20.0			24	80.0		
It is recommended to avoid foods rich in dietary fiber, in addition to nuts, seeds, and legumes	Incorrect	26	86.7	1.13	Р	8	26.7	1.73	G
	Correct	4	13.3			22	73.3		
Spicy foods	Incorrect	28	93.3	1.06	Р	4	13.3	1.86	G
	Correct	2	6.7			26	86.7		
Caffeine	Incorrect	22	73.3	1.26	Р	4	13.3	1.86	G
	Correct	8	26.7			26	86.7		
Add solid foods gradually after surgery	Incorrect	22	73.3	1.26	Р	6	20.0	1.80	G
	Correct	8	26.7			24	80.0		
Eat 5–6 small meals during the day	Incorrect	25	83.3	1.16	Р	6	20.0	1.80	G
	Correct	5	16.7			24	80.0		
Exercise regularly	Incorrect	26	86.7	1.13	Р	7	23.3	1.76	G
	Correct	4	13.3			23	76.7		
	Knowledge item         Increase soluble fiber in the diet         The use of healthy unsaturated fats         Use low-fat protein sources         Eating fruits and vegetables         Choose lean meat         Avoid processed foods         Avoid fatty meat         It is recommended to avoid full-fat dairy products after cholecystectomy         It is recommended to avoid foods rich in dietary fiber, in addition to nuts, seeds, and legumes         Spicy foods         Caffeine         Add solid foods gradually after surgery         Eat 5–6 small meals during the day         Exercise regularly	Case group PretestKnowledge itemClassIncrease soluble fiber in the dietIncorrect CorrectThe use of healthy unsaturated fatsIncorrect CorrectUse low-fat protein sourcesIncorrect CorrectEating fruits and vegetablesIncorrect 	Knowledge itemCase groupIncrease soluble fiber in the dietIncorrect26Correct4Incorrect24The use of healthy unsaturated 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Table 2. Evaluation of patients' knowledge about the daily dietary routine after cholecystectomy in the pre-test and post-test of the case group.

F: Frequencies, %: Percent; M.S = Mean of score, Each item evaluated as Poor [P] = 1-1.33, Moderate [M] = 1.34-1.67, Good [G] = 1.68-2

This data lend credence to the theory that cholelithiasis risk increases with age. This agrees with what Panpimanmas et al. [9] found after studying 407 Thai people. Both gallstones and the necessity for gallbladder surgery increase with age, according to a 2009 study by Panpimanmas and Manmee. Women constituted over 50% of the patients surveyed in this research. Finding out how often gallstones occur and what variables put patients at risk for having their gallbladders removed was the goal of Khalaf et al. [10], who examined data from Basrah, Iraq. Cholelithiasis is more common in females than males, according to data obtained from 1001 individuals (Kamil Khalaf & Al Mousawi [11]; Dahwan, Aguslina & Hasan [10]). Our novel conclusion is supported by the same findings of two studies conducted in Taiwan and Ireland, Hung et al. (2018) and Bass et al. [12], respectively, which investigated 398 patients. These research aimed to determine the frequency of gallbladder removal and the most common causes of gallstones. Gallstones were more prevalent in women, according to the results of both studies, which included mostly female participants. It has been shown that estrogen levels can increase bile cholesterol levels, which in turn increases the likelihood of gallstones and the necessity of cholecystectomy. This may explain why menopause is associated with a higher incidence of gallstones in women aged 50 and above (Hung et al., [13]; Bass, Gilani & Walsh, [14]). Additionally, the purpose of a 564-person Korean study was to determine the frequency of gallbladder problems and to examine risk factors linked with them (Kim et al., 2016). The results were consistent with what Choi et al. [15] found.

The results of this study showed that most patients in both groups had finished high school. It was discovered that most cholelithiasis patients had finished secondary school in a 2017 study by Alishi et al. in India that comprised 213 persons (Barré et al. [16]). Contrary to what Leotine (2019) found,

		Control group								
No		Pretest					Posttest			
	Knowledge item	Class	F	%	M.s	Ass	n	%	M.s	Ass
1	Increase soluble fiber in the diet	Incorrect	25	83.3	1.16	Р	22	73.3	1.26	Р
		Correct	5	16.7			8	26.7		
2	The use of healthy unsaturated fats	Incorrect	24	80.0	1.20	Р	24	80.0	1.20	Р
	·	Correct	6	20.0			6	20.0		
3	Use low-fat protein sources	Incorrect	26	86.7	1.13	Р	20	66.7	1.33	Р
	-	Correct	4	13.3			10	33.3		
4	Eating fruits and vegetables	Incorrect	24	80.0	1.20	Р	24	80.0	1.20	Р
		Correct	6	20.0			6	20.0		
5	Choose lean meat	Incorrect	25	83.3	1.16	Р	23	76.7	1.23	Р
		Correct	5	16.7			7	23.3		
6	Avoid processed foods	Incorrect	23	76.7	1.23	Р	22	73.3	1.26	Р
	-	Correct	7	23.3			8	26.7		
7	Avoid fatty meat	Incorrect	24	80.0	1.20	Р	23	76.7	1.23	Р
		Correct	6	20.0			7	23.3		
8	It is recommended to avoid full-fat dairy products after cholecystectomy	Incorrect	23	76.7	1.23	Р	23	76.7	1.23	Р
		Correct	7	23.3			7	23.3		
9	It is recommended to avoid foods rich in dietary fiber:, in addition to nuts, seeds, and legumes	Incorrect	24	80.0	1.20	Р	23	76.7	1.23	Р
		Correct	6	20.0			7	23.3		
10	Spicy foods	Incorrect	23	76.7	1.23	Р	22	73.3	1.26	Р
		Correct	7	23.3			8	26.7		
11	Caffeine	Incorrect	25	83.3	1.16	Р	23	76.7	1.23	Р
		Correct	5	16.7			7	23.3		
12	Add solid foods gradually after surgery	Incorrect	20	66.7	1.33	Р	20	66.7	1.33	Р
		Correct	10	33.3			10	33.3		
13	Eat 5–6 small meals during the day	Incorrect	25	83.3	1.16	Р	22	73.3	1.26	Р
		Correct	5	16.7			8	26.7		
14	Exercise regularly	Incorrect	23	76.7	1.23	Р	22	73.3	1.26	Р
	- ·	Correct	7	23.3			8	26.7		

Table 3. Evaluation of patients' knowledge about the daily dietary routine after cholecystectomy in the pre-test and post-test of the control group.

F: Frequencies, %: Percent; M.S = Mean of score, Each item evaluated as Poor [P] = 1-1.33, Moderate [M] = 1.34-1.67, Good [G] = 1.68-2

Table 4. Comparison significant between two periods (pre- and post- tests) for patient' knowledge about daily diet routine post cholecystectomy for the study and control group.

Groups	Periods	М	SD	Paired t- test	d.f.	P value	Sig.
Case	Pretest	1.19	0.090	-14.052	29	.000	HS
	Posttest	1.79	0.18				
Control	Pretest	1.20	0.096	-1.592	29	.122	Ns
	Posttest	1.25	0.16				

M = Arithmetic mean, S.D = standard deviation, P = probability valu., NS: Non-Significant at  $P \ge 0.05$ , HS: Significant at P < 0.05, T = paired sample t. test

most participants were illiterate (Moris & Pappas [17]). When asked, the vast majority of research participants identified as married. There may be a correlation between marital status and the incidence of gallstones, since gallstones are more common in women who have given birth several times. This is backed up by the findings of an investigation on gall-bladder disease risk factors carried out by Channa et al. (2013) on 150 individuals residing in North India. According to the study, gallstones were less common in women who were married at a younger age.

Getting married young increases a woman's fertility and her chances of having children. The presence of female sex hormones, which affect fertility, may have a substantial influence on gallstone growth and the necessity of cholecystectomy, as stated by Dhamnetiya et al. [18]. Rina and Melati's research on Indonesia supports this conclusion (2020).

The majority of the patients resided in rural areas. People with poorer wages, less education, poor sanitation, and limited access to information are more likely to have gallstones, which may explain this

Patient knowledge	Demographic data	Sum of squares	df	Mean square	F	Sig.
Age group	Between groups	10.750	8	1.344	1.417	.247
	Within groups	19.917	21	.948		
	Total	30.667	29			
Occupation	Between groups	19.467	8	2.433	3.297	.013
	Within groups	15.500	21	.738		
	Total	34.967	29			
Level of education	Between groups	52.533	8	6.567	12.729	.000
	Within groups	10.833	21	.516		
	Total	63.367	29			
Material status	Between groups	6.367	8	.796	1.453	.233
	Within groups	11.500	21	.548		
	Total	17.867	29			
Residency	Between groups	.875	8	.109	.397	.910
5	Within groups	5.792	21	.276		
	Total	6.667	29			
Income	Between groups	9.050	8	1.131	1.447	.235
	Within groups	16.417	21	.782		
	Total	25.467	29			

Table 5. Statistical relationship between demographic characterizes of patient and effectiveness of instructional program on their patient's knowledge toward daily diet routine after cholecystectomy study group (post-test) by ANOVA.

M: Mean, SD: Standard deviation, F: ANOVA test, d.f: Degree of freedom, Sig: Significance level at 0.05

trend. The results of this study corroborate those of Naeem et al. [19], who looked at Pakistan. The vast majority of the 410 patients polled lived in remote places without easy access to medical treatment, as reported by Naeem et al. [19]. The majority of the patients in the research did not have enough money coming in from their families to cover their basic expenses. There may be a connection between this and the worsening situation of poverty and unemployment in Egypt, especially in the countryside. The study carried out in Taiwan by Lu et al. [20] was supported by these results. A link between cholelithiasis and poor socioeconomic position was identified by Hung et al. [14] in an analysis of 225,558 individuals in China. Accordingly, the majority of the patients who were studied received free treatment at the hospital that is associated with the university (Hung et al. [14]; Lu et al. [20]). However, as can be seen from Table 2, the study group demonstrated a lack of understanding for every item on the case group's pre-test. After completing the course, members of the case group showed a moderate level of understanding on all but one subtest.

Patients in the current study who had gallbladder illness and did not participate in a patient education program had poor understanding on the daily food pattern to follow following cholecystectomy, according to the pretest. On the other hand, following the teaching program, the patients demonstrated a high level of knowledge on the posttest. In 2019, Lal conducted research in India to see how well cholecystectomy patients understood and followed their dietary therapy. This study backs up his findings. Following cholecystectomy, individuals failed to comprehend and execute the recommended dietary therapy plan (Lal [12]). In order to determine the efficacy of a post-cholecystectomy educational program, Abd El Gwad Elkalashy et al. [21] studied 150 patients in Egypt. The study found that before the educational program was put into place, most participants gave false answers. According to Abd El Gwad Elkalashy and Masry [21], participants' knowledge level increased after the post-instruction program was implemented.

Nutritional counseling significantly improved the knowledge of the intervention group and their adherence to dietary recommendations, according to a 2021 U.S. study by Ranta. After completing the program, their nutrition knowledge score increased by 13 points, which is a notable 21% improvement from their pre-program level of 62. In contrast, the control group showed very modest change, with their nutrition knowledge scores going up slightly from 65 before the program to 68 after it (Ranta, [22]). Table 3 shows that the control group's study sample had very little knowledge on all of the pre-test items. Similarly, the control group's post-test results demonstrated a lack of knowledge across the board. Therefore, with regards to the patient's knowledge regarding their daily eating routine following cholecystectomy, there were no significant differences between the pre- and post-tests of the control group. It appears that the patient's knowledge was not taught anything new.

A study conducted in India by Abbasnia et al. [23] examined the effects of virtual reality (VR) on 100 patients who were having laparoscopic cholecystectomy. The goal of the study was to determine whether

VR may alleviate post-operative pain and anxiety. According to the study's results, patient groups that participated in the educational program did not see any substantial improvement in their educational outcomes (Lal [23]; Abbasnia et al. [24]). An academic stance Because the control group did not participate in the training program, the results of the preand post-tests showed no change in the patients' knowledge, according to this study. Therefore, for the control group, there was no discernible change in patients' knowledge between pre- and post-tests. Table 4 shows that the control group did not show any statistically significant differences (P = 0.122) in patient knowledge between the pre- and post-tests. On the other hand, the research group's patient knowledge scores were significantly different between the preand post-tests (P 0.000). The case group in the study benefited from the educational program, according to the results. There were no statistically significant differences between the educational program's efficacy and patients' demographic parameters (age, marital status, residency, and income), as shown in Table 5. On the other hand, when the p-value was higher than 0.05 (post-test), only differences in the study group's demographic features (level of education and occupation) and the program's impact on their knowledge were found to be statistically significant. There was a statistically significant relationship between patients' knowledge level and sociodemographic variables, such as their educational attainment and occupation, according to the current study. The results are consistent with those of Putri in Taiwan, who found that patients' knowledge was significantly related to their education level. Patients' levels of knowledge did not differ significantly according to their gender, sex, marital status, wealth, or place of residence in the present study (Putri et al., [25]).

#### 4. Conclusions

According to the result of the present study, and after the analysis and discussion of the findings related to the study variables, the researcher justifies the findings and concludes that. The effectiveness of the Instruction program was clearly observed on the knowledge of cholecystectomy patients by improving their knowledge and adherence of the daily dietary routine. There is a significant relationship between effectiveness of instructional program and,level education, and monthly income of patient at P  $\leq$ 0.05level. There is non-significant association between the effectiveness of instructional program and patient age, gender, marital status, residency and occupation at P  $\leq$ 0.05level.

#### References

- D.E. Sanford, "An update on technical aspects of cholecystectomy," Surgical Clinics, vol. 99, no. 2, pp. 245–258, 2019.
- A.T. Fisher, K.E. Bessoff, R.I. Khan, G.C. Touponse, M.M.K. Yu, A.A. Patil, J. Choi, C.D. Stave, and J.D. Forrester, "Evidencebased surgery for laparoscopic cholecystectomy," *Surgery Open Science*, vol. 10, pp. 116–134, 2022.
- D.E.M. Litwin and M.A. Cahan, "Laparoscopic cholecystectomy", *Surgical Clinics of North America*, vol. 88, no. 6, pp. 1295–1313, 2008.
- A.M. Madden, D. Trivedi, N.C. Smeeton, and A. Culkin, "Modified dietary fat intake for treatment of gallstone disease," *Cochrane Database of Systematic Reviews*, vol. 2021, no. 6, 2021.
- D.F. Altomare, M.T. Rotelli, and N. Palasciano, "Diet after cholecystectomy," *Current Medicinal Chemistry*, vol. 26, no. 19, pp. 3662–3665, 2019.
- Y. Park, D. Kim, J.S. Lee, Y.N. Kim, Y.K. Jeong, K.G. Lee, and D. Choi, "Association between diet and gallstones of cholesterol and pigment among patients with cholecystectomy: A case-control study in Korea," *Journal of health, population and nutrition*, vol. 36, pp. 1–7, 2017.
- A.M. Cao, G.D. Eslick, and M.R. Cox, "Early cholecystectomy is superior to delayed cholecystectomy for acute cholecystitis: A meta-analysis," *Journal of Gastrointestinal Surgery*, vol. 19, pp. 848–857, 2015.
- R.Nidoni, T. Vudachan, P. Sasnur, R. Baloorkar, V. Sindgikar, and B. Narasangi, "Predicting difficult laparoscopic cholecystectomy based on clinicoradiological assessment," *Journal of Clinical and Diagnostic Research*, vol. 9, no. 12, pp. PC09-PC12, 2015.
- S. Panpimanmas and C. Manmee, "Risk factors for gallstone disease in a Thai population," *Journal of Epidemiology*, vol. 19, no. 3, pp. 116–121, 2009.
- S. Kamil Khalaf and H. Al-Mousawi, "Prevalence and risk factors of asymptomatic gallstones in a sample of population in Basrah, Iraq," *Archives of Medicine*, vol. 8, no. 4, 2016.
- D. Dahwan, F. Aguslina, and W. Hasan, "The effect of nutrition status and occupancy density compliance with home contact pulmonary TB insidence in specialized hospital of pulmonary," *Jurnal Kesehatan Masyarakat*, vol. 16, no 2, pp. 200–206, 2020.
- 12. S.G. Lal, "Knowledge and practice on dietary management among patients with gallbladder diseases," *Medico-Legal Update*, vol. 19, no. 1, pp. 152–155, 2019a.
- G. Bass, S.N.S. Gilani, T.N. and Walsh, "Validating the 5Fs mnemonic for cholelithiasis: Time to include family history," *Postgraduate Medical Journal*, vol. 89, no. 1057, pp. 638–641, 2013.
- S.C. Hung, K.F. Liao, S.W. Lai, C.I. Li, and W.C. Chen, "Risk factors associated with symptomatic cholelithiasis in Taiwan: A population-based study", *BMC Gastroenterology*, p. 11, 2011.
- Y.S. Choi, J.H. Do, S.W. Seo, S.E. Lee, H.C. Oh, Y.J. Min, and H. Kang, "Prevalence and risk factors of gallbladder polypoid lesions in a healthy population," *Yonsei Medical Journal*, vol. 57, no. 6, pp. 1370–1375, 2016.
- A. Barré, G. Gusto, C. Cadeau, F. Carbonnel, and M.-C. Boutron-Ruault, "Diet and risk of cholecystectomy: A prospective study based on the French E3N cohort," *Official journal of the American College of Gastroenterology* | ACG, vol. 112, no. 9, pp. 1448–1456, 2017.
- D. Moris and T.N. Pappas, "Time to revisit indications for cholecystectomy," *The Lancet*, vol. 394, no. 10211, pp. 1803– 1804, 2019.

- D. Dhamnetiya, M. Goel, B. Dhiman, and O. Pathania, "Gallstone disease and its correlates among patients attending teaching hospital of North India," *Journal of Family Medicine and Primary Care*, vol. 8, no. 1, p. 189, 2019.
- M. Naeem, N.A. Rahimnajjad, M.K. Rahimnajjad, M. Khurshid, Q.J. Ahmed, S.M. Shahid, F. Khawar, and M.M. Najjar, "Assessment of characteristics of patients with cholelithiasis from economically deprived rural Karachi, Pakistan," *BMC Research Notes*, pp. 5, 2012.
- P. Lu, N.P. Yang, N.T. Chang, K.R. Lai, K.B. Lin, and C.L. Chan, "Effect of socioeconomic inequalities on cholecystectomy outcomes: A 10-year population-based analysis," *International Journal for Equity in Health*, vol. 17, no. 1, 2018.
- R. Abd El GwadElkalashy and S. Masry, "The effect of preoperative educational intervention on preoperative anxiety and postoperative outcomes in patients undergoing open cholecystectomy," *BJU Int*, vol. 117, no. 1, pp. 62–71, 2018.

- 22. M. Ranta, The Impact of Nutrition on Patient Recovery in Postoperative Care, 2021.
- 23. F. Abbasnia, N. Aghebati, H.H. Miri, and M. Etezadpour, "Effects of patient education and distraction approaches using virtual reality on pre-operative anxiety and post-operative pain in patients undergoing laparoscopic cholecystectomy," *Pain Management Nursing*, vol. 24, no. 3, pp. 280–288, 2023.
- 24. S.G. Lal, "Knowledge and practice on dietary management among patients with gallbladder diseases," *Medico-Legal Update*, vol. 19, no. 1, pp. 152–155, 2019b.
- I.M. Putri, L. Rosida, Suyani and E.P. Silmina, "Level of knowledge and self efficacy improve breast self-examination (BSE) behaviors," *Kemas*, vol. 18, no. 3, pp. 309–315, 2023.
- 26. D.A. Rina and L. Meliati, 'The implementation of healthy food diet for high-risk pregnant woman (amaris) class on the level of knowledge and attitude of pregnant woman," *Jurnal Kesehatan Masyarakat*, vol. 16, no. 2, pp. 182–191, 2020.