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Nurses' Knowledge Toward Post Open Heart Surgeries Complications in Nasiriyah Heart Center

A thesis Submitted

By

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بسم الله الرحمن الرحيم

(قَالَ الَّذِي عِنْدَهُ عِلْمٌ مِنَ الْكِتَابِ أَنَا آَتِيكَ بِهِ قَبْلَ أَنْ يَرْتَدَّ إِلَيْكَ طَرْفُكَ فَلَمَّا رَآَهُ مُسْتَقِرًّا عِنْدَهُ قَالَ هَذَا مِنْ فَضْلِ رَبِّي لِيَبْلُوَنِي أَأَشْكُرُ أَمْ أَكْفُرُ وَمَنْ شَكَرَ فَإِنَّمَا يَشْكُرُ لِنَفْسِهِ وَمَنْ كَفَرَ فَإِنَّ رَبِّي غَنِيٌّ كَرِيمٌ)

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We certify that the organization and preparation of this thesis entitled **"Nurses Knowledge Toward Post Open Heart Surgeries Complications in Nasiriyah Heart Center"** had been made by the post graduate student **(Azhar Talib Hameed Musa)** under my supervision at the College of Nursing, University of Babylon in partial fulfillment of the requirements for the degree of master in Nursing Sciences.

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Dedication

To the compassionate man who supported me in all areas of life. Ask Allah to keep him healthy and protect him from all evil My father. To the continual love My mother

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Abstract

Background: One of the leading causes of death in the world is cardiovascular disease; it is treated with surgery, medication, and by establishing healthy habits. In postoperative cardiac surgery, involving the respiratory systems, cardiovascular, kidneys, and central nervous system complications represent an important and possibly fatal cause of morbidity and mortality. To improve educational preparation and quality of healthcare, it is important to understand how knowledge is used in everyday nursing practice. An effective nurse and appropriate interventions must anticipate the possibility of complications can be initiated to ensure a positive outcome in a timely manner.

Objectives: To assess nurses' knowledge toward post open heart surgeries complications and studying the relationship between nurses' knowledge and certain demographical and employment variables.

Methodology: A qualitative descriptive design study .the researchers conducted a study to assess the knowledge about post open heart surgeries complications for nurses of Nasiriyah heart center in Thiqar governorate from September 2021 to August 2022.The study conducted on nurse’s staff of Nasiriyah Heart Center at Thiqar Province in Nasiriyah District. In which selected (82) nurses by a convenience sample technique. After completion of the pilot study and verification of the reliability of the questionnaire and validity by sending it to (15) experts in various fields and universities to evaluate the contents of the questionnaire. Data is collected by distributing the Arabic version of the questionnaire that was created and through the individual interview of the Nasiriyah Heart Center nurses who work in ICU and Surgical department. The data of the study were analyzed by using of

descriptive (mean, standard deviation, percentage) and inferential statistical analysis (chi square).

Results: The population of study ages were between (23 – 48) years. (46) Males and (36) females. Regarding the nurse's qualifications (51.2%) was diploma level of education in nursing science. And was (41.5%) with bachelor degree in nursing science, Also one nurse with master degree and (6.1%) with high school qualifications. For the marital status of nurses (68.3%) married and (29.3%) single. And (80.5%) of the nurses was ≤ 5 years of services in nursing, (13.4%) was 6 to10 years, (3.7%) was 11 to 15 years, (4.2%) within rang 16 to 20 years. The study revealed that (3.7%) from nurses had good knowledge and (96.3%) had poor knowledge about post open heart surgeries complications.

Conclusions: The study concludes that the overall knowledge of the nurses about post open heart surgeries complications was poor. In which all domains of complications have poor knowledge. And found that place of work for nurses influence the knowledge of nurses about post open heart surgeries complications.

Recommendations: The study recommends that establishing a follow up program in ICU and surgical department to detect continuation and effectiveness of open-heart surgery complications knowledge issue among nurses' staff. Further studies can be conducted with a large sample size to evaluate nurse's knowledge about post open heart surgeries complications.

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List of Abbreviations

Item	Meaning
ACC	American College of Cardiology
AF	Atrial fibrillation
AKI	Acute kidney injury
ARDS	Acute respiratory distress syndrome
ASD	Atrial septal defect
BT	Blalock-Taussig
C.L	Confidence Interval
CABG	Coronary artery bypass grafting
CAS	Coronary Artery Spasm
CIRCI	Critical illness-related corticosteroid insufficiency
CMV	Cytomegalovirus
CO	Cardiac Output
CPB	Cardiopulmonary bypass
CPD	Continuing Professional Development
CT	Computed tomography
CVD	Cardiovascular disease
DM	diabetes mellitus
DNM	Descending Necrotising Mediastinitis
DSWI	Deep sternal wound infection
E	Expected value
ed.	Edition
et al.	Others
EuroSCORE	European System for Cardiac Operative Risk Evaluation
F	Frequency

FDA	Food and Drug Administration
H. S	Highly significant
HIT	Heparin-induced thrombocytopenia
HRQoL	Health-related quality of life
HTx	Heart Transplantation
ICD	Implantable Cardioverter Defibrillator
ICU	Intensive Care Unit
IVIG	Intravenous immune globulin
LCOS	Low cardiac output syndrome
LV	Left Ventricular
LVOTO	Left ventricular outflow tract obstruction
MEP	Maximal Expiratory Pressure
MIP	Maximal Inspiratory Pressure
MoH	Ministry of Health
MR	Mitral regurgitation
MRI	Magnetic resonance imaging
MS	Mean of Score
MV	Mechanical Ventilation
N	Total Number of the sample
N. S	Not Significant
NCDR	National Cardiovascular Data Registry
NHLBI	National Heart, Lung, and Blood Institute
NO	Number
OHS	Obesity hypoventilation syndrome
P.	Page
P.P.	Pages

PE	pulmonary embolism
POAF	Post-operative atrial fibrillation
POP	Postoperative Pneumonia
PPCs	Postoperative Pulmonary Complications
PPI	Proton pump inhibitors
PPS	Post pericardiotomy syndrome
PTP	Post-transfusion purpura
PVR	Pulmonary Valve Reinstatement
RV	Right Ventricular
S.	Significant
S.D	Standard deviation
SARS	Severe Acute Respiratory Syndrome
SPSS-26	Statistical package of Social Sciences-version 26
SVR	Systemic vascular resistance
TAVR	Transcatheter aortic valve replacement
TGA	Transposition of the great arteries
TOF	Tetralogy of Fallot
TPVR	Transcatheter Pulmonary Valve Replacement
TR	Tricuspid Regurgitation
TVP	Tricuspid Valvuloplasty
UHC	Universal health coverage
USAID	United States Agency for International Development
VSD	Ventricular septal defect
WHO	World Health Organization
x^2	Chi- square

List of Statistical Symbols

Item	Meaning
E	Expected value
F	Frequency
H. S	Highly significant
N	Total Number of the sample
N. S	Not Significant
NO	Number
S.	Significant
S.D	Standard deviation
χ^2	Chi- square

Chapter One

Introduction

1-Introduction:

Cardiovascular or heart disorders are one important of the top causes of dying about the universe, and they can be treated with procedures, drugs, and healthy habits. Surgical treatment is the most difficult and has been increasing in popularity over time, despite its high death rate and high frequency of comorbidities. (Lisboa Cordeiro et al., 2020)

According to (WHO) the cardiovascular or heart disorders are the causes leading to death about worldwide (CVDs). 17.9 million humans it killed by CVDs in worldwide at 2019, accounting to 32 % for all fatalities. Strokes in addition to heart attacks were the causes for 85 % of the deaths in the world.

Cardiovascular illnesses, which account for one-third of all fatalities globally, are the main cause of morbidity and mortality. (Barretta et al., 2017)

Heart surgeries is a medical specialty dealing with the surgical solution for heart and aorta diseases. The history of modernistic heart surgeries, which start at the end of the nineteenth century. Since then, heart surgery has evolved thanks to the efforts of many committed surgeons, who are now able to treat a wide range of heart pathologies. This process is still in progress today. Pacemakers, like double chamber devices for atrioventricular blocks, defibrillators for ventricular arrhythmia and cardiac synchronization treatment for advanced cardiac failure, are implanted to treat a variety of cardiac rhythm abnormalities. Post surgeries bleeding, stroke and renal failure & mesenteric ischemia, atrial fibrillation, cardiogenic shock, in addition respiratory distress are all major problems. The use of 10 % to 20 % of national blood products in heart surgery is due to post surgeries bleeding,

hemorrhagic shock, and coagulation abnormalities such as heparin-induced thrombocytopenia. Up to 18% of individuals undergoing heart surgery suffer from acute renal damage. Renal replacement treatment is required in 2% of the population. The frequencies of complications may be used as a quality indicate and may have an impact on payment and patient selection.(Senst et al., 2022)

Cardiac surgical critical care is emerging as an important subspecialty of critical care medicine. Simultaneously, the spectrum of cardiac surgery is expanding, with increasing use of both minimally invasive techniques and mechanical circulatory support devices. Modern cardiac surgery was made possible by the development of cardiopulmonary bypass (CPB) in the 1950s, but “off-pump” techniques are increasingly used, especially for CABG procedures. Regardless of the procedure performed, successful outcomes depend on optimal postoperative care in the ICU. Most preventable deaths after CABG operations have been linked to postoperative problems in the ICU. Thus, “failure to rescue” a patient from potentially reversible complications is an important cause of perioperative morbidity and mortality. Historically, cardiac surgeons have provided the bulk of perioperative care to their patients, but this has changed as the number of cardiac surgeons has decreased and workhour restrictions have limited the ICU experience of surgical trainees. Consequently, cardiac surgical critical care is increasingly being provided by critical care physicians. Close collaboration between the intensivist and operating surgeon remains essential for comprehensive postoperative care (Stephens & Whitman, 2015)

Postoperative issues involving the cardiovascular and respiratory systems, in addition to the kidneys and the neurological system, are all common after cardiac surgery. (L. Ball et al., 2016)

The risk of postoperative complications related to cardiac surgery is substantial; pulmonary complications (up to 33%), delirium (~26%) and arrhythmias (~30%) have been reported to occur. These complications are associated with prolonged hospitalization, increased adverse events (ie, readmission, stroke, myocardial infarction and mortality), reduced health-related quality of life (HRQoL) and higher healthcare costs. Patients with poor dietary habits (present in ~80% of the candidates for cardiac surgery), who are physically inactive (~45%), who smoke (22%), or who experience depression and/or anxiety disorders (~30%) are at higher risk for postoperative complications and are at risk for lack of functional benefits after cardiac surgery. (Hartog et al., 2019)

Age, gender, time on Cardiopulmonary bypass and DM & obesity in addition heart or kidney failure, acute myocardial infarction, balloon implantation, surgeries, pre-surgeries medication, and re surgery are all common causes of problems after heart surgeries. (Cordeiro et al., 2015)

Cardiovascular surgery has many postoperative consequences, the most common of which are respiratory and neurologically in addition to cardiovascular. Cardiovascular issues are high prone to occur after an acute infarction of myocardial or congestive with heart failure. Stroke, on the other hand, is a neurologic condition that can happen during the first 24 hours after surgery. Atelectasis in addition pneumonia and abrupt respiratory failure, respiratory distress syndrome in acute condition (ARDS), additional pleural effusion are pulmonary complications. (Lisboa Cordeiro et al., 2020)

Postoperative pneumonia is the most common infection following cardiac surgery and is strongly related to increased risks of morbidity, mortality, prolonged intensive care unit (ICU) and hospital stay. Consequently, resource utilization and total treatment costs are also significantly augmented. The incidence of postoperative pneumonia differs substantially in various studies, with reported rates of 2.1–21.6%, and evidence suggests that the real incidence may be underreported. The characteristics of patients undergoing cardiac surgery have changed over the years. Despite considerable progress in surgery and anesthesia, increasing aging populations with multiple comorbidities and the emergence of antibiotic-resistant pathogens have obviously increased the proportion of patients at a higher risk for postoperative pneumonia. Several risk factors for pneumonia after cardiac surgery have been identified, such as a reduced pulmonary reserve and poor cardiac function. However, numerous studies were based on small samples and narrow patient selection, and most published literature were nearly a decade old or more. Furthermore, the vast majority of published studies were conducted in developed countries, especially in the United States and Europe. Studies from developing countries that make up the majority of the world's population are rare. Risk factors for postoperative pneumonia following cardiac surgery may vary with relationship to the medical background of the patient. Thus, more evidence on risk factors for pneumonia after cardiac surgery is still needed (D. Wang et al., 2021)

Postoperative complications, in particular, can affect multiple organs and have a significant brunt on the duration client's length for stay at the hospital and their character of life after discharge. Added to surgical

problems, postoperative pulmonary complications (PPCs) are a significant and likely underappreciated cause of death and morbidity among patients who have undergone cardiac surgery (Ball et al., 2016)

Many patients can recover fast and leave the ICU in less time thanks to advances in surgical procedures and anesthetic drugs. Many patients, however, still develop surgical problems and require acute nursing care in the post-operative period. Patients presenting for surgery are becoming older, with more risk factors and underlying comorbid diseases, raising the likelihood of complications following surgery. Those who require surgery will likely spend more time in the ICU and hospital, according to research, as well as have a higher chance of death, than patients who do not have surgical difficulties. Nurses must be especially alert in spotting and treating potential problems as soon as they arise. (Hodge, 2019)

The Cardiology College of America (ACC) begun the National Cardiovascular Data Registry (NCDR) as a result of its investigation of diverse policy for gathering and accomplishment clinical data in order to get better cardiovascular care by prepare information, knowledge, and tools; construction quality initiatives; and supporting studies that enhance patient care and outcomes.(Ziemer & Haverich, 2017)

2-Importance of the Study:

Approximately 230 million surgical procedures are conducted worldwide each year, with cardiac treatments accounting for a large fraction of this total. More than 600,000 heart procedures were conducted worldwide in 2016, with mortality rates ranging from 8% to 24% in patients over the age of 79, as well as considerable morbidity rates, particularly at the respiratory

level. Cardiac surgery with sternotomy is a very aggressive procedure that causes huge stress with local and systemic consequences that disrupt the organism's equilibrium and lead to the development of postoperative problems. These complications vary in frequency depending on the surgical facility, operation, patient's general health, and comorbidities; they impact multiple organs, particularly the heart, lungs, and kidneys, lengthen hospital stays, reduce quality of life, and may raise mortality rates. (Marmelo et al., 2020)

After cardiac surgery, postoperative complications have a significant impact on outcomes that last well beyond the recovery period. Stroke, pneumonia, and kidney failure are all linked to a lower chance of long-term survival. (Pahwa et al., 2021)

Understanding how information is used in everyday nursing practice is essential for increasing educational preparation and health-care quality. (Skår, 2010)

Professional nursing practice is defined by the application of knowledge to the care of critically ill patients. (Fulbrook et al., 2012).

Variations in post-surgeries death rates have been linked to diversity in registered nurse team levels. There is a bigger incidence of nurse’s care that is required but not supplied when nurse staffing levels are inadequate. The absence of nurse’s care perhaps a significant foreteller of mortality for clients following surgeries. Missed care of nursing, which is strongly linked to nurse staffing, is linked to a higher risk of patients with death at hospital after routine surgical methods. The data back up the theory that the link between registered nurse staffing and patient mortality is mediated by nursing care

gaps. Missed care could be utilized as an early signal of a bigger risk of poor client's outcomes. (J. E. Ball et al., 2018)

The postoperative care of a heart surgery patient is difficult because changes can happen quickly. In postoperative treatment, the patient's preoperative status as well as intraoperative events should be considered. It is vital for the nurse to foresee future problems in order to administer appropriate treatments in a timely manner and guarantee that the patient has a positive outcome. (J. Wang, 2018)

Professionals of health care showed save their abilities up to date on a legitimate basis, and continuing learning, also known as continued professional development (CPD), allows for skill renewal and developing in settings of health care. While understanding the need of continuing education for nurses, don't know about how much they feel about it or how they perceive it, and there is currently no far-reaching worldwide icon of how nurses interpret and experience CPD. A synthesis of qualitative research for nurses' experiences with CPD may give a foundation for more successfully future structuring of CPD interventions and leveraging examples for other contexts. (Mlambo et al., 2021)

In order to give holistic care to their patients, nurses must employ the best evidence available to them. This needs a wide range of learning styles and knowledge acquisition and construction approaches. CPD, formal learning, courses, and seminars are all options for nurses, as well as informal learning in the workplace, self-reflection, and reviewing literature for the best evidence via journals, and giving reaction to one another.(Mohammad Ali Fadil Al-fatlawi & Abbas Ahmed, 2016)(Barker, 2013)

Informal learning is typically done on one's own time, and it is generally initiated and directed by staff of nurses with the aim of expanding their qualifications and knowledge.(Bernadette van Rijn et al., 2013)

On-site of work learning occurs regularly as a result of managers' discretion and willingness to foster learning by providing time and space inside clinical settings. Nonetheless, rather than being a one-time event, informal on-site learning is a continuous process that depends on daily professional encounters. The largest objection to informal workplace teaching are a lack of CPD knowledgeable nurses and ward demands, as well as decrease teaming levels.(Govranos & Newton, 2014)

According to CPD literature, more nurses prefer informal work-depending learning approaches, with the high meaningful learning occurring by interactions with their coworkers.(Zaleska & de Menezes, 2007)

Employees' professional development was influenced by corporate culture. The company's commitment to its employees' personal and professional development was seen as a sign of respect.(Lee, 2011)

3-Statement of the Problem:

Nurses' Knowledge Toward Post Open Heart Surgeries Complications in Nasiriyah Heart Center

4- Objectives of the Study

1-To measure nurses' knowledge concerning post open-heart surgery complications

2-Find the relationship between the nursing staff' knowledge with certain demographical & employment characteristics.

5-Definition of Terms

5.1 Knowledge

a-Theoretical Definition

It is the concept, skill, experience and vision that provides a framework for creating, evaluating and using the information (Gao et al., 2018)

b. Operational Definition

knowledge about post open heart surgeries complications acquired through the education and experience.

5.2 Nurses

a-Theoretical Definition

Persons that profession within the health care sector focused on the care of individuals, families, and communities so they may attain, maintain, or recover optimal health and quality of life. (Wherry , 2015)

b. Operational Definition

a person trained to care for the sick or infirm, especially in a hospital.

5.3 Open Heart Surgeries

a-Theoretical Definition

Open heart surgery is a procedure to treat heart problems. Open-heart surgery is one-way surgeons can reach the heart, Open-heart surgery requires opening the chest wall to make the heart easier for the surgeon to reach. To access the heart, surgeons cut through the sternum (breastbone) and spread the ribs.(Lawton et al., 2022)

b. Operational Definition

Open-heart surgery is any type of surgery where the chest is cut open and surgery is performed on the muscles, valves, or arteries of the heart.

5.4 Complications

a-Theoretical Definition

A complication in medicine, or medical complication, is an unfavorable result of a disease, health condition, or treatment. (Helo & Moulton, 2017)

b. Operational Definition

Unfavorable result of a disease, health condition, or treatment that occur after open-heart surgery.

Chapter Two

Review of Literatures

A review of related literatures is an important aspect of scientific research that includes information on research problem.

2.1. Open Heart Surgeries and Historical Overview:

Cardiovascular surgery has developed so rapidly that it is hard to believe that this specialty is little more than a half-century old. In fact, had it not been for World War II, the emergence of modern cardiac surgery may have been delayed further, then a captain in the medical corps, successfully removed foreign bodies from in and around the hearts of >100 soldiers who had been injured in battle. Harken's work helped overcome the notion that the heart could not be surgically manipulated and, not only did it pave the way for the incredible progress of the last 50 years, it was a catalyst for the event that would mark the dawn of this era: the creation of the first Blalock-Taussig shunt for treating tetralogy of Fallot in 1944, the striking results from this procedure, which increased the circulation through the pulmonary arterial system, caused much excitement in the surgical community. (Alivizatos, 2018)

In those early days at the midpoint of the 20th century, many warned about operating on children, particularly those with cardiovascular disease, severe cyanosis, and hypoxia. There was great concern that it would not be possible to anesthetize these young patients safely and to see them through an operation. Helen Taussig believed that one should not try to operate on a child younger than 4 years with tetralogy of Fallot or a child younger than 8 years with an aortic coarctation. Many pediatricians heeded these warnings, and it was with enormous trepidation that the anesthesia staff undertook the first congenital heart operations in very young patients. (In the earliest days

of heart surgery, nurse-anesthetists usually administered anesthesia.) However, this did not deter those who believed that successful cardiac surgery could be undertaken in younger patients. By 1959, those at Texas Children's Hospital had successfully operated on 120 infants with congenital defects (Dobson et al., 2013)

2.2. Advent of Open-Heart Surgery:

Until the mid-1950s, most pediatric operations were "palliative" extracardiac procedures performed on the closed heart. The challenge was to operate inside the heart safely and to perform a definitive intracardiac repair. A number of ingenious techniques were proposed for this purpose. For instance, Elton Watkins, a medical student at Harvard, suggested a procedure to Robert Gross that became known as the Gross atrial well (King et al., 2010)

They showed that a soft funnel sutured to an incision in the atrial surface could be used to operate within a beating heart as tall as the clients was heparinized. The surgeon's index finger, however, suffered pain as a result of this surgery because the only way to verify if the suture was perfectly placed was for the surgeon to prick his finger with the needle. During an intracardiac surgery, a technique to stop blood flow was desperately needed. Hypothermia, which was induced by immersing patients in cold water or cooling them by ice packs, one of the earliest techniques was tested. already the client's temperature was decreased for 26°F, a snare was placed on the inferior and superior of vena cava to stop blood flow to the heart. If the adjustment could be adept in less than 8 to 10 minutes, the patient would be spared cerebral issues. sadly, there were some substantial drawbacks to this strategy, counting the risk of embolism of air, which was one of the most

important problems that open-heart procedure developers had to deal with. Furthermore, more serious lesions like atrioventricular canal and big ventricular septal defects could not be corrected. As a result, it became evident that more trustworthy approaches were required. (Silvay & Castillo, 2013)

For more than a decade, Gibbon John has been writing and worked to design a device that would provide for the oxygenation and circulation of blood in an extracorporeal circuit. Finally, in 1953, his open-heart technique with total cardiopulmonary bypass was tested in 4 patients with congenital heart disease, only one of whom survived. Although Gibbon called a personal halt to the clinical use of his technique, his efforts were a strong stimulus to other investigators. (Dewall, 2011)

The first truly successful open-heart operations were performed by using a cross-circulation technique; this method had been performed as a physiological experiment for ≈50 years before the first trial in a child. This approach worked very well. One of the parents, usually the mother, served as the oxygenator. By cross-circulating the parent's arterial blood into the recipient and controlling the amount of venous blood being returned, the surgeon had up to an hour in which to perform an intracardiac repair. Proponents of this technique soon determined that the patient could survive if less than full cardiac output was used and, therefore, only moderate stress was placed on the donor. Lillehei said that it was the only operation he knew of with a potential 200% mortality rate, because both the donor and the recipient could be lost. (In Lillehei's experience, only 1 donor ever suffered a serious complication—a stroke that probably resulted from an air embolism.) With this approach, Lillehei and his team were able to correct

ventricular septal defects and even tetralogy of Fallot. With the success of this method, he became convinced that open heart surgery with temporary cardiopulmonary bypass was feasible. Among the different types of oxygenators being investigated, the one devised by one of Lillehei's younger colleagues, Richard DeWall. (Stephenson, 2008)

2.3 Open-Heart Surgeries:

2.3.1 Definition:

According to *"Heart Surgery | National Heart, Lung, and Blood Institute (NHLBI)* Open-heart surgery is any kind of surgery in which a surgeon makes a large incision (cut) in the chest to open the rib cage and operate on the heart. "Open" refers to the chest, not the heart. Depending on the type of surgery, the surgeon also may open the heart.

2.3.2 Types of Open-Heart Surgeries:

2.3.2.1 Coronary Artery Bypass Surgery:

CABG surgery is an operation that bypasses a narrowed or blocked part of a coronary artery using a graft. A graft is a length of vein or artery that is usually taken from the leg (saphenous vein), the chest wall (internal mammary artery) or the forearm (radial artery). It is quite normal to need one to six grafts. One end of the graft is connected to the aorta, with the other end attached to the coronary artery. This bypasses the blockage or narrowing, providing a new channel that allows blood to flow to the heart muscle. If the internal mammary artery is used as a graft, it remains attached to its own blood supply in the chest wall with the free end sewn onto the coronary artery, bypassing the blockage or narrowing. (Heart Foundation, 2016)

Coronary heart disease affects about half of all men and nearly a third of all women over 40. By coating the insides of coronary arteries with plaque and thus constricting the flow of oxygenated blood to the heart muscle, the disease can produce recurring and debilitating chest pain – a condition called "angina" -- and shortness of breath. Worse, plaque can produce complete – and often fatal – blockages of the blood flow (popularly called "heart attacks"). Such heart attacks are now the leading cause of adult death, accounting for nearly a third of all adult fatalities. And while drugs and diets can reduce the risks of blockages, they cannot restore the blood flowing through coronary arteries already narrowed by coatings of plaque. Rather, physicians rely on surgical procedures. (Bhide et al., 2019)

2.3.2.2 Heart Transplantation:

A heart transplant, also called as a cardiac transplant, is a surgery used to treat clients with end-stage of heart failure or squeaky coronary artery disease who have failed to respond to previous pharmacological or surgeries treatments. As of 2018, the biggest usual method is to extract a working heart from a recently deceased organ donor, with or without both lungs (brain death is the standard). (Kilic et al., 2014)

Approximately 3,500 heart transplants are performed each year worldwide, more than half of which are in the US. (Cook et al., 2015)

2.3.2.3 Heart Valve Surgery:

Heart valve problems can be divided into two categories:

Regurgitation: The valve(s) does not close completely, causing the blood to flow backward instead of forward through the valve.

Stenosis: The valve(s) opening becomes narrowed or does not form properly, inhibiting the flow of blood out of the ventricle or atria. The heart is forced to pump blood with increased force in order to move blood through the stiff (stenotic) valve(s).

2.3.2.3.1 Aortic Valve Repair / Replacement:

Aortic valve disease is a common condition that is easily treatable with cardiac surgery. This is conventionally performed by opening the sternum longitudinally down the center ("median sternotomy") and replacing the valve under cardiopulmonary bypass. Median sternotomy is generally well tolerated, but as less invasive options have become available, the efficacy of limited incisions has been called into question. In particular, the effects of reducing the visibility and surgical access has raised safety concerns with regards to the placement of cannula, venting of the heart, epicardial wire placement, and de-airing of the heart at the end of the procedure. These difficulties may increase operating times, affecting outcome. The benefits of smaller incisions are thought to include decreased pain; improved respiratory mechanics; reductions in wound infections, bleeding, and need for transfusion; shorter intensive care stay; better cosmesis; and a quicker return to normal activity. (Kirmani et al., 2015)

2.3.2.3.2 Mitral Valve Repair or Replacement:

Mitral valve repair and mitral valve replacement are types of surgery to fix or replace a leaky or stiff mitral valve in the heart. The mitral valve is between the left heart chambers (left atrium and left ventricle). Mitral valve repair and mitral valve replacement may be done as an open-heart surgery procedure or as minimally invasive heart surgery. Sometimes a mitral valve problem may be treated with a catheter-based procedure. The specific procedure used depends on the severity of your mitral valve disease and whether it's getting worse. (Liu et al., 2019)

2.3.2.3.3 Tricuspid Valve Repair or Replacement:

Tricuspid valve repair and tricuspid valve replacement are treatment options for patients who suffer from tricuspid valve disease. The tricuspid valve is the heart valve that separates the right atrium from the right ventricle. The main function of the tricuspid valve is to allow the blood to flow from the right atrium to the right ventricle. If it is not functioning correctly, blood could flow backward into the heart and affect the heart’s ability to pump oxygen-rich blood to the body. Tricuspid valve repair is almost always performed due to tricuspid regurgitation and in conjunction with left-sided valve surgery or coronary artery bypass graft. Sole tricuspid valve repairs are rare, due to an increased incidence of complications. The main indication of the repair is secondary tricuspid regurgitation due to annular enlargement, right ventricular remodeling, and advanced left heart diseases. Structural abnormalities of the valve itself usually require replacement. This activity reviews the pathophysiology, evaluation, and treatment options of tricuspid valve repair and highlights the role of the interprofessional team in evaluating

and treating patients who undergo tricuspid valve repair. (Mahboobi & Ahmed, 2022)

2.3.2.3.4 Pulmonary Valve Replacement:

Pulmonary valve replacement (PVR) is often performed in patients with repaired tetralogy of Fallot (TOF). Concomitant tricuspid valvuloplasty (TVP) in those with tricuspid regurgitation (TR) at the time of PVR is still controversial. Pulmonary valve repair and pulmonary valve replacement are procedures that treat diseases affecting the pulmonary valve. The pulmonary valve is one of four valves that regulate blood flow in the heart. The valve lies between the lower right heart chamber (right ventricle) and the pulmonary artery. Pulmonary valve disease is a condition in which the pulmonary valve doesn't work properly. The condition can interrupt blood flow from your heart to your lungs. It may occur on its own or as part of other congenital heart defects, such as tetralogy of Fallot. Often, the condition may only be detected by a physical evaluation or heart imaging for another reason. Pulmonary valve repair or pulmonary valve replacement can treat pulmonary valve disease and help restore normal blood flow, reduce symptoms, prolong life and help preserve the function of your heart muscle. (Min et al., 2022)

2.3.2.4 Myectomy:

This is an operation where the thickened heart wall is surgically removed. It is used when medications are no longer able to control symptoms of hypertrophic cardiomyopathy. Hypertrophic cardiomyopathy is highly heterogeneous with a diverse anatomy, pathophysiology, and clinical course. It is obstruction to left ventricular outflow that has become the major

hallmark of the disease. Septal myectomy has been the gold standard treatment for the relief of left ventricular outflow tract obstruction and cardiac symptoms in both adults and children with obstructive hypertrophic cardiomyopathy. Objective of the study was to evaluate effect of Myomectomy and its impact on survival for a period of one year. (Gopalan et al., 2020)

2.3.2.5 ASD Surgery:

Surgical repair of an atrial septal defect (ASD) is a safe and effective operation with little to no morbidity and mortality. In an effort to reduce the trauma of surgery, current approaches focus on less invasive surgical techniques, rather than the intracardiac repair. We will describe the different types of ASD, techniques for repair, and options for minimally invasive repair. ASD closure is indicated in the presence of any hemodynamically significant shunt causing enlargement of right heart structures, irrespective of the presence of symptoms. A hemodynamically significant shunt is classically defined as any shunt that causes right-sided volume overload and pulmonary over-circulation. The surgical treatment of ASDs in the modern era of cardiac surgery has many faces. The traditional sternotomy approach remains the easiest technique with the shortest ischemic and Cardiopulmonary bypass times. Modern minimally invasive approaches improve cosmesis, shorten hospital stay, hasten return to full function, and can now be performed without increased risk in terms of mortality and morbidity. (Liava'a & Kalfa, 2018)

2.3.2.6 VSD Surgery:

Ventricular septal defect (VSD) is by far the most common congenital heart defect, with a birth prevalence of 2.62 per 1,000 live births. Small defects may not have hemodynamic consequences, but the presence of a significant left-to-right shunt can cause left ventricular (LV) overload, pulmonary arterial hypertension, ventricular dysfunction, arrhythmias, and aortic regurgitation. Surgical closure at a young age is still the treatment of choice, and mid- to long-term results are good with regard to survival, morbidity, and quality of life.(Menting et al., 2015)

The perimembranous type is the most common in adults (about 80% of all VSDs). The clinical presentation and natural history can vary from small VSD with insignificant left-to-right shunt to VSD with significant left-to-right shunt with left ventricular (LV) volume overload and right ventricular (RV) pressure overload, which, if unrepaired, may cause pulmonary vascular disease and even Eisenmenger syndrome. Patients with a small VSD and insignificant left-to-right shunt or with a repaired VSD usually remain event-free during follow-up. However, several problems may still develop later in life, with the most important being endocarditis, LV dilatation due to volume overload, double-chambered right ventricle, LV outflow tract obstruction (LVOTO), aortic valve regurgitation (AR) and complete heart block (especially in the earlier years of cardiac surgery) (Gabriels et al., 2017)

2.3.2.7 TOF Surgery:

Tetralogy of Fallot (ToF) is the most frequent cyanotic congenital heart disease, constituting 7 to 10% of all the congenital heart diseases. It carries a very high mortality if left untreated. The 10-year survival in patients

untreated is 24% only. ToF repair in adults carry more postoperative morbidity rate compared to early repair. Complications like low cardiac output syndrome, pericardial effusion, atelectasis, atrial arrhythmia, reoperation for bleeding and varying degree of PR were encountered in our patients. The incidence of postoperative atrial arrhythmias was higher in our adult patients compared to pediatrics as reported in the literature. The incidence of junctional ectopic tachycardia and persistent complete heart block reported in literature is 2% and 1%, respectively. Lungs related complications were encountered in 3.75% of our patients. A 5% incidence of pleural effusion that required tapping. The surgical techniques for primary repair to preserve RV function, reduce arrhythmia, and optimize functional status that are still evolving and a definitive consensus is lacking. (I. Khan et al., 2016)

2.3.2.8 TGA Surgery:

TGA is a birth defect of the heart in which the two main arteries carrying blood out of the heart – the main pulmonary artery and the aorta – are switched in position, or "transposed." Because a baby with this defect may need surgery or other procedures soon after birth, d-TGA is considered a critical congenital heart defect (CCHD). (Mai et al., 2019)

Sudden death is the leading cause of mortality in patients with transposition of the great arteries (TGA) and atrial switch surgery. Understanding underlying mechanisms could contribute to identifying high-risk patients and preventing such catastrophic deaths. (Chaix et al., 2019)

Adults who have undergone a neonatal ASO to correct d-TGA have an increased risk of cognitive deficits and psychiatric disorders. Evaluation of

long-term neuropsychological and psychosocial outcomes in early adulthood is a crucial step to anticipate for adapted treatment strategies in adults with congenital heart disease. (Kasmi et al., 2018)

2.3.2.9 Glenn Surgery:

Glenn surgery is used as palliative surgery and consists of the anastomosis of the superior vena cava to the right pulmonary artery in an end-to-side manner. Therefore, venous blood passage from the upper half of the body through the right ventricle is avoided. In this way, the single ventricle functions as an aspirating and expelling pump. In the aspirating phase, it passively performs the pulmonary circulation, while in the expelling phase, it is exclusively dedicated to the systemic circulation. However, for this hemodynamic system to work, there must be low pulmonary resistance and low systemic ventricular end-diastolic pressure. Any condition that provokes an increase in these two variables will cause the system's dysfunction with increased central venous pressure and the appearance of peripheral edema. (Hernández-Morales et al., 2021)

2.3.2.10 Bentall Surgery:

The Bentall procedure is a type of serious open-heart surgery needed to repair the aortic root and the aortic valve, such as might be needed for an aortic aneurysm in this part of the aorta. The procedure is named for Hugh Bentall, who first performed and described it in 1968. It is considered a standard for individuals who require aortic root replacement, and the vast majority of individuals who undergo the surgery receive mechanical valves. (Kouchoukos et al., 2018)

2.3.2.11 BT Shunt Surgery:

A BT shunt is a systemic to pulmonary shunt which is a palliative procedure usually performed in neonates to establish a reliable pulmonary blood flow in patients with obstructed pulmonary blood flow. tricuspid atresia, pulmonary atresia and severe Tetralogy of Fallot. (Service, 2020)

Adults with complex congenital heart disease palliated with systemic-to-pulmonary artery shunts have become rare and represent a particularly challenging patient group for the cardiologist. One of the complications and causes of severe clinical deterioration during long-term follow-up are progressive obstruction or total occlusion of the shunt. The risk for surgical intervention is frequently high and catheter intervention may be complicated by complex anatomy and shunt calcification. (Illner et al., 2019)

2.3.2.12 Myxoma Surgery:

Cardiac myxoma is the most common benign intracardiac tumor, Cardiac myxomas are rare benign tumors, which account for nearly 50% of all adult primary cardiac tumors. Approximately 75-80% of myxomas are located in the left atrium, 10-20% are located in the right atrium, and 5-10% are in both atria or either ventricles. (M. Khan et al., 2013)

Right ventricular (RV) myxomas are extremely rare, but may have dreadful clinical sequelae including pulmonary embolism. (M. Khan et al., 2013)

Atrial myxoma can be resected with good long-term survival. Late onset AF is common after surgery in patients with atrial myxoma. Advanced age,

left atrial diameter, and mitral valve surgery were independent predictors of outcomes. (Jiang et al., 2019)

2.4 Post Open Heart Surgeries Complications:

According to (Hodge, 2019; Woods, 2010), the complications are divided into:

- Early Complications
- Late Complications

2.4.1 Early Complications:

Advances in surgical techniques and anesthetic agents allow Advances in surgical techniques and anesthetic agents allow many patients to recover quickly and move from the ICU in shorter periods of time. However, many patients still experience complications of surgery and require intensive nursing care in the initial post-op period. Patients presenting for surgery are increasingly older with more risk factors and underlying comorbid conditions, which increases the risk of complications after surgery. Patients who experience complications often have a longer ICU and hospital stay and may have a higher risk of death than patients who do not experience surgical complications. Nurses must be extra vigilant to observe for and treat potential. (Hodge, 2019)

2.4.1.1 Cardiovascular Complications:

2.4.1.1.1 Postoperative Bleeding:

Bleeding and transfusion of blood and blood products is a serious concern in patients undergoing cardiac surgery. Some of the significant

factors including deficiency of coagulation factor, an improper heparin reversal, raised fibrinolytic state, platelet deficiency and technical causes. The surgical technical causes have been reported the leading cause of coagulopathic condition. The definite cause of bleeding is not easy to define. This is started with replacement of volume and transfusion of blood, he surgical factor of bleeding requiring re-exploration reported from 35-100%. It is usually at the sites of anastomosis, conduits side branches, soft tissues under the sternum, suture sites of the sternum, periosteum and bone marrow. Anti-platelet medications are also leading to platelet defects in acute coronary disease patients resulting in platelet dysfunction in Preoperative condition. Clopidogrel and Aspirin are the commonly used drugs in cardiac surgery patients. (B. Khan et al., 2022)

2.4.1.1.2 Myocardial Infarction:

Coronary embolism can rarely be a cause of myocardial infarction. It is usually associated with atrial fibrillation, dilated cardiomyopathy, bacterial endocarditis and underlying hypercoagulable state, as well as heart surgery. Heart surgery could be followed by unexpected and potentially fatal complications, coronary embolism being one of them. In such case, the prompt and adequate reaction by the whole medical team is crucial for a patient's survival and recovery. (Preveden et al., 2020)

2.4.1.1.3 Cardiac Tamponade:

Hemodynamic impairment in patients after cardiac surgery is a common challenge with a wide differential. Cardiac tamponade is one of the most feared life-threatening complications with mortality rates up to ~30%. The incidence of cardiac tamponade after cardiothoracic surgery ranges from

0.5% to 8.8%. Although there is no clear consensus, literature differentiates between early (<72 h) and late (>72 h) tamponade depending on the timing after surgery. Early diagnosis and re-exploration are important to prevent further deterioration, serious complications and death. However, re-explorations also increase the risk of acute-kidney injury, atrial fibrillation, sternal wound infections, pulmonary infections, increased number of days on mechanical ventilation and an increased ICU length of stay. Therefore, the threshold to perform additional diagnostic evaluations should be low, while the diagnostic accuracy of these evaluations must be high suitable to the severity of the complication, the lack of specific clinical symptoms, and the need to avoid unnecessary re-explorations. (Ellenbroek et al., 2021)

2.4.1.1.4 Low Cardiac Output:

Low cardiac output syndrome was defined as the requirement for postoperative mechanical circulatory support and/or hemodynamic instability requiring prolonged inotropic support. Incidence, risk factors, and association of low cardiac output syndrome with postoperative outcomes. Cardiac surgical patients who develop postoperative low cardiac output syndrome suffer greater mortality and have greater resource use, health care costs, and all-cause readmission. (Duncan et al., 2020)

Mortality after stage 1 palliation of hypoplastic left heart syndrome remains significant. Both cardiac output (CO) and systemic vascular resistance (SVR) contribute to hemodynamic vulnerability. Simultaneous measures of mean arterial pressure and somatic regional near infrared spectroscopy saturation can classify complex hemodynamics into 4 distinct states, with a low-CO state of higher risk. (Hoffman et al., 2021)

2.4.1.1.5 Arrhythmias:

The main causes of arrhythmias in the early postoperative period are direct injury to the cardiac conduction system during surgery or edema and inflammation in myocardial tissue in areas close to the conduction system. In addition, it has been suggested that different conditions such as ischemia and reperfusion injury associated with cardiopulmonary bypass (CPB), electrolyte imbalance, acidosis or alkalosis, age at the time of operation, hemodynamics, acidosis, pain, sedation, and inotropic drugs and doses may affect the development and frequency of arrhythmias. (Öztürk, 2021)

Cardiac arrhythmias occupy one of the key places in the structure of complications of the early postoperative period following cardiac surgery. According to various literature sources, they range from 10% to 40% and often determine the course of the postoperative period. (Danilevych et al., 2021)

2.4.1.1.6 Myocardial Ischemia:

The diagnosis of postoperative myocardial ischemia after cardiac surgery is difficult, and how to treat it is a hot matter of controversy. After heart surgery, electrocardiographic abnormalities are common and difficult to interpret, but troponin levels are predicted to be high. Because patients rarely report characteristic ischemic symptoms early after heart surgery, clinicians in critical care units have a difficult time distinguishing between minor and benign alterations and clinically relevant myocardial ischemia, which can be reversed with appropriate management. Doctors use cardiac biomarkers, hemodynamic anomalies, and imaging to detect myocardial damage. The decision of whether to rush the patient to the catheterization lab,

return the patient to the operating room for revision, or wait quietly and observe the course is loaded with controversy and uncertainty, necessitating a step-by-step investigation. (Robinson et al., 2021)

2.4.1.1.7 Coronary Vasospasm:

Postoperative coronary vasospasm is a rare but potentially life-threatening complication after cardiac surgery. This study presents the case of a young patient with osteogenesis imperfecta who developed coronary vasospasm after each of his 2 aortic valve procedures. this case provides new information about the presentation, potential for recurrence, and clinical progression of perioperative coronary vasospasm.(Rahmouni El Idrissi et al., 2020)

Although the prevalence of coronary artery spasm (CAS) is unknown, evidence suggests that it remains underdiagnosed and undertreated. A large registry study showed that 62% of patients undergoing elective cardiac catheterization for suspected coronary artery disease had no obstructive disease. A prospective study of 124 patients with typical angina but angiographically normal coronary arteries evaluated the frequency of provocable CAS using intracoronary acetylcholine. Epicardial CAS was demonstrated in 28% of patients. An additional 34% of patients had evidence of microvascular spasm. Similarly, in the CorMICA (Coronary Microvascular Angina) trial, acetylcholine testing induced epicardial vasospasm in 37% of patients with angina but no obstructive coronary artery disease. (Savage & Moe, 2021)

2.4.1.1.8 Pericardial effusion:

Postoperative Pericardial effusion is a well-known complication after open heart surgery. Different operative strategies and drugs are used to prevent early postoperative pericardial collection and cardiac tamponade like opening of left pleura, placing posterior mediastinal drain and use of anti-inflammatory drug like colchicine, posterior pericardiotomy during valve replacement surgery is a safe and effective technique to prevent postoperative pericardial effusion and mortality associated with it. (Sher-i-Murtaza et al., 2021)

2.4.1.2 Pulmonary Complications:

2.4.1.2.1 Pleural Effusion:

Pleural effusions appearing within the first 30 postoperative days following coronary artery bypass grafting (CABG) are classified as early and believed to be directly related to the surgery. The characteristics of such effusions are well-described. Orthotopic heart transplantation is also known to be complicated by pleural effusions; however, their characteristics have not been systematically reported. We assessed the features of early postoperative pleural effusions after heart transplantation and compared them to those of early effusions following CABG. (Jain et al., 2021)

2.4.1.2.2 Pneumothorax:

The pneumothorax likely resulted from a needle-stick injury to the left lung during attempts to access the left axillary vein. The cause of the pneumopericardium was not immediately apparent. We think that the patient’s previous CABG may have caused a pleuropericardial fistula to

form, allowing air to enter the pericardial space. A similar mechanism has been described. The lung adhesions that formed after CABG probably limited the pneumothorax to its basal location. (Goel et al., 2021)

2.4.1.2.3 Prolonged Mechanical Ventilation:

In study looked for investigated the prognostic significance of T3 for prolonged MV in patients having undergone cardiac surgery. As revealed from this study, decreased T3 could be common in the cardiac patients with prolonged MV before surgery, and it would be further reduced after patients undergoing cardiac surgery. Decreased T3 before surgery was an effective predictor for prolonged MV after cardiac surgery, there by demonstrating that thyroid hormone therapy might be profitable in the mentioned patients. (Shen et al., 2021)

Age at surgery, post-operative lactate, and low-weight-for-age score are associated with prolonged mechanical ventilation and death. (Jonas et al., 2021)

2.4.1.2.4 Pneumonia:

Pneumonia is a frequent complication in patients undergoing heart transplantation (HTx) that increases morbidity and mortality in this population. Nevertheless, the risk factors for postoperative pneumonia (POP) are still unknown. The occurrence of pneumonia after HTx is frequent and increases mortality among HTx recipients. Most frequently, the pathogens are Enterobacteriaceae or Pseudomonas aeruginosa, which should be at the centre of the empirical treatment for POP. In contrast to plasmapheresis and IVIg administration, mechanical ventilation prior to HTx and postoperative

transfusion appear to be the main identified risk factors for POP. (Vidal et al., 2020)

2.4.1.2.5 Phrenic Nerve Injury (Diaphragmatic Paralysis or Dysfunction):

The incidence of postoperative diaphragm dysfunction after elective cardiac surgery is high and might contribute to prolonging ICU length of stay. (Bruni et al., 2020)

Symptomatic Diaphragmatic dysfunction was found in 7.6% of patients after cardiac surgery. It leads to an increase of respiratory complications, such as pneumonia and prolonged ventilation and ICU stay. Coronary bypass grafting with internal mammary artery harvesting was the principal factor associated with Diaphragmatic dysfunction, along with obesity and systemic hypertension in multivariate analysis. Early diagnosis and appropriate support can probably minimize its consequences. (LAGHLAM et al., 2020)

2.4.1.2.6 Respiratory Distress Syndrome:

Acute respiratory distress syndrome (ARDS) is a common complication after Acute aortic dissection, especially after Sun's procedure. ARDS significantly increases the postoperative mortality, which accounts for 30%-55% of the overall mortality. At the same time, AAD also seriously affects the prognosis, prolongs the ventilator use and postoperative ICU retention times, and may induce multiple organ failure. (Zhao et al., 2021)

Despite advances in treatment strategies, acute respiratory distress syndrome (ARDS) after cardiac surgery remains associated with high

morbidity and mortality. A method of screening patients for risk of ARDS after cardiac surgery is needed. (Huang et al., 2021)

2.4.1.2.6 Atelectasis:

Atelectasis is one of the most common respiratory complications after open-heart surgery. Its prevalence after heart surgeries has been reported Up to 78% of pulmonary complications. The incidence of atelectasis after heart surgery has been reported 75% in an Iranian study. Atelectasis is characterized by the collapse of the alveoli, lobules or larger unit respiratory systems that occurs after thoracic surgeries due to reasons such as uneven distribution of ventilation and perfusion due to factors such as anesthesia, extracorporeal circulation, sternotomy, analgesics, respiratory muscle dysfunction, post-operative pain, drainage, decreased phrenic nerve activity and diaphragmatic dysfunction, which lung volumes are reduced, and atelectasis happens then. (Setak-Berenjestanaki et al., 2018)

The reduced lung volumes and atelectasis are common after open-heart surgery, and pronounced restrictive lung volume impairment has been found. Lung function was decreased by approximately 50% and the postoperative lung volumes were less than 40% of predictive values on the second postoperative day after open-heart surgery. there were large decreases in lung volumes two days after open-heart surgery. Patients with high BMI had lower postoperative lung volumes, which is an indication that these patients should receive extra attention during postoperative care. Postoperative pain was related to a larger decrease in postoperative lung volumes: therefore, it is important to determine optimal pain relief for the patient. (Urell et al., 2012)

2.4.1.2.6 Pulmonary Embolism:

Pulmonary embolism (PE) is a widespread cause of disease and dead after surgeries and in a range of medical conditions. The incidence of accidental PE has increased in tandem with the rising usage of CT. Atelectasis is one of the biggest prevalent pulmonary complications following open-heart surgeries. It has been found that it occurs more frequently after heart surgery. Up to 78 % of lung illnesses are caused by smoking. In an Iranian study, the incidence of atelectasis post cardiac surgeries was reported to be 75%. (Beck et al., 2018)

2.4.1.3 Gastrointestinal Complications:

2.4.1.3.1 Bleeding:

The incidence of GI complications is variably reported in studies, ranging from .3% to 5.5% with an average incidence of approximately 1.2%. Reported associated mortality varies even more widely, from .3–87%, although average mortality approximates 32% in contemporary studies. GI complications are heterogenous; however, the most common complication reported overall is GI bleeding, accounting for approximately 35% of GI complications. (Allen, 2014)

Pharmacotherapy with gastric acid suppression using a proton pump inhibitor (PPI) is currently recommended to reduce the risk of peptic and duodenal ulcers and GI bleeding and has been shown to be superior to no prophylaxis and to use of a histamine receptor antagonist in preventing these complications. (Patel & Som, 2013)

2.4.1.3.2 Cholecystitis:

Acute cholecystitis is a complication in critically ill patients. However, a few studies have described its incidence, risk factors, and mortality in patients who underwent cardiovascular surgery. Investigated the incidence, perioperative predictors, and clinical features of acute cholecystitis after cardiovascular surgery. Approximately 1% of patients who underwent cardiovascular surgery developed postoperative cholecystitis; half of them were asymptomatic. Since cholecystitis is associated with high mortality, it is a complication after cardiovascular surgery that needs to be considered. (Kamei et al., 2021)

2.4.1.3.3 Acute Hemorrhagic Pancreatitis:

Pancreatitis is a serious complication after cardiac surgery and can lead to significant morbidities and mortality. The incidence of pancreatitis is even higher in patients undergoing heart transplantation than in those undergoing other cardiac surgeries. Nevertheless, the clinical presentations of pancreatitis are frequently atypical in these patients. The causes of pancreatitis after heart transplantation include low cardiac output, immunosuppressant use and cytomegalovirus infection. The typical symptoms of pancreatitis might be not apparent in patients after heart transplantation because of their immunosuppressive status. Furthermore, in patients complicated with right heart failure after transplantation, the manifestation of pancreatitis could be even more obscure. The prompt diagnosis is highly depended on the clinician's astuteness. (Lin et al., 2016)

2.4.1.3.3 Diarrhea:

Diarrhea is an important complication in critically ill patients undergoing enteral feeding. The occurrence of diarrhea may lead to systemic and local complications and negatively impacts on nursing workload and patient's wellbeing. An enteral feeding based on blenderized natural food could be beneficial in reducing the risk of diarrhea. No study has compared natural and commercial enteral feedings in critically ill cardiac surgery patients. Administration of a blenderized diet based on natural food for enteral feeding can reduce the incidence of diarrhea in cardiac surgery critically ill patients. This strategy may reduce the risk of diarrhea-associated malnutrition and systemic and local complications, also having a positive impact on nursing workload and patient wellbeing. (Fabiani et al., 2020)

2.4.1.4 Neurological Dysfunction:

Postoperative neurological impairment after cardiac surgery is a serious complication. Clinical manifestations are various, and include cognitive behavioral disturbances, altered states of consciousness, and focal neurological deficits. Neurocognitive impairment occurs in 15–66% of patients at discharge, and in up to 40% of patients at 5 years after surgery. Symptomatic stroke occurs in 1.2 to 6% of patients, and its incidence is higher in the elderly. Several studies have evaluated postoperative neurologic complications and risk factors in cardiac surgery patients, though the results are conflicting, or incomplete mainly due to a low number of interventions or a low number of variables. Some studies have reported the association between prolonged cardiopulmonary bypass and the development of postoperative stroke, while others have questioned its significance. Few

studies have evaluated the incidence of postoperative neurological complications in a large group of patients who have undergone a variety of cardiac procedures. (Raffa et al., 2019)

2.4.1.4.1 Stroke:

Stroke is a major complication after cardiac surgery causing increased morbidity and mortality. There are limited data on outcomes of patients with large vessel occlusion after cardiac surgery. Stroke is a devastating complication after cardiac surgery that increases operative morbidity and mortality. Stroke with large vessel occlusion was associated with worse survival. However, early intervention did not impart a survival benefit. (Sultan et al., 2020)

2.4.1.4.2 Memory Disturbance:

Cognitive dysfunction is the most common clinical evidence of brain injury after cardiac surgery. It can be detected only with careful neuropsychological testing by a trained and experienced examiner. A meticulous look for characteristic disturbances in memory, psychomotor speed, executive function, visuo-constructional ability, and ability to concentrate is required. A strong association has been found between MRI lesions and prevalent cognitive dysfunction and dementia. Such an association could be predicted based on the location of the lesions. The frontal lobe, a common location, plays an important role in executive function, social behavior, and motivational status. Moreover, MRI lesions are positioned so as to affect cortical areas important for language, praxis, and self-awareness. It therefore is plausible that accumulating silent lesions, in the absence of overt stroke, may contribute to impairment of cognitive

function and to difficulties in mental flexibility, language, and short-term and working memory. (Sun et al., 2012):

2.4.1.4. 3 Brachial Plexus Injury:

Brachial plexus injury and ulnar nerve injury, are described after cardiac surgery. The brachial plexus is susceptible to stretch injury and can occur with sternal retraction is a key factor responsible for injury. In addition to a history of upper extremity pain and paresthesia, examination for brachial plexus injury includes evaluation of motor function of muscle groups innervated by the brachial plexus and sensation to pin prick. Ulnar nerve injury, a result of nerve compression, is frequently described by patients after cardiac surgery as paresthesias in the affected arm below the elbow in the ulnar distribution involving the third, fourth, and fifth digits. (Woods, 2010)

2.4.1.4.2.4 Delirium:

Postoperative delirium is a common complication of major surgery in elderly patients, but often remains undiagnosed. Also, delirium occurring after cardiac surgery is a common acute neurocognitive disorder bearing severe consequences for the patients. With aging of populations worldwide and an increasing number of cardiac operations performed yearly, post-cardiac surgery delirium is a major epidemiologic and clinical problem. The consequences of delirium are long-lived and include increased mortality and morbidity, long-term cognitive dysfunction and memory loss, increased risk of falls, and decreased functional status. (Kotfis et al., 2018)

2.4.1.4.2.5 Confusion:

Despite extensive research, acute confusion states after cardiac surgery remain a subject of great importance and controversy. The profound impact of psychotic disturbances on postoperative outcomes was noted in numerous studies. Postoperative delirium has been shown to be associated with prolonged and more costly hospital stay, impaired postoperative cognition, and higher possibility of early postoperative death. (Norkienė et al., 2013)

2.4.1.4.2.6 Hallucinations:

Cardiac surgery often improves patients' quality of life, but can be complicated by cerebral complications, including hallucinations. Very little is known about the prevalence, risk factors and phenomenology of postoperative hallucinations. Clinical studies on hallucinations in cardiac surgery patients are sparse; we could only identify two case reports, one case series of three patients and one prospective observational study that included 52 patients. The latter reported a high incidence of hallucinations and illusions of 58%, but the authors did not address any specific characteristics, such as modality or duration. (Ottens et al., 2020)

2.4.2 Late Complications:

Complications of cardiac surgery may occur at many points along the path to recovery, deals with complications that tend to occur later in the hospital stay, often after patients are transferred out of the ICU. However, complications may occur late in the hospital stay, and complications discussed may occur early. (Hodge, 2019)

2.4.2.1 Cardio Vascular:

2.4.2.1.1 Post Pericardiotomy Syndrome:

Post pericardiotomy syndrome (PPS) is a common complication after cardiac surgery. It may lead to prolonged hospital stay, readmissions, and invasive interventions including pericardial or pleural drainage, but the majority of cases have a benign course with mild fever and self-limiting pericardial and pleural effusions. (Lehto et al., 2015)

2.4.2.1.2 Late Cardiac Tamponade:

Cardiac tamponade (CT) following cardiac surgery is a potentially fatal complication and the cause of surgical reintervention in 0.1%–6% of cases. There are two types of CT: acute, occurring within the first 48 h postoperatively, and subacute or delayed, which occurs more than 48 h postoperatively. The latter does not show specific clinical signs, which makes it more difficult to diagnose. The factors associated with acute CT are related to coagulopathy or surgical bleeding, while the variables associated with subacute tamponade have not been well defined. (Leiva et al., 2018)

2.4.2.1.3 Low Cardiac Output Syndrome:

Low cardiac output syndrome (LCOS), which manifests with symptoms of hypotension, tachycardia, oliguria, and poor peripheral perfusion [1,2], is not rare after cardiac surgery in adults. Typically, high dose of inotropes are required to maintain adequate perfusion pressure in patients experiencing LCOS. Persistent LCOS may lead to multiorgan failure, which results in postoperative morbidity and mortality. In this setting of critical illness and stress, critical illness-related corticosteroid insufficiency (CIRCI) may occur and aggravate hemodynamic instability. Conversely, CIRCI can be the cause of LCOS. However, insufficient evidence and guidelines exist regarding the management of CIRCI in patients with LCOS. (Ok et al., 2018)

2.4.2.1.4 Atrial Fibrillation:

Acute or new-onset AF (termed postoperative atrial fibrillation [POAF]) is a common postoperative complication that occurs in around 35% of cardiac surgery cases and is associated with numerous detrimental sequelae. In contrast, the incidence of POAF following thoracic surgery is between 10 and 30% and the incidence following non-cardiac, non-thoracic surgery ranges from 1 to 15%. Advanced age is the most consistently reported and widely accepted risk factor for POAF. The aging process leads to a loss of myocardial fibers, increased fibrosis and collagen deposition in the atria, particularly near the sinoatrial node, which alters atrial electrical properties. Age-related physiological changes are a ‘setup’ for POAF, with acute surgical trauma and inflammation likely providing the inciting factors that induce POAF (Greenberg et al., 2017)

2.4.2.1.5 Arrhythmias:

Arrhythmias are a known complication after cardiac surgery and represent a major cause of morbidity, increased length of hospital stay, and economic costs. However, little is known about incidence, risk factors, and treatment of early postoperative arrhythmias. Both tachyarrhythmias and bradyarrhythmia's can present in the postoperative period. In this setting, atrial fibrillation is the most common heart rhythm disorder. Postoperative atrial fibrillation is often self-limiting, but it may require anticoagulation therapy and either a rate or rhythm control strategy. However, ventricular arrhythmias and conduction disturbances can also occur. Sustained ventricular arrhythmias in the recovery period after cardiac surgery may warrant acute treatment and long-term preventive strategy in the absence of reversible causes. Transient bradyarrhythmia's may be managed with temporary pacing wires placed at surgery, but significant and persistent atrioventricular block or sinus node dysfunction can occur with the need for permanent pacing. We provide a complete and updated review about mechanisms, risk factors, and treatment strategies for the main postoperative arrhythmias. (Peretto et al., 2014)

2.4.2.1.5 Heparin-Induced Thrombocytopenia:

Heparin-induced thrombocytopenia (HIT) is an immune-mediated reaction to heparin that provokes a prothrombotic state and causes a decline in platelet count. Data describing outcomes of HIT after cardiac surgery are limited. Although uncommon, HIT is a highly morbid and potentially lethal complication, which should reinforce the importance of timely recognition and treatment of this adverse outcome. (Brown et al., 2021)

2.4.1.2 Pulmonary Complications:

2.4.1.2.1 Bronchospasm:

Pulmonary complications, such as atelectasis, pulmonary oedema, pleural effusion, bronchospasm, and pneumonia, have been reported following cardiac surgery. Shallow breathing leading to impaired lung function is the major cause of respiratory complications. Decreases in respiratory muscle strength can be measured using the maximal inspiratory pressure (MIP) and maximal expiratory pressure (MEP) produced in the oral cavity. This study aimed to determine the decrease in respiratory muscle strength 8 weeks following cardiac surgery. Moreover, the relationship between lung function and respiratory muscle strength was studied. The respiratory muscle strength was not impeded either before or 2 months after cardiac surgery. However, the exact mechanism for the alteration in lung function remains unclear. Measures to re-establish the ideal postoperative lung capacity should concentrate on different perioperative pulmonary exercises. (Naseer et al., 2019)

2.4.1.2.1 Mediastinitis:

Mediastinitis is a rare but severe infection, defined as an inflammation of the connective tissues and structures within the mediastinum. Due to its proximity to vital structures, mediastinitis represents a highly morbid pathological process associated with a high risk of mortality. In most cases mediastinitis requires treatment in the intensive care unit. Mediastinitis is a life-threatening infection with significant associated morbidity and mortality. The diagnosis relies on both thorough clinical examination and early cross-sectional imaging. Subsequent management depends on the underlying

aetiology and can be divided into DSWI, oesophageal perforation and DNM. Identification of the causative bacteria is critical to appropriately direct antimicrobial therapy, although the responsible pathogens vary according to anatomical location making empirical treatment challenging. Surgery and supportive measures should aim to reduce the inoculum of pathogens by providing adequate drainage and debridement. (Pastene et al., 2020)

2.4.1.4 Neurological Dysfunction:

Although the pathogenesis of adverse neurologic events after CABG is probably multifactorial, there is growing evidence that patient-related risk factors, such as the extent of preexisting cerebrovascular and systemic vascular disease, have a greater effect on both short- and long-term neurologic sequelae than do procedural variables, such as on-pump versus off-pump surgery. Therefore, the risk of postoperative stroke or cognitive decline should not be a factor in the choice of surgical therapy for coronary artery disease. short-term cognitive decline after CABG typically refers to changes in cognitive performance observed up to several weeks after surgery. Results from studies that have included comparison groups with coronary artery disease indicate that although mild cognitive decline does occur in some patients, there are no substantive differences in the degree of short-term cognitive change after CABG as compared with that after cardiac interventions that do not involve cardiopulmonary bypass. Mild postoperative cognitive decline also has been reported after noncardiac surgery performed while the patient was under general anesthesia, suggesting that when short-term postoperative decline does occur after CABG, it is not specific to the use of cardiopulmonary bypass (Selnes et al., 2012)

2.4.1.5 Renal Failure:

Acute kidney injury (formerly known as acute renal failure) is a syndrome characterised by the rapid loss of the kidney's excretory function and is typically diagnosed by the accumulation of end products of nitrogen metabolism (urea and creatinine) or decreased urine output, or both. It is the clinical manifestation of several disorders that affect the kidney acutely. Acute kidney injury (AKI) complicates recovery from cardiac surgery in up to 30 % of patients, injures and impairs the function of the brain, lungs, and gut, and places patients at a 5-fold increased risk of death during hospitalization. Renal ischemia, reperfusion, inflammation, hemolysis, oxidative stress, cholesterol emboli, and toxins contribute to the development and progression of AKI. Risk factors for acute kidney injury (AKI) are common among patients undergoing cardiac surgery , and partially explain why AKI occurs in up to 30 % of patients . Many of these factors are not modifiable, such as advanced age, hypertension, hyperlipidemia, and peripheral vascular disease. Other factors are specific to anesthetic, surgical, and ICU management, and physicians should be cognizant of these factors in order to eliminate or mitigate their effects. The unique characteristics of cardiac surgery, including cardiopulmonary bypass (CPB), aorta cross-clamping, high rates and volumes of exogenous blood product transfusion, and high doses of exogenous vasopressors, increase the risk of AKI compared with noncardiac surgery. These factors alter renal perfusion, induce cycles of ischemia and reperfusion, increase oxidative damage, and increase renal and systemic inflammation—all mechanisms implicated in the development of AKI. (O’Neal et al., 2016)

2.4.1.6 Gastrointestinal Complications:

2.4.1.6.1 Nonocclusive Mesenteric Ischemia:

Gastrointestinal complications after cardiac surgery are rare, but are associated with significant morbidity and mortality which varies between 13,9 and 63% .Mesenteric ischemia accounts for approximately 14% of post cardiac surgery gastrointestinal complications with a mortality rate of 50-100% in some studies .Early diagnosis allows timely management to improve patient prognosis. However, definitive diagnosis remains difficult in most cases because of the variety and non-specificity of clinical presentations. (Atmani, 2021)

2.4.1.6.1 Paralytic Illuis:

Abdominal complications following cardiopulmonary bypass (CPB) have been reported since the early days of cardiac surgery. Despite improvements in surgical techniques and perfusion technologies, the incidence and mortality have not decreased during the last two decades. It remains a significant problem in the clinical practices. Early diagnosis and aggressive treatment is the key to successfully reduce mortality. Abdominal complications were classified as following, paralytic ileus, gastrointestinal haemorrhage, gastroduodenal perforation, acute calculus cholecystitis, acute acalculus cholecystitis, hepatic dysfunction and ichemic bowel disease. Patients with transient intestinal ileus, mild hepatic dysfunction, or asymptomatic jaundice were not included. Other rare complications such as acute pancreatitis and pseudomembranous colitis were not encountered in our series. The most common events in abdominal complications were paralytic ileus (11, 33.3%), followed by gastrointestinal

bleeding (9, 27.3%), gastroduodenal ulcer with perforation (2, 6.1%), acute calculus cholecystitis(2, 6.1%), acute acalculus cholecystitis(3, 9.1%), hepatic dysfunction (4, 12.1%), and ischemia bowel diseases(2, 6.1%). Most of the abdominal complications occurred late in the postoperative period ranging from 2 to 21 days(mean 11.8 days postoperative) (Dong et al., 2012)

2.4.1.6 Wound Infection:

Although the incidence of sternal wound infections has decreased to 1% to 4% of all cardiac surgery procedures, they continue to be associated with increased morbidity and mortality, and decreased long-term life expectancy. Sternal wound infections are now publicly reported, and the US Center for Medicare and Medicaid services will no longer reimburse hospital costs incurred in the treatment of deep sternal wound infections (DSWI) following coronary artery bypass graft (CABG) surgery, Despite the significant clinical and economic consequences of sternal wound infections, there are currently no specific guidelines in cardiac surgery for the prevention and treatment of sternal wound infections. (Lazar et al., 2016)

2.5 Previous Studies Related to Open Heart Surgeries Complications:

(Abbas & Jasim, 2019)"Assessment of Nurses Knowledge toward Prevention of Complications Related to Valvular Replacement Surgery at Surgical Department in Nasiriyah Heart Center" was the title of a study conducted in Iraq. The study's goal is to analyses nurses' knowledge on how to prevent valve replacement surgery problems, as well as the link between nursing knowledge and demographic and occupational variables. The nurses in the study were mostly between the ages of 20 and 29, and the results showed that the nurses have moderate knowledge regarding preventing complications from valve replacement surgery on a significant level across all scale items (educational level, age, experience years, gender, in the Surgical Ward, and training lectures). According to the findings, the majority of nurses lacked considerable surgical expertise and did not receive adequate training. According to the study, nurses should be taught how to avoid complications after heart valve replacement surgery through educational seminars and continuing education lectures.

(Altohamy & Musa, 2018) "Nurses awareness of acute renal injury in patient following cardiac surgery at Alshaab teaching hospital" according to a study conducted in Sudan. Acute kidney injury (AKI) after cardiac surgeries is linked to an elevate risk of morbidity and mortality, as well as longer period hospital stays and higher health-care expenses. This study was undertaken at Alshaab Teaching Hospital to assess nurses' knowledge of acute kidney injury following heart surgery. It was a descriptive, cross-section, hospital-based study with a size of sample is 30 nurses from Alshaab Teaching Hospital's open-heart surgery unit (OHS). To assess nurses'

knowledge, data was gathered using a self-structured for questionnaire and analyzed using SPSS in the form of frequency and percentages. Tables are used to present the information. We used mean and standard deviation for group comparisons with a p value of 0.005. They had a poor understanding of AKI following cardiac surgery, including signs and symptoms (31.1percent), risk factors (42.23percent), diagnostic criteria (41.1percent), and AKI consequences (41.1percent). (48.9 percent). They also had a limited understanding of AKI patient care (48.9 percent). 76.7 percent of the population They knew everything there was to know about the causes of AKI following heart surgery (100 percent).

(Mohammad Ali Fadil Al-fatlawi & Abbas Ahmed, 2016) conducted a study in Iraq titled as "Assessment of Nurses' Knowledge Concerning Discharge Planning for Patients' with Open Heart Surgery in Cardiac Centre at Baghdad City" The goal of this study is to investigate nurse discharge planning knowledge and the relationship between nursing knowledge and socio-demographic variables including sex, age, educational qualification, marital state, experience years, in addition to training course. Nurses' knowledge of discharge planning for open-heart surgery patients was found to be deficient in numerous categories, with domain three (Nurses' Knowledge of Patients Follow-up) showing the biggest gap. At Ibn-Al-Bitare Hospital, there was a significant relationship at nurses' knowledge with married status, while at Iraqi Center for Cardiac Surgery, there was a strong correlation between nurses' expertise and their age group. Through educational and training initiatives, elevate and get better nurses' awareness of emptying planning for clients who have had open heart surgeries (regular lectures for nursing staff). In order to empower patients' care, nurses'

expertise must be improved. You can raise these nurses' understanding of discharge planning by producing and giving brochures to them. Also, do similar research with a larger sample size in other Iraqi governorates.

(Hussein & Rada, 2016) conducted a study in Iraq titled as " Effectiveness of an Educational Program on Nurses Knowledge Concerning Prevent of Post-Thoracic Surgery Complications at AL-Najaf Teaching Hospitals" To examine nurses' knowledge of prevention of thoracic surgery complications in thoracic surgery units and wards, as well as the efficiency of an educational program focused on the Intensive Care Units and ward nurses' understanding of thoracic surgery complications prevention, as well as socio-demographic data. A study is descriptive and was undertaken since October 4th, at 2016 for August 1st, at 2017. The sample is non-probability for 50 nurses was recruited. As a research tool, a questionnaire was used. Frequency distributions, percentages, MS, and inferential of statistical analysis were used to examine the data. The findings of the study show that educational programs can help nurses improve their knowledge on how to prevent post-thoracic surgery complications. The participants of bulk study were women. The study's participants were mostly ranging the ages of 21 and 25. There were extremely substantial differences between the study group's two periods (before and after testing) in all domains of the questionnaire.

(Santos et al., 2016) conducted a study in Brazil titled as Nurses in post-operative heart surgery: professional competencies and organization strategies, The goal for this study was to look at nurses' abilities in post-cardiac surgeries and the techniques they used to mobilize such abilities. This study was a qualitative exploratory study with a methodological design based on a collective case study. This research carried out by 18 nurses in three

post-operative department for heart surgeries. Data was gathered through direct observation and semi-structured interviews. Thematic analysis was used to compile the data. Among the nine competencies discovered were theoretical-practical knowledge and high-complexity nursing care and nursing supervision, nursing leadership in addition to decision-making addendum to conflict resolution also personnel management, material and financial resource management, and on-the-job continuing education. To establish and increase competencies, organizational and individual tactics were used, such as frequent course and lecture offerings, as well as individual pursuits of knowledge and growth. The findings are in prospect to motivate future of nurses and centers of training to assess the need for more cardiac unit training, as well as the necessity to design programs focused at improving the capabilities of these professionals.

(JOSEPHINA & J. SATHYA, SHENBEGA, 2013) conducted a study in India titled as "Effectiveness of Planned Teaching Program on Knowledge Regarding Post-Operative Management of Patients with CABG Among Staff Nurses Working in Post-Operative Cardiac Units of Selected Hospitals at Mangalore" The goal of this research was to see how much knowledge staff of nurses have about post-surgeries care for CABG clients. The other aim for this study was to see if there was a link between staff nurses' knowledge of CABG patient post-operative care and the leverage of a planned program teaching on staff of nurses' knowledge of CABG patient after surgeries treatment in Post-Operative Cardiac Units. throughout the research study's final month, with their chosen demographic factors, like age, sex, qualification of education, years to experience for nurses in Post- Cardiac Surgeries Units, participation in any particular CABG post-operative

management training program, and availability of any extra CABG ofter surgery management information. The majority of the staff nurses, according to the study, had insufficient expertise of CABG patients' post-operative treatment. Staff nurses' knowledge of post-operative management of CABG patients improved significantly after receiving PTP; consequently, the Planned Teaching Program may be concluded to be an effective teaching technique for improving staff nurses' knowledge of post-operative management of CABG patients.

(Golubović et al., 2012) this study was conducted in Serbia titled as Postoperative nonlethal complications following open heart surgery, the goal was to see if there was a link between the level of projected surgical risk and postoperative nonlethal complications. The results demonstrate a strong link between the Euro SCORE model's predicted level of operating risk and the frequency of postoperative nonlethal complications. In terms of the frequency of heart rhythm problems, pulmonary and neurological complications, and predicted surgical mortality, there is a statistically significant difference.

Chapter Three

Methodology

This chapter, the researcher sheds light on the method of conducting the study which consists of the following: Study design, study setting, study sample, administrative and ethical arrangements, instrument construction (questionnaire) of the study, also perform the pilot study, content validity, reliability, collection of data and analysis of data.

3.1. Design of Study:

A qualitative descriptive study design which applied to nurse's staff of Nasiriyah Heart Center at Thiqar Province in Nasiriyah District to assess nurses` knowledge about post open heart surgeries complications.

3.2. Study Setting:

The study was made in Thiqar Province on Nasiriyah District at Nasiriyah Heart Center on nurses` of Intensive Care Unit and Surgical Department.

3.3. Sample of the Study:

A convenience sample technique of (82) nurses in Nasiriyah Heart Center, which was (30) from the Surgical Department and (52) from the Intensive Care Unit.

3.3.1 Inclusion Criteria

The nurses who agree to participate in the study were selected related to the following criteria:

1- Working at intensive care unit & surgical department.
2- Presenting during the period of data collection.

4- Involving in direct contact with patients who admitted to the intensive care unit & surgical department.

3.3.2 Exclusion Criteria

Nurses who participate in the pilot study.

3.4. Administrative and Ethical Arrangements:

A series of arrangements have been done to obtain official permission and facilities from the following:

a. An ethical approval was obtained from the Ethical Research Committee at the Faculty of Nursing / University of Babylon (Appendix A1)

b. A permission have been gained from the Ministry of Health / Nasiriyah Heart Center in Thiqar Governorate when the research protocol has been approved (Appendix A2-A3).

c. Finally, a voluntary verbal agreement was gained from the participants after explaining the purpose of the study in order to participate in the study.

3.5. Creation of Study Instrument:

The questionnaire was advanced and created after a strict review of literature and regarding studies to use for the study purpose, to assess knowledge of nurses` about early and late post open heart surgeries complications, which included the following parts:

First Part:

This part included sociodemographic characteristics of the nurses which involve items of age, gender, qualification, marital Status.

Second Part:

The second part is concerned with employment status of the nurses which involve items of years of services in nursing, Years of Services in Cardiac Intensive Care Unit, Years of Services in Surgical Department, and ask the nurses about participated in courses related to complications after open heart surgeries, read to learn and develop yourself about knowledge in work field.

Third Part:

The third part is concerned with nurse's knowledge about post open heart surgeries complications (52) items and divided into (6) sections (Appendix- C2) which includes:

a. statements about cardio vascular complications: Which composed of (20) items.

b. Statements about pulmonary complications: Which composed of (17) items.

c. Statements about gastrointestinal complications: Which composed of (3) items.

d. Statements about neurological complications: Which composed of (5) items.

e. Statements about wound infection: Which composed of (3) items.

f. Statements about renal complications: Which composed of (4) items.

3.6. Content Validity:

Validity refers to the ability of the instruments to gather the data intended to be gathered. The questionnaire was sent to (15) experts (Appendix- B) in various fields and universities to evaluate the contents of the questionnaire. They were from University of Babylon / Faculty of Nursing (10) Expert, from the University of Babylon / Faculty of Nursing (4) expert, from the University of Kufa / Faculty of Nursing (2) expert, from the University of Kerbala / Faculty of Nursing (1) expert, also (1) expert from the Ministry of Health-Al Nasiriyah Heart Center. The experts were asked to revise the form and review the content to make sure of its clarity and adequacy where they were provided with copies of the study instrument. Most agreed that the questionnaire was clear, adequate and relevant. Based on expert recommendations and suggestions, some modifications were made to the questionnaire.

3.7. Pilot Study:

A pilot study was conducted at Nasiriyah Heart Center, among (10) Nurses who were selected randomly (5) from Intensive Care Unit and (5) from Surgical department which represents (10%) of the total number of study sample. Which are stated from the period 1st April 2022 to 2nd April 2022. The sample of the pilot study was excluded from the total study sample.

3.8.1. The Purposes of the Pilot Study are to:

- Reveal the reliability of the participants.

- Check the simplicity and adequacy of the content in the constructed questionnaire.
- Determine the time required after completing each questionnaire form during the interview process.
- Detect that the best solutions are required when you discover the nature problems that may face when conducting the questionnaire (Leon et al., 2011).

3.8.2. The Results of the Pilot Study:

The results of the pilot study discovered the following:

- The time needed for filling the questionnaire was clearly estimated.
- The items of the study instrument were clear and understood.

3.9. Reliability of Questionnaire:

The purpose of using the reliability of the questionnaire is to determine the internal consistency and stability in the variables of study. In this study, the researcher used SPSS program version (26) according to Cronbach's Alpha to determine stability and internal consistency. Where the test showed a high level of the stability and internal consistency in the main study domain (cardio vascular complications, pulmonary complications, gastrointestinal complications, neurological complications, wound infection, renal complications). The acceptable reliability coefficient is more than (0.70) where the normal range is (0 - 1), as shown in Table (3.1).

Table (3.1) Reliability of Questionnaire

Reliability Coefficients	Gained value	Accepted value	N of Items	Assessment
Cronbach's Alpha	0.795	0.70	52	Pass

The table shows the statistical result when using SPSS program version (26) by using the alpha-Cronbach method to find out the reliability of the study. The result showed a high level of stability and internal consistency of the main study domain.

3.10. Data Collection:

After the questionnaire was constructed, the related data which collected from nurses who willing to involve in this study to evaluate the knowledge of nurses about complication after open cardiac surgeries by self-report method, each nurse need about (10-30) minutes to completely fill the questionnaire items, the data was collected by distributing the Arabic version of the questionnaire (Appendix- C2). The process of data collection has begun from 5th April 2022 to 10th May 2022

3.11. Rating and Scoring:

The statements of questions about knowledge had Correct and Incorrect responses according to the ideal answers for each question have been rated and score according to the 2 points of Likert Scale, which include score (1) for Incorrect answer and score (2) for Correct answer.

3.12. Data Management and Statistical Analysis:

The questionnaire of the (82) nurses enrolled in this study were verification for errors or missed data then numbered and transmutation into a computerized database; the (SPSS v.26) statistical package for social sciences used for this purpose and the next statistical process and analysis were used:

3.12.1. Descriptive Statistics Analysis:

Summarization and presentation of descriptive statistics and characteristics of the studied group presented as a mean, standard deviation and range for continuous variable when are applicable. Frequencies and proportions (%) are used for the presentation of categorical variables, the following equations are used to calculate the aforementioned statistics:

a. Mean =

$$\text{Mean } (\bar{X}) = \frac{\sum X}{n}$$

b. Percentage = $\% = \frac{\sum f}{n} \times 100\%$

c. Standard deviation (SD): $S = \sqrt{\frac{\sum (X - \bar{X})^2}{n-1}}$

S = standard deviation.

X = a numerical value in the data collection.

$\bar{X}$ = mean for every value in the data set.

n = sample size (number of participants).

3.12.2. Inferential Statistical Analysis:

Chi square ($\chi 2$) test is used to assess the relationship between overall knowledge about post open heart surgeries complications from one side and categorical variables from the other side. Where:

O = observed value, E= expected value

- P.value ≤ 0.05 consider as statically significant.
- P.value > 0.05 not significant statically.
- P.value < 0.01 high significant.
- P.value < 0.001 very high significant.

3.13. Calculation of Knowledge Scores of the Nurses:

Knowledge scores were calculated according to the responses of the nurses about the items of knowledge domains, the responses scored (1) for incorrect answer, (2) correct answer. The mean score calculated for each nurse as the summation of all answers for each domain divided by the number of items at that domain, and for the overall knowledge, as the summation of scores for all items divided by the total number of items.

Cutoff point is calculated by dividing the number (1) that represents numbers of interval between two categories in the questionnaire (Correct Choice, Incorrect Choice) on the numbers of categories (2) = 1.5 the assessment knowledge of nurses was made against specified cutoff points then the nurses are considered to have:

- **Poor knowledge:** when his/her score is (1 - 1.50).
- **Good knowledge:** when the mean score is (1.51 - 2).

Chapter Four

Results of the Study

The results of statistically analysis of the study data are presented in this chapter and arranged systematically by tables as follows:

Table (4.1): Sociodemographic characteristics of nurses (N = 82)

Variables		No.	%
Age (year)	≤ 25	33	40.2%
	26-30	34	41.5%
	31-35	8	9.8%
	36-40	7	8.5%
Gender	Male	46	56.1%
	Female	36	43.9%
Level of Education	High school	5	6.1%
	Diploma	42	51.2%
	Bachelor	34	41.5%
	Master	1	1.2%
Marital Status	Married	24	29.3%
	Single	56	68.3%
	Divorced	2	2.4%
Years of Employed in Nursing	≤ 5	66	80.5%
	6-10	11	13.4%
	11-15	3	3.7%
	16-20	2	2.4%
Years of Employed in ICU	1-2	27	51.9%
	3-4	14	26.9%
	5-6	9	17.3%
	7-8	2	3.8%

Years of Employed in Surgical Department	1-2	22	42.3%
	3-4	7	13.5%
	5-6	1	1.9%
Courses participation about post open heart surgeries complications	Yes	39	47.6%
	No	43	52.4%
Read about post open heart surgeries complications	Yes	45	54.9%
	No	37	45.1%
Place of Work	ICU	52	63.4
	Surgical unit	30	36.6

The aforementioned characteristics of the studied group are summarized in this table (Table 4.1), in which there were (82) nurses enrolled in this study, their ages were between (23 – 48) years. (46) Males and (36) females.

Regarding the nurse's level of education (51.2%) was diploma level of education in nursing science. And was (41.5%) with bachelor degree in nursing science, Also one nurse with master degree and (6.1%) with a high school qualification.

For the marital status of nurses (68.3%) married and (29.3%) single. And (80.5%) of the nurses was ≤ 5 years of employed in nursing, (13.4%) was between 6 and 10 years, (3.7%) was ranged 11 to 15 years, (4.2%) within rang 16 to 20 years.

As for the years of service in the intensive care unit, (51.9%) of the nurses had a service ranging from 1-2 years and (26.9%) had a service of 3-4 years and (17.3%) have 5-6 years of employed, (3.8%) with 7-8 years out of 52 nurses from the ICU.

While the nurse's staff in the Surgical Dpartment, (42.3%) of them had years of service of 1-2 years, and (13.5%) of them had years of service of 3-4, and (1.9%) of nurses have 5-6 years of employed out of 30 nurses working in the Surgical Department.

As for participating in training courses on complications after open heart surgeries, it was (47.6%) of the nurses who work in the Surgical Department and intensive care unit have participated and the rest did not. And (54.9%) of them were interested in learning and reading about post open heart surgeries complications.

Table (4.2): Nurses Knowledge about Cardiovascular Complications

Statement About Cardiovascular Complications Domain	Correct		Incorrect		Std. Deviation	Mean score	Assessment
	N	%	N	%			
1.When educating a patient about the causes of a myocardial infarction after open heart surgery. Which statement by the patient indicates they misunderstood your teaching and requires you to re-educate them?	18	22.0	64	78.0	0.41	1.22	Poor
2.Note in the patient's chart that the patient recently had a myocardial infarction due to a blockage in the left coronary artery after open heart surgery. You know that which of the following is true about this type of blockage?	38	46.3	44	53.7	0.50	1.46	Poor
3.A patient is 36 hours status posts a myocardial infarction after open heart surgery. The patient is starting to complain of chest pain when they lay flat or cough. Note on auscultation of the heart a grating, harsh sound. What complication is this patient mostly likely suffering from?	26	31.7	56	68.3	0.46	1.32	Poor

4.The most common causes of cardiac tamponade after open heart surgery are the following except:	14	17.1	68	82.9	0.37	1.17	Poor
5.All of the following are true about cardiac tamponade after open heart surgery except?	24	29.3	58	70.7	0.45	1.29	Poor
6.Causes of Cardiac tamponade after open heart surgery is the following except:	23	28.0	59	72.0	0.45	1.28	Poor
7.All of the following may be seen in patients of cardiac tamponade after open heart surgery except:	23	28.0	59	72.0	0.45	1.28	Poor
8.Changes in what lab value is indicative of renal failure in clients with decreased cardiac output after open heart surgery?	26	31.7	56	68.3	0.46	1.32	Poor
9.Cardiac output after open heart surgery is very important for determining if a patient is in cardiogenic shock. What is a normal cardiac output in an adult?	17	20.7	65	79.3	0.40	1.21	Poor
10.Which patient below is at MOST risk for developing cardiogenic shock after open heart surgery?	24	29.3	58	70.7	0.45	1.29	Poor
11.They physician orders a Dobutamine IV drip on a patient in cardiogenic shock post open heart surgery. After starting the IV drip, the nurse would make it priority to monitor for?	28	34.1	54	65.9	0.47	1.34	Poor
12.A patient has a blood pressure of 220/140 after open heart surgery. The physician prescribes a vasodilator. This medication will?	30	36.6	52	63.4	0.48	1.37	Poor
13.A client with rapid rate atrial fibrillation after open heart surgery asks a nurse why the physician is going to perform carotid massage. The nurse responds that this procedure may stimulate the:	33	40.2	49	59.8	0.49	1.40	Poor
14.A nurse is caring for a client with unstable ventricular tachycardia after open heart surgery. The nurse instructs the client to do which of the following, if prescribed, during an episode of ventricular tachycardia?	29	35.4	53	64.6	0.48	1.35	Poor

15.A client has developed atrial fibrillation after open heart surgery, which a ventricular rate of 150 beats per minute. A nurse assesses the client for:	28	34.1	54	65.9	0.47	1.34	Poor
16.What is myocardial ischemia?	28	34.1	54	65.9	0.47	1.34	Poor
17.A patient is receiving anticoagulant therapy after open heart surgery. The nurse should be alert to potential signs and symptoms of external or internal bleeding, as evidenced by which of the following?	27	32.9	55	67.1	0.47	1.33	Poor
18.This is one of the symptoms of Coronary artery disease after open heart surgery:	43	52.4	39	47.6	0.50	1.52	Good
19.The modifiable risk factor associated with coronary artery disease after open heart surgery is:	40	48.8	42	51.2	0.50	1.49	Poor
20.Coronary angioplasty, part of coronary artery disease's treatment involves:	38	46.3	44	53.7	0.50	1.46	Poor
Overall for Domain	1.3396						Poor
Std. deviation	0.13850						

This table (Table 4.2) shows the responses of the nurses on the multiple-choice questions about cardiovascular complications after open heart surgery, higher proportions of the nurses gave the incorrect response about cardiovascular complications after open heart surgery, except for item No. 18, which concerns the coronary artery disease symptoms of after the open-heart surgery, where it was a good evaluation in answering this item. However, the overall knowledge score for this domain was 1.3396 out of 2 and assessed as poor.

Table (4.3): Nurses Knowledge about Pulmonary Complications

Statement About Pulmonary Complications Domain	Correct		Incorrect		Std. Deviation	Mean score	Assessment
	N	%	N	%			
1.What is the presence of air and fluid in the pleural cavity after open heart surgery?	34	41.5	48	58.5	0.49	1.41	Poor
2.What do the physical findings of pleural effusion after open heart surgery vary with?	30	36.6	52	63.4	0.48	1.37	Poor
3.What is an effusion seen in association with pneumonia after open heart surgery?	20	24.4	62	75.6	0.43	1.24	Poor
4.A patient has a chest tube for treatment of a pneumothorax in the left lung after open heart surgery. Which finding during your assessment requires immediate nursing intervention?	33	40.2	49	59.8	0.49	1.40	Poor
5.A patient is admitted with a chest wound after open heart surgery and experiencing extreme dyspnea, tachycardia, and hypoxia. The chest wound is located on the left mid-axillary area of the chest. On assessment, note there is unequal rise and fall of the chest with absent breath sounds on the left side. also note a "sucking" sound when the patient inhales and exhales. The patient's chest x-ray shows a pneumothorax. What type of pneumothorax is this known as?	43	52.4	39	47.6	0.50	1.52	Good
6.Which of the following is a LATE sign of the development of a tension pneumothorax after open heart surgery?	31	37.8	51	62.2	0.48	1.38	Poor
7.The critical care nurse and the other members of the care team are assessing the patient after open heart surgery to see if he is ready to be weaned from the ventilator. What are the most important predictors of successful weaning that the nurse should identify?	33	40.2	49	59.8	0.49	1.40	Poor
8.A 68-yr-old male patient diagnosed with sepsis is orally intubated on mechanical ventilation after open heart surgery. Which nursing action is most important?	33	40.2	49	59.8	0.49	1.40	Poor
9.A patient is presenting with mild symptoms of pneumonia after open heart surgery. The doctor diagnoses the patient with "walking pneumonia") non-medical term for a mild case of pneumonia. (. From your nursing knowledge, you know this type of pneumonia is caused by what type of infectious agent?	13	15.9	69	84.1	0.36	1.16	Poor
10.Diaphragmatic dysfunction after cardiac surgery result from damage in:	31	37.8	51	62.2	0.48	1.38	Poor
11.When teaching a class on critical care concepts after open heart surgery to a group of new nurses. During discussing the topic of acute respiratory distress syndrome (ARDS). At the beginning of the lecture, to assess the new nurses	17	20.7	65	79.3	0.40	1.21	Poor

understanding about this condition. Which statement by a new nurse demonstrates he understands the condition?							
12.Which patient below is at MOST risk for developing ARDS after open heart surgery and has the worst prognosis?	24	29.3	58	70.7	0.45	1.29	Poor
13.Which of the following is the most common cause of atelectasis after open heart surgery?	23	28.0	59	72.0	0.45	1.28	Poor
14.Atelectasis after open heart surgery is often asymptomatic, and signs are often absent. Atelectasis should be suspected and imaging studies ordered in patients who have unexplained respiratory symptoms and who have risk factors for the condition. Of these imaging studies, which of the following is the most appropriate initial step in diagnosing atelectasis?	22	26.8	60	73.2	0.44	1.27	Poor
15.Evidence for the efficacy of most treatments for atelectasis after open heart surgery is weak or absent. However, common treatments include chest physiotherapy, directed cough, breathing exercises, and which of the following?	19	23.2	63	76.8	0.42	1.23	Poor
16.A client has a pulmonary embolism after open heart surgery and is started on oxygen. The student nurse asks why the clients oxygen saturation has not significantly improved. What response by the nurse is best?	27	32.9	55	67.1	0.47	1.33	Poor
17.An intubated client's oxygen saturation has dropped to 88% after open heart surgery. What action by the nurse takes priority?	27	32.9	55	67.1	0.47	1.33	Poor
Overall for Domain	1.3300						Poor
Std. deviation	0.13419						

In this table (Table 4.3) 17 items of this domain about pulmonary complications, the majority of the nurses had incorrect responses for the multiple-choice questions and assessed as poor for each item. The mean overall score for this domain was (1.33) giving generally poor knowledge about pulmonary complications.

Table (4.4): Knowledge of the nurses about Gastrointestinal Complications Domain

Statement about gastrointestinal complications domain	Correct		Incorrect		Std. Deviation	Mean score	Assessment
	N	%	N	%			
1.The older adult patient presents with severe vomiting for 3 days after open heart surgery. Which of the following is the major complication of continuous vomiting?	19	23.2	63	76.8	0.42	1.23	Poor
2.A patient with GI bleeding after open heart surgery. Which is a priority nursing action for this patient?	23	28.0	59	72.0	0.45	1.28	Poor
3.A client has diarrhea after open heart surgery. What should the nurse expect when auscultating the abdomen?	33	40.2	49	59.8	0.49	1.40	Poor
Overall for Domain	1.3049						Poor
Std. deviation	0.28304						

(Table 4.4) was generally poor with a mean overall knowledge score of (1.3049) for this domain, however, the higher correct response rate (40.2%) was reported for the statement about nurse expect when auscultating the abdomen during diarrhea after open heart surgery and (28 %) for priority nursing action for patient with GI bleeding after open heart surgery, (23.2%) for major complication of continuous vomiting after open heart surgery, (28%) for item about priority nursing action for patient with GI bleeding after open heart surgery.

Table (4.5): Knowledge of the nurses about Neurological Complications domain

Statement About Neurological Complications Domain	Correct		Incorrect		Std. Deviation	Mean score	Assessment
	N	%	N	%			
1.Which patient below is at most risk for a hemorrhagic stroke after open heart surgery?	34	41.5	48	58.5	0.49	1.41	Poor
2.A nurse is caring for a client with delirium after open heart surgery. Which nursing intervention has the highest priority?	27	32.9	55	67.1	0.47	1.33	Poor
3.A nurse suspects her patient may be suffering from delirium after open heart surgery. What signs does the nurse observe to support this diagnosis?	18	22.0	64	78.0	0.41	1.22	Poor
4.Which statement should indicate to a nurse that an individual is experiencing a delusion after cardiac surgery?	29	35.4	53	64.6	0.48	1.35	Poor
5.The causes of depression after cardiac surgeries is:	35	42.7	47	57.3	0.49	1.43	Poor
Overall for Domain	1.3488						Poor
Std. deviation	0.22402						

The knowledge of nurses in this table (Table 4.5) about neurological complications after open heart surgeries was poor in five items, in this domain giving an overall assessment of poor knowledge about neurological complications. The higher knowledge score was 1.43 where (57.3%) of the nurses incorrectly recognized the causes of depression after cardiac surgeries. The lower score was 1.22 (poor knowledge) about signs does the nurse observe to support the diagnosis of delirium, and the overall mean knowledge score for this domain was (1.3488) and assessed as poor knowledge about neurological complications after open heart surgeries.

Table (4.6): Knowledge of the nurses about Wound Infection domain

Statement About Wound Infection Complications Domain	Correct		Incorrect		Std. Deviation	Mean score	Assessment
	N	%	N	%			
1.Symptoms of Infected Wound after cardiac surgery is the following:	28	34.1	54	65.9	0.47	1.34	Poor
2.Risk Factors of Infected Wound after cardiac surgery is the following:	38	46.3	44	53.7	0.50	1.46	Poor
3.Which of the following is the correct sequential order of the phases of healing?	29	35.4	53	64.6	0.48	1.35	Poor
Overall for Domain	1.3862						Poor
Std. deviation	0.27452						

The mean scores and responses of nurses about the statements of wound infection domain are summarized in this table (Table 4.6). In which the mean score of knowledge about the different statements about wound infection domain ranged between 1.34 (poor) for the Symptoms of Infected Wound after cardiac surgery, to 1.46 (poor) for the phases of wound healing. The overall knowledge score for this domain was 1.3862 and it was within the poor knowledge assessment.

Table (4.7): Knowledge of the nurses about Renal Complications domain

Statement About Renal Complications Domain	Correct		Incorrect		Std. Deviation	Mean score	Assessment
	N	%	N	%			
1.Post open heart surgery patient with acute renal injury has a GFR (glomerular filtration rate) of 40 mL/min. Which signs and symptoms below may this patient present with?	28	34.1	54	65.9	0.47	1.34	Poor
2.The nurse is caring for a client diagnosed with acute kidney injury (AKI) after open heart surgery who is prescribed 50% dextrose IV and 10 units of regular insulin IV bolus. Which type of electrolyte imbalance will these prescribed medications help to correct?	21	25.6	61	74.4	0.43	1.26	Poor
3.The nurse is caring for a 68-yr-old man who had coronary artery bypass surgery 24 hours ago. During the oliguric phase of acute kidney disease, which action would be appropriate to include in the plan of care?	33	40.2	49	59.8	0.49	1.40	Poor
4.A patient after open heart surgery with acute kidney injury (AKI) has an arterial blood pH of 7.30. The nurse will assess the patient for:	37	45.1	45	54.9	0.50	1.45	Poor
Overall for Domain	1.3628						Poor
Std. deviation	0.29437						

The responses of the nurses towards the statements about renal complications domain in this table (Table 4.7) was poor in all the four items of this domain, the higher correct response rate was (45.1%) for the item number 4, the lower rate was (25.6%) for the correct response about the nursing caring for a client diagnosed with acute kidney injury (AKI) after open heart surgery, the knowledge scores in all items were within poor level giving an overall poor knowledge about renal complications with (1.3628) mean score.

Table (4.8): Mean overall knowledge scores of the nurses for different domains about post open heart surgeries complications

Domains	Mean score	Assessment
Cardiovascular Complications	1.3396	Poor
Pulmonary Complications	1.3300	Poor
Gastrointestinal Complications	1.3049	Poor
Neurological Complications	1.3488	Poor
Wound Infection	1.3862	Poor
Renal Complications	1.3628	Poor
Overall knowledge	**1.3398**	**Poor**

This table (Table 4.8) shows the summary of the mean knowledge scores and assessment of nurses knowledge about the different domains of post open heart surgeries complications; as is shown in this table, poor knowledge score was reported for the domain about wound infection with a mean overall knowledge score of (1.3862) followed by domain about renal complications (1.3628), and domain about neurological complications with a mean of (1.3488), and domain about cardiovascular complications with a mean of (1.3396) followed by domain of gastrointestinal complications with main of (1.3049), the knowledge scores in all items were within poor level giving an overall poor knowledge for all domains about post open heart surgeries complications with(1.3398) mean score .

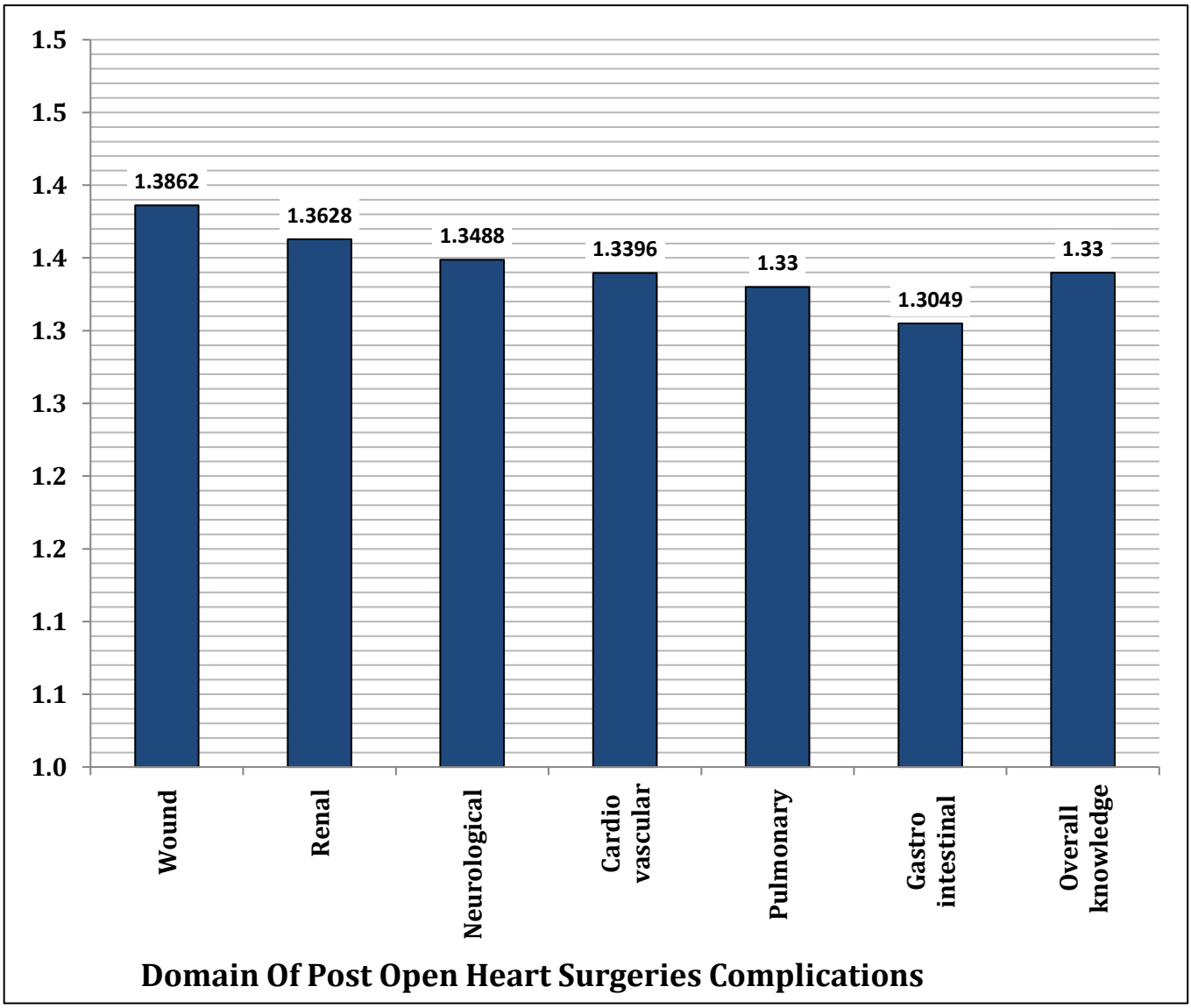

Figure (4.1): Comparison of mean knowledge scores of the nurses about all domains of post open heart surgeries complications arranged in descending sorting

Figure (4.1) revealed the mean overall knowledge of the nurses for all domains about post open heart surgeries complications which was poor with a mean score of (1.33).

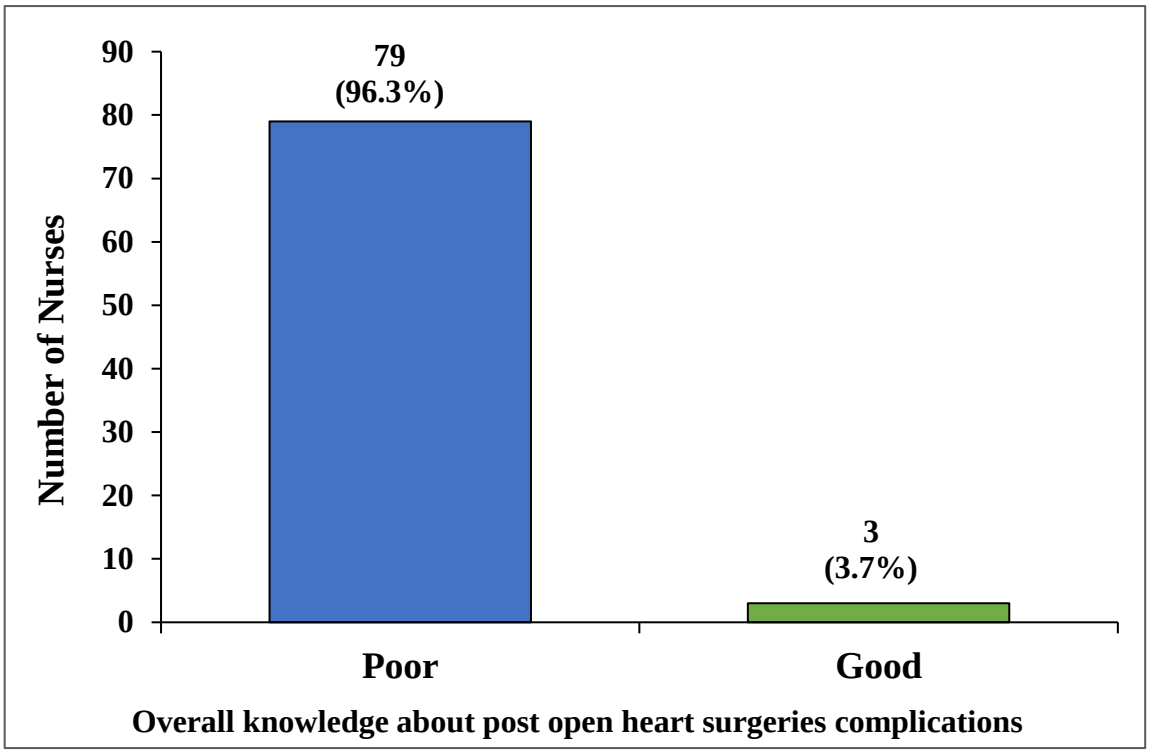

Figure (4.2): Overall knowledge about post open heart surgeries complications for nurses (N = 82)

From other point of view, according to the overall mean scores of knowledge (Figure 4.2) revealed that the distribution of the nurses was 79 (96.3%) having poor knowledge and 3 (3.7%) from the nurses have good knowledge.

Table (4.9): Results of assessment knowledge of the nurses for each domain about post open heart surgeries complications

All domains	Good		Poor	
	No.	%	No.	%
Cardiovascular Complications	9	11.0	73	89.0
Pulmonary Complications	8	9.8	74	90.2
Gastrointestinal Complications	16	19.5	66	80.5
Neurological Complications	19	23.2	63	76.8
Wound Infection	23	28.0	59	72.0
Renal Complications	21	25.6	61	74.4
Overall knowledge	3	3.7	79	96.3

(Table 4.9) and according to knowledge scores revealed that the distribution of nurses was obtained for each domain is further detailed.

Table (4.10): Relationship of overall knowledge about post open heart surgeries complications with age, gender, marital status and level of education of the nurses

Variables		Overall knowledge				Chi square ($\chi 2$)	P. value	Sig
		Good (No=3)		Poor (No=79)				
		No	%	No	%			
Age (year)	≤ 25	2	66.7	31	39.2	3.871	0.276	Non-significant
	26-30	0	0	34	43			
	31-35	1	33.3	7	8.9			
	36-40	0	0	7	8.9			
Gender	Female	2	66.7	34	43	0.655	0.418	Non-significant
	Male	1	33.3	45	57			
Level of education	High school	0	0	5	6.3	0.423	0.936	Non-significant
	Diploma	2	66.7	40	50.6			
	Bachelor	1	33.3	33	41.8			
	Master	0	0	1	1.3			
Marital Status	Married	2	66.7	22	27.8	2.121	0.346	Non-significant
	Single	1	33.3	55	69.6			
	Divorced	0	0	2	2.5			

(Table 4.14) shows a poor overall knowledge of the nurses was insignificantly associated with age, gender and level of education, marital status in all comparisons (p. value > 0.05).

Table (4.11): Relationship of overall knowledge about post open heart surgeries complications with employment status (N = 82)

Variables		Overall knowledge				Chi square ($\chi 2$)	P. value	Sig
		Good (N=3)		Poor (N=79)				
		No.	%	No.	%			
Years of Employed in Nursing	≤ 5	2	66.7	64	81	46.670	0.939	Non-significant
	6-10	1	33.3	10	12.7			
	11-15	0	0	3	3.8			
	16-20	0	0	2	2.5			
Years of Employed in ICU	1-2	2	66.7	25	51.0	47.570	0.611	Non-significant
	3-4	1	33.3	13	26.5			
	5-6	0	0	9	18.4			
	7-8	0	0	2	4.10			
Years of Employed in Surgical Department	1-2	0	0	22	73.3	18.721	0.767	Non-significant
	3-4	0	0	7	23.3			
	5-6	0	0	1	3.3			
Courses participation about post open heart surgeries complications	Yes	1	33.3	38	48.1	30.016	0.092	Non-significant
	No	2	66.7	41	51.9			
Read to learn and develop about post open heart surgeries complications	Yes	1	33.3	44	55.7	15.866	0.777	Non-significant
	No	2	66.7	35	44.3			
Place of Work	ICU	3	100	49	62	**44.696**	**0.002**	**Significant**
	Surgical Unit	0	0	30	38			

(Table 4.11) shows a poor overall knowledge of the nurses about post open heart surgeries complications was high significantly associated with place of work between ICU and Surgical Unit of the nurses (p. value < 0.05).

Chapter Five

Discussion of Study

This study assessed the knowledge of post open heart surgeries complications among (82) nurses at Al- Nasiriyah district in Thiqar Governorate. However, in this chapter there will be a regular discussion of the results of the study and a reasonable interpretation of the results of the study that have emerged with evidence from literature and related studies.

5.1. Sociodemographic Characteristics of Nurses:

Throughout the course analysis of data, the sociodemographic characteristics for the study sample enrolled in this study, their ages were between (23 – 48) years. Male and females were almost equally distributed, in which 56.1% male and 43.9% female of nurses. (Table 4.1). These results almost similar with the results obtained by the study of (Fleih Hassan, 2015) who had studied knowledge of nurses for safety of patient following cardiac catheterization to adult clients, in which (48%) of his study sample were males and (52%) were female, also most of the respondents were between the ages of 20 and >41 years, the percentage distribution of the nurses in their various teaching level were this study had (28%) nursing school, (30%) diploma and (30%) with bachelor degree and (2%) post graduated . As well as, the results of the present study showed that almost three-quarters of the nurses (68.3%) were having single marital status and the remaining (29.3%) were married, (2.4%) divorced (Table 4.1), this finding is somewhat similar by the study of (Jarelnape, 2021) who studied the knowledge of nurses' regarding the discharge plan of patients after cardiac surgery, in which (83%) were single marital status and (15%) were married, (2%) were divorced.

The present study showed that the most of the nurse's experience in nursing in general was ≤5 years with percentage (80.5), (Table 4.1), that indicates that the nurses do not have good enough experience in nursing in general. These results are supported by the study of (Hussein & Rada, 2016) in that they studied the efficiency for education program to knowledge of nurses about prevent of post-thoracic surgery complications, in which their finding indicated that most of the study sample were (80%) <5 years for study group, (92%) for control group.

Concerning years of employedin ICU results of present study indicated that more than half of nurses have ranging (1-2) years of experience represented by (51.9%) and (26.9%) of nurses ranging (3-4) years (Table 4.1). These results concurrent with the study of (Hussein & Rada, 2016) who studied the educational program effectiveness for nurse's knowledge about prevent of post-thoracic surgery complications, where they found that most of nurses were ≤5 by (84%) in group of study and (100%) in group of control. And in (Elateif, 2017) (Hussein & Rada, 2016) who studied the Effect of Training Program Regarding Care of Patients Undergoing Open Heart Surgery on Nurses' Performance Approach where they found that (66.7%) of nurses have ranging (1-2) years of experience, and so that in (Altohamy & Musa, 2018) who studied the state of Nurses knowledge regarding acute kidney injury in patient post cardiac surgery at Alshaab teaching hospital is ranging (1-2) years of employedby (43.3%) and (43.3%) ranging (mounths-1 years) and so that in experience of Surgical Department.

Regarding the courses of participation about post open heart surgeries complications, the present study found that a little less than half of nurses participated in the courses about post open heart surgeries by (47.6%) and (52.4%) did not participate out of the total study sample and (54.9%) were Read about post open heart surgeries complications, (45%) not read (Table 4.1). This result concurrents with the study of (Jarelnape, 2021) study in that they studied the state of knowledge for nurses toward the discharge plan to patients after cardiac surgery. They found that most of their study sample were (63%) as who participated in training course and (38%) did not participate in training course.

5.2. Nurses Knowledge about Post Open Heart Surgeries Complications:

5.2.1. Nurses Knowledge about Cardiovascular Complications Domain:

Higher proportions of the nurses gave the incorrect response, about most common causes of cardiac tamponade after open heart surgery (82.9%) with the mean score 1.17 out of 2. While lower proportion of the nurses gave the incorrect response about the Coronary artery disease symptoms after open heart surgeries (47.6%) with the mean score 1.52. However, the overall knowledge score for the domain of cardiovascular complication was 1.3396 out of 20 items and assessed as poor (Table 4.2).

This weakness can be explained by the fact that the nurses do not have enough experience and are not specialized in this field with the possibility of changing their workplaces every month, dissatisfaction and desire to work and develop the field of work.

There is no previous study that touched on measuring the level of knowledge about Cardiovascular Complication after open heart surgery for nurses.

5.2.2. Nurses Knowledge about Pulmonary Complications Domain:

Most of the nurses in this domain had incorrectly responded about Pulmonary Complications for symptoms of pneumonia after open heart surgery and infectious agent (84.1%) with the mean of score 1.16. But only (47.6%) had incorrectly recognized about type of pneumothorax after open heart surgery with mean score 1.52. where the mean overall score for this domain was (1.33) giving generally poor knowledge about Pulmonary Complications after open heart surgery (Table 4.3).

This weakness can be explained by the fact that the nurses do not have enough experience and are not specialized in this field with the possibility of changing their workplaces every month, dissatisfaction and desire to work and develop the field of work, poor training and development, and the absence of specialized nursing staff in the field of intensive care and open-heart surgeries.

5.2.3. Knowledge of the Nurses about Gastrointestinal Complications Domain:

Higher incorrect response appears in this domain which was reported for the statement about complication of continuous vomiting after open heart surgery which was (76.8%) with mean score 1.23. While lower proportions of nurses (59.8%) incorrectly responded about statement auscultating the abdomen for diarrhea after open heart surgery with mean score 1.4. However overall knowledge for this domain was generally poor with mean score

1.3049 (Table 4.4). There was no previous study that concerned nurses' knowledge about Gastrointestinal Complications after open heart surgery and this level of knowledge in this domain may be due to the same courses of knowledge weakness in past domains

5.2.4. Knowledge of the Nurses about Neurological Complications Domain:

Larger part of the nurses in this domain (78%) incorrectly recognized the signs of delirium for patient after open heart surgery, with the mean score was (1.22). But the higher score was 1.43 (poor knowledge) about causes of depression after cardiac surgeries. That gives an overall assessment for this domain which was a poor knowledge about Neurological Complications with mean score 1.3488 (Table 4.5).

5.2.5. Knowledge of the Nurses about Wound Infection Domain:

The overall knowledge score for this domain was 1.3862 and it was within the poor knowledge assessment. In which higher proportion of nurses (65.9%) was incorrectly responded about symptoms of infected wound after cardiac surgery, with the mean score 1.34 (poor assessment). While the statement for risk factors of infected wound after cardiac surgery gains the higher mean score 1.46 (poor assessment) (Table 4.6).

there was no any study that concerned knowledge for nurses about wound infection after open heart surgeries and this level of knowledge in this field may be due to the lack of a sufficient role for the nursing staff to follow up on the surgical wound, and this role was limited to doctors.

5.2.6. Knowledge of the Nurses about Renal Complications Domain:

The responses of the nurses towards the statements in this domain was poor assessment in all the four items about renal complications related to late complications, with overall mean score 1.3628. in which higher incorrect response rate was (74.4%) about electrolyte imbalance for patient with acute kidney injury after open heart surgery and the lower rate of incorrect response was (54.9%) for statement about patient assessment after open heart surgery with acute kidney injury (Table 4.7).

5.3. Overall Knowledge of The Nurses for Different Domains about Post Open Heart Surgeries Complications:

Based on the statistical cut off point, the results reveal that all the domains of post open heart surgeries complications of nurses had poor assessment for the knowledge, the lower overall knowledge score was 1.3049 for gastrointestinal complications and the domains about wound infection have the higher mean score 1.3862 (poor) (Table 4.8).

5.4. Overall Knowledge about Post Open Heart Surgeries Complications for Nurses:

The Nurses' distribution consequently to their overall mean of knowledge scores, revealed that (96.3%) had poor knowledge and (3.7%) had good knowledge (Figure 4.2), (Table 4.9).

There is no research within the previous studies that evaluates nurses' knowledge about postoperative complications of open heart surgery, but there is only one research that assessed nurses' knowledge about acute kidney injury after open heart surgery(Altohamy & Musa, 2018), and its results were

similar to the domain of renal complications, where the level of knowledge was poor and in the Iraqi study on knowledge of nurses regarding valvular replacement surgery complications prevention in heart center of Nasiriyah at surgical department, (71.4%) of nurses had a poor level for knowledge, while (28.6%) had a good knowledge level (Nurse, 2019).

There is more than one explanation for the reason of the nurses' poor knowledge of post open-heart surgery complications. It may be the result of a lack of university education during the study, or the nurses' lack of interest in knowledge, research and development of their capabilities, or a weakness in training and development within health institutions, and it may be the result of a lack of precice specializations in Nursing and this thing is not approved in Iraq, where nurses are assigned to work in various departments and units in all specialties without prior preparation or training related to work, in addition to the continuous change in the places of work of the nursing staff.

5.5. Relationship of Overall Knowledge about Post Open Heart Surgeries Complications and Demographic Characteristics of the Nurses:

5.5.1. Relationship of Overall Knowledge about Post Open Heart Surgeries Complications with Marital Status, Gender, Age, and Level of education of The Nurses:

The present study showed statistically insignificant association for the overall knowledge with the variables of age, gender, level of education and marital status. These results are supported by a similar Iraqi study on nurses concerning the knowledge about planning of discharging to post open heart surgeries patients (Mohammad Ali Fadil Al-fatlawi & Abbas Ahmed, 2016)

and other Iraqi study titled "Nurses Knowledge About Patient Safety After Cardiac Catheterization for Adult Patients In ibn Al - Biter Specialist Center Cardiac Surgery" (Fleih Hassan, 2015).

And another study that was conducted in Sudan on knowledge for nurses toward the discharge plan to patients after cardiac surgery showed the existence of a relationship between the variable of knowledge with the variable of level of education and the absence of a relationship with the variable of age and gender (Jarelnape, 2021)

A recent Iraqi study on knowledge for nurse's about complications prevention regarding to surgeries of valvular replacement in heart center of Nasiriyah at surgical department revealed a relationship between variable knowledge with gender and qualification (Nurse, 2019)

5.5.2. Relationship of Overall Knowledge about Post Open Heart Surgeries Complications with Employment Status of The Nurses:

The statistical results of univariate analysis (Chi-Secure) showed poor overall knowledge of the nurses was significantly associated with work place variable in ICU nurses and Surgical Department nurses (p. value < 0.05), (Table 4.10). that may be due to attributed by nurses working in the intensive care unit are close to patients during and after surgery, and the possibility of following up and seeing the surgery directly from inside the surgery room, as well as direct follow-up of patients throughout their stay in the intensive care unit and monitoring all changes and signs on the patient directly.

The results also showed the absence of relationship between the variable of knowledge with years of employedin nursing and employedin the intensive care unit and the surgical department, This result of present study is supported by similar study conducted in the Iraq, by (Abbas & Jasim, 2019)for "knowledge of nurses regarding prevention of complications related to valvular replacement surgery" and other study conducted in Iraq (Fleih Hassan, 2015) to assess the nurses knowledge in specialist center for surgeries of the heart (ibn al – biter) toward safety of clients after cardiac catheterization to adult clients. As well as another Iraqi study to "assessment of knowledge for nurses' about discharge planning in cardiac center at Baghdad city to patients' with open heart surgery" (Mohammad Ali Fadil Al-fatlawi & Abbas Ahmed, 2016)

As well as the absence of a relationship with the variable of participation in training courses, reading and learning about complications after open heart surgery, this result of present study is supported by similar studies conducted in the Iraq, by (Abbas & Jasim, 2019)and (Fleih Hassan, 2015),(Mohammad Ali Fadil Al-fatlawi & Abbas Ahmed, 2016) and other study conducted in Sudan for assessment of knowledge for nurses toward patient safety post cardiac catheterization for adult patients (Fleih Hassan, 2015).

Chapter Six

Conclusions & Recommendations

The main results and conclusions of the present study are found in this chapter, as well as the higher important recommendations that should be taken into consideration.

6.1. Conclusions:

In the light of the study findings and its discussion, as well as the interpretation of the results, the current study has concluded that:

6.1.a. the overall knowledge of the nurses about post open heart surgeries complications in Nasiriyah Heart Center was poor.

6.1.b. All the domains of nurse's knowledge toward post open heart surgeries complications had poor knowledge.

6.1.c. Higher knowledge score was reported for the domain about wound infection, while lower knowledge score was reported for the domain of gastrointestinal complications.

6.1.d. Age, gender, level of education, marital status of the nurses does not influence the knowledge of nurses about post open heart surgeries complications.

6.1.e. Years of employed in nursing, years of services in ICU, years of services in Surgical Department, reading and training courses participation of the nurses does not influence the knowledge of nurses about post open heart surgeries complications.

6.1.f. Place of work (ICU nurses, Surgical Department nurses) for nurses was influencing the knowledge of nurses about post open heart surgeries complications.

6.2. Recommendations:

The present study recommends the following based on its conclusions:

6.2.a. Managers of specialized centers for cardiac surgery can use the findings of this study, identify the strengths and weaknesses of nurse's knowledge about post open heart surgeries complications and adopt the necessary measures in enhancing quality of nurse's knowledge.

6.2.b. Sustain an educational activity for all nurses about the importance of post open heart surgeries complications are needed through holding specialized training courses to increase the knowledge of nurses for all domains.

6.2.c. Replication of the study on larger probability sample must be considered to allow greater generalization of the results.

6.2.d. More emphasis needs to be put on the importance of open-heart surgeries and its complications knowledge especially in the nursing curriculum.

6.2.e. Distributing prepared educational materials about post open heart surgeries complications to the nurses and their leaders.

6.2.f. Establishing a follow up system in ICU and a Surgical Department to detect continuation and effectiveness of open-heart surgery complications knowledge issue among nurses' staff.

6.2.g. Maintaining an educational booklets, pamphlets, and posters that contain all instructions and information about post open heart surgery complications in the ICU and surgical department.

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Appendices

Appendix (A)

Appendix- A1

جـامـعة بـابـل
كـلية التمريـض
لجنة اخلاقيات البحث العلمي

University of Babylon
College of Nursing
Research Ethics Committee

Issue No:
Date: / /2021

Approval Letter

To,
Azhar Talib Hammed

The Research Ethics committee at the **University of Babylon, College of Nursing** has reviewed and discussed your application to conduct the research study entitled **" Nurses Knowledge Toward Post Open Heart Surgeries Complications in Nasiriyah Heart Center**

The Following documents have been reviewed and approved:

1. Research protocol
2. Research instrument/s
3. Participant informed consent

Committee Decision.

The committee approves the study to be conducted in the presented form. The Research Ethics committee expects to be informed about any changes occurring during the study, any revision in the protocol and participant informed consent.

Prof. Dr. Salma K. Jehad
Chair Committee
College of Nursing
Research Ethical Committee
30 / 1 /2022

Appendix- A2

Ministry of Higher Education and Scientific Research
وزارة التعليم العالي والبحث العلمي
University of Babylon
College of Nursing
جامعة بابل
كلية التمريض
لجنة الدراسات العليا

العدد : ٧١١
التاريخ : ٧ / ٢ /٢٠٢٢

Ref. No. :
Date: / /

الى / دائرة صحة ذي قار – مركز الناصرية للقلب
م/ تسهيل مهمة

تحية طيبة :

يطيب لنا حسن التواصل معكم ويرجى تفضلكم بتسهيل مهمة طالب الماجستير (أزهر طالب حميد موسى) لغرض جمع عينة دراسة الماجستير والخاصة بالبحث الموسوم :

معارف الممرضين باتجاه مضاعفات ما بعد عمليات القلب المفتوح في مركز الناصرية للقلب

Nurses Knowledge Toward Post Open Heart Surgeries Complications in Nasiriyah Heart Center

مع الاحترام ...

المرافقات //
- بروتوكول .
- استبانة

ا.م . د. نهاد محمد قاسم الدوري
معاون العميد للشوون العلمية والدراسات العليا
٧ / ٢ / ٢٠٢٢

صورة عنه الى //
- مكتب السيد العميد للتفضل بالاطلاع مع الاحترام
- لجنة الدراسات العليا
- الصادر

E-mail:nursing@uobabylon.edu.iq
STARS
وطني 07711632208
المكتب 009647711632208

Appendix- A3

وزارة الصحة
دائرة صحة ذي قار
مركز التدريب والتنمية البشرية
لجنة البحوث

استمارة رقم ٢٠٢١/٠٣

رقم القرار: ذي قار/٢٠٢٢٠٨٢
تاريخ القرار: ٢٠٢٢/٣/٦

قرار لجنة البحوث

درست لجنة البحوث في دائرة صحة **ذي قار** مشروع البحث ذي الرقم (٢٠٢٢٠٨٢) المعنون:

Nurses knowledge toward post open heart surgeries complication in nasiriyah heart center

والمقدم من الباحثين (م.جامعي / ازهر طالب حميد) الى وحدة إدارة البحوث و التنمية في مركز التدريب والتنمية البشرية في دائرة صحة ذي قار بتاريخ ٢٠٢٢/٣/٦ وقررت:

"الموافقة على تنفيذ مشروع البحث بصيغته المقدمة ولاما نع من تنفيذه في مؤسسات الدائرة."

المرفقات:
لا يوجد

ملاحظات:
- تم تخويل رئيس لجنة البحوث او مقرر اللجنة للتوقيع على هذا القرار استنادا الى النظام الداخلي للجنة البحوث .
- الموافقة تعني ان مشروع البحث قد استوفى المعايير الأخلاقية والعلمية لإجراء بحث والمعتمدة في وزارة الصحة، اما التنفيذ فيعتمد على التزام الباحث بتعليمات المؤسسة الصحية التي سينفذ فيها البحث.

Appendix- A4

وزارة الصحـــــــة/ البينة
دائـــــرة صحـــــــة ذي قـــــــار
قسم التدريب و التنمية البشرية
العدد /
التاريخ ٢٠٢٢/٣/٦

الى / مركز الناصرية للقلب

م/ تسهيل مهمة

تحية طيبة..

بناء على الطلب المقدم من قبل (م. جامعي /ازهر طالب حميد) في ٢٠٢٢/٣/٦ و بناءً على موافقتكم المبدئية على استمارة مشروع البحث المقدمة من الباحث، تم عرض الاستمارة على لجنة البحوث في دائرتنا خلال جلستها الاسبوعية و كان قرار اللجنة :

" الموافقة على التنفيذ مشروع البحث بصيغته المقدمة و لا مانع من تنفيذه في مؤسسات الدائرة "

نرفق لكم ربطاً قرار لجنة البحوث ذي العدد (٢٠٢٢٠٨٢) و لا مانع لدينا من تسهيل مهمته ، على ان لا تتحمل دائرتنا اي تبعات مالية او قانونية و ان يلتزم الباحث بالاعتبارات الاخلاقية اثناء اجراء البحث

للتفضل بالاطلاع مع الاحترام ..

الدكتور
مشعل زوري جبار
مدير قسم التدريب والتنمية البشرية
٢٠٢٢/٣/

نسخة منه الى//

- قسم التدريب والتنمية البشرية/ شعبة ادارة البحوث والمعرفة... مع الاوليات

البريد الالكتروني thiqarhealthtraining@yahoo.com

عبير ٢٠٢٢

Appendix- A5

Ministry of Higher Education and Scientific Research

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

University of Babylon
College of Nursing

جامعة بابل
كلية التمريض

Ref. No. :
Date: / /

العدد :
التاريخ : / /

الى /جامعة بابل / كلية التربية للعلوم الانسانية – قسم اللغة الانكليزية
م/ مقوم لغوي

تحية طيبة :

يرجى التفضل بتحديد عضو هيئة تدريس في كليتكم لغرض تقويم رسالة الماجستير للطالب (**ازهر طالب حميد موسى**) والموسومة ب

معارف الممرضين باتجاه مضاعفات ما بعد عمليات القلب المفتوح في مركز الناصرية للقلب .

Nurses Knowledge Toward Post Open Heart Surgeries Complications in Nasiriyah Heart Center .

مع الاحترام ...

إ.م.د. نهاد محمد قاسم
معاون العميد للشوون العلمية والدراسات العليا
/ ٥/ ٢٠٢٢

نسخة منه الى//
-مكتب السيد العميد... للتفضل بالاطلاع مع الاحترام.
-مكتب السيد معاون العميد للشوون العلمية...للتفضل بالاطلاع مع الاحترام.
- وحدة الدراسات العليا مع الاوليات.
-الصادرة

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STARS

babylon.edu.iq

Appendix- A6

وزارة التعليم العالي والبحث العلمي
جمهورية العراق
Ministry of Higher Education and Scientific Research
جامعة بابل
University of Babylon
كلية التربية للعلوم الانسانية
College of Education for Human Sciences

Ref. No :

العدد : ٤٧١٣
التاريخ : ٢٥ / ٥ / ٢٠١٩

الى/جامعة بابل/كلية التمريض
مكتب السيد معاون العميد للشؤون العلمية المحترم

م/أعادة مرسالة

تحية طيبة :

نعيد إليكم رسالة طالب الدراسات العليا / الماجستير (ازهر طالب حميد موسى) بعد تقويمها لغوياً من قبل (أ.م.د.حسين حميد معيوف) من قسم اللغة الانكليزية في كليتنا، وقد ثبت الملاحظات على متن الرسالة يرجى من الباحث الالتزام بها.

*** مع الاحترام ***

أ.د. اسامة كاظم عمران
معاون العميد للشؤون العلمية
والدراسات العليا

نسخة منه إلى //
- الدراسات العليا .
- الصادرة

//سارة //

البريد الالكتروني bad_edu_humsci@yahoo.com
امنية 07801010633

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Appendix

(B)

Appendix- B

قائمة خبراء تحكيم الاستبيان

ت	اسم الخبير	اللقب العلمي	الشهادة والاختصاص	مكان العمل	سنوات الخدمة
1	د. امين عجيل ياسر	استاذ	دكتوراه تمريض صحة الاسرة والمجتمع	جامعة بابل / كلية التمريض	37
2	د. راجحة عبد الحسن حمزة	أستاذ	دكتوراه تمريض بالغين	جامعة الكوفة / كلية التمريض	37
3	د. حسين هادي عطية	استاذ	دكتوراه تمريض بالغين	جامعة بغداد / كلية التمريض	36
4	د. هدى باقر حسن	أستاذ	دكتوراه تمريض بالغين	جامعة بغداد / كلية التمريض	35
5	د. صباح عباس حسن	استاذ	دكتوراه تمريض بالغين	جامعة بغداد / كلية التمريض	34
6	د. حكيمة شاكر حسن	استاذ	دكتوراه تمريض بالغين	جامعة بغداد / كلية التمريض	32
7	د. سحر أدهم علي	أستاذ	دكتوراه تمريض بالغين	جامعة بابل / كلية التمريض	27
8	د. شذى سعدي محمد	استاذ	دكتوراه تمريض بالغين	جامعة بابل / كلية التمريض	24
9	د. عقيل مندل الخفاجي	طبيب استشاري	دكتوراه جراحة القلب	مركز الناصرية للقلب	22
10	د. تحسين رجب محمد	أستاذ مساعد	دكتوراه تمريض بالغين	جامعة بغداد / كلية التمريض	22
11	د. خالدة محمد خضر	استاذ	دكتوراه تمريض بالغين	جامعة بغداد / كلية التمريض	19
12	د. حسن عبد الله عذبي	أستاذ مساعد	دكتوراه تمريض بالغين	جامعة كربلاء / كلية التمريض	19
13	د. ضياء عبد الكريم عبد علي	أستاذ مساعد	دكتوراه تمريض بالغين	جامعة العميد /كلية التمريض	15
14	د. صادق عبد الحسين حسن	أستاذ مساعد	دكتوراه تمريض بالغين	جامعة بغداد / كلية التمريض	12
15	د. قاسم علي خزعل	أستاذ مساعد	دكتوراه تمريض بالغين	جامعة ذي قار/ كلية التمريض	11

Appendix (C)

Appendix C1

استمارة تقييم معارف الممرضين باتجاه مضاعفات ما بعد عمليات القلب المفتوح في مركز الناصرية للقلب

عزيزي الممرض /عزيزتي الممرضة

تحية طيبة....

الاستمارة التي بين يديك تخص بحث لطالب الدراسات العليا /كلية التمريض في جامعة بابل تحت عنوان

" معارف الممرضين باتجاه مضاعفات ما بعد عمليات القلب المفتوح في مركز الناصرية للقلب "

(Nurses Knowledge toward Post Open Heart Surgeries Complications in AL-Nasiriyah Heart Center)

نرجو منكم التفضل بالإجابة على كل فقراتها شاكرين تعاونكم. علما بان المعلومات ستعامل بسرية وتستعمل لأغراض البحث العلمي فقط ولا داعي لذكر الاسم.

Appendix- C

الاستبانة

رقم الاستمارة:

الجزء الأول: الخصائص الديموغرافية

1. العمر: ☐ سنة

2. الجنس: ذكر☐ انثى☐

3. المؤهل العلمي: اعدادية☐ دبلوم ☐ بكالوريوس ☐ ماجستير ☐ دكتوراه☐

4. الحالة الزوجية: متزوج ☐ أعزب ☐ منفصل/ة☐ أرمل/ة ☐ مطلق/ة ☐

الجزء الثاني: الحالة الوظيفية

1. سنوات الخدمة: ☐ **سنة**

2. سنوات الخدمة في وحدة العناية المركزة: ☐ **سنة**

3. سنوات الخدمة في قسم الجراحة: ☐ **سنة**

4. هل اشتركت بدورات تخص مضاعفات ما بعد عمليات القلب المفتوح؟

نعم ☐ لا ☐

5. هل تقوم بالقراءة للتعلم وتطوير نفسك حول مضاعفات ما بعد عمليات القلب المفتوح؟

نعم ☐ لا ☐

الجزء الثالث: أسئلة الاختيار من متعدد لتقييم معرفة الممرضين تجاه المضاعفات ما بعد عمليات القلب المفتوح

المحور الاول: مضاعفات القلب والأوعية الدموية

1. **عند تعليم المريض حول أسباب احتشاء عضلة القلب بعد عملية القلب المفتوح. ما هي العبارة التي يدلي بها المريض والتي تشير إلى أنه أساء فهم التعليمات ويتطلب إعادة تعليمه؟**
   - **أ.** يمكن أن يحدث تسلخ الشريان التاجي بشكل عفوي ويحدث بشكل أكبر عند النساء.
   - **ب.** السبب الأكثر شيوعا لاحتشاء عضلة القلب هو تشنج الشريان التاجي من تعاطي المخدرات أو ارتفاع ضغط الدم.
   - **ت.** المرضى المصابون بمرض الشريان التاجي معرضون بشدة لخطر الإصابة باحتشاء عضلة القلب.

2. **لوحظ في ملف المريض أن المريض أصيب مؤخرًا باحتشاء عضلة القلب بعد عملية القلب بسبب انسداد في الشريان التاجي الأيسر. أي مما يلي ينطبق على هذا النوع من الانسداد؟**
   - **أ.** انسداد الشريان التاجي الأيسر يسبب أقل قدر من الضرر لعضلة القلب.
   - **ب.** يمكن أن يسبب انسداد الشريان التاجي الأيسر موت الجدار الأمامي الذي يؤثر على البطين الأيسر.
   - **ت.** يمكن أن يتسبب انسداد الشريان التاجي الأيسر في موت الجدار الخلفي الذي يؤثر على البطين الأيمن.
   - **ث.** الشريان الأمامي الأيسر النازل هو الأقل عرضة للإصابة بمرض الشريان التاجي.

3. **حالة مريض بعد 36 ساعة من احتشاء عضلة القلب بعد عملية القلب. بدأ المريض بالشكوى من ألم في الصدر عند الاستلقاء أو عند السعال. عند تسمع القلب لوحظ صوتًا قاسيًا مزعجًا. ما هي المضاعفات التي من المرجح أن يعاني منها هذا المريض؟**
   - **أ.** تسلخ القلب
   - **ب.** تمزق الحاجز البطيني
   - **ت.** تدلي الصمام التاجي
   - **ث.** التهاب التامور

4. الأسباب الأكثر شيوعًا لحدوث السدادة القلبية (cardiac tamponade) بعد عمليات القلب هو الاتي باستثناء:

أ. امراض الأورام
ب. التهاب التامور مجهول السبب
ت. انصباب التامور (pericardial effusion)
ث. قسطرة القلب

5. كل ما يلي صحيح فيما يتعلق بالسداد القلبي (cardiac tamponade) بعد عمليات القلب باستثناء؟

أ. يمكن أن ينتج بسببه 200 مل من السوائل في الحيز التأموري، إذا تطور بسرعة
ب. في الانصباب البطيء النمو يمكن أن يوجد أكثر من 2000 مل من السوائل في الفضاء التامور
ت. يختلف حجم السائل المطلوب لإنتاج السداد القلبي بشكل مباشر مع سماكة عضلة القلب البطينية
ث. يختلف حجم السائل المطلوب لإنتاج السداد القلبي بشكل مباشر مع سمك جدار التامور

6. أسباب السدادة القلبية بعد عمليات القلب هي كالاتي باستثناء:

أ. أورام القلب
ب. خمول الغدة الدرقية
ت. الفشل الكلوي
ث. الجفاف

7. يمكن ملاحظة كل ما يلي في مرضى السداد القلبي بعد عمليات القلب باستثناء:

أ. علامة كوسماول(هي ارتفاع غير معقول في الضغط الوريدي الوداجي (jugular venous pressure) عند الشهيق) .

ب. النبض التناقضي (يعبر عن هبوط كبير ب الضغط الانقباضي أثناء الشهيق أكثر من 10 ملم /زئبق)
ت. انهيار (Collapse) البطين الأيمن الانبساطي في سونار القلب
ث. ارتفاع في درجة الحرارة

8. التغييرات في أي قيمة مختبرية تشير إلى الفشل الكلوي لدى المرضى الذين يعانون من انخفاض في النتاج القلبي بعد عمليات القلب؟

أ. ناقلة امين الاسبارتات (Aspartate Aminotransferase)
ب. نيتروجين اليوريا في الدم (BUN)
ت. التروبونين (Troponin)
ث. البروتين الدهني منخفض الكثافة

9. النتاج القلبي بعد عمليات القلب مهم جدا لتحديد ما إذا كان المريض يعاني من صدمة قلبية. ما هو النتاج القلبي الطبيعي عند الشخص البالغ؟

أ. 2-5 لتر / دقيقة
ب. ب- 1-3 لتر / دقيقة
ت. ج- 4-8 لتر / دقيقة
ث. 8-10 لتر / دقيقة

10. أي المرضى أدناه هو الأكثر عرضة للإصابة بصدمة قلبية (cardiogenic shock**) بعد عملية القلب؟**

أ. رجل يبلغ من العمر 52 عامًا.
ب. أنثى تبلغ من العمر 25 عامًا تعرضت لإصابة في النخاع الشوكي الصدري العلوي.
ت. ذكر يبلغ من العمر 72 عامًا بعد إجراء عملية زرع كبد.
ث. أنثى تبلغ من العمر 49 عامًا تعاني من احتشاء حاد في عضلة القلب.

11.يصف الطبيب جرعة Dobutamine IV تسريب وريدي لمريض مصاب بصدمة قلبية بعد عملية القلب. عند بدء التسريب الوريدي، على الممرض ان يضع في أولوية المراقبة؟

أ. ارتفاع ضغط الدم الارتدادي (Rebound hypertension)
ب. رنين في الأذنين
ت. تفاقم انخفاض ضغط الدم
ث. صداع شديد

12.كان ضغط الدم لمريض ما 140/220 بعد خروجه من عملية القلب. وصف الطبيب له موسع للأوعية. هذا الدواء سوف ب؟

أ. خفض ضغط دم المريض وزيادة الحمل القلبي اللاحق(afterload)
ب. خفض ضغط دم المريض وتقليل الحمل القلبي اللاحق
ت. خفض ضغط دم المريض وزيادة الحمل القلبي المسبق(preload)
ث. زيادة ضغط دم المريض ولكن انخفاض النتاج القلبي.

13.مريض يعاني من رجفان أذيني سريع بعد خروجه من عملية القلب يسال الممرض عن سبب قيام الطبيب بإجراء تدليك الشريان السباتي. يستجيب الممرض بأن هذا الإجراء قد يحفز:

أ- العصب التائه (vagus nerve) لزيادة معدل ضربات القلب.
ب- العصب الحجابي لزيادة معدل ضربات القلب
ت- العصب الحجابي لإبطاء معدل ضربات القلب
ث- العصب التائه (vagus nerve) لإبطاء معدل ضربات القلب

14.ممرض يعتني بمريض يعاني من عدم انتظام دقات القلب البطينية بعد خروجه من عملية القلب. الممرض يرشد المريض للقيام بأي مما يلي، أثناء نوبة تسرع القلب البطينية؟

أ- قم بإزالة أي مجوهرات معدنية

ب- تنفس بعمق وانتظام وسهولة
ت- يستنشق بعمق ويسعل بقوة كل ثانية إلى ثلاث ثوان
ث- الاستلقاء في السرير

15.تطورت حالة المريض الى الرجفان الأذيني بعد عملية القلب، حيث يبلغ معدل نبضات قلبه 150 نبضة في الدقيقة. يقوم الممرض بتقييم المريض من أجل:

أ- ارتفاع ضغط الدم والصداع
ب- الغثيان والقيء
ت- انخفاض ضغط الدم والدوخة

16.ما هو نقص تروية عضلة القلب؟ اختر تعريف مطابق:

أ- ألم متقطع في الصدر يحدث بنفس نمط البداية والمدة والشدة
ب- تفاقم تصلب الشرايين مما يسبب أعراض نقص تروية
ت- انسداد جزئي أو فرع أو أكثر من الشريان التاجي الأيمن أو الأيسر
ث- يستخدم ATP لتقلص عضلات بطينات القلب. يؤدي نقص التروية المزمن إلى فشل البطين

17.مريض يتلقى علاجًا مضادًا للتخثر بعد عملية القلب. يجب أن يكون الممرض متيقظ للعلامات والأعراض المحتملة للنزيف الخارجي أو الداخلي، كما يتضح من أي مما يلي؟

أ- انخفاض ضغط الدم
ب- ارتفاع ضغط الدم
ت- انخفاض معدل ضربات القلب
ث- ارتفاع حجم الخلايا المكدسة(hematocrit)

18.من أعراض مرض الشريان التاجي بعد عملية القلب:

أ- مشاكل النوم
ب- الصداع
ت- الإسهال
ث- ألم أو إزعاج في الصدر أو الفك السفلي أو الذراعين

19.إن عامل الخطر القابل للتعديل المرتبط بمرض الشريان التاجي بعد عملية القلب هو:

أ- العمر
ب- السمنة

ت- الوراثة
ث- الجنس

20.قسطرة الشريان التاجي، جزء من علاج امراض الشرايين التاجية ويشمل:
أ- جزء جديد من الشريان يحل محل الجزء المسدود
ب- لتوسيع الشريان ، يتم استخدام الدواء
ت- انتفاخ بالون صغير داخل الشريان
ث- ليس مما سبق

المحور الثاني: المضاعفات الرئوية

21.وجود الهواء والسوائل في التجويف الجنبي بعد عملية القلب يعرف ب؟
أ- استرواح الصدر (Hydropneumothorax)
ب- تقيح الصدر (Pyopneumothorax)
ت- تسرب الكيلوس (Chylothorax)
ث- تدمي الصدر (Hemothorax)

22.بماذا تختلف النتائج الجسدية للانصباب الجنبي(pleural effusion) بعد عمليات القلب؟
أ- بزل الصدر (Thoracentesis)
ب- كمية السائل
ت- تقيح الصدر (Pyopneumothorax)
ث- استسقاء الصدر (Hydropneumothorax)

23.ما هو الانصباب المرتبط بالالتهاب الرئوي(pneumonia) بعد عمليات القلب؟
أ- الانصباب الجنبي(pleural effusion)
ب- استرواح الصدر (Hydropneumothorax)
ت- تقيح الصدر (Pyopneumothorax)
ث- انصباب نظير ذات الرئة (Parapneumonic diffusion)

24.مريض لديه أنبوب صدري لعلاج استرواح الصدر(pneumothorax) **بعد عملية القلب في الرئة اليسرى. أي نتيجة أثناء التقييم تتطلب تدخلاً تمريضًيا فوريًا؟**

أ- وجود فقاعات متقطعة في الغرفة الوسطى لنظام الصرف الصدري.
ب- المريض لديه انحراف طفيف في القصبة الهوائية إلى الجانب الأيمن.
ت- تقلب او تموج حجرة مانع التسرب أثناء الشهيق والزفير.
ث- د- يشكو المريض من إيلام في موقع إدخال الأنبوب الصدري.

25.مريض تم استقباله بجرح في الصدر بعد عملية القلب ويعاني من ضيق التنفس الشديد، وعدم انتظام دقات القلب، ونقص الاوكسجين. جرح الصدر يقع في منطقة منتصف الإبط اليسرى من الصدر. في التقييم، لوحظ وجود ارتفاع وانخفاض غير متساويين في الصدر مع غياب أصوات التنفس على الجانب الأيسر. يمكن أيضًا ملاحظة صوت "الشفط" عندما يستنشق المريض ويزفر. تظهر الأشعة السينية على صدر المريض استرواح الصدر(pneumothorax)**. ما هو نوع استرواح الصدر المعروف بما سبق؟**

أ- استرواح الصدر المغلق
ب- استرواح الصدر المفتوح
ت- استرواح الصدر الضاغط
ث- د- استرواح الصدر التلقائي ،الذاتي

26.أي مما يلي هو علامة متأخرة لتطور استرواح الصدر الضاغط (tension pneumothorax**) بعد عملية القلب؟**

أ- انخفاض ضغط الدم
ب- عدم انتظام دقات القلب
ت- انحراف القصبة الهوائية
ث- ضيق التنفس

27.يقوم ممرض العناية الحرجة والأعضاء الآخرون في فريق الرعاية بتقييم حالة المريض بعد عملية القلب لمعرفة ما إذا كان مستعدًا لفصله من جهاز التنفس الصناعي. ما أهم العوامل التي تنبئ بان حالة المريض جيدة ومؤهل لفصله عن جهاز التنفس الصناعي؟

أ- المؤشرات الحيوية المستقرة وغازات الدم الشرياني مستقرة.
ب- مقياس التأكسج النبضي فوق 80٪ وعلامات حيوية مستقرة.
ت- الحالة التغذوية المستقرة وغازات الدم الشرياني مستقرة.
ث- إدراك ومستوى وعي طبيعي.

28.مريض ذكر يبلغ من العمر 68 عاما تم تنبيبه عن طريق الفم على التهوية الميكانيكية بعد عملية القلب تم تشخيص إصابته بالإنتان(sepsis). ما هو الاجراء التمريضي الأكثر أهمية؟

أ- استخدم تقنية الشفط المفتوح.
ب- . اعطائه المورفين لعدم الراحة.
ت- الحد من الضوضاء.
ث- ارفع رأس السرير 30 درجة.

29.مريض يعاني من أعراض خفيفة من الالتهاب الرئوي بعد عملية القلب. يقوم الطبيب بتشخيص المريض "حاله خفيفة من الالتهاب الرئوي". من معرفتك التمريضية، أي نوع من العوامل المعدية التالية تسبب هذا النوع من الالتهاب الرئوي؟

أ- . الفطريات
ب- بكتيريا العقدية الرئوية
ت- . الميكوبلازما الرئوية
ث- . الانفلونزا

30.ضعف الحجاب الحاجز بعد جراحة القلب ناتج عن تلف في:

أ- إصابة العصب الحجابي
ب- العصب المبهم (Vagus nerve)
ت- العصب الوربي (Intercostal nerve)
ث- العصب تحت الضلع (Subcostal nerve)

31.عند تدريس فصل حول مفاهيم العناية الحرجة بعد عمليات القلب لمجموعة من الممرضين الجدد. وبعد مناقشة موضوع متلازمة الضائقة التنفسية الحادة (ARDS). وللقيام بتقييم فهم الممرضين الجدد لهذه الحالة. أي تصريح من ممرض جديد يوضح أنه يفهم الحالة؟

أ- "تتطور هذه الحالة لأن الغدد الخارجية الصماء تبدأ في العمل بشكل غير صحيح مما يؤدي إلى تكوين مخاط سميك وغزير يتجمع في أكياس الحويصلات الهوائية".
ب- "متلازمة الضائقة التنفسية الحادة هي مرض رئوي يتسبب تدريجياً في إعاقة مزمنة لتدفق الهواء من الرئتين."

ت- تحدث متلازمة الضائقة التنفسية الحادة نتيجة لانهيار الرئة بسبب تراكم الهواء في الحيز الجنبي.
ث- "تتطور هذه الحالة لأن نفاذية الغشاء الشعري السنخي قد تغيرت مما يؤدي إلى تجمع السوائل في الحويصلات الهوائية".

32.أي المرضى أدناه هو الأكثر عرضة للإصابة بمتلازمة الضائقة التنفسية الحادة بعد عملية القلب ولديه أسوأ تخمين او توقع؟

أ- مريض يبلغ من العمر 52 عامًا مصابًا باسترواح الصدر.
ب- ذكر يبلغ من العمر 48 عامًا يعالج من الحماض الكيتوني السكري.
ت- أنثى تبلغ من العمر 69 عامًا مصابة بالإنتان بسبب عدوى بكتيرية سالبة الجرام.
ث- انثى تبلغ من العمر 30 عاما مصابة بالتليف الكيسي.

33.أي مما يلي هو السبب الأكثر شيوعًا لانخماص الرئة(atelectasis) بعد عمليات القلب؟

أ. تندب برنكيما الرئة
ب. تثبيط الجهاز التنفسي
ت. خلل في السيرفكتانت
ث. ورم في الرئة

34.انخماص الرئة بعد عمليات القلب غالبا ما يكون بدون أعراض، وغالبا ما تكون العلامات غائبة. يجب توقع انخماص الرئة وإجراء دراسات التصوير للمرضى الذين يعانون من أعراض تنفسية غير مبررة والذين لديهم عوامل خطر لهذه الحالة. من بين دراسات التصوير هذه، أي مما يلي هو الخطوة الأولية الأكثر ملاءمة لتشخيص انخماص الرئة؟

أ. تنظير القصبات (Bronchoscopy)
ب. اشعة الصدر
ت. تصوير مقطعي محوسب (CT scan)
ث. التصوير بالرنين المغناطيسي للصدر (MRI)

35.الدليل على فعالية معظم العلاجات لانخماص الرئة(atelectasis) بعد عمليات القلب ضعيف أو غائب. ومع ذلك، تشمل العلاجات الشائعة العلاج الطبيعي للصدر والسعال الموجه وتمارين التنفس وأي مما يلي؟

أ. ضغط مجرى الهواء الإيجابي المستمر
ب. تهوية ذات حجم مدّي أكبر
ت. قياس التنفس التحفيزي(سبايرومتري)
ث. ضغط الزفير الإيجابي

36.مريض يعاني من انسداد رئوي (pulmonary embolism) بعد جراحة القلب ويبدأ العلاج بالأكسجين. أحد طلاب التمريض يسال لماذا لم يتحسن تشبع الأكسجين للمريض بشكل ملحوظ. ما هو أفضل رد من قبل الممرض؟

أ. التنفس بسرعة يتداخل مع الأوكسجين.
ب. ربما يكون المريض مصابا بمتلازمة الضائقة التنفسية.
ت. تتداخل الجلطة الدموية مع التروية في الرئتين.
ث. يحتاج المريض إلى التنبيب الفوري والتهوية الميكانيكية.

37.انخفض تشبع الأكسجين للمريض الذي تم تنبيبه بعد عملية القلب إلى 88٪. ما هو الإجراء الذي يتخذه الممرض حسب الأولوية؟

أ- تحديد ما إذا كان الأنبوب ملتويًا.
ب- التأكد من أن جميع التوصيلات تعمل بشكل صحيح.
ت- الاستماع إلى رئتي المريض.
ث- شفط انبوب القصبة الهوائية.

المحور الثالث: مضاعفات الجهاز الهضمي

38.مريض يشكو من قيء شديد لمدة 3 أيام بعد جراحة القلب. أي من التالي يعتبر من المضاعفات الرئيسية للتقيؤ المستمر؟

أ- . فقدان الوزن
ب- عدم انتظام ضربات القلب
ت- شفط القيء (Aspiration of vomitus)
ث- . الجفاف

39.مريض مصاب بنزيف في الجهاز الهضمي بعد عملية القلب. ما هو العمل التمريضي ذو الأولوية لهذا المريض؟

أ- الحصول على العلامات الحيوية كاملة.
ب- اعطاء الأدوية الموصوفة للألم.
ت- تناول مضادات الحموضة الموصوفة كل ساعتين.
ث- تناول الأدوية الموصوفة للغثيان والقيء

40.المريض يعاني من الإسهال بعد جراحة القلب. ما الذي يجب أن يتوقعه الممرض عند تسمع البطن؟

أ- غياب اصوات الامعاء
ب- أصوات الأمعاء شديدة النشاط
ت- أصوات الأمعاء منخفضة النشاط
ث- أصوات أمعاء عالية النبرة

المحور الرابع: مضاعفات الجهاز العصبي

41.أي المرضى أدناه هو الأكثر عرضة للإصابة بالسكتة الدماغية النزفية بعد عمليات القلب؟

أ- مريض يبلغ من العمر 65 عامًا مصابًا بتضيق الشريان السباتي.
ب- انثى تبلغ من العمر 89 عاما تعاني من تصلب الشرايين.
ت- رجل يبلغ من العمر 88 عامًا يعاني من ارتفاع ضغط الدم غير المنضبط ولديه تاريخ من إصلاح تمدد الأوعية الدموية في الدماغ منذ عامين.
ث- أنثى تبلغ من العمر 55 عامًا مصابة برفرفة أذينية.

42.ممرض يعتني بمريض يعاني من الهذيان بعد عملية القلب. أي تدخل تمريضي له الأولوية القصوى؟

أ- توفير بيئة آمنة
ب- إقامة أنشطة ترفيهية
ت- توفير بيئة منظمة
ث- اتخاذ تدابير لتعزيز النوم

43.ممرض يشتبه في أن مريضه يعاني من الهذيان بعد جراحة القلب. ما هي العلامات التي يلاحظها الممرض لدعم هذا التشخيص؟

أ- تداخل الكلام والضعف من جانب واحد
ب- وجه يشبه القناع + رجفان
ت- بداية تدريجية للنسيان ابلغ عنها افراد الاسرة.
ث- الارتباك والهلوسة البصرية

44.أي عبارة يجب أن تشير للممرض أن الفرد يعاني من الذهان(delusion)؟

أ. "هناك كائن فضائي ينمو في كبدي."
ب. "أرى زوجي الميت في كل مكان أذهب إليه."
ت. "يجوز لمصلحة الضرائب تدقيق ضرائبي".
ث. "لن آكل طعامي. رائحته مثل الكبريت."

45.أسباب الاكتئاب بعد عمليات القلب هي:

أ. ردود الفعل على التخدير
ب. ردود الفعل على مسكنات الألم
ت. الإصابة بالاكتئاب قبل الجراحة
ث. كل ما سبق

المحور الخامس: عدوى الجرح

46.أعراض وجود عدوى بالجروح بعد عمليات القلب هي التالية:

أ- حمى
ب- التهاب احمرار الجلد
ت- وذمة
ث- كل ما سبق

47.عوامل الخطر لعدوى الجروح بعد جراحة القلب هي كالتالي:

أ. ضعف الدورة الدموية
ب. مرض السكري
ت. السمنة
ث. كل ما سبق

48.أي مما يلي هو الترتيب التسلسلي الصحيح لمراحل شفاء الجروح؟

أ. إعادة البناء والالتهاب والإرقاء والإصلاح
ب. الالتهاب، الارقاء، الانتشار والنضج
ت. الارقاء والالتهاب وإصلاح وإعادة البناء
ث. الالتهاب والنضج والتكاثر والإرقاء

المحور السادس: مضاعفات الكلى

49.المريض المصاب بإصابة كلوية حادة (Acute Kidney Injury) بعد عملية القلب لديه معدل ترشيح كبيبي 40 مل / دقيقة. ما هي العلامات والأعراض أدناه التي قد يعاني منها هذا المريض؟

أ- فرط حجم الدم
ب- نقص بوتاسيوم الدم
ت- زيادة الكولسترول
ث- انخفاض مستوى الكرياتينين

50.يقوم الممرض برعاية مريض تم تشخيصه بإصابة الكلى الحادة (AKI) بعد عملية القلب وصف له الطبيب الدكستروز بنسبة 50 ٪ IV و10 وحدات من جرعة الأنسولين المنتظمة IV. ما نوع اختلال توازن الاكترولايت الذي ستساعد هذه الأدوية الموصوفة في تصحيحه؟

أ. ارتفاع الصوديوم في الدم
ب. ارتفاع الكالسيوم في الدم
ت. ارتفاع الفوسفات في الدم
ث. ارتفاع البوتاسيوم في الدم

51.ممرض يعتني برجل يبلغ من العمر 68 عامًا خضع لعملية جراحية في الشريان التاجي قبل 24 ساعة. خلال مرحلة قلة البول من مرض الكلى الحاد ، ما الإجراء المناسب لتضمينه في خطة الرعاية؟

أ. قدم الأطعمة الغنية بالبوتاسيوم.
ب. تقييد السوائل على أساس إخراج البول.
ت. مراقبة الإخراج من غسيل الكلى البريتوني.
ث. قدم وجبات خفيفة غنية بالبروتين بين الوجبات.

52.مريض يعاني من إصابة الكلى الحادة (AKI) بعد جراحة القلب لديه درجة حموضة في الدم الشرياني تبلغ 7.30. يقوم الممرض بتقييم حالة المريض حول:

أ. توسع الأوعية.
ب. تورم الجلد الفقراء.
ت. النبضات المحيطة.
ث. التنفس السريع.

Appendix C2

Dear Nurse ……

Good greeting……

The form in your hands belongs to the research of the graduate student Master / Faculty of Nursing at the University of Babylon under the title **((Nurses Knowledge toward Post Open Heart Surgeries Complications in Al-Nasiriyah Heart Center**)) Please kindly answer all the paragraphs thank you for your cooperation.

Note: that the information will be treated confidentially and used for scientific research purposes only and there is no need to mention the name. With thanks and appreciation……...

Objectives:

1- To Measure Nurses' Knowledge Concerning post open-heart surgery complications

2- To Find the Relationship Between the Nursing staff' Knowledge with Certain Demographical Characteristics and Employment Component.

Appendix- C

QUESTIONNARE **Form NO:**

Part One: Demographic Characteristics

1.Age: ☐ years

2.Gender: Male☐ Female☐

3.Qualification: High school ☐ Diploma ☐ Bachelor ☐ M.Sc. ☐ Ph.D☐ .

4.Marital Status: Married ☐ Single ☐ Divorced☐ Separated ☐ Widowed ☐

Part Two: Employment Status

1.Years of Services in Nursing: ☐ Years

2.Years of Services in Intensive Care Unit: ☐ Years

3.Years of Services in Surgical Department: ☐ Years

4.Have you participated in courses related to complications after open heart surgeries? Yes ☐ No ☐

5.Do you read and learn about complications after open heart surgeries ؟

Yes ☐ No ☐

Part Three: Multiple Choice Questions to Assess Post Open-Heart Surgeries Complications.

DOMAIN: CARDIO VASCULAR FIRSTL COMPLICATIONS

1. When educating a patient about the causes of a myocardial infarction after open heart surgery. Which statement by the patient indicates they misunderstood your teaching and requires you to re-educate them?

   A. Coronary artery dissection can happen spontaneously and occurs more in women.
   B. The most common cause of a myocardial infarction is a coronary spasm from illicit drug use or hypertension.
   C. Patients who have coronary artery disease are at high risk for developing a myocardial infarction.
   D. Both A and B are incorrect.
   Answer: B

2. Note in the patient's chart that the patient recently had a myocardial infarction due to a blockage in the left coronary artery after open heart surgery. You know that which of the following is true about this type of blockage?

   A. A blockage in the left coronary artery causes the least amount of damage to the heart muscle.
   B. Left coronary artery blockages can cause anterior wall death which affects the left ventricle.
   C. Left coronary artery blockage can cause posterior wall death which affects the right ventricle.
   D. The left anterior descending artery is least likely to be affected by coronary artery disease.
   Answer: B

3. A patient is 36 hours status posts a myocardial infarction after open heart surgery. The patient is starting to complain of chest pain when

they lay flat or cough. Note on auscultation of the heart a grating, harsh sound. What complication is this patient mostly likely suffering from?

A. Cardiac dissection
B. Ventricular septum rupture
C. Mitral valve prolapses
D. Pericarditis
Answer: D

4. The most common causes of cardiac tamponade after open heart surgery are the following except:

A. neoplastic disease
B. idiopathic pericarditis
C. pericardial effusion
D. cardiac catheterization
Answer: D

5. All of the following are true about cardiac tamponade after open heart surgery except?

A. it can result by even 200 ml of fluid in the pericardial space, if it develops rapidly
B. in slowly developing effusions more than 2000 ml of fluid can exist in the pericardial space
C. the volume of fluid required to produce cardiac tamponade varies directly with the thickness of the ventricular myocardium
D. the volume of fluid required to produce cardiac tamponade varies directly with the thickness of parietal pericardium
Answer: D

6. Causes of Cardiac tamponade after open heart surgery is the following except:
A. Heart tumors
B. Underactive thyroid gland
C. Kidney failure
D. Dehydration

Answer: D

7. All of the following may be seen in patients of cardiac tamponade after open heart surgery except:

   A. Kussmaul's sign
   B. Pulsus paradoxus
   C. Right ventricular diastolic collapse in echocardiography
   Answer: A

8. Changes in what lab value is indicative of renal failure in clients with decreased cardiac output after open heart surgery?

   A. Aspartate Aminotransferase
   B. BUN
   C. Troponin
   D. VHDL(Very Low-Density Lipoprotein)
   Answer: B

9. Cardiac output after open heart surgery is very important for determining if a patient is in cardiogenic shock. What is a normal cardiac output in an adult?

   A. 2-5 liters/minute
   B. 1-3 liters/minute
   C. 4-8 liters/minute
   D. 8-10 liters/minute
   Answer: C

10. Which patient below is at MOST risk for developing cardiogenic shock after open heart surgery?

    A. A 52-year-old male who is experiencing a severe allergic reaction from
    B. A 25-year-old female who has experienced an upper thoracic spinal cord injury.
    C. A 72-year-old male who is post-op from a liver transplant.

D. A 49-year-old female who is experiencing an acute myocardial infarction.
Answer: D

11. They physician orders a Dobutamine IV drip on a patient in cardiogenic shock post open heart surgery. After starting the IV drip, the nurse would make it priority to monitor for?

A. Rebound hypertension
B. Ringing in the ears
C. Worsening hypotension
D. Severe headache
Answer: C

12. A patient has a blood pressure of 220/140 after open heart surgery. The physician prescribes a vasodilator. This medication will?

A. Decrease the patient's blood pressure and increase cardiac afterload
B. Decrease the patient's blood pressure and decrease cardiac afterload
C. Decrease the patient's blood pressure and increase cardiac preload
D. Increase the patient's blood pressure but decrease cardiac output.
Answer: B

13. A client with rapid rate atrial fibrillation after open heart surgery asks a nurse why the physician is going to perform carotid massage. The nurse responds that this procedure may stimulate the:

A. Vagus nerve to increase the heart rate
B. Diaphragmatic nerve to overdrive the rhythm
C. Diaphragmatic nerve to slow the heart rate
D. Vagus nerve to slow the heart rate
Answer: D

14. A nurse is caring for a client with unstable ventricular tachycardia after open heart surgery. The nurse instructs the client to do which of the following, if prescribed, during an episode of ventricular tachycardia?

    A. Remove any metal jewelry
    B. Breathe deeply, regularly, and easily
    C. Inhale deeply and cough forcefully every 1 to 3 seconds
    D. Lie down flat in bed
    Answer: C

15. A client has developed atrial fibrillation after open heart surgery, which a ventricular rate of 150 beats per minute. A nurse assesses the client for:

    A. Hypertension and headache
    B. Nausea and vomiting
    C. Hypotension and dizziness
    Answer: C

16. What is myocardial ischemia? Choose matching definition:

    A. intermittent chest pain occurring with the same pattern of onset, duration and intensity
    B. worsening atherosclerosis causing ischemic symptoms
    C. partial blockage or one or more branches of the left or right coronary artery
    D. ATP is used to contract the muscles in the ventricles of the heart. Chronic ischemia leads to ventricular failure
    Answer: C

17. A patient is receiving anticoagulant therapy after open heart surgery. The nurse should be alert to potential signs and symptoms of external or internal bleeding, as evidenced by which of the following?
    A. Low blood pressure

B. High blood pressure
C. Decreased heart rate
D. Elevated hematocrit
Answer: A

18. This is one of the symptoms of Coronary artery disease after open heart surgery:
A. Sleep problems
B. Headache
C. Diarrhea
D. Pain or discomfort in the chest, lower jaw or arms
Answer: D

19. The modifiable risk factor associated with coronary artery disease after open heart surgery is:
A. Age
B. Obesity
C. Heredity
D. Gender
Answer: B

20. Coronary angioplasty, part of coronary artery disease's treatment involves:
A. A new part of artery replaces the blocked section
B. to expand artery, medication is used
C. inflation of a tiny balloon inside an artery
D. None of these
Answer: C

SECOND DOMAIN: PULMONARY COMPLICATIONS

21. What is the presence of air and fluid in the pleural cavity after open heart surgery?
    A. Hydropneumothorax
    B. Pyopneumothorax
    C. Chylothorax
    D. Hemothorax
    Answer: A
22. What do the physical findings of pleural effusion after open heart surgery vary with?
    A. Thoracentesis
    B. The amount of fluid
    C. pyopneumothorax
    D. Hydropneumothorax
    Answer: B
23. What is an effusion seen in association with pneumonia after open heart surgery?
    A. Pleural effusion
    B. Hydropneumothorax
    C. pyopneumothorax
    D. Parapneumonic diffusion
    Answer: D
24. A patient has a chest tube for treatment of a pneumothorax in the left lung after open heart surgery. Which finding during your assessment requires immediate nursing intervention?
    A. The water seal chamber has intermittent bubbling.
    B. The patient has slight tracheal deviation to the right side.
    C. The water seal chamber fluctuates while the patient inhales and exhales.
    D. The patient complains of tenderness at the chest tube insertion site.
    Answer: B

25. A patient is admitted with a chest wound after open heart surgery and experiencing extreme dyspnea, tachycardia, and hypoxia. The chest wound is located on the left mid-axillary area of the chest. On assessment, note there is unequal rise and fall of the chest with absent breath sounds on the left side. also note a "sucking" sound when the patient inhales and exhales. The patient's chest x-ray shows a pneumothorax. What type of pneumothorax is this known as?
    A. Closed pneumothorax
    B. Open pneumothorax
    C. Tension pneumothorax
    D. Spontaneous pneumothorax
    Answer: B
26. Which of the following is a LATE sign of the development of a tension pneumothorax after open heart surgery?
    A. Hypotension
    B. Tachycardia
    C. Tracheal deviation
    D. Dyspnea
    Answer: C

27. The critical care nurse and the other members of the care team are assessing the patient after open heart surgery to see if he is ready to be weaned from the ventilator. What are the most important predictors of successful weaning that the nurse should identify?
    A. Stable vital signs and ABGs
    B. Pulse oximetry above 80% and stable vital signs
    C. Stable nutritional status and ABGs
    D. Normal orientation and level of consciousness
    Answer: A
28. A 68-yr-old male patient diagnosed with sepsis is orally intubated on mechanical ventilation after open heart surgery. Which nursing action is most important?
    A. Use the open-suctioning technique.

B. Administer morphine for discomfort.
C. Limit noise.
D. Elevate the head of the bed 30 degrees.
Answer: D

29. A patient is presenting with mild symptoms of pneumonia after open heart surgery. The doctor diagnoses the patient with "walking pneumonia"(non-medical term for a mild case of pneumonia.) . From your nursing knowledge, you know this type of pneumonia is caused by what type of infectious agent?
A. Fungi
B. Streptococcus pneumoniae
C. Mycoplasma pneumoniae
D. Influenza
Answer: C

30. Diaphragmatic dysfunction after cardiac surgery result from damage in:
A. Phrenic nerve injury
B. Vagus nerve
C. Intercostal nerve
D. Subcostal nerve
Answer: A

31. When teaching a class on critical care concepts after open heart surgery to a group of new nurses. During discussing the topic of acute respiratory distress syndrome (ARDS). At the beginning of the lecture, to assess the new nurses understanding about this condition. Which statement by a new nurse demonstrates he understands the condition?
A. "This condition develops because the exocrine glands start to work incorrectly leading to thick, copious mucous to collect in the alveoli sacs."
B. "ARDS is a pulmonary disease that gradually causes chronic obstruction of airflow from the lungs."
C. "Acute respiratory distress syndrome occurs due to the collapsing of a lung because air has accumulated in the pleural space."

D. "This condition develops because alveolar capillary membrane permeability has changed leading to fluid collecting in the alveoli sacs."
Answer: D

32. Which patient below is at MOST risk for developing ARDS after open heart surgery and has the worst prognosis?
A. A 52-year-old male patient with a pneumothorax.
B. A 48-year-old male being treated for diabetic ketoacidosis.
C. A 69-year-old female with sepsis caused by a gram-negative bacterial infection.
D. A 30-year-old female with cystic fibrosis.
Answer: C

33. Which of the following is the most common cause of atelectasis after open heart surgery?
A. Lung parenchymal scarring
B. Suppression of respiration
C. Surfactant dysfunction
D. Tumor of the lung
Answer: B

34. Atelectasis after open heart surgery is often asymptomatic, and signs are often absent. Atelectasis should be suspected and imaging studies ordered in patients who have unexplained respiratory symptoms and who have risk factors for the condition. Of these imaging studies, which of the following is the most appropriate initial step in diagnosing atelectasis?
A. Bronchoscopy
B. Chest x-ra
C. CT scan of the chest
D. MRI of the chest
Answer: B

35. Evidence for the efficacy of most treatments for atelectasis after open heart surgery is weak or absent. However, common treatments

include chest physiotherapy, directed cough, breathing exercises, and which of the following?

A. Continuous positive airway pressure
B. Higher tidal volume ventilation
C. Incentive spirometry
D. Positive end-expiratory pressure

Answer: C

36. A client has a pulmonary embolism after open heart surgery and is started on oxygen. The student nurse asks why the clients oxygen saturation has not significantly improved. What response by the nurse is best?

A. Breathing so rapidly interferes with oxygenation.
B. Maybe the client has respiratory distress syndrome.
C. The blood clot interferes with perfusion in the lungs.
D. The client needs immediate intubation and mechanical ventilation.

Answer: C

37. An intubated client's oxygen saturation has dropped to 88% after open heart surgery. What action by the nurse takes priority?

A. Determine if the tube is kinked.
B. Ensure all connections are patent.
C. Listen to the client's lung sounds.
D. Suction the endotracheal tube.

Answer: C

THIRD DOMAIN: GASTROINTESTINAL COMPLICATIONS

38. The older adult patient presents with severe vomiting for 3 days after open heart surgery. Which of the following is the major complication of continuous vomiting?

A. Weight loss
B. Cardiac dysrhythmias
C. Aspiration of vomitus
D. Dehydration

Answer: D

39. A patient with GI bleeding after open heart surgery. Which is a priority nursing action for this patient?
    A. Obtain complete vital signs.
    B. Administer prescribed medication for pain.
    C. Administer prescribed antacids every 2 hours.
    D. Administer prescribed medication for nausea and vomiting
    Answer: A

40. A client has diarrhea after open heart surgery. What should the nurse expect when auscultating the abdomen?
    A. Absent bowel sounds
    B. Hyperactive bowel sounds
    C. Hypoactive bowel sounds
    D. High-pitched bowel sounds
    Answer: B

FOURTH DOMAIN: NEUROLOGICAL COMPLICATIONS

41. Which patient below is at most risk for a hemorrhagic stroke after open heart surgery?
    A. A 65-year-old male patient with carotid stenosis.
    B. A 89 year old female with atherosclerosis.
    C. A 88 year old male with uncontrolled hypertension and a history of brain aneurysm repair 2 years ago.
    D. A 55-year-old female with atrial flutter.
    Answer: C
42. A nurse is caring for a client with delirium after open heart surgery. Which nursing intervention has the highest priority?
    A. Providing a safe environment
    B. Offering recreational activities
    C. Providing a structured environment
    D. Instituting measures to promote sleep
    Answer: A

43. A nurse suspects her patient may be suffering from delirium after open heart surgery. What signs does the nurse observe to support this diagnosis?
    A. Slurred speech and one-sided weakness
    B. Mask-like face and tremors
    C. Gradual onset of forgetfulness reported by family members
    D. Confusion and visual hallucinations
    Answer: D

44. Which statement should indicate to a nurse that an individual is experiencing a delusion after cardiac surgery?
    A. "There's an alien growing in my liver."
    B. "I see my dead husband everywhere I go."
    C. "The IRS may audit my taxes."
    D. "I'm not going to eat my food. It smells like brimstone."
    Answer: A

45. The causes of depression after cardiac surgeries is:
    A. reactions to anesthesia
    B. reactions to pain medications
    C. having depression before surgery
    D. all of above
    Answer: D

FIFTH DOMAIN: WOUND INFECTION

46. Symptoms of Infected Wound after cardiac surgery is the following:
    A. fever
    B. erythema
    C. edema
    D. all of above
    Answer: D

47. Risk Factors of Infected Wound after cardiac surgery is the following:
    A. Poor circulation
    B. Diabetes
    C. Obesity
    D. All of above
    Answer: D

48. Which of the following is the correct sequential order of the phases of healing?
    A. Remodeling, inflammation, hemostasis, and repair
    B. Inflammation, hemostasis, proliferation, and maturation
    C. Hemostasis, inflammation, repair, and remodeling
    D. Inflammation, maturation, proliferation, and hemostasis
    ANSWER: C

SEXTH DOMAIN: RENAL COMPLICATIONS

49. Post open heart surgery patient with acute renal injury has a GFR (glomerular filtration rate) of 40 mL/min. Which signs and symptoms below may this patient present with?
    A. Hypervolemia
    B. Hypokalemia
    C. Increased cholesterol
    D. Decreased Creatinine level
    Answer: A

50. The nurse is caring for a client diagnosed with acute kidney injury (AKI) after open heart surgery who is prescribed 50% dextrose IV and 10 units of regular insulin IV bolus. Which type of electrolyte imbalance will these prescribed medications help to correct?
    A. Hypernatremia
    B. Hypercalcemia
    C. Hypophosphatemia
    D. Hyperkalemia

51. The nurse is caring for a 68-yr-old man who had coronary artery bypass surgery 24 hours ago. During the oliguric phase of acute kidney disease, which action would be appropriate to include in the plan of care?
    A. Provide foods high in potassium.
    B. Restrict fluids based on urine output.
    C. Monitor output from peritoneal dialysis.
    D. Offer high-protein snacks between meals.

52. A patient after open heart surgery with acute kidney injury (AKI) has an arterial blood pH of 7.30. The nurse will assess the patient for:
    A. Vasodilation.
    B. Poor Skin Turgor.
    C. Bounding Pulses.
    D. Rapid Respirations.

الخلاصة

الاستنتاجات: خلصت الدراسة إلى أن المعرفة العامة للممرضين بمضاعفات ما بعد جراحات القلب المفتوح في مركز الناصـــرية للقلب كانت ضـــعيفة. وفي جميع محاور مضـــاعفات ما بعد جراحات القلب المفتوح لديهم معرفة ضـــعيفة. ووجد أن مكان العمل (وحدة العناية المركزة، قســـم الجراحة) للممرضين كان له تأثير على معرفة الممرضين بمضاعفات جراحات القلب المفتوح.

التوصيات: أوصت الدراسة بإنشاء برنامج متابعة في وحدة العناية المركزة وقسم الجراحة للكشف باســـتمرار وفعالية عن المشـــكلة المعرفية حول مضـــاعفات ما بعد جراحة القلب المفتوح بين طاقم التمريض. إجراء مزيد من الدراســات بحجم عينة كبير لتقييم معرفة الممرضــين بمضــاعفات ما بعد جراحات القلب المفتوح.

الخلاصة

الخلفية: من الأسـباب الرئيسـية للوفاة في العالم أمراض القلب والأوعية الدموية. يتم علاجها بالجراحة والأدوية في المؤسـسـات الصـحية. في جراحة القلب وبعد الجراحة، التي تنطوي على مضاعفات الجهاز التنفسي والقلب والأوعية الدموية والكلى والجهاز العصبي المركزي وتمثل سببًا مهمًا وربما قاتلًا للمراضـة والوفيات. لتحسين الإعداد التعليمي وجودة الرعاية الصـحية، من المهم فهم كيفية استخدام المعرفة في ممارسة الممرض اليومية. يجب أن يتوقع الممرض التدخلات الفعالة المناسبة وإمكانية منع حدوث مضاعفات لضمان نتيجة إيجابية في الوقت المناسب.

الأهداف: تقييم معرفة الممرضـين بمضـاعفات ما بعد جراحات القلب المفتوح ودراسـة العلاقة بين معرفة الممرضين وبعض المتغيرات الديموغرافية والوظيفية.

المنهجية: دراسـة نوعية وصـفية ، أجرى الباحث الدراسـة لتقييم المعرفة حول مضـاعفات ما بعد جراحات القلب المفتوح لممرضين مركز الناصرية للقلب في منطقة الناصرية بمحافظة ذي قار من سـبتمبر 2021 إلى أغسـطس 2022، أجريت الدراسـة على ملاك الممرضـين في مركز القلب في محافظة ذي قار بمنطقة الناصـرية لتقييم معرفة الممرضـين بمضـاعفات جراحات القلب المفتوح. وفيه تم اختيار (82) ممرض/ة بأسـلوب العينة المسـتهدفة. بعد الانتهاء من الدراسـة الاسـتدلالية والتحقق من مصـداقية الاسـتبيان وصـلاحيته بإرسـاله إلى (15) خبيراً في مختلف المجالات والجامعات لتقييم محتويات الاستبيان. تم جمع البيانات من خلال توزيع النسخة العربية من الاستبيان الذي تم إنشاؤه ومن خلال المقابلة الفردية لممرضين مركز الناصرية للقلب الذين يعملون في وحدة العناية المركزة وقسم الجراحة. تم تحليل بيانات الدراسـة باسـتخدام التحليل الوصـفي (المتوسـط ، الانحراف المعياري، النسبة المئوية) والتحليل الإحصائي الاستنتاجي (مربع كاي).

النتائج: تراوحت أعمار مجتمع الدراسة بين (23 - 48) سنة. (46) ذكور و (36) أنثى. أما بالنسبة لمؤهلات الممرضـين (51.2٪) كانت درجة الدبلوم في علوم التمريض. وكان (41.5٪) حاصـلين على بكالوريوس علوم تمريض وممرض واحد بدرجة الماجسـتير و (6.1٪) حاصـل على مؤهل ثانوي. الحالة الزواجية للممرضين (68.3٪) متزوجين و (29.3٪) غير متزوجين. و (80.5٪) من الممرضين كانو ≤ 5 سنوات من الخدمة في التمريض، (13.4٪) كان لديهم من 6 إلى 10 سنوات، (3.7٪) من 11 إلى 15 سنة، (4.2٪) في حدود 16 إلى 20 سنة. أظهرت الدراسة أن (3.7٪) من الممرضـين لديهم معرفة جيدة و (96.3٪) لديهم معرفة ضـعيفة بمضـاعفات ما بعد جراحات القلب المفتوح.

وزارة التعليم العالي والبحث العلمي
جامعة بابل - كلية التمريض

معارف الممرضين باتجاه مضاعفات ما بعد عمليات القلب المفتوح في مركز الناصرية للقلب

رسالة تقدم بها

أزهر طالب حميد موسى البطاط

الى مجلس كلية التمريض / جامعة بابل

وهي جزء من متطلبات نيل درجة الماجستير علوم في التمريض

اشراف

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