

## Nurses' knowledge and practice Regarding Care for Patients Undergoing Cholecystectomy

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### Abstract

**Background:** Cholecystectomy is the surgical removal of the gallbladder and is one of the most common abdominal surgical procedures today. **Aim of the study:** was to assess nurses' knowledge and practice regarding care for patients undergoing cholecystectomy. **Design:** A descriptive exploratory design was utilized. **Setting:** The study was conducted at three surgical departments at Zagazig University Hospitals, hepatic surgery and endoscopy department, general surgery department and vascular surgery department. **Subjects:** The study was conducted on convenience sample of available nurses working in surgical departments and caring for patients undergoing cholecystectomy. **Tools of data collection:** Two tools were used; an interviewing questionnaire and an observational checklist. **Results:** More than half (52%) of studied nurses aged less than 30 years old, 92% of the studied nurses were females and married, 40% of the studied nurses had diploma degree and 44% of the studied nurses worked in general surgery department, 52% of studied nurses had less than ten years of experience in surgical departments and 100% of studied nurses didn't receive any training program about cholecystectomy. 82% of the studied nurses had unsatisfactory level of knowledge, while about 92% of the studied nurses had unsatisfactory level of practices. There was a highly statistical significant relation between nurses' knowledge regarding care for patients undergoing cholecystectomy and their education level. There was a statistical significant relation between nurses' practice and their age and years of experience. There was a statistically positive correlation between nurses' knowledge score, and their practice score. **Conclusion:** The researcher can concluded that the studied nurses had unsatisfactory knowledge and practice. **Recommendations:** Continuous in-service training programs are recommended to improve and maintain nurses' performance regarding care for patients undergoing cholecystectomy.

**Key words:** Cholecystectomy, Nurses' knowledge and Practice.

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### **Introduction:**

The gallbladder is a small hollow organ about the size and shape of a pear. It is a part of the biliary system, also known as the biliary tree or biliary tract. The biliary system is a series of ducts within the liver, gallbladder, and pancreas that empty into the small intestine. There are intrahepatic and extrahepatic components. The gallbladder is a component of the extrahepatic biliary system where bile is stored and concentrated (Bazira, 2023).

Several disorders affect the biliary system and interfere with normal drainage of bile into the duodenum. These disorders include inflammation of the biliary system and carcinoma that obstructs the biliary tree. Gallbladder disease with gallstones is the most common disorder of the biliary system. Although not all occurrences of gallbladder inflammation (cholecystitis) are related to gallstones (cholelithiasis), more than 90% of patients with acute cholecystitis have gallstones. Most of the 15 million Americans with gallstones have no pain, however, and are unaware of the presence of stones (Unalp-Arida and Ruhl, 2023).

Cholecystectomy is now the standard treatment modality for gall stone disease. After multiplied episodes of acute cholecystitis, gall bladder removal is the main treatment. Open Cholecystectomy (OC) is a traditional surgical method in which a 10- 15 cm incision is made under right ribs. At present, doctors use this method in the patient whose inflammation is quite severe, if gallbladder is perforated or if there are contraindications for a minimally invasive method. With the advent of laparoscopic cholecystectomies, the indications to perform an open cholecystectomy have decreased. The most common instance (2% to 10%) that an open cholecystectomy is performed is when converting from a laparoscopic to open cholecystectomy. This change is made for a variety of reasons. Any time there is a question of the anatomy, surgeons may change to an open technique (Yeo, 2017).

Laparoscopic cholecystectomy (LC) is minimally invasive surgery to remove the gallbladder. This method is considered the standard treatment and has replaced open surgery since early 1990s. It is currently indicated for the treatment of acute or chronic cholecystitis, symptomatic cholelithiasis, biliary dyskinesia, acalculous cholecystitis, gallstone pancreatitis, and gallbladder masses or polyps. Contraindications to a laparoscopic approach include lack of surgeon experience, patient intolerance to pneu-moinsufflation, and the inability to safely dissect and identify the pertinent anatomic structures. It requires special surgical instruments and specific skill and expertise of an operating doctor (Lee et al., 2023).

The nurse is the patient's chief advocate in the surgery. The care of the nurse continues to the patient as long as the surgical procedure is planned and advised in the immediate preoperative phase, the surgical stage and the recovery from anesthesia. The patient wants to make sure that someone offers protection during the operation and is anesthetized, since surgery is generally a traumatic experience. The postoperative period of the surgical experience lasts from the moment the patient is moved to the recovery room or postanesthesia care unit until he or she is transported back to the surgical unit, released from the hospital until the follow-up care is completed (Potter et al., 2023).

### **Significance of the study:**

In Egypt, there is increasing incidence and prevalence rate of patients treated by cholecystectomy, it was observed that there is insufficient information to promote nursing care before, during and after surgery. In Benha, the number of patients who performed cholecystectomy during the year of 2021 and admitted to general surgery department of Benha University Hospital was approximately 142 case, 89 case performed open Cholecystectomy and 53 case performed laparoscopic Cholecystectomy (Benha University Hospital statistical office, 2021).

The surgical nurses play an important in caring of patients undergoing cholecystectomy during pre / postoperative time. They should also have proper knowledge, and practices to provide proper nursing care, prevent complications and decreases coast of treatment. Therefore, there is need to conduct this study to assess nurses' knowledge, and practices regarding care for patients undergoing cholecystectomy.

### **Aim of the study**

The aim of this study was to assess nurses' knowledge and practice regarding care for patients undergoing cholecystectomy.

### **Research Questions:**

1. What is the level of nurses' knowledge regarding care for patients undergoing cholecystectomy?
2. What is the level of nurses' practice regarding care for patients undergoing cholecystectomy?

### **Subjects and Methods**

A descriptive exploratory design was used. The study was conducted at three surgical departments at Zagazig University Hospitals, hepatic surgery and endoscopy department, general surgery department and vascular surgery department. The study was conducted on convenience sample of available nurses working in surgical departments and caring for patients undergoing cholecystectomy.

### **Tools of data collection:**

**Tool I:** An Interviewing questionnaire was written in a simple Arabic language to avoid misunderstanding. It was designed by the researcher after reviewing of related literature (Poser et al., 2024; Alaa et al., 2023; Linton and Matteson, 2023; Lewis et al., 2016) to assess nurses' knowledge regarding patients undergoing cholecystectomy, and included the following:

**Part 1:** Demographic characteristics of the studied nurses: were composed of seven closed ended questions including nurses' age, sex, social status, education, department, years of experience and training courses about cholecystectomy.

**Part 2:** Nurses' knowledge Questionnaire: was used to assess nurses' knowledge regarding patients undergoing cholecystectomy.

### **Scoring System for Nurses' Knowledge:**

Scoring system for the knowledge items, the correct answer was scored one and the incorrect zero. For each area of knowledge, the scores of the items were summed up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. Knowledge was considered satisfactory if the percent score was equal or above 60% and unsatisfactory if, less than 60% based on statistical analysis and importance of nurses' knowledge regarding patient undergoing cholecystectomy.

**Tool II: An Observational Checklists:** was used to assess nurses' practice regarding patients undergoing cholecystectomy. Included 197 items developed by the investigator guided by (Iseda et al., 2023; Vincent et al., 2023; Potter et al., 2023; Harding et al., 2020).

#### **Scoring system interpretation:**

Scoring system for the observational checklist items, score "one" given for done step and score "zero" for the not done. For each checklist of practice, the scores of the items were summed up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. Practice was considered satisfactory if the percent score was equal or above 60% and unsatisfactory if, less than 60% based on statistical analysis and importance of nurses' practice regarding patient undergoing cholecystectomy.

#### **Administrative and ethical consideration:**

An Official permission for data collection in three surgical departments at Zagazig University was obtained from the hospital administrative personnel by the submission of a formal letter from the Dean of the Faculty of Nursing. Before collecting data, oral consent was obtained from participating nurses who were informed of the nature, purpose, and methods of the study to ensure maximum cooperation as well as to make arrangements for the attendance of the participants. The participants were also informed of their right to participate or withdraw at any time from the study. Strict confidentiality was ensured throughout the study process, and all nurses were assured that their data was used for research purposes only.

#### **Pilot study:**

was performed to test the clarity, applicability, relevance, comprehensiveness, understanding and feasibility of the tools. For this study the researcher selected five (10%) nurses random to participate in the pilot testing of the questionnaire, checklist and not excluded from the study sample because of no modifications in the tool.

#### **Field work:**

Upon securing all necessary official permission were obtained, fieldwork of the study was implemented from the beginning of March 2023 to the end of August 2023 where the researcher was available three days weekly from 9 am to 2 pm.

#### **Content validity& Reliability:**

The tools were revised by a panel of five jury of expertise from nursing, who reviewed the tool's content for clarity, relevance, comprehensiveness, understandable and applicable. All recommended modifications were done. Reliability statistics of the study, Cronbach's Alpha that

used to measure the internal consistency (reliability of used tool) was 75% for knowledge, and 95% for practice.

### Statistical analysis:

All data were collected, tabulated and statistically analyzed using IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp. Quantitative data were expressed as the mean  $\pm$  SD & median (range), and qualitative data were expressed as number & (percentage). Wilcoxon sign rank test was used to compare between paired or non-normally distributed variables. Percent of categorical variables were compared using, Chi square test or Fisher Exact test when appropriate. MCNemar Test was used to compare between paired categorical data.

Pearson' correlation coefficient was calculated to assess relationship between various study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. Multiple linear regressions is a predictive analysis. Multiple linear regression is used to describe data and to explain the relationship between one dependent continues variable and one or more independent variables. All tests were two sided. p-value < 0.05 was considered statistically significant, p-value  $\geq$  0.05 was considered statistically insignificant.

### Result:

Table (1) clarifies that 52% of studied nurses aged less than 30 years old with mean  $\pm$  SD  $30 \pm 5.83$ , 92% of the studied nurses were females and married, 40% of the studied nurses had Diploma degree and 44% worked in general surgery department. Also 52% of studied nurses had less than ten years of experience in surgical departments with mean  $\pm$  SD  $10.9 \pm 6.63$ . Additionally, 100% of studied nurses didn't receive any training program about cholecystectomy.

Table (2) identifies that 18% of the studied nurses had satisfactory total knowledge regarding cholecystectomy. Meanwhile 82% had unsatisfactory total knowledge regarding cholecystectomy

Table (3) presents that only 8% of the studied nurses had satisfactory total level of practice regarding care for patient undergoing cholecystectomy. Meanwhile 92% of the studied nurses had unsatisfactory total level of practice

Table (4) demonstrates that there was a highly statistical significant relation between nurses' knowledge regarding care for patients undergoing cholecystectomy and their education level as P value equal 0.0001

Table (5) shows that there was a statistical significant relation between nurses' practice regarding care for patients undergoing cholecystectomy and their age and years of experience as P value equal 0.046.

Table (6) demonstrates that there was a positive correlation coefficient between nurses' knowledge score, and nurses' practice score with statistical significant difference p-value at (0.028, 0.004) respectively

### Discussion:

The results of the current study revealed that more than half of studied nurses aged less than 30 years old. Most of the studied nurses were females and married. About more than one third of the studied nurses had diploma degree and worked in general surgery department. Also more than half of studied nurses had less than ten years of experience in surgical departments. According to the researcher opinion, the majority of nurses working in surgical departments were females, and this conclusion may be related to the fact that nursing education used to be exclusively for females. Additionally, the fact that the least number of nurses at surgical departments possessed a bachelor's degree in nursing may have something to do with the hospital's chronic lack of highly qualified nurses due to their constant administrative workload.

This study finding was in the same line with **Elmansy (2023)**, who presented in a study about "Nurses' Level of Practice and Attitude Toward Care of Patients Pre/Post Laparoscopic Cholecystectomy at Ismailia Medical Complex" that more than half of the study sample were in the age between (20-<30 years old), and more than two thirds of the study sample were females, while, half of studied sample had from 5 to less than 10 years of experience in surgical department.

Similarly, with **Abdelhafiez et al., (2021)**, who reported in a study entitled "Developing Nurses Performance Guidelines for Patients Undergoing Cholecystectomy based on Needs Assessment at El demerdash surgical Hospital" that half of studied nurses had diploma degree in nursing. In congruent with **Kreem and Hamza, (2019)**, who stated in a study about "Effectiveness of Educational Program on Nurses' Knowledge regarding Pre and Post-Operative Nursing Management at Al-Sadder Medical City in Al-Najaf City" that most of the sample in study group were married and 40% of the sample in study group are graduated from nursing secondary school.

This finding disagreed with **Ibrahim and Muhamad, (2021)** who found in a study about "Assessment of Nurses Knowledge toward Pre and Post Nursing Interventions Laparoscopic Cholecystectomy at AL-Imam AL-Hussein Teaching Hospital in AL-Nasiriya City" that almost half of the studied sample are from technical institutes and the majority of the study sample ranges between (1-5 years) years of experience in surgical department.

The Finding of the current study clarified that all of the studied nurses didn't receive any training programs regarding patient undergoing cholecystectomy. Similarly, **Kareem et al., (2022)** found in a study about "Assessment of Nurses' Knowledge Regarding Management of Patient's with Cholelithiasis Disease at Al-Sadder Medical City in Al-Najaf City" that most of the studied nurses had not previously attend any training courses regarding Management of Patient's with Cholelithiasis.

Regarding to overall the nurses' knowledge, the current study showed that less than one third of the studied nurses had satisfactory knowledge regarding care for patients undergoing cholecystectomy. This might be due to about more than one third of the studied nurses had diploma degree, more than half of the studied nurses had less than ten years of experience in surgical departments as well as lack of motivation, and insufficient courses. This result was supported by **Metwaly et al., (2020)**, who clarified in a study about "Effect of small-group teaching on nurses' competency level regarding patients undergoing cholecystectomy at Zagazig

University Hospitals” that data collected about general knowledge of cholecystectomy before small-group teaching on nurses showed decrease in mean score of knowledge. Similarly, **Basuony et al., (2023)**, reported in a study about “Effect of the Training Program on Nurses' Performance Regarding Surgical Wounds Management at Zagazig University Hospitals” that the majority had unsatisfactory knowledge of surgical wound care.

As regard to total nurses' practices throughout the study phases the current study revealed that the majority of the studied nurses had unsatisfactory knowledge regarding care for patients undergoing cholecystectomy. This finding in the same line with **Romeeh et al., (2023)**, who illustrated that more than half of nurses had unsatisfactory level of practice. In addition, this disagreed with **Salime and Shakweer, (2021)**, who found that less than one quarter of the studied nurses had in-competent practice regarding pre-operative care of laparoscopic cholecystectomy.

Regarding relation between nurses' knowledge regarding care for patients undergoing cholecystectomy and their demographic characteristics, the result of the present study showed that there was statistically significant relation between nurses' knowledge and their education level. These results were consistent with **Ibrahim and Muhamad, (2021)**, who found that there were statistically significant differences between level of education, and knowledge level of studied nurses. Contrary with **Kareem et al., (2022)** who found that there is a non-significant difference association between the overall assessment of nurses' knowledge regarding management of patient's with cholelithiasis disease and their demographic data.

Regarding relation between nurses' practice regarding care for patients undergoing cholecystectomy and their demographic characteristics, the result of the present study showed that there was statistically significant relation between nurses' practice and their age and years of experience. This was supported by **Shaheen and Hawash, (2021)**, who reported in a study about “Assessment of Nurses' Knowledge and Practices Regarding Prevention of Surgical Site Infection at Alexandria Main University Hospital” that statistically significant relation was noticed between nurse's age, experience and level of practice. This result agreed with **Tegegne et al., (2022)**, who explained in a study about “Knowledge and Practice of Wound Care and Associated Factors among Nurses Working in South Wollo Zone Government Hospitals” that the number of years of expertise and the availability of guidelines were strongly associated with practices of wound care. Additionally, it was revealed that nurses with greater work experience—more than ten years—was more likely to have good practice than nurses with less experience.

The current study demonstrated that, there was a positive correlation between nurses' knowledge score, and nurses' practice score with statistical significant difference. The current study result agreed with **Basuony et al., (2023)**, who illustrated that there was a statistically significant positive correlation of nurses' knowledge score regarding surgical wounds management with their practice score of wound care. Also **Abdelgilil et al., (2020)** found that there was a positive correlation between knowledge scores and practice scores.

#### **conclusion:**

Based on the findings of the present study, it can be concluded that the majority of studied nurses had unsatisfactory knowledge and practices regarding care for patients undergoing

cholecystectomy. Also, there was a positive statistically significant correlation between nurses' knowledge score, and practice score.

### Recommendations :

In view of the main results of the study the following recommendations were derived and suggested:

- Continuous in-service training programs are recommended to improve and maintain nurses' performance regarding care for patients undergoing cholecystectomy.
- Exerting more efforts by the continuing education units in the hospital to develop and update the nurses' knowledge, practice and improve their attitudes regarding care for patients undergoing cholecystectomy.
- Regular evaluation of nursing staff performance, using a motivation action as rewarding good performance and giving them feedback.

**Table 1: Frequency and Percentage Distribution of Demographic Characteristics for Studied Nurses (n=50)**

Variables	No.	%
Age per years		
<30 years	26	52.0
>30 years	24	48.0
Mean $\pm$ SD	30 $\pm$ 5.83	
Median(range)	29(20-40)	
Sex		
Males	4	8.0
Females	46	92.0
Social status		
Married	46	92.0
Single	4	8.0
Education		
Diploma	20	40.0
Technical institute	18	36.0
Bachelors	12	24.0
Department		

Liver endoscopy	16	32.0
General surgery	22	44.0
Vascular surgery	12	24.0
Experience in surgical department		
<10 years	26	52.0
>10 years	24	48.0
Mean ±SD	10.9±6.63	
Median(range)	9(2-22)	
Training program		
No	50	100.0

**Table 2: Total Nurses' Knowledge Regarding Care for Patients Undergoing Cholecystectomy (n=50)**

Total Nurses' Knowledge	No.	%
Total Nurses' Knowledge		
Satisfactory	9	18.0
Unsatisfactory	41	82.0
Mean ±SD	47±15.55	

M:McNemar test,\* p<0.05:significant

**Table 3: Total Nurses' Practices Regarding Care for Patients Undergoing Cholecystectomy (n=50)**

Total Nurses' practices	No.	%
Total Nurses' practices		
Satisfactory	4	8.0
Unsatisfactory	46	92.0
Mean ±SD	87.28±24.16	

M:McNemar test,\* p<0.05:significant

Table 4: Relation between Nurses' Knowledge Regarding Care for Patients Undergoing Cholecystectomy and their Demographic Characteristics (n=50)

Demographic Characteristics	Nurses' knowledge				$\chi^2$	p-value
	Satisfactory n.9		Unsatisfactory n.41			
	No.	%	No.	%		
Age per years						
<30 years	4	15.4	22	84.6	f	0.721
>30 years	5	20.8	19	79.2		
Sex						
Males	2	50.0	2	50.0	f	0.144
Females	7	15.2	39	84.8		
Social status						
Married	9	19.6	37	80.4	f	0.99
Single	0	.0	4	100.0		
Education level						
Diploma	0	.0	20	100.0		
Technical institute	1	5.6	17	94.4	25.5	0.0001*
Bachelors	8	66.7	4	33.3		
Department						
Endoscopy	4	25.0	12	75.0	3.49	0.174
Surgical	5	22.7	17	77.3		
Vascular surgical	0	.0	12	100.0		
Experience in surgical department						
<10 years	4	15.4	22	84.6	f	0.721
>10 years	5	20.8	19	79.2		
Training program						
No	9	18.0	41	82.0		

$\chi^2$ : Chi-square test, F: Fisher exact test,  $p > 0.05$  no significant,  $p < 0.05$ : significant

**Table 5: Relation between Nurses' Practice Regarding Care for Patients Undergoing Cholecystectomy and their Demographic Characteristics (n=50)**

Demographic Characteristics	Nurses' practice				$\chi^2$	p-value
	Satisfactory n.4		Unsatisfactory n.46			
	No.	%	No.	%		
Age per years						
<30 years	0	.0	26	100.0	f	0.046*
>30 years	4	16.7	20	83.3		
Sex						
Males	0	.0	4	100.0		0.99
Females	4	8.7	42	91.3	f	
Social status						
Married	4	8.7	42	91.3	f	0.99
Single	0	.0	4	100.0		
Education level						
Diploma	0	.0	20	100.0	3.2	0.202
Technical institute	2	11.1	16	88.9		
Bachelors	2	16.7	10	83.3		
Department						
Endoscopy	0	.0	16	100.0	5.53	0.063
Surgical	4	18.2	18	81.8		
vascular surgical	0	.0	12	100.0		
Experience in surgical department						
<10 years	0	.0	26	100.0	f	.046*
>10 years	4	16.7	20	83.3		
Training program						
No	4	8.0	46	92.0		

$\chi^2$ : Chi-square test,  $p > 0.05$  no significant,  $p < 0.05$ : significant

**Table 6: Correlation Coefficient between Nurses' knowledge, and Practice Scores Regarding Care for Patients Undergoing Cholecystectomy and their Age and Years of Experience (n=50)**

	Nurses' knowledge score		Nurses' practice score	
	r	p	r	p
Nurses' knowledge score	1			
Nurses' practice score	0.038**	0.004	1	
Age	0.119	0.409	0.035	0.811
Experience per years	0.026	0.858	-0.048	0.74

(r) Correlation coefficient \*\* Correlation is significant at the 0.01 level (2-tailed). \* Correlation is significant at the 0.05 level (2-tailed).

## References

- [1] **Bazira, P. J. (2023):** Anatomy of the gallbladder and bile ducts. *Surgery (Oxford)*, 41(6), 319-324.
- [2] **Unalp-Arida A, & Ruhl CE, (2023):** Increasing gallstone disease prevalence and associations with gallbladder and biliary tract mortality in the US. *Hepatology*, 77(6), 1882-1895.
- [3] **Yeo, C. J. (2017):** Shackelford's Surgery of the Alimentary Tract: Shackelford's Surgery of the Alimentary Tract, E-Book. 8th ed, Elsevier Health Sciences. China, p: 1280.
- [4] **Benha University Hospital statistical office, (2021).**
- [5] **Lee, C. E., Lee, S. J., Moon, J. I., Choi, I. S., Yoon, D. S., Choi, W. J., & Kim, S. G. (2023):** Acute cholecystitis in old adults: the impact of advanced age on the clinical characteristics of the disease and on the surgical outcomes of laparoscopic cholecystectomy. *BMC gastroenterology*, 23(1), 1-8.
- [6] **Potter, P. A., Perry, A. G., Stockert, P. A., & Hall, A. (2023):** Fundamentals of nursing-e-book. 11<sup>th</sup> ed, Elsevier health sciences.p:21.
- [7] **AbdElgilil, S. A., Talaat, T., & Mahmoud, B. H. (2020):** Nurses Performance Regarding Care of Patients Undergoing Laparoscopic Cholecystectomy. *International Journal of Novel Research in Health Care and Nursing* (1), 1202-16.
- [8] **Alaa, S. M., Ahmed, H. A. M., Syam, N. M., & Ali, S. S. (2023):** Nurses' Knowledge and practices regarding the Perioperative Care of Patients with Cholelithiasis undergoing Laparoscopic Cholecystectomy: Guidelines Proposal. *Alexandria Scientific Nursing Journal*, 25(1), 93-101.

- [9] Lewis, S.L., Dirksen, S. R., Heitkemper, M.M. & Bucher, L. (2016): Medical-Surgical Nursing in Canada-E-Book. 10<sup>th</sup> ed, Elsevier Health Sciences. P: 974
- [10] Linton, A. D., & Matteson, M. A. (2023): Medical-Surgical Nursing E-Book: Medical-Surgical Nursing E-Book. 8<sup>th</sup> ed, Elsevier Health Sciences. p:1,807.
- [11] Poser, K., Linton, A. D., & Matteson, M. A. (2024): Linton and Matteson's Medical-Surgical Practical Nursing in Canada-E-Book. 8<sup>th</sup> ed, Elsevier Health Sciences. Pp: 207, 852.
- [12] Harding, M. M., Kwong, J., Roberts, D., Hagler, D., & Reinisch, C. (2020): Lewis's medical-surgical nursing. 11<sup>th</sup> ed, Amsterdam, The Netherlands: Elsevier Health Sciences. P:299
- [13] Iseda, N., Iguchi, T., Sasaki, S., Itoh, S., Honboh, T., Yoshizumi, T., & Matsuura, H. (2023): Textbook outcome in the surgical treatment of acute cholecystitis.
- [14] Potter, P. A., Perry, A. G., Stockert, P. A., & Hall, A. (2023): Fundamentals of nursing-e-book. 11<sup>th</sup> ed, Elsevier health sciences.p:21.
- [15] Vincent, R., Deewan, S., Ismat, P., Iqbal, A., & Vincent, J. (2023): Effect of an Evidence-Based Practice (EBP) Educational Program on the Competence of Nursing Students. International Journal of Science and Research Archive, 10(2), 321-328.
- [16] AbdElhafiez, H. M., Hegazy, S. M., Nada, M. A., & Abdelatif, D. A. (2021): Developing Nurses Performance Guidelines for Patients Undergoing Cholecystectomy based on Needs Assessment. Egyptian Journal of Nursing and Health Sciences, 2(1), 53-69.
- [17] Elmansy, F. M. (2023): Nurses' level of Practice And Attitude Toward Care Of Patients Pre/Post Laparoscopic Cholecystectomy. Ann. For. Res, 66(2), 212-226.
- [18] Ibrahim, B. K., & Muhamad, S. J. (2021): 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, 11(2), 105-113.
- [19] Kreem, M. M., & Hamza, R. A. H. (2019): Effectiveness of educational program on nurses' knowledge regarding pre and post-operative nursing management. Scopus Ijphrd Citation Score, 10(01), 964.
- [20] Kareem, M. M. A., Shraida, A. A., & Razzaq, M. S. (2022): Assessment of Nurses' Knowledge Regarding Management of Patient's with Cholelithiasis Disease. 5(6), Pp:1942-1947.
- [21] Basuony, N. A. M., Mohamed, M. A., Hassanin, F. M. A., & Mohamed, S. H. (2023): Effect of the Training Program on Nurses' Performance Regarding Surgical Wounds Management. Egyptian Journal of Health Care, 14(3), 46-73.

- [22] Romeeh, M. S., Shehata, A. E. S., Aboalizm, S. E., & Elgahsh, N. F. (2023): Effect of Educational Nursing Intervention on Nurse's Practice among Patients with Upper Gastrointestinal Endoscopy. *Menoufia Nursing Journal*, 8(1), 259-268.
- [23] Salime, R., A & Shakweer, T. T (2021): Effect of self-learning package on nurses' knowledge and practices regarding patient care undergoing laparoscopic cholecystectomy. *Egyptian Journal of Health Care*, 12(1), 156-170.
- [24] Metwaly, E. A., Bayomi, R. R., & Taha, N. M. (2020): Effect of small-group teaching on nurses' competency level regarding patients undergoing cholecystectomy. *Egyptian Nursing Journal*, 17(1), 56.
- [25] Shaheen, S. R., & Hawash, M. A. H. (2021): Assessment of Nurses' Knowledge and Practices Regarding Prevention of Surgical Site Infection. *Egyptian Journal of Nursing and Health Sciences*, 2(2), 176-197.
- [26] Tegegne, B., Yimam, F., Mengesha Yalew, Z., Wuhib, M., Mekonnen, L., Asmamaw Yitayew, Y. (2022): Knowledge and Practice of Wound Care and Associated Factors among Nurses Working in South Wollo Zone Government Hospitals, Ethiopia. *Chronic Wound Care Management and Research*; 9(1), 1-11.