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Effect Of Educational Program On Nurses Knowledge And Practice Toward Open Cholecystectomy

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Abstract
Background*: Five percent of cases require the major procedure known as an open cholecystectomy. It is performed because of complications such as adhesions, infections, or perforations. The aim of the study is to assess how educational programs have affected on nurses knowledge and practice toward open cholecystectomy.*
Materials and Methods*: Quasi-experimental research design was utilized in this study. The study was conducted in the general surgery Department at Assiut University Hospital. In this study a convenience sample of all available nurses (60 nurses) was included. Three tools were used: Post-operative assessment sheet for nurses, Post-operative competencies sheet for nurses Opinionnaire and Patient's assessment sheet.*
Results*: The results can be concluded that there is a highly statistical significance difference in all items of nurses' knowledge pre and post application of educational program. Additionally, there is high statistical significant difference between the pre- and post-implementation levels of nursing practice in postoperative educational programs. There is a positive correlation between score of knowledge and score of practices of nurses' post implementing postoperative educational program.*
Conclusion: *It can be concluded that, Enhancing the skills and expertise of nurses can help prevent or minimize postoperative problems.*
Keywords: *cholecystectomy; educational program; Knowledge; practice.*

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I. Introduction

The gallbladder is an organ in the right upper quadrant of the abdomen that resembles a pear. Its dimensions are 4 cm in breadth and 7 to 10 cm in length. Anatomically, the gallbladder is located anteriorly on the undersurface of liver segments IV and V. The gallbladder has an inferior peritoneal surface and a superior liver surface. The gallbladder fundus is wide, and as it continues into the main body, it narrows in diameter. The gallbladder body tapers into the infundibulum, which then connects to the neck and cystic duct[1]

The function of the gallbladder is to store and concentrate bile, which is released into the duodenum during digestion. Bile is an alkaline fluid continuously produced by the liver whose main purpose is to facilitate in digestion and absorption of lipids, as they are not soluble in water. It is composed of phospholipids, ions, water, bile salts, bilirubin, and cholesterol. The cholesterol excreted into bile eliminates most of the cholesterol in the body[2]

Cholecystectomy is the surgical procedure of choice for symptomatic gallstones because it removes the organ that implicated in the development of gallstones and the complications result from them. Carl Langenbuch performed the first cholecystectomy in Berlin, Germany, in 1882. Erich Mühe performed the first laparoscopic cholecystectomy in Germany in 1985. By 1992, 90% of cholecystectomies carried out in the US were done so laparoscopically[3]

Five percent of cases require the major operation known as an open cholecystectomy, which is carried out under general anesthesia. It may be necessary to perform open surgery instead of laparoscopic surgery for the following conditions: Severe inflammation of the bile duct or gallbladder, Inflammation of the abdominal lining (peritonitis), High pressure in blood vessels in the liver (portal hypertension), being in the third trimester of pregnancy, a major bleeding disorder or use of medicines to prevent blood clotting (anticoagulant medication), Scar tissue from many previous abdominal surgeries, abnormal anatomy in the abdomen[4]

In cases presenting after cholecystectomy with a bile duct injury, the priority should be accurate assessment of the type of injury and early repair if possible; when a bile duct injury is recognized intraoperatively, consult an experienced hepatobiliary surgeon. Delayed diagnosis of a bile duct injury can occur weeks to months

after the initial operation with elevation of liver function tests or, in some cases, cholangitis; when patients present after 2 weeks with established sepsis, it may be better to wait to allow appropriate control of sepsis and schedule definitive biliary reconstruction after 3 months[5]

Post-cholecystectomy syndrome is defined as a complex of heterogeneous symptoms which persist after cholecystectomy. PCS is caused by changes in bile flow due to the loss of the reservoir function of the gallbladder. There could be two types of issues. The first issue is continuously increased bile flow into the upper GI tract, which may contribute to esophagitis and gastritis. The second consequence is related to the lower GI tract, where it may cause colicky lower stomach pain and diarrhea[6]

Nursing practice standards list the assessment of the preoperative patient as one of their responsibilities. Identifying risk factors for intraoperative and postoperative complications is one of the many functions of a thorough preoperative evaluation; The nurse also uses this information to construct preoperative and postoperative education plans and takes action to address or prevent probable issues[7]

With the admission of the patient to the post anesthesia care units, the postoperative phase begins and it ends with a follow-up evaluation either at home or in the clinical setting. During this time The scope of nursing care covers a wide range of activities. Maintaining the patient's airway open, monitoring vital signs, evaluating the effects of the anesthetic agents, assessing the patient for complications, and providing comfort and pain relief are all priorities in the early post-operative phase. Nursing activities then focus on promoting the patient's recovery and initiating the teaching, follow-up care, and referrals essential for recovery and rehabilitation after discharge[(8)]

To prevent or decrease postoperative complications patients taught preoperative and applicate postoperative exercises. In order to reduce the risk of postoperative pulmonary problems such as hypoxemia, atelectasis, and pneumonia, deep breathing exercises are taught. Deep breathing slows the respiratory rate and produces a sustained maximal inspiration, increase tidal volume and minute ventilation, and stimulates surfactant to keep alveoli open. It also can be used as a technique to decrease pain when patient change positions and move[(9)]

Before a patient is discharged, it is crucial to advise him and his family with information about comfort and rest, avoid over exertion, walk as much as possible, avoid lifting or participating in strenuous activities for 3-5 days for laparoscopic and 10-14 days for open cholecystectomy, After 7–10 days, Routine follow up, return to the hospital to have the stitches removed[(10)]

The current study aims to evaluate the effect of educational program on nurses knowledge and practice toward open cholecystectomy.

II. Material And Methods

This quasi-experimental study was carried out on nurses and patients of department of general surgery department at Assiut University Hospital. A total 60 nurses subjects were for in this study.

Study Design: This study used a quasi-experimental research design.

Study Location: This was carried out at Assiut University Hospital's general surgery department.

Sample size: A convenient sample of all 60 nurses who are currently employed by Assiut University Hospital's general surgery department.

Study tools:

Tool I: Post-operative assessment sheet for nurses: Prior to the start of the planned educational program, Pre/post test questionnaire sheet was used to measure the exact knowledge and practice level of nurses regarding care of cholecystectomy patient. It has three primary components:

Part (1): Sociodemographic characteristics of nurses, including age, sex, marital status, qualifications and years of experience.

Part (2): Assessment of Nurses' knowledge about cholecystectomy and post-operative cholecystectomy nursing care.

Scoring system: Every correct response received one point. There were 50 points awarded overall. Less than 50% of the total, or less than 25 degrees, was regarded as a poor level. More than 70% (more than 35 degrees) was seen as having an excellent level of knowledge, while those who received 50%–70% (25–35 degrees) were thought to have a satisfactory level.

Part (3): Assessment of Nurses practice observation checklist about post-operative care of cholecystectomy:

Scoring system: The observation checklist sheet had a total score of 512 degrees. Each item on the checklist was given a score of two degrees for each step completed correctly, one degree for each step completed incorrectly, and zero for a step that was left undone.

This system translated in results into adequate and inadequately done, Appropriately done includes steps that done correct and inadequately done include steps that done incorrect and not done. Scores more than or equal 60 % (more than or equal 307 degrees) were graded as adequate level of practice. Less than 60% of the possible points (less than 307) indicated an inadequate amount of practice.

Tool II: Patient's assessment sheet: In addition to some chosen biosocial features data for patients, it was used to evaluate anticipated complications that might arise among cholecystectomy patients admitted to the General Surgery Department following implementation of the planned educational program.

Ethical approval: An official permission to conduct the study was obtained by the researcher from the head of the general surgery department. Each nurse gave their Oral consent to participate voluntarily after being informed of the study's nature and objectives. The researcher underlined that all data was coded to ensure subject identity and confidentiality, and that participation is entirely optional.

Methods:

This study was carried out in three phases:

Phase (1): preparatory phase:

Through the use of books, articles, periodicals, and magazines, a review of previous and present local and worldwide literature pertaining to the many parts of the problems was conducted. Five expert professors in fields of nursing and medicine reviewed the content validity of this tool and any necessary corrections were made. At the end of this phase, a pilot study was conducted on 10% of sample to test the feasibility of the study and applicability of the tools and the time needed to complete the tool.

Phase (2): implementation phase:

Data were collected at Assiut University Hospital's, general surgery department. The tools were completed by means of patient and nurse interviews. The nurses were briefed on the study's purpose before they responded to the questions. The study was carried out at morning, and after noon shifts.

The researcher initiate the interview by introducing herself and outlining the nature and goals of the planned educational program. Also she scheduled with them the teaching sessions for both theory and practice and the nurses were divided into small groups, each group contains 4-5 nurses. The designed educational program have been implemented for nurses in terms of sessions and the teaching was done during their official working hours. A copy of the educational program booklet, which contained all of the training materials, was given to each nurse.

Additionally, the selected patients who agreed to participate in the study were given an explanation by the researcher about the nature and goals of the educational program.

The evaluation phase is the final stage of a planned educational program. Immediately after the educational program implementation the nurses' knowledge and practices has been evaluated by the researcher.

III. Results

Table (1): Frequency distribution of study sample regarding socio-demographic characteristics of nurses (nurses=60):

Socio-demographic characteristics	No. (n= 60)	%
Age: (years)		
< 30	23	38.3
30 - < 40	19	31.7
≥ 40	18	30.0
Mean ± SD (Range)	33.03 ± 8.60 (20 – 55)	
Sex:		
Male	19	31.7
Female	41	68.3
Marital status:		
Single	11	18.3
Married	49	81.7
Qualification:		
Nursing diploma	53	88.3
Technical Nursing Institute	1	1.7
Nursing Bachelor	6	10.0
Years of experience:		
< 10 years	31	51.7
10 - < 20 years	10	16.7

≥ 20 years	19	31.7
Previous training courses about cholecystectomy:		
Yes	-	-
No	60	100.0

Table (1): According to the table, the average age of nurses was 33.03 ± 8.60, and 68.3% of them were female. Eighty-seven percent of nurses reported being married. Additionally, the table reveals that 88.3% of nurses held a diploma. Regarding years of experience, the results were 51.7%, 16.7%, and 31.7 % for those with less than 10 years, 10 to 20 years, and more than 20 years. Lastly, the table discusses how 100% of the nurses had never attended a cholecystectomy educational program.

Table (2): Distribution of the study sample according to total score of nurses' knowledge about care for cholecystectomy patients.

Knowledge	Pre (n= 60)		Post (n= 60)		P-value
	No.	%	No.	%	
Good	-	-	60	100.0	0.0001*
Satisfactory	11	18.3	-	-	
Poor	49	81.7	-	-	

Chi-square test
* Statistical significant difference (P< 0.05)
- =Not applicable
N.B. total score of knowledge is 50.
Good >70% (more than 35 degree).
Satisfactory 50-70% (25 – 35 degree).
Poor < 50% (less than 25 degree).

Table (2): The table indicates that there is a statistically significant difference (P<0.0001) between the nurses' knowledge levels before and after the implementation of the postoperative educational program.

Fig. (1): Distribution of the study sample according to total knowledge score about care for cholecystectomy patients:

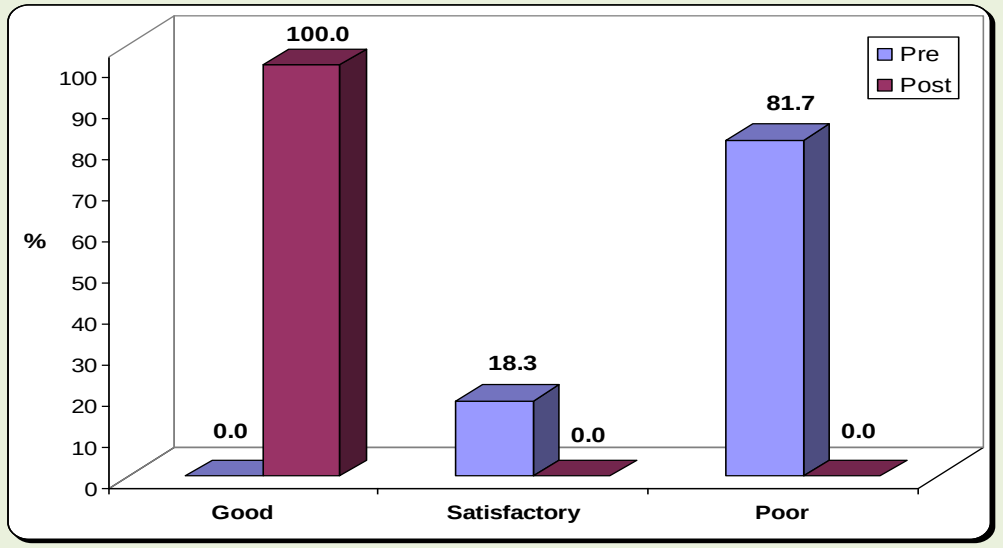

Figure (1): The figure illustrates the significantly significant difference in nurses' knowledge between pre and post implementation of a postoperative educational program (P<0.0001).

Table (3): Frequency distribution of the level of nurses` practice as regard pre and post implementing postoperative educational program (n= 60).

Variables	Pre (n= 60)		Post (n= 60)		P-value
	No.	%	No.	%	
Inadequate	60	100.0	10	16.7	0.0001*
Adequate	-	-	50	83.3	

Chi-square test * Statistical significant difference (P< 0.05)

- =Not applicable

N.B. Total score of practice is 512.

Inadequate < 60% (less than 307 degree). Adequate ≥ 60% (307 degree and more).

IV. Discussion

The aim of the study is to evaluate the effect of educational program on nurses knowledge and practice toward open cholecystectomy.

The most common therapy for gallbladder disorders is cholecystectomy. Gallstones (small, solid formations composed of cholesterol and bile salts) can cause problems in the gallbladder and the entire biliary system, including the pancreas. They are often responsible for very painful and potentially serious inflammation of the gallbladder called cholecystitis. Cholecystectomy is the preferred choice of treatment for this condition. Over 700,000 of these procedures are performed each year in the United States[(11)]

Regarding to Frequency distribution of study sample according to socio-demographic characteristics of nurses the present study illustrated that "The majority of nurses had more than three years of experience, were married, and were female. The proportion of nurses with nursing diplomas was highest". In the same respect Abd El-gafour,[(12)] is consistent with the results of the current study, which showed that "the majority of nurses were married women with a nursing degree, and the majority of them had experience."

Additionally, the results revealed that before implementation of educational program for cholecystectomy patients, more than half of nurses had poor level of knowledge. This could be related to a deficiency of scientific courses related to cholecystectomy included in their undergraduate curriculum of nursing education and also this may be attributed to lack of continuous education and in-service training programs.

This result was supported by Chandra, et al [(13)]the results of the study which revealed that "data collected before the designed (pre- test) nursing intervention protocol implementation, showed an inadequate level of knowledge, which reflects the lack in their scientific preparation".

This study illustrated that all nurses had inadequate level of total practice scores in all skills items pre implementation of postoperative educational program for cholecystectomy patients. Attia, [(14)] was in was parallel to the current study which revealed that "the majority of nurses had inadequate practice level pre implementing teaching protocol". However (Shoqirat, et al 2019) disagreed with the findings of the current study, which showed that the majority of nurses (85.7%) and 100%, respectively, had acceptable levels of practice before and after applying planned nursing protocols.

According to the current study showed that all nurses had inadequate level of total practice scores in all skills items pre implementation of postoperative educational program about care of patients with cholecystectomy. Habahbeh, & Alkhalaileh, [(15)] was consistent with the findings of the present study which presented that "the majority of nurses had unsatisfactory practice level pre implementing teaching protocol".

The current study's findings showed that, a significant increase in the nurses practice scores and they had adequate level of practice after the application of the designed educational program. This has been concluded by the presence of statistical significant difference between results of pre-test and post-test. These results indicated that nurses` skills can be easily improved, especially if linked with their relevant scientific base level of knowledge.

Williams, et al , [(15)] are in the same line with the current study results which revealed that , a significant improvement in the practice score levels obtained by nurses after the application of the designed nursing protocol.

Tiruneh, et al [(17)] recommended that educational programs be structured to meet the needs of nurses with ongoing evaluation and adopting proper checklists for work monitoring to improve patient and staff awareness; lead to lower process errors, reducing overall risks, eventually resulting in effective patient care.

The current study demonstrates appositive correlation between nurses' knowledge and practice scores with regard to nursing care for patients post cholecystectomy. However, Mohammed, [(18)] found that there was no appreciable difference between the nurses' knowledge and practice scores on the pretest. Also, Gutt, et al [(19)] was at odds with the findings of the current study, which showed that "Nursing knowledge and practice prior to, throughout the immediate post-test period, and one month thereafter" did not positively correlate.

In the present study more than half of patients were females, married, their age more than or equal 40 years, illiterate, housewives and live in rural areas. These results agree with the study of Abd Al Jaleel, and Bakey**,** [(20)] which revealed that; the study was done on patients suffering from chronic cholecystitis. 58% of them were females, married. Their median ages were 47 years, Women are probably at increased risk because estrogen stimulates the liver to remove more cholesterol from blood and divert it into the bile which diverted to bile stones later.

The present study shows a statistical significant difference between control and study groups of patients related to postoperative anesthesia complications (Nausea and vomiting), while the other items show decrease in the incidence but not reach to a statistical significant difference**.** Sangiorgio, et al[(21)] was in the same line with the

results of the current study which revealed that " the incidence of patient's complications after application of the designed nursing intervention protocol was lesser than pre implementing the designed protocol".

V. Conclusion

Based on the result of the present study, it can be concluded that, developing and implementing educational program shows a significant improvement in nurses' knowledge and practice. Improving nurses' knowledge and practice can favorable effect in preventing or reducing postoperative complications.

VI. Recommendations

Based on results of the present study the following can be recommended:

1- Continued nursing education and in-service training programs are necessary to upgrade the knowledge and skills of practicing nurses, which will be reflected on better outcome and service for inpatients.

2- Nurses should be aware by postoperative complications, how to prevent it and how to deal with it when develop.

3- Nurses should be aware by instructions that given to patients before discharge and inform patients about them.

4- Patients are to be provided with sufficient information about signs and symptoms of the potential complications and the importance for seeking rapid medical advice.

5- similar studies should be replicated on longitudinal bases till one year as a minimum time period for follow up.

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