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Postoperative satisfaction and perception among laparoscopic cholecystectomy patients in Diyala Province, Iraq

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Abstract

Background: Over the past two decades, laparoscopic surgeries have significantly progressed, and surpassing traditional surgical methods across multiple medical fields. This study aims to assess the patients' satisfaction and the related factors toward the laparoscopic cholecystectomy in Iraq.

Methods: A cross-sectional study was conducted from April 2023 to 30th March 2024 at the Alkalis General Hospital and Al Hayat Private Hospital, Diyala province, Iraq. Semi-structured questionnaire was recruited to collect the pre and post operative data from patients. Statistical analysis was carried out using SPSS-21, with significance set at $p < 0.05$.

Results: Data of 157 patients with mean age (± Standard Deviation) of 47.57 (SD +12.80) were analyzed. Most of them (53.5%) were females, operated in public hospitals (52.2%), unemployed (51.6%), and earned less than USD 400 (60.5%). The majority of patients expressed high overall satisfaction with the laparoscopic cholecystectomy procedure (42.7% being strongly satisfied and 38.9% satisfied). In the multiple logistic regression, the patients who were operated in private hospital (OR = 4.506, 95% CI: 1.394 to 14-577; P-value= 0.012), with monthly income exceeds USD 400 (OR = 4.887, 95% CI: 1.531 to 15.601; P-value=0.007), involved in the choosing of surgery technique (OR = 5.596, 95% CI: 1.425 to 21.982; P-value=0.014), and those recommend laparoscopic cholecystectomy for others (OR = 9.100, 95% CI: 1.425 to 21.982; P-value=0.001), had the highest odds ratios. The Hosmer and Lemeshow test indicated a good fit (p = 0.552).

Conclusion: Patient satisfaction is high especially among high income patients operated in private hospital however, the perception of postoperative outcomes remains important areas of focus, particularly in regions with unique healthcare challenges like Iraq.

Keywords: Surgery, Laparoscopic, Cholecystectomy, Patients, Satisfaction, Public, Private, Hospital, Iraq

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Background

Laparoscopic cholecystectomy, the minimally invasive removal of the gallbladder, has become the standard treatment for gallstone disease and other gallbladder pathologies globally. This surgical technique offers significant advantages over traditional open cholecystectomy, including reduced postoperative pain, shorter hospital stays, quicker return to normal activities, and minimal scarring [1]. As a result, laparoscopic cholecystectomy has seen widespread adoption, with a significant number of patients undergoing this procedure annually [2]. However, despite its popularity and general success, postoperative satisfaction and patient perception of the surgery's outcomes remain critical areas of investigation [3], particularly in diverse healthcare settings such as Iraq [4]. The prevalence of laparoscopic cholecystectomy is high in many countries, reflecting its status as a preferred surgical option. In the United States, for example, over one million cholecystectomies are performed each year, with the vast majority being laparoscopic [5]. Similarly, in Europe and many parts of Asia, the procedure is commonly performed, supported by advances in surgical technology and expertise [1]. The widespread use of this technique underscores the importance of understanding patient satisfaction and perception following the surgery, as these factors significantly influence overall healthcare quality and patient compliance with postoperative care instructions [3,6,7]. Numerous studies have explored postoperative outcomes and patient satisfaction following laparoscopic cholecystectomy. Research indicates that most patients report high levels of

satisfaction due to the minimally invasive nature of the procedure, which typically results in less pain and quicker recovery compared to open surgery [6,7,8,]. For instance, a study conducted in the United Kingdom found that over 90% of patients were satisfied with their laparoscopic cholecystectomy experience, citing reduced pain and faster recovery as major contributing factors [9]. Similarly, researches from United States of America and Japan highlighted high patient satisfaction rates, with significant improvements in postoperative pain and quicker return to daily activities reported by patients [10,11]. Despite these generally positive outcomes, certain issues can influence postoperative satisfaction and perception, such as the presence of postoperative complications, the quality of preoperative information provided to patients, and the level of postoperative care and support. Complications, although relatively rare, can negatively impact patient satisfaction. These include common bile duct injuries [12,13,14], postoperative infections, and persistent abdominal pain [15,16]. The quality of communication and information provided to patients before surgery also plays a crucial role; patients who are well-informed about the procedure and its potential risks and benefits tend to have higher satisfaction levels [17]. In the context of Iraq, the landscape of healthcare and surgical outcomes presents unique challenges and considerations. Iraq has faced significant healthcare system disruptions due to prolonged periods of conflict, economic sanctions, and political instability [18]. These factors have led to varying levels of medical infrastructure and resource availability across different regions [19]. Consequently, the experiences and perceptions of patients undergoing laparoscopic cholecystectomy in Iraq may differ from those in more stable and resource-rich settings. Research on postoperative satisfaction and perception among laparoscopic cholecystectomy patients in Iraq is limited [20,21,22], but available studies suggest that while the procedure is widely performed, patient experiences can vary significantly. Factors such as the quality of surgical facilities, availability of trained surgical personnel, and postoperative care services all play critical roles in shaping patient outcomes. Additionally, cultural factors and patient expectations can influence perceptions of the surgery's success and satisfaction [20]. One study conducted in Iraq indicated that while many patients reported satisfactory outcomes, issues such as inadequate pain management, limited access to postoperative care, and insufficient preoperative information were common concerns [21]. These findings highlight the need for improvements in patient education, pain management protocols, and postoperative care to enhance patient satisfaction and overall surgical outcomes in the region [22]. Addressing these challenges requires a multifaceted approach that includes enhancing surgical training, improving healthcare infrastructure, and implementing standardized protocols for preoperative and postoperative care. Moreover, understanding patient expectations and cultural factors is crucial for providing tailored care that meets the needs and preferences of patients in Iraq [23]. This study aims to assess the patients' satisfaction after the laparoscopic cholecystectomy in Diyala province, Iraq.

Methods

Study design and participants

A cross-sectional prospective study was conducted between 1st April 2023 to 30th March 2024 at the Alkalis General Hospital and Al Hayat Private Hospital.

Sample size

Considering the margin of error between 7%, a confidence level of 90%, and a 50% response distribution the sample size reached 159 (138 +15% drop out) using the following formula: $N= [Za^2 \times P \times Q / (M.E.)^2]$

Inclusion and exclusion criteria

Patients of both genders, aged 18 years and above, underwent to laparoscopic cholecystectomy, signed the consent form and willing to participate. We excluded those who underwent open cholecystectomy, declined participation, or could not provide informed consent for any reason.

Study tool

A modified questionnaire was designed to collect data. The questionnaire included three sections; first section to collect the sociodemographic and economic characteristics of respondents; the second section was to collect data about the information given to patients about the surgery of laparoscopic cholecystectomy; the third section was bout the patients' satisfaction toward the procedure. Responses were given in the second section to be either "Yes", "No", or "don't know". While the responses in the third section were given in five item Likert scale ranged from "Strongly Satisfied" to "Strongly Dissatisfied". Moreover, patients were asked to rate their overall satisfaction towards the laparoscopic cholecystectomy, and to declare whether they recommend laparoscopic cholecystectomy or open cholecystectomy to others based on their experience. Written consent was obtained from all patients or first-degree relatives before the management procedure and the local ethics committee approved the study.

Dependent and independent variables

The dependent variable was the overall satisfaction to either "Satisfied" or "Dissatisfied". Several variables used in this study including the age, gender, educational status, employment status, the monthly income and the preference for type of surgery.

Statistical analysis

The data were analyzed using SPSS version 21 (SPSS Inc., Chicago, IL, USA). Quantitative variables were presented as means ± standard deviation (SD), while qualitative variables were represented as frequencies and percentages. The chi-squared test was employed for the analysis of categorical variables. Multiple logistic regression was utilized to predict overall satisfaction with laparoscopic cholecystectomy. A p-value of less than 0.05 was considered statistically significant.

Results

Characterization COVID-19 patients

Out of 159 collected samples, 157 were analyzed. The mean age of the patients was 47.57 years, with a standard deviation of 12.80, and the age range was between 25 and 72 years. More than fifty (53.5%) were females, from public hospitals (52.2%), low educated (51.6%), unemployed (51.6%), and 60.5% earned less than USD 399 equivalent to 600,000 IQD.

Table 1. Socio-demographic and economic characteristics of operated patients (n=157).

Variables	Categories	N (%)
Age	Mean (+ SD): 47.57 (12.80)	
	Range: 25-72	
Age groups	25-34	34 (21.7)
	35-44	29 (18.5)
	45-54	39 (24.8)
	55-64	35 (22.3)
	> 64	20 (12.7)
Gender	Male	73 (46.5)
	Female	84 (53.5)
Transferring hospital	Public	82 (52.2)
	Private	75 (47.8)
Educational level	Primary school or less	19 (12.1)
	Secondary to high school	62 (39.5)
	Bachelor ‘s degree	59 (37.6)
	Postgraduate degree (diploma, master, doctorate)	17 (10.8)
Employment status	Unemployed	81 (51.6)
	Employed	76 (48.4)
Monthly income	< USD 399	95 (60.5)
	USD 400 and above	62 (39.5)

Table 2 summarizes participants' responses concerning their experiences and information received about laparoscopic cholecystectomy. The communication was effective between the surgical team and 77.1% of patients before the operation. More than seventy percent received adequate information about preoperative preparations. There was lack of information among 73.2% of respondents about the surgery, and its risks, benefits, and consequences, however, majority (89.2%) involved in choosing the laparoscopic surgery technique. More than two-third (67.5%) of patients informed and made discussion about the method of anesthesia. Most of participants (80.9%) found healthcare sufficiently responsive to their concerns and questions before the procedure, and 86.6% of patients praised the clarity of instructions provided for postoperative care. The vast majority (88.5%) of participants would recommend laparoscopic cholecystectomy over open cholecystectomy to others.

Table 2. Participants' responses about general information regarding laparoscopic cholecystectomy (n=157).

No.	Statement	NO N (%)	Yes N (%)
1	There was an effective communication with the surgical team before the operation.	36 (22.9)	121 (77.1)
2	Patient received adequate information about the preoperative preparations for laparoscopic cholecystectomy.	47 (29.9)	110 (70.1)
3	There was sufficient information about the surgery of laparoscopic cholecystectomy, potential risks, benefits and consequences.	115 (73.2)	42 (26.8)
4	Patient was involved in the selection of the laparoscopic surgery technique.	17 (10.8)	140 (89.2)
5	The method of anesthesia (general or local), benefits and consequences have been discussed with the patient before the operation.	51 (32.5)	106 (67.5)
6	There was sufficient responsiveness of healthcare professionals to patient's concerns and questions before the procedure.	30 (19.1)	127 (80.9)
7	There was clarity of the instructions provided for postoperative care.	136 (86.6)	21 (13.4)
8	Would you recommend laparoscopic cholecystectomy or open cholecystectomy to others based on your personal experience?	18 (11.5)	139 (88.5)

Table 3 summarizes participants' satisfaction levels with various aspects of their laparoscopic cholecystectomy experience. The majority of patients expressed high overall satisfaction with the laparoscopic cholecystectomy procedure (42.7% being strongly satisfied and 38.9% satisfied). Most of the patients (38.2%) of patients felt strongly satisfied and (31.2%) satisfied toward the support they received from the healthcare team during recovery. However, satisfaction with the information provided about potential complications and their management was moderate (18.5% strongly satisfied and 38.9% satisfied), compared to 22.3% were dissatisfied and 10.8% strongly dissatisfied, and 9.6% were unsure. The professionalism and competence of the healthcare team received mixed feedback, with 51.6% strongly satisfied or satisfied. At the same time a significant portion (36.9%) were unsure, while 8.3% were dissatisfied and 3.2% strongly dissatisfied. Effective pain management was positively noted, with 15.3% strongly satisfied and 56.7% satisfied, however 20.4% were uncertain. Nursing care during the hospital stay was praised by 17.2% strongly satisfied and 45.2% satisfied. Satisfaction regarding the management of complications or adverse effects, including pain, was varied. About 21.0% were strongly satisfied and 33.1% satisfied, while 20.4% were dissatisfied and 16.6% strongly dissatisfied. The financial burden associated with the procedure was a concern, with only 3.2% strongly satisfied and 12.7% satisfied. A significant portion (22.3%) were dissatisfied and 14.0% strongly dissatisfied, while 47.8% were unsure.

Table 3. The participants' satisfaction toward the laparoscopic cholecystectomy (n=157).

No.	How satisfied were you with the following statements?	Strongly Satisfied N (%)	Satisfied N (%)	Not know N (%)	Dissatisfied N (%)	Strongly Dissatisfied N (%)
1	The overall satisfaction with the laparoscopic cholecystectomy procedure.	67 (42.7)	61 (38.9)	5 (3.2)	19 (12.1)	5 (3.2)
2	The patient felt supported by the healthcare team during the recovery period after laparoscopic cholecystectomy.	60 (38.2)	49 (31.2)	12 (7.6)	19 (12.1)	17 (10.8)
3	The sufficiency of information provided about potential complications and their management after the procedure.	29 (18.5)	61 (38.9)	15 (9.6)	35 (22.3)	17 (10.8)
4	The overall professionalism and competence of the healthcare team involved in the laparoscopic cholecystectomy.	18 (11.5)	63 (40.1)	58 (36.9)	13 (8.3)	5 (3.2)
5	The healthcare team dealt with the patient's pain effectively after laparoscopic cholecystectomy.	24 (15.3)	89 (56.7)	32 (20.4)	8 (5.1)	4 (2.5)
6	There was sufficient nursing care during hospital stay for laparoscopic cholecystectomy.	27 (17.2)	71 (45.2)	25 (15.9)	16 (10.2)	18 (11.5)
7	The complications or adverse effects including pain following the laparoscopic cholecystectomy procedure.	33 (21.0)	52 (33.1)	14 (8.9)	32 (20.4)	26 (16.6)
8	The financial burden associated with the laparoscopic cholecystectomy procedure.	5 (3.2)	20 (12.7)	75 (47.8)	35 (22.3)	22 (14.0)

Factors associated with overall satisfaction in bivariate analysis Cross tabulation indicated that patients from private hospitals (chi square test ($\chi2$) =13.288, p-value < 0.001), employed individuals ($\chi2$ =8.389, p-value = 0.004), those earning USD 400 or more ($\chi2$ = 12.645, p-value < 0.001), those who did experience effective communication with surgical team ($\chi2$ = 6.851, p-value = 0.009), those who did receive adequate preoperative information ($\chi2$ = 5.704, p-value = 0.017), those involved in selecting the laparoscopic cholecystectomy technique ($\chi2$ = 6.526, p-value = 0.011), those who did discuss anesthesia ($\chi2$ = 4.045, p-value = 0.044), and patients who would recommend laparoscopic cholecystectomy ($\chi2$ = 31.359, p-value < 0.001), were significantly associated with the high satisfaction rate (Table 3)

Table 4: cross-tabulation chi-square test of different variables on the satisfaction level (n=157).

Variable	Categories	Not satisfied	Satisfied	Total	Chi Square	p-value
Hospital	Public	24 (29.3)	58 (70.7)	82 (52.2)	13.288	0.000
	Private	5 (6.7)	70 (93.3)	75 (47.8)		
Employment	Unemployed	22 (27.2)	59 (72.8)	81 (51.6)	8.389	0.004
	Employed	7 (9.2)	69 (90.8)	76 (48.4)		
Monthly income	<USD 399	26 (27.4)	69 (72.6)	95 (60.5)	12.645	0.000
	USD 400 and more	3 (4.8)	59 (95.2)	62 (39.5)		
Q1-Effective Communication	NO	12 (33.3)	24 (66.7)	36 (22.9)	6.851	0.009
	YES	17 (14.0)	104 (86.0)	121(77.1)		
Q2-Adequate Preoperative Information	NO	14 (29.8)	33 (70.2)	47 (29.9)	5.704	0.017
	YES	15 (13.6)	95 (86.4)	110 (70.1)		
Q4-Involvement in Technique Selection	NO	7 (41.2)	10 (58.8)	17 (10.8)	6.526	0.011
	YES	22 (15.7)	118 (84.3)	140 (89.2)		
Q5 Discussion the type of Anesthesia	NO	14 (27.5)	33 (72.5)	51 (32.5)	4.045	0.044
	YES	15 (14.2)	91 (85.8)	106 (67.5)		
Q8- Laparoscopic cholecystectomy Surgery Recommendation	NO	12 (66.7)	6 (33.3)	18 (11.5)	31.359	0.000
	YES	17 (12.2)	122 (87.8)	139 (88.5)		

Factors associated with overall satisfaction in multiple logistic regression

Table 4 presents the final model of the multivariable logistic regressions. Several variables were associated significantly with "overall patient satisfaction toward laparoscopic cholecystectomy" (p < 0.05). The total model was significant (p = 0.001) and accounted for 39.6% of variance (Nagelkerke R square = 0.396). The patients who were operated in private hospital (OR = 4.506, 95% CI: 1.394 to 14-577; P-value= 0.012), with monthly income exceeds USD 400 (OR = 4.887, 95% CI:

1.531 to 15.601; P-value=0.007), involved in the choosing of surgery technique (OR = 5.596, 95% CI: 1.425 to 21.982; P-value=0.014), and those recommend Laparoscopic cholecystectomy for others (OR = 9.100, 95% CI: 1.425 to 21.982; P-value=0.001), had the highest odds ratios. The Hosmer and Lemeshow test indicated a good fit (p = 0.552).

Table 4: Factors associated with overall satisfaction in multiple logistic regression (n=157)

Variable	Categories	*B*	SE	WALD	Sig.	Exp(B)	95.0% C.I./Lower-Upper
Hospital come from	Private	1.506	0.599	6.321	0.012	4.506	1.394-14-577
	Public					Reference	
Monthly income	USD 400 and more	1.587	0.592	7.177	0.007	4.887	1.531-15.601
	<USD 399					Reference	
Q4-Involvement in Technique Selection	Yes	1.722	0.698	6.086	0.014	5.596	1.425-21.982
	No					Reference	
Q8- Laparoscopic cholecystectomy Surgery Recommendation	Yes	2.208	0.638	11.963	0.001	9.100	1.425-21.982
	No					Reference	

Discussion

The demographic characteristics observed in this study are consistent with findings from other similar studies. For instance, a study by Kim et al. [24] reported that the majority of patients undergoing laparoscopic cholecystectomy were in their fifth decade of life, aligning with our finding that 47.1% of patients were between the ages of 45 and 64 years. The gender distribution in our study, with a slight female predominance (53.5%), is also consistent with another research. A study by Anand et al. [25] found a similar trend, with females constituting approximately 75% of the study population undergoing laparoscopic cholecystectomy. Numerous prior studies [25,26,27] have identified that being female sex increases the risk of developing gallstone disease. In terms of socio-economic status, our study's finding that a majority of patients had lower income levels is in line with a study by Lu et al. [28] that highlighted the socio-economic disparities in access to laparoscopic cholecystectomy, showing that patients from lower-income groups are more likely to present with advanced gallbladder disease and cholecystectomy surgery. A majority of patients (77.1%) reported effective communication with the surgical team before the operation, which is crucial for patient satisfaction and outcomes. Similar results were found by Aragon and Gesell [29], who highlighted the significant impact of patient-provider communication on patient satisfaction and perceived quality of care. Additionally, 70.1% of patients felt they received adequate information about preoperative preparations, aligning with findings by Wongkietkachorn et al. [30] that emphasized the importance of preoperative education in enhancing patient understanding and reducing anxiety. However, only 26.8% of patients felt they did not receive sufficient information about the surgery and its associated risks and benefits. Liu et al. [31] found that comprehensive preoperative counseling improved patient satisfaction and postoperative outcomes, underscoring the importance of adequate surgical information for informed consent and patient autonomy. A significant majority (89.2%) of patients reported involvement in the selection of the laparoscopic surgery technique. Kiesler and Auerbach [32] demonstrated that shared decision-making leads to better health outcomes and higher patient satisfaction. Furthermore, 67.5% of patients stated that the method of anesthesia and its benefits and consequences were discussed with them. Oh et al. [33] linked detailed preoperative anesthesia information to reduced patient anxiety and improved satisfaction, underscoring the importance of proper anesthesia discussions for patient comfort and trust. Approximately 80.9% of patients felt that healthcare professionals were sufficiently responsive to their concerns and questions before the procedure, corroborating studies by Świątoniowska-Lonc et al. [34] that highlight the critical role of responsiveness to patient concerns in determining patient satisfaction. Lastly, 86.6% of patients reported receiving clear postoperative care instructions, essential for recovery and compliance. Yang et al. [35] found that clear discharge instructions significantly improved patient understanding and adherence, reinforcing the importance of clear postoperative guidance. Most participants (81.6%) expressed satisfaction with the laparoscopic cholecystectomy procedure, aligning with Keus et al.'s findings, which highlighted high satisfaction rates due to the minimally invasive nature and faster recovery time of laparoscopic cholecystectomy compared to open cholecystectomy [36]. Approximately 69.4% of patients felt supported by the healthcare team during the recovery period, which is crucial for patient recovery and satisfaction. This is supported by Tafazal et al., who found that patients who felt supported during recovery reported better outcomes and higher satisfaction levels [37]. Regarding information about potential complications and their management, 57.4% of patients were satisfied. However, 33.1% expressed dissatisfaction or uncertainty, indicating a need for better communication. Brodersen et al. [38] emphasized the importance of clear and comprehensive communication about potential complications to enhance patient understanding and satisfaction. Furthermore, 51.6% of participants were satisfied with the professionalism and competence of the healthcare team, while 36.9% were unsure. This suggests a mixed experience among patients. Williams et al. supported the notion that perceptions of healthcare provider competence significantly influence overall satisfaction [39]. Effective pain management is crucial for patient satisfaction, with 72% of patients satisfied with pain management post-surgery. Ip et al. [40] found that effective pain control is directly correlated with higher patient satisfaction and better recovery outcomes. Additionally, 62.4% of patients felt they received

sufficient nursing care during their hospital stay, highlighting the importance of nursing care quality in patient satisfaction. Kutney-Lee et al. [41] demonstrated that better nursing care environments are associated with higher patient satisfaction. Only 54.1% of patients were satisfied with how complications or adverse effects were managed, while 37% reported dissatisfaction or uncertainty. This underscores the need for improved postoperative care and communication about managing potential complications. Fu et al. [42] emphasized that clear guidelines and proactive management of complications can significantly enhance patient satisfaction. Lastly, only 15.9% of participants were satisfied with the financial burden associated with the procedure, with 36.3% expressing dissatisfaction. The cost of medical procedures is a significant factor in patient satisfaction, as evidenced by Alexander et al. [43], who found that financial concerns substantially impact patient perceptions of care quality and overall satisfaction. Employment status showed a significant correlation with satisfaction levels (Chi-square = 8.389, p = 0.004). Employed patients exhibited a higher satisfaction rate (90.8%) compared to unemployed patients (72.8%). This is consistent with findings by Ikar et al. [44], who noted that employed individuals often have better access to healthcare resources and information, leading to higher satisfaction. Ugur [45] also found that employed individuals typically experience greater life satisfaction, financial stability, and structured time, contributing to higher happiness levels. Discussing anesthesia options was also significantly associated with satisfaction (Chi-square = 4.045, p = 0.044), with 85.8% of informed patients being more satisfied compared to 72.5% of those uninformed. This aligns with Shafique et al. [46], highlighting the importance of discussing anesthesia to reduce patient concerns and enhance satisfaction. Multiple logistic regression analysis revealed a significant link between hospital type and overall patient satisfaction. Patients treated in private hospitals were more than four times as likely to be satisfied compared to those in public hospitals (Exp(B) = 4.506, p = 0.012). This aligns with Javed et al. [47], who noted that private healthcare settings often offer superior service quality and personalized care, resulting in higher patient satisfaction. Monthly income also significantly impacted satisfaction levels. Patients earning USD 400 or more per month were nearly five times more likely to report satisfaction (B = 1.587, SE = 0.592, p = 0.007; Exp(B) = 4.887). This supports Hekkert et al. [48], which showed that higher-income patients often receive better healthcare services and report higher satisfaction levels. Involvement in selecting the laparoscopic surgery technique was another key factor, with involved patients being over five times more likely to be satisfied (B = 1.722, SE = 0.698, p = 0.014; Exp(B) = 5.596). This finding echoes the research of Gattellari et al. [49] and Birkeland et al. [50], which emphasized that patient involvement in decision-making significantly boosts satisfaction and treatment adherence. The most significant predictor of overall satisfaction was the recommendation of laparoscopic cholecystectomy to others. Patients who would recommend the procedure were nine times more likely to be satisfied (B = 2.208, SE = 0.638, p = 0.001; Exp(B) = 9.100). This is consistent with the studies by Jenkins [28] and Gach et al. [51], which found that positive personal experiences and successful outcomes lead to higher satisfaction and a greater likelihood of recommending the procedure [52].

Conclusion

In summary, the majority (81.6%) of respondents revealed high overall satisfaction with the laparoscopic cholecystectomy surgery. The analysis indicates that satisfaction with laparoscopic cholecystectomy is significantly influenced by the type of hospital, monthly income, patient involvement in technique selection, and the likelihood of recommending the surgery to others. These factors collectively suggest that higher satisfaction levels are associated with private hospital care, higher income, active patient involvement, and a positive recommendation of the surgery. Further research is needed to explore these issues comprehensively and develop strategies to optimize patient experiences and satisfaction in Iraq and similar contexts.

Abbreviation

SD: Standard Deviation; USD: United State Dollar; IQD: Iraqi Dinar;

Declaration

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Availability of data and materials

Data will be available by emailing amjad.alsadi.aa@gmail.com

Authors' contributions

The author conceived and designed the study, analyzed and interpreted the data; drafted the manuscript; and revised the manuscript. The author read and approved the final manuscript.

Ethics approval and consent to participate

We conducted the research following the declaration of Helsinki. The ethical approval [Ref. No. 2023] was obtained from the Ethic Committee of Alkalis General Hospital and Al Hayat Private Hospital, Diyala province, Iraq.

Consent for publication

Not applicable

Competing interest

The authors declare that they have no competing interests.

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