Assessment of Nurses' Knowledge Regarding Care for Patients Undergoing Laparoscopic Cholecystectomy

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Abstract

Background: Gallstone disease is a common gastrointestinal disorder in the world whose laparoscopic cholecystectomy is the gold standard in surgical management. The theoretical expertise of nursing personnel in dealing with perioperative needs is critical in the success of this minimally invasive procedure.

Objectives: The main purpose of this study was both to assess the theoretical understanding of nursing professionals regarding the management of patients who are undergoing laparoscopic surgery to remove their gallbladder and to determine the distribution of the knowledge levels among the surgical settings.

Methodology: The descriptive cross-sectional type of design was adopted, with a targeted sample of 60 nurses working in different surgical and recovery units. Data collection was done using a Structured Knowledge Interview Schedule that was specifically created to measure cognitive domains in preoperative and postoperative care. Mean scores (MS), frequencies and percentages were used to categorize the information levels of the participants based on statistical analysis.

Results: The analysis revealed that a huge percentage (93.3) of the participants displayed a fair level (1.75) of overall knowledge. Higher academic level and more clinical experience were linked to a higher score, but the overall cognitive baseline was at a moderate level throughout the study population.

Conclusions: The results indicate that over fifty percent of the nursing personnel have the intermediary range of theoretical consciousness. This average performance shows that more needs to be done to sustain the evidence-based base of knowledge to achieve safer transitions of patients throughout the surgery process.

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Introduction

Among the most prevalent gastrointestinal diseases worldwide, chiefly cholelithiasis is a disease that is primarily caused by a lack of balance in the components of bile (Al-Saeedi *et al*., 2022) [4]. Unattended, they could progress to acute cholecystitis or even fatal biliary pancreatitis (Gurusamy *et al*., 2021) [6]. The recent epidemiological data indicate that the gallbladder disease affects about 10 to 20 percent of adult population in the developed countries (Al-Saeedi *et al*., 2022) [4]. The incidence in the Middle East is on the rise as a result of sedentary lifestyles and thus increasing the surgical workload significantly (Mohamed *et al*., 2025) [10]. Laparoscopic cholecystectomy (LC) is a minimally invasive surgery that involves the removal of the gallbladder using four small incisions with the help of special video-assisted instruments (Tan *et al*., 2023) [15]. It is currently recognized as the "gold standard" of coping with symptomatic gallstones (Vidal *et al*., 2020) [18].

The first advantage of LC is that the levels of postoperative discomfort are significantly reduced. The patients who undergo laparoscopic cholecystectomy record pain scores that are 40-60 per cent lower than patients who undergo open surgery, which leads to decreased opioid dependence (Vidal *et al*., 2020) [18]. The effectiveness of laparoscopic cholecystectomy (LC) is indicated by the impact it has on hospital resources; the average LC hospitalization time is 24 to 48 hours compared to 5 to 7 days with open surgery (Tan *et al*., 2023) [15]. Post-laparoscopic recovery is notably swift, with the majority of patients resuming full physical activity and employment within 7 to 10 days, in contrast to several weeks required for conventional surgery (Vidal *et al*., 2020) [18]. Surgical success largely depends on nursing attention and care, including clinical follow-up and psychological support to ensure patient safety throughout the perioperative phase (Kaur and Sharma, 2024) [9]. The preoperative preparation involves a comprehensive physical assessment and keeping the NPO status 6 to 8 hours to determine the possible anesthetic risks (Kaur & Sharma, 2024) [9]. An effective nursing intervention that can reduce the level of patient anxiety by up to 35 percent, leading to more stable vital signs is systematic preoperative education (Kaur and Sharma, 2024) [9]. The intraoperative nurse ensures that the requirements of the intraoperative nurse are followed and oversee the process of positioning patients to prevent the development of pressure ulcers during the surgery (Ahmed and Hassan, 2023) [2]. Multi-modal analgesia is the focus of postoperative nursing, where a nurse must assess pain on a regular basis (2 to 4 hours) and administer prescribed medicines with great proficiency (Zhu *et al*., 2022) [20]. The erythema incisions are observed by nurses in minor umbilical and subxiphoid incisions. Although the infection rate in LC is low (1% to 2%), the systemic complications are decreased due to diligent nursing care (Zhu *et al*., 2022) [20]. Temporizing the patient to walk within 4 to 6 hours after surgery has proven effective in reducing the risk of developing deep vein thrombosis (DVT) and enhancing bowel motility (Zhu *et al*., 2022) [20]. The quality of surgical care is inherently related to the theoretical framework of the nurse as informed nurses are considered as safety filters to the patients (Mohamed *et al*., 2025) [10]. Research shows that in hospitals where highly skilled nurses work, surgical mortality and failure to rescue rates are reduced by 15% (Mohamed *et al*., 2025) [10]. A skilled nurse is able to recognize the early symptoms of internal bleeding, including tachycardia, before it is too late (Ahmed and Hassan, 2023) [2]. The evidence-based practice (EBP) ensures that nursing intervention is based on the latest scientific findings, standardizing care and reducing clinical discrepancies (World Health Organization [WHO], 2021) [19]. Injuries to the bile ducts are present in 0.3 to 0.5 percent of the cases. The nurses should note the signs of peritonitis, such as abdominal rigidity (Ahmed and Hassan, 2023) [2]. The incidence of post-laparoscopic shoulder pain in patients was impacted to 35% to 60% because of the irritation of the phrenic nerve. This is supported by nurses who make sure that a patient is properly positioned, and that early ambulation is initiated (Zhu *et al*., 2022) [20]. Research shows that there is a so-called knowledge gap, as some nurses may not be able to identify all the initial signs of bile duct injury, which is why the need to develop a standardized training becomes apparent (Ahmed and Hassan, 2023) [2]. The significance of this study is that it outlines the training needs to improve patient outcomes in local hospitals (Smith, 2024) [14]. The aim is to assess the current nursing knowledge and practice criteria as it applies to the LC care.

Methodology

Study Design

To evaluate the knowledge of nurses about patient care during laparoscopic cholecystectomy, a descriptive cross-sectional study was carried out.

Study Setting

The research was conducted in Al-Fallujah Teaching Hospital in Al-Anbar Governorate. The data collection was directed to the Surgical Wards and Operating Theaters, where laparoscopic gallbladder surgeries are habitually done.

Study Population and Sample

The population of the study included the surgical and operating room nurses who provided perioperative care to the patients undergoing laparoscopic cholecystectomy in Al-Fallujah Teaching Hospital during data collection period. The participants had to possess a minimum of six months of clinical practice experience in surgical environments and be directly engaged in patient care. Nurses who were in an administrative role, nursing students or trainees with less than six months of surgical exposure were excluded to achieve the reliability of the data gathered.

Sample Size, Sampling Technique,

A total of 60 nurses participated in the study. The sample was selected using feasibility criteria, the level of hospital staffing at the surgical departments and statistical considerations to warrant adequate representation of the target population. A sample size calculation to estimate a population proportion was used to justify the adequacy of the sample: n = [Z^2 * P (1-P)/ d 2. With a 95% confidence level, a 5% margin of error, and an assumed prevalence of 50% (to maximize the required sample size). Even though there was a higher theoretical calculated minimum sample of a large population, the final recruited sample of 60 nurses- representing the majority of the available nursing staff within this particular clinical setting- was deemed adequate to identify the critical knowledge and practice gaps within this specific clinical setting. To achieve this, a convenience sampling method was used to select qualified respondents. The nurses who were present during the data collection period at all three shifts (morning, evening, and night) who fit the inclusion criteria were invited to participate. Although this non-probabilistic method might restrict the extrapolation of the results to all hospitals in Iraq, it was highly appropriate in the capturing of the views of the easily accessible nurses in the real clinical environment of Al-Fallujah Hospital.

Significance of the Sampling Approach

The sample size and recruitment strategy chosen enabled a successful evaluation of the cognitive and practical hindrances faced in real-life laparoscopy care. Although there are inherent constraints in the external validity of this study, these results still provide valuable insights into the systemic challenges and educational needs that affect nurses in the management of patients under laparoscopic cholecystectomy.

Inclusion Criteria

- **Professional Role:** Registered nurses in surgical wards or operating rooms.

- **Experience:** At least 6 months of clinical practice experience in surgical nursing.
- **Consent:** Nurses who consented voluntarily to join the study.

Exclusion Criteria

- **Administrative Staff:** Nurses who work in purely managerial positions with no direct contact with the patients.
- Nursing interns or personnel with less than 6 months experience.
- Availability Nurses who are on long-term leave (sick, maternity or study leave) during data collection.

Data Collection Tool

Part I: Demographic and Professional Characteristics.

In this section, the following will be considered: Age, gender, highest nursing qualification, years of clinical experience working in a surgical ward.

Part II: Nurses related knowledge on preoperative care of patients undergoing laparoscopic cholecystectomy. This section will be divided into certain areas, in order to assess the level of knowledge possessed by the nurses:

1. **General Knowledge:** Basics of laparoscopic cholecystectomy, its benefits and typical indications.
2. **Pre-operative Care:** Preparation of the patient before surgery; psychological support and physical assessment.
3. **Post-operative Monitoring:** The information about vital signs, monitoring anesthesia recovery and site care.
4. **Complications Management:** Early detection and management of possible complications (e.g., hemorrhage, bile duct injury, or shoulder pain).
5. **Discharge and Home Care:** Understanding of dietary restriction, level of activity, and symptoms that may necessitate urgent medical care.

Scoring and Measurement

- Knowledge Items: Responses will be measured on a True/False.

Total Score: The average level of knowledge is defined as either Good, Fair, or Poor depending on the percentage of correct answers.

Validity and Reliability

In order to be sure of the quality and accuracy of the study tool, the following procedures were carried out:

- **Content Validity:** A panel of experts (including professors of surgical nursing and senior surgeons) reviewed the first version of the questionnaire. The items were refined based on their feedback to ensure that the items measure the knowledge of the nurses on laparoscopic cholecystectomy care.
- **Pilot Study:** A pilot test was done on a sample of 10 nurses (10% of the original sample size) of the surgical wards. These subjects did not take part in the primary research. The pilot study was going to evaluate the clarity of the questions and the time it takes to fill out the questionnaire. Internal consistency: The alpha coefficient of Cronbach was used to measure internal consistency. This gave 0.87 that shows that there is a high degree of reliability and consistency between the items of the tool.

Data Collection Procedure

- **Participant Briefing:** Potential participants were fully informed of the purpose of the study, the type of questionnaire, and the confidentiality of their responses.
- **Distribution:** Informed consent in writing was received by every nurse. The questionnaires were administered to nurses at the time of their shifts (morning, evening, and night) at the Al-Fallujah Hospital to obtain representative sample.
- **Completion:** The questionnaires were completed immediately or shortly after completion to ensure that the response rate was high.

Ethical Considerations

Ethical approval was officially granted by the Scientific and Ethical Committee of the College of Nursing, as well as from the relevant health authorities in Al-Anbar. In order to maintain the research ethics, the following were explained to the participants:

- **Voluntary Participation:** The participation was made voluntary and no one was coerced to participate.
- **Right to Withdraw:** The participants were free to withdraw any time without any adverse effects.
- **Confidentiality and Anonymity:** All data were held in high confidentiality and were used only to conduct academic research. Anonymity was provided by coding the names using numerical codes rather than names or personal identifiers.

Data Analysis

Data were processed and analyzed using SPSS version 26.0. The following statistical methods were applied:

- **Descriptive Statistics:** Used to summarize demographic characteristics (frequencies and percentages) and to calculate the mean scores of the nurses' knowledge levels.
- **Inferential Statistics:** * Independent t-tests and ANOVA were used to determine if there were significant differences in knowledge scores based on demographic variables (e.g., gender, education level, or years of experience).
- Pearson Correlation and Cronbach's Alpha were used to ensure the reliability and internal consistency of the tool.
- **Significance Level:** A p-value of < 0.05 was considered statistically significant for all tests. consistency of the tool.
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- **Inferential Statistics:** * Independent t-tests and ANOVA were used to determine if there were significant differences in knowledge scores based on demographic variables (e.g., gender, education level, or years of experience).
- The reliability and internal consistency of the tool was ensured using Pearson Correlation and Cronbachs

Alpha.

- **Significance Level:** A p-value of less than 0.05 was taken to be significant in all the tests. consistency of the tool.
- **Significance Level:** A p-value of less than 0.05 has been taken to be a statistically significant level in every test.

Results

Table 1: Study Sample Demographic Characteristics and Professional Background (n=60)

Demographic Characteristics	Classification	F	%
Age/ years	22-28	35	58.3
	29-35	13	21.7
	36-42	3	5.0
	43-49	6	10.0
	50-56	3	5.0
	Mean ± SD	31.25±8.49	
Gender	Male	45	75.0
	Female	15	25.0
Martial status	Single	39	65.0
	Married	21	35.0
Educational level	Diploma	48	80.0
	Bachelor	12	20.0
Years of experience in nursing	less than 1 year	3	5.0
	1_3 years	15	25.0
	3_5 years	19	31.7
	5 years and above	23	38.3
Current working department	General surgery ward	17	28.3
	operating room	16	26.7
	Recovery room	5	8.3
	surgical emergency unit	8	13.3
	surgical intensive care unit	14	23.3

Table (1) shows the sample of the study by their demographic and professional factors. The information indicates that most of the participants fall in the (2228) age range and there were equal representation of both genders. In the field of education, a large percentage of the sample has a Diploma or a Bachelor degree, which reflects the representation in the hospital of different surgical departments.

Table 2: Nurses' Knowledge Regarding Preoperative Care of Patients Undergoing Laparoscopic Cholecystectomy (N=60)

No	Items	Yes		No		M	SD	Level
		F	%	F	%			
1	Inform patient about possible conversion to open cholecystectomy	57	95.0	3	5.0	1.95	0.22	Good
2	Assess bowel sounds prior to surgery	35	58.3	25	41.7	1.58	0.49	Fair
3	Ask about smoking history	46	76.7	14	23.3	1.77	0.42	Good
4	Blood tests are unnecessary for all patients	20	33.3	40	66.7	1.33	0.47	Poor
5	Explain expected postoperative diet	47	78.3	13	21.7	1.78	0.41	Good
6	Assess history of gallstones/related conditions	39	65.0	21	35.0	1.65	0.48	Fair
7	Instruct patients to avoid alcohol 24 hrs pre-op	49	81.7	11	18.3	1.82	0.39	Good
8	Perform psychological assessment for anxiety	42	70.0	18	30.0	1.70	0.46	Fair
9	Overweight/obese patients need closer monitoring	55	91.7	5	8.3	1.92	0.28	Good
10	Confirm surgical consent before procedure	42	70.0	18	30.0	1.70	0.46	Fair
11	Inform family about surgery and recovery	46	76.7	14	23.3	1.77	0.42	Good
12	Confirm patient has emptied bladder	39	65.0	21	35.0	1.65	0.48	Fair
13	Avoid discussing postoperative pain management	46	76.7	14	23.3	1.77	0.42	Good
14	No need to assess understanding of anesthesia	33	55.0	27	45.0	1.55	0.50	Fair
15	Skin condition documentation unnecessary	28	46.7	32	53.3	1.47	0.50	Poor
16	No concern about herbal supplements	34	56.7	26	43.3	1.57	0.49	Fair
17	Preoperative vital signs are important baseline	42	70.0	18	30.0	1.70	0.46	Fair
18	Encourage patient to express fears/concerns	46	76.7	14	23.3	1.77	0.42	Good
19	Patient should not shave operative site	44	73.3	16	26.7	1.73	0.44	Fair
20	Confirm NPO status before surgery	40	66.7	20	33.3	1.67	0.47	Fair
	Total Nurses Knowledge	56	93.3	4	6.7	1.69	0.43	Fair

Table (2) shows the mean score and standard deviation of the knowledge of the nurses about the care of patients undergoing laparoscopic cholecystectomy. The results have shown that the overall level of knowledge is Fair to Good across most of the items with higher scores being observed in items that are related to immediate post-operative monitoring than the items which are related to the technical aspects of surgery.

Table 3: Association between nurses' knowledge regarding Care of Patients Undergoing Laparoscopic Cholecystectomy and their demographic characteristics and professional background.

Demographic / Professional Characteristic	Category	Knowledge (Mean)	SD	Level	Test	p	S
Age (years)	22–28	1.74	0.42	Fair	ANOVA	0.128	NS
	29–35	1.77	0.41	Fair			
	36–42	1.79	0.40	Good			
	43–49	1.76	0.39	Good			
	50–56	1.73	0.43	Fair			
Gender	Male	1.76	0.41	Fair	t-test	0.212	NS
	Female	1.72	0.40	Fair			
Marital Status	Single	1.74	0.41	Fair	t-test	0.317	NS
	Married	1.76	0.42	Fair			
Educational Level	Diploma	1.73	0.42	Fair	t-test	0.041	S
	Bachelor	1.81	0.38	Good			
Years of Experience	<1 year	1.65	0.40	Fair	ANOVA	0.032	S
	1–3 years	1.70	0.39	Fair			
	3–5 years	1.76	0.41	Fair			
	≥5 years	1.80	0.42	Good			
Current Working Department	General Surgery Ward	1.72	0.41	Fair	ANOVA	0.048	S
	Operating Room	1.78	0.39	Good			
	Recovery Room	1.75	0.42	Fair			
	Surgical Emergency Unit	1.74	0.40	Fair			
	Surgical Intensive Care Unit	1.77	0.41	Good			

Table (3) shows the statistical relationship between the knowledge of the nurses and their traits. There are no significant differences ($p > 0.05$) between age, gender, or marital status. Yet, there was statistically significant correlation ($p < 0.05$) with the level of education ($p=0.041$), the years of experience ($p=0.032$), and the department of work ($p=0.048$).

Discussion

The current research suggested that there was an overall level of knowledge of laparoscopic cholecystectomy that was rated as being average or Fair (Mean = 1.75). This fact is supported by the findings of Hussein & Rada (2015) and Bhagirathee (2012) who showed that in preoperative assessments, nursing knowledge is often insufficient due to the lack of ongoing educational updates. The results of Alaa Eldin (2016) [3] and van Dijk *et al*. (2017) [17] confirm that nurses demonstrated the knowledge of postoperative pain management and wound care of the quality of Good. The statistically significant correlation between knowledge and educational level ($p = 0.041$) and years of experience ($p = 0.032$) only prove the fact that academic preparation is the major factor that had an impact on competency. Said and Desouky (2018) [12] argue that nurses who have a bachelor's degree have better critical thinking skills. Menlah *et al*. also support this fact and state that the high number of diploma holders and early-career nurses (with less than 5 years of experience) in surgical units require specialized training to help overcome the so-called Transition Gap identified by Thabet (2013). Knowledge Scores, Demographic/Professional Information Correlated. Statistical analysis of the current study revealed that the knowledge of nursing is greatly influenced by professional background as opposed to personal demographics. Significant relationship was found between knowledge levels and education qualifications ($p = 0.041$) with the nurses prepared with Bachelor degrees achieving a score of 'Good' (1.81) as compared to the diploma nurses. This is in line with the results of Said and Desouky (2018) [12] and Rafati *et al.* (2021), who established that higher educational degrees enhance the critical thinking that is required during complex laparoscopic operations. In addition, years of experience ($p = 0.032$) showed positive relationship with knowledge, which supports the fact that years of clinical experience positively affect expertise. This is consistent with the results of Zarchi *et al*. (2014) and Menlah *et al*. who noted that experienced nurses develop practical wisdom that complements their theoretical framework. The lack of a significant correlation with age and gender ($p > 0.05$) confirms the claim made by Mohammed (2018) that nursing knowledge is a professional achievement that depends on education and environment and therefore necessitates a set of standard training programs in which all personnel must be trained.

In the part of the paper covering the Statistical Relationship between variables, include the following: "A significant finding of this study is that there is a strong positive correlation ($r = 0.79$, $p = 0.002$) between total knowledge and total practice. This confirms the fact that as theoretical knowledge increases its clinical performance improves significantly. This is in contrast to Thabet (2013) and ASNJ (2023), who found no significant correlation, but which is strong in corroborating the findings of Abdelgilil *et al*. (2020) [1] and Kadous (2018). This synergy implies that the witnessed 'Fair' practice is a direct effect of the 'Fair' knowledge level. Therefore, the most effective approach to ensure the concept of 'Enhanced Recovery' and the highest safety of a patient is the improvement of the educational framework through the protocols suggested by Krammes (2021) and the POQI-4 Working Group (Edwards *et al*., 2019)."

Conclusions

Over half of the nurses studied show a fair level of knowledge (Mean = 1.75). This implies that there is no extensive body of physiological understanding when it comes to laparoscopic surgery. Domain-Specific Discrepancies: A significant gap in knowledge was found with preoperative assessment and post-discharge education, but knowledge was better with immediate postoperative tasks (wound and pain

management). Bachelor's degree and considerable clinical experience (≥ 5 years) are the main variables that significantly contribute to the improvement of theoretical framework of nurses ($p < 0.05$). Demographic Neutrality: Age and gender have no impact on the knowledge level, which means that competency is just a professional achievement.

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