https://doi.org/10.15218/ejnm.2024.12 Erbil j. nurs. midwifery, Vol. 7, No. (2), Nov, 2024
Original Article

Assessing the Performance of Statistical Tools for Postoperative Nursing Care Quality of Patients with Laparoscopic Cholecystectomy in Teaching Hospitals at Erbil City

Yahya Zakarya Shakir; *Department of Nursing, College of Nursing, Hawler Medical University, Erbil, Kurdistan Region, Iraq.* (Correspondence: yahya.shakir@hmu.edu.krd).

Burhan Izzaddin Sabir; *Department of Nursing, College of Nursing, Hawler Medical University, Kurdistan Region, Erbil, Iraq.*

Paree khan Abdulla Omer; *Department of Statistics and Informatics, College of Administration and Economics, Salahaddin University, Erbil, Kurdistan Region, Iraq.*

Ali Taher Mohammedameen; *Department of Nursing, College of Nursing, Hawler Medical University, Erbil, Kurdistan Region, Iraq*

ABSTRACT

Background and Objectives: Laparoscopic Cholecystectomy is a minimally invasive surgery for or conducting gallbladder removal, providing faster recovery times and fewer complications compared to conventional open surgery. This study aims to evaluate and compare the standard of post-operative nursing care provided to patients who undergo Laparoscopic Cholecystectomy procedures in surgical units at teaching hospitals and understand statistical tools' performance in evaluating care quality.

Methods: A cross-sectional descriptive study design, involving fifty nurses via non-probability (purposive) sampling technique, who had been working in the surgical unit. The data were collected through the use of the observational checklist, which consisted of two parts; the first part includes information about the socio-demographic characteristics of respondents, and the second part is about the assessment of Postoperative nurses' care items consisting of five main domains. The data were collected from October -2023 to February -2024 after approval of the proposal by the Ethical Committee, using statistical tools to analyze the data.

Result: The finding of the study showed that most study items responding to the questionnaire showed significant differences and that there is insufficient provision of high-quality postoperative nurse interventions for patients undergoing Laparoscopic cholecystectomy at surgical wards at Erbil City teaching hospitals.

Conclusion: This study concludes that several demographic factors, such as age, marital status, and level of education, among nursing staff significantly correlate with the quality of nursing care provided in surgical wards. Despite their educational background, many nurses lacked adequate professional skills and training in postoperative nursing interventions for care.

Keywords: Assessment; Postoperative Nursing Care; Laparoscopic Cholecystectomy; Statistical Tools.

Received: 31/03/2024 *Accepted: 26/05/2024* *Published: 30/11/2024*

INTRODUCTION

The liver, gallbladder, and pancreas work together to secrete enzymes and other substances that aid in the digestion of food in the stomach and small intestine. If these organs are not functioning correctly, it can lead to digestive problems, which can result in poor nutrition. Collaborative care for patients with biliary system problems should include enhanced nutrition to support healthy cellular function (AbdElgilil et al., 2020). Laparoscopic cholecystectomy (LC) is a minimally invasive surgery for performing gallbladder removal, providing faster recovery times and fewer complications compared to conventional open surgery (Aziret et al., 2019; Farhangmehr & Menzies, 2020). However, despite its benefits, postoperative nursing care plays a critical role in ensuring optimal patient outcomes and quality of care delivery. Postoperative nurses need to understand the importance of the procedure, potential risk factors, and know the signs of complications. Precise nursing assessment, as well as intervention is essential to support patients in quickly and safely regaining optimal function. Nursing attention is concentrated on restoring the patient's physiological equilibrium to prevent or identify post-surgery complications promptly. Moreover, timely nursing implementation is necessary for checking vital signs, alleviating pain levels, managing nausea and vomiting, promoting wound healing, and minimizing drainage. Nurses should intervene promptly to ensure adequate ventilation, alleviate pain, preserve skin integrity, provide optimal nutrition, and implement measures to minimize patient discomfort during recovery. Furthermore, nurses should educate patients on essential information for post-operative recovery and after discharge (Edwards et al., 2019; EL-Shatby & El-Monem, 2020; Salime & shakweer, 2021).

Assessing the performance of statistical tools within this context aids in gauging the effectiveness of postoperative nursing interventions. Patients expect the use of effective and safe interventions and avoidance of unnecessary or inappropriate therapies. Post-operatively, the proficiency and application of healthcare professionals are crucial factors in managing patients' care. Lack of information persists regarding the pre and postoperative nursing care quality for patients undergoing LC in Erbil City. Despite some available data indicating substandard levels of care in various cities across Iraq, such as Kirkuk (Hussein & Khudair, 2019), Al-Najaf (Kareem et al., 2022), and Al-Nasiriya (Ibrahim & Muhamad, 2021), Sulaymaniyah City stands out for its commendable proficiency in both knowledge acquisition and practical application. (Hassan & Saeed, 2023) In teaching hospitals across Erbil City, the efficacy of postoperative nursing care for patients undergoing LC is paramount, necessitating a comprehensive evaluation of the statistical tools employed to assess care quality. Aim of the study: The current study aims to evaluate and compare the standard of post-operative nursing care provided to patients who undergo laparoscopic cholecystectomy procedures in surgical units at teaching hospitals and understand statistical tools' performance in evaluating care quality.

METHODS

A cross-sectional descriptive study was conducted about the post-operative quality of nurse care at a teaching hospital. A non-randomly purposeful sample of fifty nurses was selected, who has been working in surgical wards, from teaching hospitals (Hawler Teaching Hospital, Rizgary Teaching Hospital, and Rojhalat Emergency Hospital) including both genders. The duration of the study, which

was conducted during the period of 15, Sep. 2023 to April. 2024. The data were collected from Oct. 2023 to Feb. 2024 after approving the proposal. The data were collected through the use of a standard post-operative observation checklist, by the researchers after a strong review of the relevant literature (AbdElhafiez et al., 2021; Brenner & Kautz, 2015) which consisted of two parts; the first part includes information about the socio-demographic characteristics of respondents such as (age, gender, marital state, level of education, years of experience, number of years of experience in surgical unit, training course on post-operative nursing care for patients undergoing laparoscopic cholecystectomy). The second part is about the assessment of Postoperative Nurses' care items consisting of five main domains. First: Nurses' practices concerning monitoring and managing potential complications included 8 items. Second: Nurses' practices concerning improving respiratory status included 6 items. Third: Nurses' practices concerning relieving pain included 4 items. Fourth: Nurses' practices concerning maintaining skin integrity and drainage included 11 items. Fifth: Nurses' practices concerning maintaining nutritional status included 6 items. The checklist was administered through direct observation utilizing the standardized post-operative observational checklist. All nursing personnel actively serving in surgical units at the designated teaching hospitals were encompassed in the study, encompassing both male and female cohorts. Exclusion criteria were applied to individuals declining participation in interviews or facing impediments to study involvement. The ethical aspect of data collection is paramount, with prior approval secured from the Ethics Committee at the Nursing College, University of Hawler Medical. Verbal consent and authorization were sought from administrative personnel, as well as head nurses/supervisors of surgical departments. Participation in the study entails no inherent risks. Information is anonymized to protect the confidentiality of participants, thereby fostering maximal cooperation from study samples. Data were coded and analyzed utilizing Microsoft Office Excel 2016, in addition to the software statistical package for the social sciences (SPSS version 27). Here used the useful test called the chi-square test, and is a non-parametric test that is specifically used for two tasks: (a) Testing the hypothesis that two or more groups, populations. (b) Calculating the probability that the observed data distribution fits the expected distribution (i.e., evaluating goodness of fit). It is meant to evaluate categorical data, such as patients who are male or female, smokers or not (Rana & Singhal, 2015), (ELsayed, 2022). The expected count deducted from the observed count is to determine the difference between them. Then, the square of the difference is computed, to eliminate the negative values because the squares of (2 and 2) are naturally both four. The hypothesis of null and alternative for this test will be (Rana & Singhal, 2015): H0: no association between two categorical variables. H1: an association between two categorical variables. The binomial distribution used in statistics and probability theory, which generally offers only two possible outcomes for any experiment: such as gender (male or female) and (success or failure). Similarly, there are only two possible outcomes while taking a test: pass or fail , yes or No (Phillips, 2006).

RESULT

Table 1 shows that there is a significance among the level of the studied (Y1) Gender variable because (α = 0.05) is greater than (P-Value = 0.033) (α > P-Value). While it reports a highly significant, with (Y2) age groups, (Y3) marital state, (Y4) educational level, (Y5) years of experience in hospitals, (Y6) years of experience in surgical units, and (Y7) training course on post-operative nursing care for patients undergoing LC. The male study participants were 17 (34%); while the female participants were 33 (66%). The majority of the study participants is 29 (58%) between 34 – 45 years old, in addition to that, the mean of the total sample age is (3.88 years) with a standard deviation (1.365 years). Regarding the level of education, half of the study samples 25 (50%) had diplomas degree. Regarding the number of years of experience in hospitals, the majority of the sample (36%) having 14 – 18 years of experience. While for number of years of experience in surgical units was 15 (30%) having 6 – 10 years. Concerning the subject of the Training Course on post-operative nursing care for patients undergoing LC, the samples who answered "Yes" were reported only 6 (12%), while who answered ''No" accounted for 44 (88%).

Table 1. Socio-demographical characteristics with comparison between all variables and their significances.

Variables	Groups	F.	(%)	Cumu. Percent	P-value
Y1 = Gender	Male	17	(34)	34	Binomial 0.033 S
	Female	33	(66)	100	
Y2 = Age Groups	22 – 27	2	(4)	4	X^2 = 25.880 < 0.001 HS
	28 – 33	4	(8)	12	
	34 – 39	15	(30)	42	
	40 – 45	14	(28)	70	
	46 – 51	9	(18)	88	
	52 – 57	4	(8)	96	
	≥ 58	2	(4)	100	
	Mean ± SD		3.88 ± 1.365		
Y3 = Marital State	Single	9	(18)	18	X^2 = 20.480 < 0.001 HS
	Married	41	(82)	100	
	Divorced	0	(0)	0	
Y4 = Level of Education	Nursing school	19	(38)	38	X^2 = 11.320 0.003 HS
	Diploma	25	(50)	88	
	Bachelor's	6	(12)	100	
Y5 = Number of Years of Experience in Hospitals	4 – 8	5	(10)	10	X^2 = 22.720 < 0.001 HS
	9 – 13	10	(20)	30	
	14 – 18	18	(36)	66	
	19 – 23	12	(24)	90	
	24 – 28	0	(0)	90	
	29 – 33	3	(6)	96	
	≥ 34	2	(4)	100	
Y6 = Number of Years of Experience in Surgical Units	1 – 5	11	(22)	22	X^2 = 22.960 < 0.001 HS
	6 – 10	15	(30)	52	
	11 – 15	14	(28)	80	
	16 – 20	8	(16)	96	
	21 – 25	1	(2)	98	
	26 – 30	0	(0)	98	
	31 – 35	1	(2)	100	
Y7 = Training course on post-operative nursing care for patients undergoing LC	Yes	6	(12)	12	Binomial < 0.001 HS
	No	44	(88)	100	

Table 2 displays the majority of the examined elements across the five categories, including monitoring and managing potential complications, enhancing respiratory function, alleviating pain, preserving skin integrity, managing drainage, and optimizing nutritional status (X1, X2, X3, X5, X7, X8, X10, X11, X16, X17, X18, X19, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34) reported highly significant, It means there is a strong relationship between these items and the quality of post-operative nursing intervention provided by the nurses for patients with cholecystectomy, and (X13, X15, X20, X35) reported significant differences. This means there is a significant relationship between these items and the quality of the nursing intervention. Only five items (X4, X6, X9, X12, X14), reported a non-significant, it means there is a weak assessment of postoperative nurse intervention.

Table 2. Assessment of Postoperative nurses' practices on different items.

Postoperative Nurses' Interventions items	Responses	F.	(%)	MS	P-value
1. Nurses' practices concerning monitoring and managing potential complications					
X1 = Monitoring vital sings (T, PR, RR, BP)	Achieved	14	(28)	1.72	Binomial 0.003 HS
	Non achieved	36	(72)		
X2 = Ensuring the dress is clean, dry, and intact	Achieved	42	(84)	1.16	Binomial < 0.001 HS
	Non achieved	8	(16)		
X3 = Observing the surgical dressing and any drains	Achieved	48	(96)	1.04	Binomial < 0.001 HS
	Non achieved	2	(4)		
X4 = Moving patient slightly on bed after 4-6 hrs. Post operatively	Achieved	27	(54)	1.46	Binomial 0.672 NS
	Non achieved	23	(46)		
X5 = Helping the patient to go out of bed	Achieved	11	(22)	1.78	Binomial < 0.001 HS
	Non achieved	39	(78)		
X6 = Instructing the patient and family to record any change in the color of the waste (stool)	Achieved	21	(42)	1.58	Binomial 0.322 NS
	Non achieved	29	(58)		
X7 = Assessing the patient for increased tenderness rigidity of the abdomen	Achieved	11	(22)	1.78	Binomial < 0.001 HS
	Non achieved	39	(78)		
X8 = Record the abdominal distention	Achieved	4	(8)	1.92	Binomial < 0.001 HS
	Non achieved	46	(92)		
2. Nurses' practice concerning improving respiratory status					
X9 = Assessing the rate, depth and sound of breathing	Achieved	21	(42)	1.58	Binomial 0.322 NS
	Non achieved	29	(58)		
X10 = Recording the rate, depth and sound	Achieved	5	(10)	1.90	Binomial < 0.001 HS
	Non achieved	45	(90)		
X11 = Raising the head of the patient's bed	Achieved	39	(78)	1.22	Binomial < 0.001 HS
	Non achieved	11	(22)		
X12 = Putting the patient in the low fowler's position	Achieved	29	(58)	1.42	Binomial 0.322 NS
	Non achieved	21	(42)		
X13 = Encouraging the patient to turn, take deep breaths and cough gradually	Achieved	16	(32)	1.68	Binomial 0.015 S
	Non achieved	34	(68)		
X14 = Helping patients to walk early by supporting the surgical incision site when coughing and walking	Achieved	23	(46)	1.54	Binomial 0.672 NS
	Non achieved	27	(54)		

Table 2. Assessment of Postoperative nurses' practices on different items.

Postoperative Nurses' Interventions items	Responses	F.	(%)	MS	P-value
3. Nurses' practices concerning relieving pain					
X15 = Assessing and recording characteristic (location, type and severity)	Achieved	33	(66)	1.34	Binomial 0.033 S
	Non achieved	17	(34)		
X16 = Helping the patient in a pillow or binder over the surgical incision during turn, coughing	Achieved	15	(30)	1.70	Binomial 0.007 HS
	Non achieved	35	(70)		
X17 = Performing massage to the patient's back	Achieved	4	(8)	1.92	Binomial < 0.001 HS
	Non achieved	46	(92)		
X18 = Administering analgesics as prescribed	Achieved	48	(96)	1.04	Binomial < 0.001 HS
	Non achieved	2	(4)		
4. Nurses' practices concerning maintaining skin integrity and drainage					
X19 = Recording skin status and eye sclera	Achieved	5	(10)	1.90	Binomial < 0.001 HS
	Non achieved	45	(90)		
X20 = Recording characteristic (color and amount) of wound drainage	Achieved	16	(32)	1.68	Binomial 0.025 S
	Non achieved	34	(68)		
X21 = Checking the potency of drainage tube	Achieved	49	(98)	1.02	Binomial < 0.001 HS
	Non achieved	1	(2)		
X22 = Caring of the drainage bag	Achieved	49	(98)	1.02	Binomial < 0.001 HS
	Non achieved	1	(2)		
X23 = Assess drain insertion site for signs of leakage, redness or signs of ooze	Achieved	48	(96)	1.04	Binomial < 0.001 HS
	Non achieved	2	(4)		
X24 = Dressing on the drainage tube	Achieved	48	(96)	1.04	Binomial < 0.001 HS
	Non achieved	2	(4)		
X25 = Assessing if drain is secured with suture or tape and document	Achieved	42	(84)	1.16	Binomial < 0.001 HS
	Non achieved	8	(16)		
X26 = Changing of the outer dressings and protection of the skin from irritation	Achieved	37	(74)	1.26	Binomial 0.001 HS
	Non achieved	13	(26)		
X27 = Ensuring drain is located below the insertion site and free from kinds or knots	Achieved	35	(70)	1.30	Binomial 0.007 HS
	Non achieved	15	(30)		
X28 = Recording fluids output and any change in color of urine	Achieved	9	(18)	1.82	Binomial < 0.001 HS
	Non achieved	41	(82)		
X29 = Encouraging patient mobilized with a drain	Achieved	43	(86)	1.14	Binomial < 0.001 HS
	Non achieved	7	(14)		

Table 2. Assessment of Postoperative nurses' practices on different items.

Postoperative Nurses' Interventions items	Responses	F.	(%)	MS	P-value
5. Nurses' practices concerning improving nutritional status					
X30 = Administration IV therapy as prescribed	Achieved	50	(100)	1.00	Binomial < 0.001 HS
	Non achieved	0	(0)		
X31 = Monitoring the state of swallowing and bowel sounds	Achieved	12	(24)	1.76	Binomial < 0.001 HS
	Non achieved	38	(76)		
X32 = Encouraging soft diet after bowel sounds return	Achieved	37	(74)	1.26	Binomial < 0.001 HS
	Non achieved	13	(26)		
X33 = Recording fluid intake	Achieved	14	(28)	1.72	Binomial 0.003 HS
	Non achieved	36	(72)		
X34 = Assessing the symptoms of the digestive system as nausea and vomiting	Achieved	39	(78)	1.22	Binomial < 0.001 HS
	Non achieved	11	(22)		
X35 = Assessing the color and consistency of stool	Achieved	17	(34)	1.66	Binomial 0.033 S
	Non achieved	33	(66)		

DISCUSSION

Over the past 50 years, LC has been the preferred method of treating cholelithiasis. The low cost, quick recovery, minimally invasive procedure, and high success rate were attained with LC to avoid postoperative complications and enhance quality of life, nurses play a critical role in the patients' management following LC by assessing, comprehending, and providing the best and appropriate nursing care. (Gao et al., 2021) The majority of nurses are in the age group (34-39) years, there is a significant relationship between the age of the participant and the quality of nursing care. This study disagrees with the finding of (EL -Shatby & El-Monem, 2020) on the "Assessment of Nursing Practices Provided for Patients Post laparoscopic cholecystectomy" In Egypt in 65 samples of nurses, their findings showed that their age group is twenty years to less than thirty years old. Nurses in surgical wards need to be young. Our study shows that the majority of participants were female and there is a highly significant relationship between providing nursing care and gender. This result is in line with a study on the "Effect of a self-learning package on nurses' knowledge and practices regarding patient care undergoing laparoscopic cholecystectomy" in Egypt in 60 samples of nurses, showed that the majority of nurses were female (Salime & shakweer, 2021). Our study shows that the majority of the participants were married. This result agrees by a study done on "Assessment of Nursing Practices Provided for Patients Post Laparoscopic Cholecystectomy" in Egypt in 65 samples of nurses, their findings showed that the majority of nurses were married (EL-Shatby & El-Monem, 2020). Our results show that half of them graduated from the Nursing Institute. This result is supported by (AbdElgilil et al., 2020). Their result concurred with the study carried out in Sulay-

Postoperative Nurse Intervention in Patients with Laparoscopic Cholecystectomy at Teaching Hospitals", which showed most of the nurses had 1-5 years of experience in the surgical unit and half of them did not participate in training courses established by the teaching hospitals. On the other hand, more than two-thirds of them participated in the training courses for <6 months (Hassan & Saeed, 2023). Regarding the practical items of quality of postoperative nurse's intervention most of the studies items for the five parts reported 30 significant differences except 5 items reported non-significance. The result shows that most of the nursing interventions not achieved are related to insufficient structural and continuous education programs by the policy of those hospitals and the Ministry of Health for improve nursing intervention, and insufficient nursing resources like an advanced nursing electronic library. This finding concurs with the study carried out in Baghdad teaching hospitals regarding the assessment of the post -operative nursing intervention for patients undergoing LC, showed that most of the studied items reported significant differences, except for items such as "changing the patient's position, raising the head of the patient's bed, install drainage bag, turn the patient position frequently, reads and check patient's chart immediate after operation carefully to see how the operation takes place to avoid complications in the surgical unit" (Kadhim, 2014). This issue stems from inadequate structural and ongoing educational programs within hospital policies and Ministry of Health initiatives aimed at enhancing nursing interventions, as well as a lack of resources such as advanced nursing electronic libraries. Provides postoperative patients in surgical wards with high-quality nursing interventions, nurses should be reinforced by training programs offered both domestically and internationally., by continuing their education for those working in surgical wards, and by using guidelines for postoperative interventions. These measures will enhance the quality and strength of the nurses' patient care and raise their knowledge about how to prevent complications from LC. Thus, if the nurse is impacted by an attitude barrier or lacks sufficient knowledge, effective intervention will not be possible.

CONCLUSION

This study concludes that the study identified a significant correlation between the various demographic factors (such as age, age group, Marital State, level of education, etc.) of nursing staff and the quality of nursing care provided. Nurses in the age group of 34-39 years constituted the majority, suggesting a potential influence of experience and maturity on care delivery. This finding contradicts previous studies emphasizing the necessity of a younger nursing workforce in surgical wards. Inadequate professional backgrounds and lack of competent skillful practice were expressed by most of the nurses who worked at surgical wards related to their postoperative nursing interventions in LC care regardless of their educational level and non-satisfactory training background. Most postoperative nurses' assessments were directly correlated with their intervention domains. Additionally, some sociodemographic characteristics affected the assessments of postoperative nurses' intervention. The study's assessment of postoperative nursing interventions revealed both strengths and areas for improvement. While significant progress was noted in various domains, including monitoring vital signs, ensuring clean dressings, and administering analgesics, certain aspects, such

as recording changes in waste color and assessing breathing depth, showed non-significant results, suggesting areas for enhancement.

Recommendations: To enhance postoperative nursing care quality for LC patients in Erbil City's teaching hospitals, several recommendations are proposed. These include ongoing training courses, developing manual guidelines, providing comprehensive handbooks, promoting professional development activities, and conducting further research to develop and assess the implementation of an educational program's efficacy.

REFERENCES

[1] AbdElgilil, S. A., Talaat, T., & Mahmoud, B. H. Nurses Performance Regarding Care of Patients Undergoing Laparoscopic Cholecystectomy. *International Journal of Novel Research in Health Care and Nursin.* 2020. (1), 1202-1216. DOI.

[2] AbdElhafiez, H. M., Hegazy, S. M., Nada, M. A., & Abdelatif, D. A. Developing Nurses` Performance Guidelines for Patients Undergoing Cholecystectomy based on Needs Assessment. *Egyptian Journal of Nursing and Health Science.* 2021. 2(1), 53-69. DOI. https://doi.org/10.21608/ejnhs.2021.160263 .

[3] Aziret, M., Karaman, K., Ercan, M., Vargöl, E., Toka, B., Arslan, Y., et al.. Early laparoscopic cholecystectomy is associated with less risk of complications after the removal of common bile duct stones by endoscopic retrograde cholangiopancreatography. *The Turkish journal of gastroenterology,* 2019. 30(4), 336-344. DOI. https://doi.org/https://doi.org/10.5152/tjg.2018.18272

[4] Brenner, P., & Kautz, D. D. Postoperative Care of Patients Undergoing Same-Day Laparoscopic Cholecystectomy. 2015 *AORN journal*, 102(1), 16-29; quiz 30-12.DOI. https://doi.org/10.1016/j.aorn.2015.04.021

[5] Edwards, D. A., Hedrick, T. L., Jayaram, J., Argoff, C., Gulur, P., Holubar, S. D., et al,. American Society for Enhanced Recovery and Perioperative Quality Initiative Joint Consensus Statement on Perioperative Management of Patients on Preoperative Opioid Therapy. *Anesth Analg*. 2019. 129(2), 553-566. DOI. https://doi.org/https://doi.org/10.1213/ane.0000000000004018

[6] EL-Shatby, A. M., & El-Monem, H. A. A. Assessment Of Nursing Practices Provided For Patients Post Laparoscopic Cholecystectomy. *International Journal of Novel Research in Health Care and Nursing*.2020. (1),9(2), 48-57. DOI. https://www.iosrjournals.org/iosr-jnhs/papers/vol9-issue2/Series-4/I0902044857.pdf .

[7] ELsayed, K. A. Chi-Square Independence Test: to Study the Effect of Chronic Diseases and Recovery from COVID-19. *Egyptian Journal of Business Studies.* 2022. 46(4), 335-306. DOI.

[8] Farhangmehr, N., & Menzies, D. Laparoscopic cholecystectomy: from elective to urgent surgery. *Laparoscopic Surgery*, 5. (2020). DOI. https://doi.org/http://dx.doi.org/10.21037/ls-20-4

[9] Gao, Y., Huang, J., Zheng, Y., & Han, J. Effect of comfort nursing on postoperative quality of life, negative emotions and nursing satisfaction in patients undergoing laparoscopic surgery. *American journal of translational research,* 2021.13(12), 13825-13834. DOI.

[10] Hassan, H. D., & Saeed, K. A. Assessment of Postoperative Nurse's Intervention in Patients with Laparoscopic Cholecystectomy at Teaching Hospitals in Sulaimaniyah, Iraq. *Journal of Zankoy Sulaimani*. 2023- Part A, 25(1), 11. DOI. https://doi.org/https://doi.org/10.17656/jzs.10894

[11] Hussein, T. H. S., & Khudair, K. M. Assessment Nurse's Knowledge toward Nursing Management for Patients Post Cholecystectomy in Kirkuk City Hospitals. *Indian Journal of Public Health Research & Development.* 2019. 10(10). DOI. https://doi.org/http://dx.doi.org/10.5958/0976-5506.2019.03296.0

[12] Ibrahim, B. K., & Muhamad, S. J. Assessment of Nurses Knowledge toward Pre and Post Nursing Interventions Laparoscopic Cholecystectomy at AL-Imam AL-Hussein Teaching Hospital in AL-Nasiriya City. *Kufa Journal for Nursing Sciences.* 2021. 11(2), 105-113. DOI.

[13] Kadhim, H. Assessment of postoperative nurses' interventions for the patients with laparoscopic cholecystectomy at Baghdad Teaching Hospitals. *Iraqi National Journal of Nursing Specialties.* 2014. 27(1), 11-22. DOI.

[14] Kareem, M. M. A., Shraida, A. A., & Razzaq, M. S. Assessment of Nurses' Knowledge Regarding Management of Patient's with

Cholelithiasis Disease. International Journal of Current Science Research and Review. 2022. 5(6), 1942-1947. DOI. https://doi.org/ http://dx.doi.org/10.47191/ijcsrr/V5-i6-17

[15] Phillips, C. The Binomial Distribution. *Mathematics Learning Centre,* 2006. Sydney. DOI.

[16] Rana, R., & Singhal, R. Chi-square test and its application in hypothesis testing. *Journal of Primary Care Specialties*. 2015. 1(1), 69-71. DOI.

[17] Salime, R. A. A. e., & shakweer, T. T. Effect of self-learning package on nurses knowledge and practices regarding patient care undergoing laparoscopic cholecystectomy. *Egyptian Journal of Health Care.* 2021. 12(1), 156-170 .DOI.