A study on college of nursing students knowledge about post-operative complications

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Abstract
According to estimates, 234 million surgeries are conducted worldwide each year, resulting in two million deaths annually. In addition, 7 million patients experience postoperative complications, of which 50% could have been avoided. The post-operative period starts as soon as the operation is over and lasts till the patient is taken off of medical assistance. Following surgery, problems are typical.
Keywords: Health; post-operative; nursing students

1. Introduction

Shock, Hemorrhage, Wound Infection, Deep Vein Thrombosis, Pulmonary Problems, Urinary Retention, and Anesthesia Reaction are the most frequent complications, according to the American Medical Association. However, difficulties and discomforts can vary from person to person. Age, general health, and medical history will all play a role in how any post-surgical complications are treated specifically. the disease's extent, kind of surgery, sensitivity to certain treatments, procedures, or drugs (1)
In the 234 million surgeries performed each year around the world, it is estimated that two million people die and 7 million suffer from complications after surgery, 50% of which could have been prevented. In affluent nations, high-complexity procedures have complication rates between 3 and 16%, and one patient dies for every 300 patients admitted. (2)
As a result, one of a nurse's duties is to provide pre- and postoperative advice in plain language while respecting the knowledge and culture of the patient. This information should include the patient's health issue, the surgical procedure, and, most importantly, how they can participate in their postoperative recovery. (3) As the patient is with the nurse day and night, educational activities are a natural part of the nurse's job description. This enables the nurse to foster an environment where patients can receive orientations and feel empowered to take care of themselves, in addition to promoting health and averting potential complications. With regard to the patient's care, this practitioner is now the member of the medical team with the most opportunity. (3) Additionally, the role of nursing at the beginning, middle, and end of the procedure is unquestionably crucial. For instance, it certifies the patient's identity, consent, location, and procedure. It also verifies the patient's vital signs and keeps them monitored and with venous access while removing any risks like blood loss, airway problems, allergic reactions, and postoperative complications. (4)
The majority of the post-operative nursing care during this time should be scheduled from the patient's admission until release. One of the tactics for a safe procedure is the systematization of nursing care. The best postoperative care, however, enables early hospital discharge, lowers postoperative complications, and ultimately improves patient satisfaction. (5)

Study justification

Nurses have the vital and important role in identifying the occurrence of postoperative complications and management them, as well as teaching the patient how to deal with them. Sufficient knowledge about post-operative complications, will enable the Nursing students to enter the labor market later, confident in themselves and their information.(6,7) This study will allow to design educational programs for the Nursing students, to repairing any deficiency in their knowledge, and strengthening their good one. And Enhancing and improving students' knowledge levels will enhancing the quality of patient care and reduction in the morbidity and mortality rates among patients, And the speed of recovery and discharge from the hospital, in addition to reducing the costs of patient care.(6) also There are not many scientific studies focusing on the knowledge of the College Nursing students about post-operative complications, and it is one of the first researches in this field in Iraq From here this study came to determine the level of knowledge of students of the College of Nursing about postoperative complications.

2. Literature Review

After surgery, many people experience complications; some are minor, some are major, but all are significant to patients. The type of operation, the patient's pre-existing comorbid condition, and perioperative treatment all affect the chance of postoperative problems. Postoperative complications can be categorized according to when they first appear and can be either general or unique to particular operations: instant, early, and late (8)

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Promoting safe surgical care and surgery is an important global and regional challenge for patient safety providers, and it aims to reduce post-operative complications that lead to disability or death. Or - at the very least - extending the stay of a significant proportion of patients in hospitals. This percentage ranges from 3% to 25% of patients. This percentage means that seven million patients each year may be exposed to complications following surgery, and that up to 10% of patients who undergo major surgery - about one million patients - die as a result of the lack of surgical safety and the low level of surgical care (9) The most frequent consequences are those involving the respiratory system, including pneumothorax. It can happen after the insertion of a central venous catheter, the insertion of a total parenteral nutrition catheter, during a thoracentesis, spontaneously, with a penetrating gunshot or knife wound, a fractured rib, and for other reasons, including the presence of lung pathology like chronic obstructive pulmonary disease and cystic fibrosis when these disorders, traumatic injuries, and diseases for one reason or another create positive pressure with the collection (10)

Cardiovascular complications are also frequent after surgery, including hemorrhage and excessive bleeding, which can happen as a result of any invasive procedures, especially when the procedure is extensive in nature, extensive in duration, the client has a clotting disorder, and the client has been taking anticoagulant medications. In addition to changes in central venous pressure, arterial blood gases, renal function, hemodynamic monitoring, decreased urinary output, metabolic acidosis, and increased blood viscosity, the signs of bleeding, hemorrhage, and hypovolemic shock also include changes in the client's intake and output, vital signs, intake, and central venous pressure.(11)

Gastrointestinal complications related to surgery are common, alteration and deficiency of the oral food intake and decreased gastrointestinal tract motility may cause symptoms of digestive disorders after surgery. Especially if the surgery is on the digestive tube, and narcotic and sedative drugs cause nausea and vomiting, delay intestinal emptying, and reduce intestinal movement, so the oral intake must start early after surgery (12)

Urinary complications also include postoperative problems; As narcotic drugs induce increased contraction of the smooth muscles that control urinary squeezes, painful urinary retention occurs after surgery. Also, heavy bleeding during and after surgery can reduce the amount of fluid and blood in the body and lead to acute kidney failure, which leads to anuria, and the lack of fluid and electrolyte replacement plays a negative role in the function of the urinary system. Usually, urinary problems are mixed with problems with fluid and electrolyte disorders, where excessive fluid volume can occur as a result of rapid infusion of intravenous fluids, or if the patient suffers from chronic cardiac or kidney disease. Conversely, hypervolemia can occur as a result of slow or insufficient intravenous infusion, which leads to decreased renal output and tissue ischemia (13) .

Dehydration may be caused by a lack of fluid volume (vomiting, bleeding, wound drainage, or sucking of a secretion). Calcium deficiency may occur as a result of loss from the urinary or intestinal tract. When potassium is not compensated intravenously, a decrease in the level of potassium in the plasma directly affects cardiovascular and renal function, and adequate compensation for potassium is 40 ml equivalent daily, and potassium should not be administered until the renal function has been evaluated, as the urinary output is considered 0. at least 5 ml / kg / hour is an indication of insufficient renal function (14)

Since postoperative fever can have a variety of viral causes as well as a noninfectious inflammatory response to the treatment itself, it can be difficult for surgeons to diagnose. To direct the course of the diagnostic process, knowledge of the most prevalent causes of fever after surgery is required. In general, the cytokine IL-1, which is released by activated neutrophils and macrophages among other cells, mediates fever. Along with IL-1 and TNF, IL-1 promotes the inflammatory response and induces fever by changing the hypothalamic temperature set point. Surgery frequently triggers an inflammatory reaction, which results in a fever. After the first 24 hours, however, this is self-limited and does not happen (15)

Surgical site infections (SSI), often known as wound infections Due to bacterial contamination, wound infections, also known as surgical site infections (SSI), can develop in the surgical field from deep organ compartments to superficial skin. Examples include superficial and deep abscesses as well as cellulitis. When the GI tract is accessed and contents pour out, such as when constructing a bowel anastomosis or if bile leaks during a cholecystectomy, deep abscesses may develop as a result of temporary contamination of the peritoneal space. If an anastomosis does not heal correctly and finally spills GI contents in a delayed manner, abscesses may also develop. Despite proper sterile preparation of the skin, most surgical wounds are contaminated with bacteria. Depending on the kind of surgery, these bacteria often comprise of normal endogenous flora from the skin, respiratory, or GI tracts. , depending on the type of surgery (16)

Postoperative pain it is an acute pain that occurs after undergoing surgery, as many patients suffer for months and even years of continuous and often strong pain, which is known as chronic postoperative pain. Postoperative chronic pain is characterized by the following symptoms: - Continuous pain at the site of the operation that lasts for more than two months after the operation. The main and direct cause of pain is the surgical procedure, and there are also some contributing factors to causing pain, such as the condition of the disease, its age, the site of the operation, the size of the operation and its

complications. Post-operative pain is treated with analgesics, such as some oral, rectal, or injection medications (17)

Recent research has indicated that nursing students can play a pivotal role in directing and making health care outcomes provided to hospitalized patients, and accordingly, today's nurse must be equipped to be able to rapidly identify patients' short-term and long-term needs, and must be equipped to be capable to actively participate with patients and their families, health team members, and community institutions to create an innovative health care system. Accordingly, the process of evaluating nursing students' knowledge about postoperative complications is an important process because it provides a good level of important data and knowledge to base on in the student's curriculum development plan, the importance of the current study also stems from the lack of similar studies carried out in the same context, and this is what gave it an additional importance that increases the justification for conducting it.(18)

According to the limits of the researcher's knowledge, the current study is a recent study, one of its variables was not addressed before (nursing students), but there are many studies conducted to evaluate the knowledge of the nursing staff about the complications of surgery. Among those studies is a study (Huyssteen, 2004) which aimed to assess Recovery room nurses' knowledge regarding postoperative airway emergencies in adults in private hospitals in Northern Gauteng, South Africa, and its results showed that 70% of the participants had a poor level of knowledge (19) Among the studies carried out is a study (Urban et al, 2016) that aimed to assess the level of nurses' knowledge about the complications of gallstone disease following laparoscopic cholecystectomy, and its results showed that the majority of participants lack an acceptable level of knowledge (20 Also a study was conducted by (Sadia, 2017) was aimed to assess the Nurses' Knowledge and Practices Regarding Prevention of Surgical Site Infection, The Findings of that study demonstrated poor knowledge which suggests an urgent need of educational and awareness programs for improvement in nurses" knowledge regarding prevention of surgical site infection (21)

Also (Al Battniji, 2018) conducted a study to assess the Nurse's knowledge and practice regarding post-operative care for patient with open heart surgery in the first 24 hours at Sudan Heart Center, and the results showed that the majority of the participating nurses had a good level of knowledge about post-operative complications (22)

Among the studies carried out was a study (Dessie et al, 2019) that aimed to assess the level of Knowledge and Attitudes of Ethiopian Nursing Staff Regarding Post-Operative Pain Management, the results showed that more than half of nurses in the study area had adequate knowledge towards post-operative complications (7)

Study aim

The present study was aimed to "assess the knowledge of nursing students about post-operative complications in Nursing College of Warith Alanbiyaa University.

Study Question

What is the level of the nursing students knowledge about post-operative complications in nursing college of Warith Alanbiyaa University

3. Materials and Methods

Materials: Research Design Descriptive cross sectional study design was applied

Research Setting

Nursing College in Warith Alanbiyaa University.

Sampling:

This study was conducted on a sample made up of third and fourth year students in the College of Nursing, whose approximate number is 270 students (150 in the third year, 120 in the fourth year), where 56% (151 students) of the students were selected as a sample for the study in a simple random sampling technique.

Tools:

The study data collected by using Appropriated structured knowledge questionnaire, which developed by the researcher from reviewing literature, to include two parts:

Part 1: socio-demographic data for the study sample, such as: gender, age, and academic year.

Part 2: includes an assessment of student knowledge about postoperative complications according to the body systems as follow:

1. postoperative complications related to the respiratory system .
2. postoperative complications related to the cardiovascular system.
3. postoperative complications related to the digestive system.
4. postoperative complications related to the urinary system.
5. postoperative complications related to the fluid and electrolyte balance.
6. general postoperative complications.

4. Methods

1. An official approvals were taken from the College of Nursing to facilitate the implementation of the research..
2. the study tool was developed by the researcher through a review of previous literature.
3. The reliability of the tool was evaluated by presenting it to experts in the field of nursing in the College of Nursing, as the tool was valid in measuring the purpose for which it was prepared.
4. A pilot study was conducted on 10% of nursing students in the place of study to ensure the applicability and clarity of the tool, and the tool was clear and applicable.
5. The validity of the tool has been tested.

Using the Cronbach alpha test with a score of 0.81.

6. An electronic questionnaire was designed via the Google Drive application
7. An Oral consent was obtained from the nursing students for their participation in the study after clarifying the purpose of the study.
8. After selecting the students, a link to the questionnaire was sent via social media (Messenger, Whats App, Telegram) to each student to answer the questionnaire individually to ensure access to the unique knowledge of each one of them.
9. The Data were analyzed using descriptive statistics by the Statistical Package for Social Sciences (SPSS).

5. Results

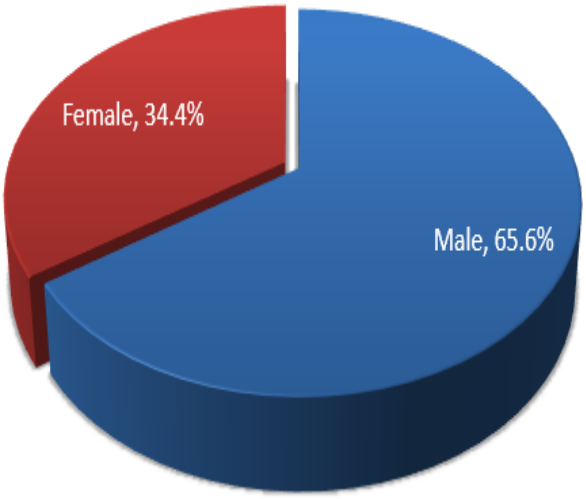

Figure 1: distribution of the sample according to their Gender.

Figure No. 1 shows the distribution of students participating in the study according to their Gender, as it showed that 65.6% of them were male and 34.4% were female.

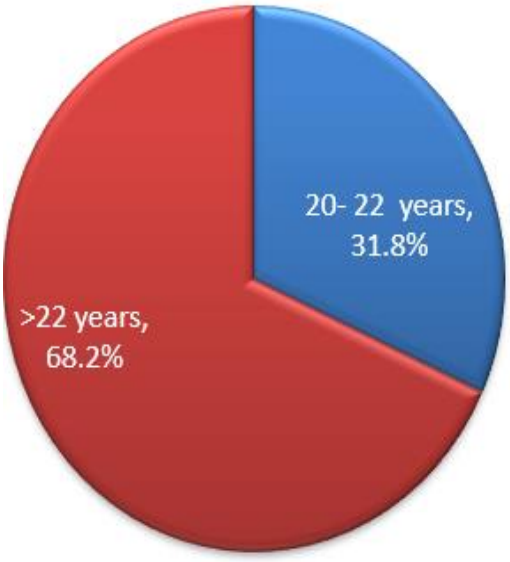

Figure 2: distribution of the sample according to their Age.

Figure No. 2 shows the distribution of the students participating in the study according to their Age, as it indicated that the higher rates of Students 68.2%, were in the age group (>22 years) followed by the age group (20-22 years) at 31.8%.

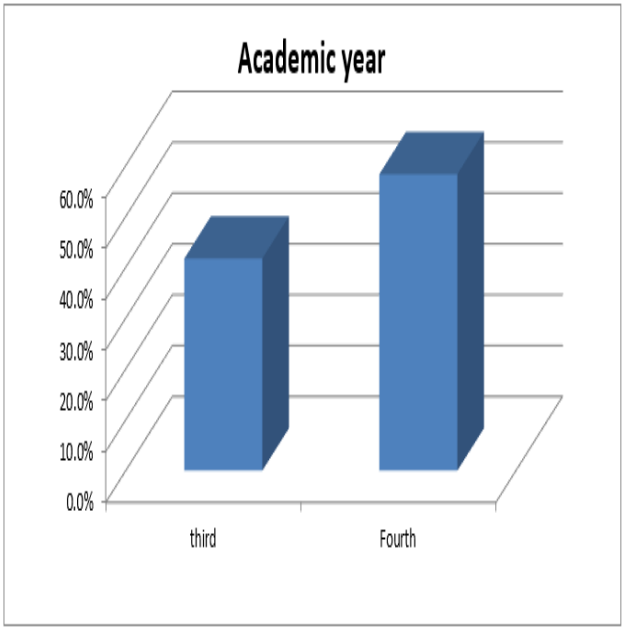

Figure 3: distribution of the sample according to their Academic year.

Figure No. 3 shows the distribution of the students participating in the study according to their Academic year, the highest percentage of them 58.3% were in the fourth year, followed by the third year students at 41.7%.

Table 1: distribution of the sample according to their correct and incorrect answers on postoperative complications related to the respiratory system.

Respiratory Complications	Correct		In Correct	
	N	%	N	%
Dystelectasis	56	37.1	95	62.9
Lung emboli	60	39.7	91	60.3
ARDS	72	47.7	79	52.3
Pneumothorax	59	39.1	92	60.9
airway obstruction	78	51.7	73	48.3
hypoxia	119	78.8	32	21.2
inspiration	76	50.3	75	49.7
Bronchospasm	94	62.3	57	37.7

Table No. 1: shows The distribution of students in the study according to their correct and incorrect answers ratio on the postoperative complications related to the respiratory system. where it showed that the highest percentages of correct answers were on hypoxia by 78.8%, Bronchospasm by 62.3%, and airway obstruction by 51.7%.

Table 2: distribution of the sample according to their answers on postoperative complications related to the cardiovascular system.

cardiovascular Complications	Correct		In Correct	
	N	%	N	%
Arrhythmia	119	**78.8**	32	21.2
Deep venous thrombosis	78	51.7	73	48.3
Acute bleeding	86	**57.0**	65	43.0
Respiratory acidosis	63	41.7	88	58.3
acute bleeding	75	49.7	76	50.3
sever hypertension	103	**68.2**	48	31.8
Painful throat	75	49.7	76	50.3
Myocardial infarction	43	28.5	108	71.5

Table No. 2: shows The distribution of students in the

study according to their correct and incorrect answers ratio on the postoperative complications related to the cardiovascular system. where it showed that the highest percentages of correct answers were on Arrhythmia by 78.8%, sever hypertension by 68.3%, and Acute bleeding by 57%.

Table 3: distribution of the sample according to their answers on postoperative complications related to the Digestive system.

Digestive Complications	Correct		In Correct	
	N	%	N	%
Nausea and vomiting	132	**87.4**	19	12.6
Sub ileus	127	**84.1**	24	15.9
Gastro paresis	51	33.8	100	66.2
Upper GI-bleeding due to ulcer	80	53.0	71	47.0
Intra-abdominal abscess	79	52.3	72	47.7
Infected bilioma	47	31.1	104	68.9
Mechanical ileus	40	26.5	111	73.5
Acute liver failure	27	17.9	124	82.1
Colon ischemia	44	29.1	107	70.9
intestinal distention	100	66.2	51	33.8
Constipation	130	**86.1**	21	13.9

Table No. 3: shows The distribution of students in the study according to their correct and incorrect answers ratio on the postoperative complications related to the Digestive system. where it showed that the highest percentages of correct answers were on Nausea and vomiting by 87.4%, Constipation by 86.1%, and Sub ileus by 84.1%.

Table 4: distribution of the sample according to their answers on postoperative complications related to the Urinary system.

Urinary Complications	Correct		In Correct	
	N	%	N	%
Acute renal failure	61	40.4	90	59.6
Urinary retention	123	81.5	28	18.5
Urinary tract infection:	87	57.6	64	42.4
urination pain	122	80.8	29	19.2
Anuria	91	60.3	60	39.7
heamaturia	33	21.9	118	78.1
Oliguria	103	68.2	48	31.8
Urinary stones	84	55.6	67	44.4

Table No. 4: shows The distribution of students in the study according to their correct and incorrect answers ratio on the postoperative complications related to the Urinary system. where it showed that the highest percentages of correct answers were on Urinary retention by 81.5%, urination pain by 80.8%, and Oliguria by 68.2%.

Table 5: distribution of the sample according to their answers on postoperative complications related to the fluid and electrolyte balance.

fluid and electrolyte balance Complications	Correct		In Correct	
	N	%	N	%
Hypopotassemia	99	65.6	52	34.4
Edema	76	50.3	75	49.7
hypoglycemia	34	22.5	117	77.5
Secondary Hemorrhage	53	35.1	98	64.9
Dehydration	87	57.6	64	42.4
Low output syndrome	42	27.8	109	72.2
Delayed wound healing	40	26.5	111	73.5
angina	62	41.1	89	58.9

Table No. 5: shows The distribution of students in the study according to their correct and incorrect answers ratio on the postoperative complications related to the fluid and electrolyte balance. where it showed that the highest percentages of correct answers were on Hypopotassemia by 65.6%, Dehydration by 57.6%, and Edema by 50.3%.

Table 6: distribution of the sample according to their answers on postoperative General Complications.

General Complications	Correct		In Correct	
	N	%	N	%
Wound infection	110	72.8	41	27.2
Fever	123	81.5	28	18.5
Malignant hyperthermia	57	37.7	94	62.3
acute pain	129	85.4	22	14.6
Local infection	89	58.9	62	41.1
Pressure sores	65	43.0	86	57.0
Delirium	86	57.0	65	43.0
Post-operative Pyrexia	86	57.0	65	43.0

Table No. 6: shows The distribution of students in the study according to their correct and incorrect answers ratio on the General postoperative complications. where it showed that the highest percentages of correct answers were on acute pain by 85.4%, Fever by 81.5%, and Wound infection by 72.8%.

Table 7: distribution of the sample according to their knowledge levels about postoperative Complications for every system.

Post-operative complications	Low		Moderate		High	
	N	%	N	%	N	%
Respiratory system complications	55	36.4	59	**39.1**	37	24.5
Cardiovascular complications	49	32.5	64	**42.4**	38	25.2
Digestive complications	65	43.0	66	**43.7**	20	13.2
Urinary complications	34	22.5	50	33.1	67	**44.4**
Fluid and electrolyte balance complications	91	**60.3**	45	29.8	15	9.9
General complications	38	25.2	45	29.8	68	**45.0**
Total knowledge	59	39.1	81	**53.6**	11	7.3

Table No 7: show The distribution of the sample according to their knowledge levels about postoperative Complications for every system. We noticed that the highest percent of students have moderate level of knowledge about post-operative complications related to Respiratory, Cardiovascular, and Digestive system by 39.1%, 42.4%, 43.7% respectively. In part of general and urinary post-operative complications the highest percent of students have high level of knowledge by 44.4%, 45% respectively. But In part of Fluid and electrolyte balance post-operative complications the highest percent of students have low level of knowledge by 60.3%.

Finally the table show that the highest percent of students have moderate level of Total knowledge about post-operative complications by 53.6%, then 39.1% have low level of Total knowledge, and 7.3%

have high level of Total knowledge

6. Discussion

Postoperative patients must be monitored and assessed closely for any deterioration in condition and the relevant postoperative care plan or pathway must be implemented, recent research indicates that patients whose condition deteriorates after surgery are often not monitored closely, or that their nursing and medical interventions are not sufficient or appropriate. Therefore, adequate knowledge about possible complications after surgery and the appropriate care for them is one of the basic skills that nursing students should possess as they represent future nurses who are responsible for the tasks of providing nursing care in the future (23). so the current study came to assess nursing students' knowledge about post-operative complications. The current study shows that about two-thirds of the students participating were male, and that the higher rates of them were in the age group (>22 years), the results also showed that more than half of the participating students were in the fourth year. The current study showed that about two-thirds of the students participating students gave the wrong answers for complications related to the respiratory system, respectively Dystelectasis, Lung emboli and Pneumothorax, while a higher percentage of them answered correctly that hypoxia is a respiratory complication after surgery and the highest proportion of them had a moderate level of knowledge about postoperative respiratory complications. This was in line with a study conducted by (Bosco et al, 2018) who aimed to assessment of nurses knowledge and skills following cardiopulmonary resuscitation training for surgical patients at Mbarara Regional Referral Hospital, Uganda, where showed that more than half of nurses doesn't know that pulmonary embolism, Pneumothorax and airway obstruction are postoperative complication, and two third of them had moderate level of knowledge about postoperative complicatin related to respiratory system (24). Moreover, the results of the present study weren't supported by (Huyssteen, 2004)) who reported in his study that most of nurses doesn't know postoperative complication related to respiratory system as pulmonary embolism, airway obstruction by tongue and blood gases disorder, also the current study showed that about three quarters of nurses had poor level of knowledge about postoperative complication related to respiratory system, this study was aimed to assess Recovery room nurses' knowledge regarding postoperative airway emergencies in adults in private hospitals in Northern Gauteng, South Africa (19). The results also showed that the majority of students correctly answered a cardiovascular complication is arrhythmia and sever hypertension, the study also showed that less than half of the participating students had a moderate level of knowledge about postoperative complications related to cardiovascular system. This was in line with results of study conducted by (Almeida et al, 2011) which aimed to assess Knowledge of Nurses Working in Non-Hospital Urgent and Emergency Care Units Concerning Cardiopulmonary Arrest and Resuscitation among Purgical Patients in Brazil. The results of the study showed that the majority of the participants know that blood pressure disorders, tachycardia and ventricular fibrillation may be complications of surgery, and that study indicated that 48% of participants had a moderate level of knowledge about these potential complications after surgery (25). However, the current result was not consistent with the results of a study conducted by (Al Battniji, 2018) a study to assess nurses 'knowledge and practice regarding post-operative care for patients who underwent open heart surgery in the first 24 hours at Sudan Heart Center. The majority of the participants are aware of most of the cardiovascular complications associated with surgery, including arrhythmias, atrial flutter, orthostatic hypotension, and deep venous thrombosis, and the study also indicated that the majority of the participating nurses have a good level of knowledge about potential cardiovascular system-related complications postoperatively.(22) As regards knowledge of students about postoperative complications related to the digestive system, the results found that the majority of students answered correctly that nausea & vomiting, constipation and sub ileus were respectively of these complications. while most of them answered incorrectly that acute liver failure and colon ischemia are post-operative complications related to the digestive system, the study also found that less than half of the participating students had a moderate level of knowledge about postoperative complications related to digestive system. This result is in agreement with the results of a study (Devi et al, 2017) that aimed to assess the knowledge of the nursing staff and nursing students about postoperative complications in adult patients. The results of the study showed that the majority of students know that nausea, vomiting, constipation and intestinal bloating are postoperative complications. The study showed that about half of the participating students have a medium level of knowledge about surgery complications related to the gastrointestinal tract (18).The current result was not consistent with the results of a study conducted by (Urban et al, 2016), which aimed to assess the level of knowledge of the nurses about the complications of gallstones disease after laparoscopic cholecystectomy, and the results of that study showed that the majority of the participants do not have the necessary knowledge to distinguish between disease complications and complications Surgery, as they are not aware that constipation, intestinal infections, and gastrointestinal bleeding may be among the potential complications resulting from surgery, especially after gastrointestinal surgery, and the results also showed that the majority

of participants have a poor level of knowledge related to these complications (20). The results of current study revealed that the majority of the participating students correctly answered that urinary retention is a post-operative complication associated with the urinary system, and about two-thirds of them correctly answered the oliguria, while more than three quarters and more than half of the students respectively answered incorrectly on the sequence that haematuria and acute renal insufficiency are not post-operative complications related to the urinary system. As regards level of knowledge of students about postoperative complications related to the urinary system less than half of them had a high level of knowledge in this context. This result is in agreement with the results of a study conducted by (Dessie et al, 2019) aiming to assess the level of knowledge and attitudes of nursing staff in Ethiopia regarding pain management after surgery, and its results showed that most of the participating nurses know that pain in the bladder area is often caused by urinary retention. and most of them know that acute renal insufficiency is a dangerous complication of surgery, and the study also showed that more than half of the study participants had a good level of knowledge about postoperative complications related to the urinary system (5). However, the results of the current study were not consistent with the results of the study (Sadia, 2017), which aimed to assess the knowledge and practices of nurses regarding the prevention of complications of surgical site infection, as this study showed that a small percentage of them have knowledge about urinary tract infections that may cause the occurrence of Infections at the surgical site, and they were not aware that urinary retention is one of the complications that may cause urinary infections, and the results of that study also showed poor knowledge, indicating an urgent need for educational and awareness programs to improve nurses' knowledge regarding the prevention of surgical site infection (21). As regards knowledge of students about postoperative complications related to the fluid and electrolyte balance, the results revealed that about two-thirds of them and more than half of them respectively answered correctly that hypopotassemia and dehydration are post-operative complications related to the fluid and electrolyte balance, while more than three quarters and about two-thirds of them answered incorrectly that hypoglycemia and secondary hemorrhage aren't postoperative complication related to Fluid and electrolyte balance, As regards level of knowledge of students about postoperative complications related to Fluid and electrolyte balance about two-thirds of them had a low level of knowledge in this context. This result is in agreement with the results of the aforementioned (Sadia, 2017) study, which showed that about three-quarters of the participants do not know that fluid deficiency and dehydration are common complications after surgery and may affect wound healing and cause delay, especially the lack of electrolytes such as potassium and calcium. The results of the study showed that the majority of participants had a low level of knowledge about these complications related to fluid and electrolyte balance (21). On the other hand, the current result was not consistent with the results of the study (Perrie et al, 2014), which aimed to assess the level of intensive care nurses' knowledge about the problems expected in surgical patients, and the results of the study showed that the majority of the study participants knew that disorders of fluid and electrolyte balance may play a role in Serious complications occur after surgery, and the study also showed that the majority of study participants have a good level of knowledge about that context (26). The results revealed that the majority of the participating students correctly answered that fever and acute pain respectively are general post-operative complication, and about two-thirds and more than half of them respectively answered incorrectly that malignant hyperthermia and pressure sores aren't general postoperative complication. The results revealed also that less than half of students had moderate level of knowledge about general post-operative complication. and that more than half of them had a generally moderate level of knowledge about postoperative complications. This result is in agreement with the results of the study conducted by (Devi et al, 2017) the aforementioned, as its results showed that most of the students participating in the study know what are the general complications of surgery, including pain, edema and headache, and the study also showed that one third of the participants had a moderate level of knowledge About general complications, and an average general level of knowledge about postoperative complications associated with the majority of the body's system as a whole (18) On the contrary, the current result was not consistent with the results of the aforementioned study (Dessie et al, 2019), as its results indicated that the vast majority of participants knew that fever and mild to moderate pain are possible complications. After the surgery in general, more than half of them knew that severe ulcers are also complications, and the level of knowledge of the participants about general complications was good, and the general level about all complications was also good among more than two-thirds of the participants (5)

7. Conclusion and Recommendations

Finally, the study showed that the level of general student knowledge about post-operative complications was moderate for more than half of them, and the level of knowledge related to systems was mostly moderate to high. This result can be attributed to the fact that the highest percentage of participating students are students of the fourth year, and they are in most of them have looked and tested throughout their academic years with courses that

contain extensive knowledge related to these systems in general, and this may justify the majority of students participating in the study obtaining close levels of information, most of which range from moderate to high

8. Conclusion

The current study showed that The higher percentage of the student:

1. 39.1 % have a moderate level of knowledge about postoperative complications related to the respiratory system.
2. 78.8% answered correctly that hypoxia is a respiratory complication following surgery.
3. 42.4 % have a moderate level of knowledge about postoperative complications associated with the cardiovascular system.
4. 78.8 % answered correctly that that cardiac arrhythmias are a postoperative complications related to cardiovascular system.
5. 43.4% have a moderate level of knowledge about postoperative complications related to the gastrointestinal tract.
6. 87.4% answered correctly that nausea and vomiting are postoperative complications related to the digestive system.
7. 44.4% have a high level of knowledge about postoperative complications related to the urinary system.
8. 81.5% answered correctly that urinary retention is a postoperative complication related to the urinary system
9. 60.3% of the participants have a low level of knowledge about postoperative complications related to fluid and electrolyte imbalance.
10. 65.6% answered correctly that hypopotassiumia is a postoperative complications related to fluid and electrolyte imbalance
11. 45% have a high level of knowledge about general postoperative complications.
12. 85.4% answered correctly that acute pain is a general postoperative complications.
13. 53.6% have a general moderate level of knowledge about postoperative complication.

Recommendations

Based on the findings of the present study, the following recommendations are derived and suggested

1. Working to increase the level of students' knowledge through the development of educational curricula related to the subject of study.
2. Linking theoretical knowledge with practical knowledge by focusing on the implementation of practical courses to better stabilize the information.
3. Development of nursing curricula related to gastroenterology courses, fluid and electrolyte balance, and work to address the weaknesses in these scientific courses.
4. Conducting the study on a larger sample that includes students from other nursing colleges to benefit from them in generalizing the results in a more accurate and comprehensive.

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