Arab American University
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Cardiac Nurses Knowledge and Practice Toward Patient's Safety After Cardiac Catheterization by Distal Transradial Access at Palestinian Hospitals

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Thesis Approval

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Declaration

I certify that this thesis submitted for the degree of master is the result of my research, except where otherwise acknowledged, and that this study (or any part of the same) has not been submitted for a higher degree to any other university or hospital.

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Dedication

This thesis is dedicated to my parents, especially my mother and my father, for their endless prayers and to my family for their encouragement.

From heart dedication to my dear wife and lovely children, nothing would have been done without their patience, support, and understanding.

To all my best friends, especially Bilal Awad, thank you for your encouragement.

To all martyrs and injuries in Palestine.

To every person who helped me finish this work.

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Abstract

Title: Cardiac nurses' knowledge and practice regarding patient safety after Cardiac Catheterization by Distal Transradial Access in the cardiac units in Palestinian hospitals.

Introduction: Cardiac Catheterization by distal Transradial arteries is an interventional tool in some hospitals. It is a new procedure that started in 2017, but there are also old procedures or classic examples, such as Cardiac Catheterization by radial or femur. The responsibility of cardiac nurses is to ensure good patient care and safety without accidental harm due to a healthcare encounter.

Aim of the study: To assess cardiac nurses' knowledge and practice regarding patient safety after Cardiac Catheterization by Distal Transradial Access in the cardiac units in Palestinian hospitals.

Objectives: To assess the level of knowledge and practice among cardiac nurses and the relationship between the cardiac nurses' socio-demographic characteristics and professional experience and level of hospital Measures and their knowledge and practice regarding patients 'safety after Cardiac Catheterization by distal Transradial access.

Methodology: A descriptive, cross-sectional design was used. Data were collected via an online questionnaire from a convenience sample of 152 nurses working cardiac care departments.

Results: The study showed cardiac nurses have intermediate knowledge; With means score of 3.48 (SD=0.44). and the practice was high with means score of 4.15 (SD =0.56). Therefore, it indicates that the nurses' perception of their hospital Measures was intermediate about

patients' safety post Cardiac Catheterization (a mean of 3.13 with an SD of 0.83). The nurses' knowledge, practice, and hospital measures about patient safety after Cardiac Catheterization were intermediate, with a mean score of 3.56 and SD=0.44. There is a significant association between nurses' knowledge, practice, and hospital measures scores regarding age in years. The older nurse whose age is more important than 45 years has positive and high knowledge and practice and hospital measures scores compared with the younger nurses' age (P-values <0.05); moreover, there is a significant association between nurses' knowledge, practice, and hospital measures scores for nurses and hospital type. The nurses working in governmental hospitals have positive and higher knowledge and practice and hospital measures scores regarding patient safety after Cardiac Catheterization than nurses in private hospitals (p-value ≤ 0.05).

Conclusion: The study showed cardiac nurses have moderate knowledge about patient safety after cardiac catheterization. The practice score showed a high practice. Therefore, nurses' perceptions of hospital measures were intermediate. The research also showed a significant association between nurses' knowledge, practice, and hospital measures scores regarding age and type of hospital.

Recommendations: The current study recommended improving nurses' knowledge and practice regarding patient safety after cardiac catheterization at three levels: operational, educational, and national.

Keywords: Cardiac nurse, cardiac catheterization, CCU, Knowledge, practice, hospital measures, patient safety.

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Abbreviations

- TRA: transradial access
- RAO: radial artery occlusion
- DTRA: distal Transradial access
- PCI: Percutaneous Coronary Intervention
- RN: registered nurse
- CC: cardiac catheterization

Chapter One

Introduction

1.1 Background

Cardiovascular disease remains the leading cause of mortality globally, with 620 million people affected and 60 million new cases annually, it accounts for 1 in 3 deaths worldwide, resulting in 20.5 million deaths in 2021, and affecting 56,000 people daily (Rasool, 2023).

Cardiovascular disease (CVD) has risen globally due to epidemiological transition and economic development, becoming the leading cause of mortality and morbidity in Western developed countries by the mid-20th century (Teo & Rafiq 2021).

According to the latest report from the Palestinian Ministry of Health, cardiovascular diseases had the highest percentage of significant causes of death in 2022, with 25.3% in the West Bank and 17.8% in the Gaza Strip and according to the last report, there are 11,586 nurses in the Gaza Strip and 12,001 nurses in the West Bank, totaling 23587 nurses in Palestine (Palestine MOH & Health Annual Report, 2022).

According to the World Health Organization, nurses are the framework of healthcare organizations; they work together as a team to deliver high-quality care for people, regardless of their traits and features, for all families, ages, and communities in all sites (WHO, 2022).

Nurses play a crucial role in managing cardiovascular disease by closely monitoring patients and initiating critical interventions like resuscitation when necessary. Competent and knowledgeable nurses are essential for healthcare organizations (Yaqoob et al. (2019).

The cardiac nurse assesses and cares for patients with cardiac issues, and the nurse's role in post-coronary intervention is like a "spider-in-the-web" nature, enabling them to handle cardiovascular emergencies like rhythm recognition, early defibrillation, and emergency medication administration., and other procedures, ensuring safe transport, administering medication, controlling bleeding, and maintaining hemostasis (Keshk & Elgazzar, 2018).CC is an invasive procedure used for diagnosing and treating patients with cardiac diseases. It provides both diagnostic evaluation and therapeutic intervention (Demir et al., 2017).CC may lead to complications such as infection, injury, pain, blood clots, and damage to the kidney (Hardin & Kaplow, 2019). CC risks are minimal, influenced by patient demographics, vascular anatomy, comorbidities, and operator experience, with significant complications of less than 1% and a mortality risk of 0.05% (Manda & Baradhi, 2023).

The distal transradial artery approach in the anatomical snuffbox may be used as an alternative site for radial artery puncture during cardiac catheterization (Lin et al., 2020).

The left DTRA, or "the snuffbox," is a growing topic in interventional cardiology. Introduced by Kiemeneij in 2017, it can be successfully accessed and cannulated in suitable candidates who maintain a comfortable hand position (Al-Azizi et al., 2019).

1.2 Problem Statement

Cardiac catheterization (CC)is crucial for diagnosing and treating heart conditions. However, there is a knowledge gap in cardiac nurses' practices regarding patient safety after CC, potentially compromising care quality; addressing these factors is essential for promoting safe and effective implementation of DTRA in CC procedures. CC is a valuable method for studying cardiac anatomy and examining heart diseases, but it can lead to fatal

complications. A study conducted in the United Arab Emirates found that 64.81% of cardiac nurses had moderate knowledge, 15.74% had adequate knowledge, and 19.44% had poor knowledge regarding patient safety after CC; the study also found that there was a significant association of knowledge and practice with age, job experience, and years of experience in the cardiac unit, the study recommended that administrative and nursing leaders should provide relevant educational seminars, offer a standardized protocol for caring of the patient in simulation labs, and assess the competency of newly staff nurses caring for patients after CC to ensure high-quality nursing care (Panicker, 2022).

Another study conducted in Egypt found that (45%) of the sample had a poor level of knowledge 32.5% had a good level of knowledge 22.5% had a fair level of knowledge. More than half (55%) of the sample had poor practice levels and (45%) had a good level of practice The study suggested that nurses should update their knowledge and skills through continuous education and training programs. It found that knowledge levels and practice improved with years of experience. The recommendations included standardized protocols and competency assessments for nursing care after cardiac catheterization (Henedy, El-Sayad, & science, 2019).

Another study conducted at the Punjab Institute of Cardiology Hospital in Lahore, Pakistan, assessed the knowledge and practice of registered nurses (RN) regarding patient safety after CC; the results showed that most nurses had good knowledge and poor practice about post-cardiac catheterization. (Feroze, Afzal, Sarwar, Galani, & Afshan, 2017).

1.3 Significance of Study

This study aimed to assess the knowledge and practices of cardiac nurses regarding patient safety after CC by (DTRA), a novel technique in CC, to improve patient safety and outcomes. The study addressed knowledge gaps in the existing literature, provided insights for targeted interventions, optimized patient outcomes, informed evidence-based practice, and supported continuous improvement; the research focused on assessing cardiac nurses' knowledge and practices of patient safety after CC by DTRA in a Palestinian hospital in the West Bank. The findings guided the development of standardized protocols, guidelines, and educational initiatives focused on patient safety after CC by DTRA. The study is justified by its potential to contribute new knowledge, inform evidence-based practices, and enhance patient safety and outcomes in the dynamic field of cardiovascular nursing.

This study regarding cardiac nurses' knowledge and practice toward patient safety after CC by DTRA was the first study conducted in Palestine on cardiac nurses in all hospitals that focused on essential aspects of patient care in the context of CC. The significance of this study is to improve patient safety after CC and to prevent minor and major complications associated with CC. The incidences of vascular access complications alone have been reported to be anywhere from 0.1% to 61%, depending on the definition of complications and covariates, including the type of procedure, anticoagulation, closure devices, age, sex, and comorbidities (Urden, Stacy, & Lough, 2017). Nurses are crucial in preventing, detecting, and managing vascular complications, which can lead to discomfort, prolonged hospital stays, and impaired outcomes in CC procedures (Ebeed, Khalil, & Ismaeel, 2017). so it is essential to comprehend the knowledge and practice of nurses, patient safety protocols can be enhanced by identifying areas for improvement, through an evaluation of nurses' skills

and knowledge, this study seeks to improve patient outcomes by lowering morbidity and death from problems related to CC, to enhance patient outcomes and direct treatments, the study looked at nurses' understanding of and adherence to safety procedures in post-catheterization care, in order to ensure that best practices are upheld, this study intended to provide tailored educational programs for cardiac nurses by identifying knowledge gaps and providing ongoing education, following CC, standardized standards for patient safety are crucial because they direct the creation of evidence-based procedures that enhance patient outcomes.

This study highlights the correlation between nurses' experience and knowledge, suggesting that healthcare leaders can customize training programs based on experience and provide support to novice nurses. In summary, this study contributes to the ongoing efforts to improve patient safety during and after CC. Addressing nurses' knowledge gaps and enhancing their practices to improve the level of hospital Measures.

1.4 Aim of the Study

The study aims to assess cardiac nurses' knowledge and practice regarding patient safety after CC by DTRA.

1.5 Objectives of the Study

- To assess cardiac nurses' knowledge and practice about patient safety after CC.

- To determine the relationship between the various nurses' socio-demographic characteristics and professional experience and their knowledge and practice about patients 'safety after CC
- To determine the relationship between hospitals' measures and practice among nurses regarding patients 'safety after CC.

1.6 Research Questions

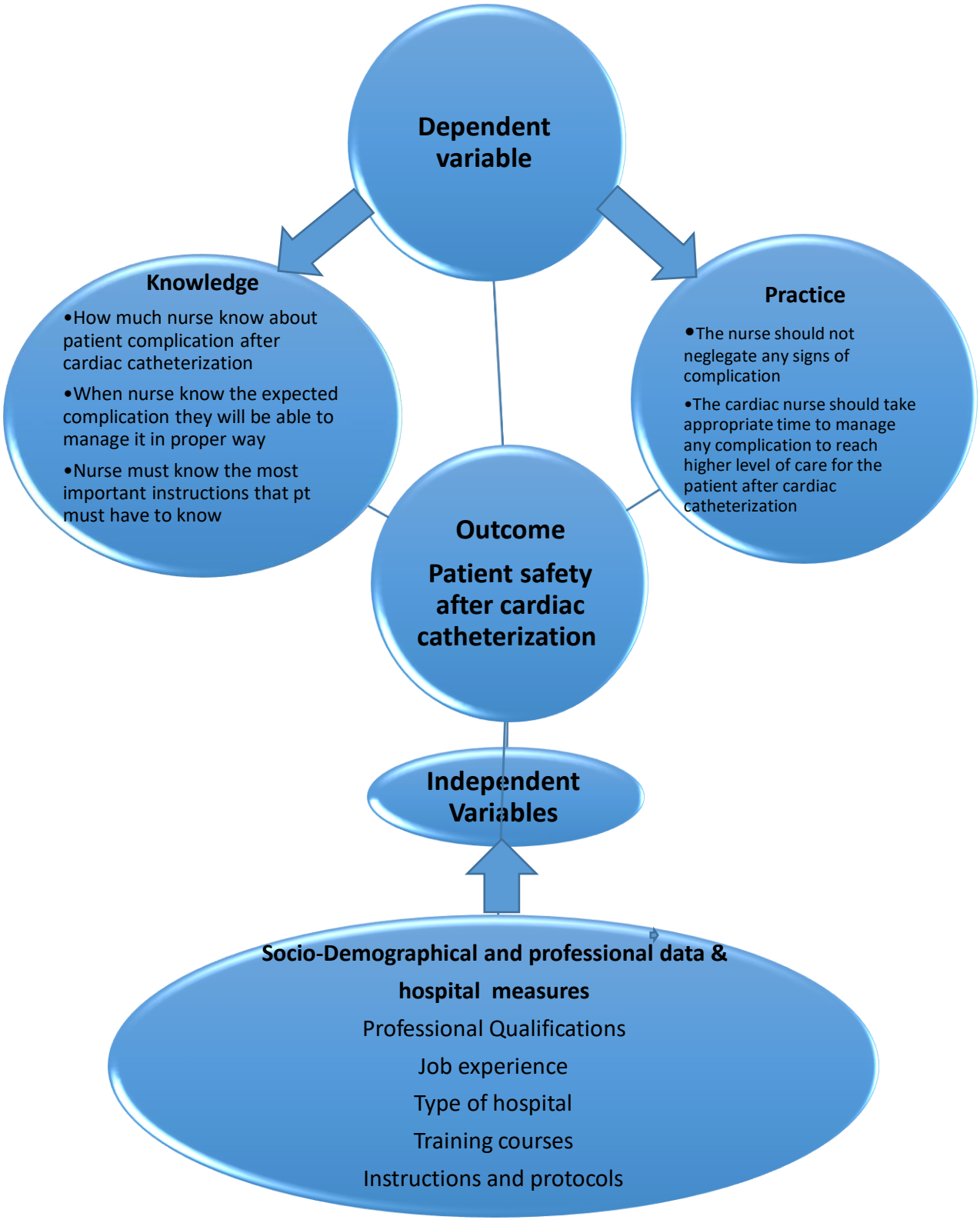
1. What is the level of hospital measures among cardiac nurses about patients' safety after CC?
2. What is the current level of knowledge among cardiac nurses regarding patient's safety after CC by DTRA?
3. What is the current level of practice among cardiac nurses regarding patient's safety after CC by DTRA?
4. Is there a significant difference between the cardiac nurses' socio-demographic characteristics example (age, gender, marital status,) and professional experience, and their knowledge and practice regarding patient's safety after CC by DTRA؟
5. What are the relationships between Nurses' knowledge, practice, and hospital measures scores among nurses about patients after CC?

1.7 Conceptual Framework

This study used Knowledge and practice as a research framework to explore cardiac nurses' knowledge and practices of patient safety after CC by DTRA. The outcomes of this

study could be used to develop strategies to improve nursing services at Palestinian hospitals.

The following figure



1.8 Study Variables

Dependent variables:

Knowledge: This noun refers to what is known through study or experience. The medical dictionary defines knowledge as familiarity, awareness, or understanding gained through experience or study (Adams, 2015).

Practice: Means doing something regularly or frequently to promote one's skill in some work. This study explores nursing practices through performance questions but not observation (Jemal et al., 2019).

Independent variables: Nurses' socio-demographic and professional data, such as professional qualifications and job experience, type of hospital, training courses, instructions and protocols, and hospital measures**.**

1.9 Operational Definitions

Knowledge: Nurses' knowledge measured by used a questionnaire Jawad Abu Sabha 2021 that used in a previous study, which is valid. A questionnaire was utilized to measure knowledge regarding the complications of CC, part two comprising 22 statements. Each statement corresponded to a potential complication or post-operative procedure, numbered from 1 to 22. Participants were asked to assess each statement as expressing a range of opinions, looking to articulate their level of agreement or disagreement The Participants were asked to answer (√) at their Squire of choice. The answer options were (strongly agree I agree, I do not know, Disagree, Disagree Hardly), which allowed for the evaluation of their understanding. The questionnaire covered various aspects, including clot

formation, serum creatinine levels, and the effects of radiographic dye on the kidneys. This method provided a comprehensive assessment of the participant's awareness and identified areas where further education might be necessary.

Practice: practice was evaluated by a questionnaire of Jawad Abu Sabha 2021 used the in a previous study, which is valid. A tool was utilized to measure the extent of nursing practice for patients after CC. The tool consisted of a questionnaire divided into sections, with the third section explicitly focusing on the frequency of certain practices. They were comprising 13 statements. Respondents were asked to rate how often they performed each practice on a scale from (strongly agree I agree, I do not know, Disagree, Disagree Hardly). For example, practice number 23 involved explaining post-operative care to the patient, while practice number 24 entailed monitoring the catheterization site for bleeding or hematoma. Each practice was assigned a number, and nurses could indicate their frequency of execution, providing a structured approach to assess the standard of care delivered to patients after cardiac procedures.

Chapter Two

Literature Review

2.1 Introduction

The research defined important terminology and characteristics to investigate the state of cardiac nursing practices and knowledge regarding patient safety after CC in hospital settings. For a literature review, use electronic resources like PubMed, UpToDate, Europe PubMed Central, and Health Inter-Network Access to Research Initiative in Health. These databases were searched for pertinent publications and journals. Cardiac nursing, patient safety, CC, nursing knowledge, nursing practice, quality of care, nurse intervention, practice errors, and safe care are used in research on cardiac nursing knowledge and practices related to patient safety following CC in a hospital context. The review's objectives in this chapter are to summarize the most important findings, point out any gaps, and advance knowledge of the best ways to guarantee patients' safety after cardiac

The Review of the Literature is Separated into Seven Parts:

1. Historical Context of CC
2. Complication & Patient Safety Concerns after CC
3. Cardiac Nurse Knowledge and Competence after CC
4. Best Practices After CC Care
5. Communication and Collaboration
6. Educational Initiatives for Cardiac Nursing
7. Conclusion

2.2 Historical Context of Cardiac Catheterization

This section provides a historical overview of CC, highlighting its evolution, significance, and increasing prevalence in modern healthcare. Explore how this procedure has become integral to diagnosing and treating cardiovascular conditions.

CC is a procedure that involves inserting a thin tube called a catheter into an artery or vein and guiding it to the heart. It can be used to diagnose or treat various heart conditions, such as coronary artery disease, heart valve problems, or heart defects (Panicker, 2022). It has a long and fascinating history, dating back to the 18th century when the first experiments were done on animals. It has a long and fascinating history, dating back to the 18th century when the first experiments were done on animals.

The development of CC started In 1733, by Stephen Hales measured a horse's blood pressure by inserting a brass rod in the femoral artery and connecting it to a glass tube(Felts, 1977).In 1844, Claude Bernard performed the first CC of a living animal (a horse) by entering the right and left ventricles from the jugular vein and carotid artery (Buzzi, 1959).In 1929, Werner Forssmann performed the first CC of a human (himself) by passing a catheter from his antecubital vein to his right atrium, using fluoroscopy to guide it (Mangieri et al., 2023).In 1941, André Cournand and Dickinson Richards developed the technique of right heart catheterization to measure pulmonary artery pressure and cardiac output. In 1956, they shared the Nobel Prize in Physiology or Medicine with Forssmann for their discoveries (Mangieri et al., 2023).In 1958, Mason Sones accidentally performed the first coronary angiography by injecting contrast into the coronary artery of a patient with angina. This led to the development of selective coronary catheterization and visualization of coronary artery disease (Ghandakly, Iacona, & Bakaeen, 2024).In 1959, Ross and Cope introduced the trans

septal catheterization technique, which allowed access to the left atrium and ventricle from the right atrium by puncturing the interatrial septum (Braghiroli & C. Ferreira, 2023).In 1964, Charles Dotter performed the first percutaneous transluminal angioplasty (PTA) by dilating a stenotic iliac artery with a catheter-mounted balloon. This paved the way for balloon catheters to treat coronary and peripheral artery disease (Linton, 2023).In 1977, Andreas Gruentzig performed the first percutaneous transluminal coronary angioplasty (PTCA) by inflating a balloon catheter in a narrowed coronary artery of a patient with angina. This revolutionized the treatment of coronary artery disease and reduced the need for coronary bypass surgery (Zeb et al.).In 1986, Ulrich Sigwart implanted the first coronary stent, a metal mesh device that acts as a scaffold to keep the artery open after balloon angioplasty. Stents have since become the standard of care for coronary interventions, reducing the risk of restenosis and improving clinical outcomes (Koźlik et al., 2023).In 2002, Alain Cribier performed the first trans catheter aortic valve implantation (TAVI), a minimally invasive procedure that replaces a diseased aortic valve with a bio prosthetic valve delivered by a catheter. TAVI has emerged as an alternative to surgical valve replacement for patients with severe aortic stenosis who are at high or prohibitive surgical risk (Agricola et al., 2023).

CC is a procedure that allows doctors to diagnose and treat heart problems by inserting a thin tube (catheter) into a blood vessel and guiding it to the heart (Powell et al., 2021).

According to some studies, the utilization of CC has increased over time in various populations, especially in patients with heart failure, acute coronary syndromes, or pulmonary hypertension. However (Manzi et al., 2024).

One study estimated that the annual rate of CC in the United States increased from 15.9 per 1000 patients in 2012 to 16.7 per 1000 patients in 2018, based on data from a national healthcare organization offering commercial and Medical care Advantage health plans. (Manzi et al., 2024) The study also found that catheterization utilization was significantly associated with older age, male sex, residence in a rural zip code, residence in a lower-income zip code, and residence in a state with a high obesity rate (Manzi et al., 2024).

Another study reported that the population rate of CC in Ontario, Canada, increased from 6.4 per 1000 patients in 1992 to 10.8 per 1000 patients in 2001, based on data from the provincial health insurance plan (Clement, Ghali, Rinfret, Manns, & Research, 2011).

These studies indicate that CC is a widely used and valuable tool in modern healthcare, but its utilization may vary depending on the context and the criteria. Therefore, it is essential to monitor the trends and outcomes of CC in different populations and settings and to optimize its use according to the best available evidence and guidelines.

CC is crucial for diagnosing and treating cardiovascular conditions by examining the heart and blood vessels using X-rays and contrast dye; angioplasty and stenting improve blood flow and reduce heart attack risk. Measurement of pressure and oxygen levels helps monitor conditions like heart failure and congenital heart defects (AHA, 2023).

2.3 Complication & Patient Safety Concerns after Cardiac Catheterization

This part addresses patient safety concerns specific to CC, explores potential complications, adverse events, and the importance of vigilant nursing practices in mitigating risks, and highlights studies that have investigated the impact of nursing interventions on patient safety outcomes.

Throughout the 1960s and 1970s, CC was primarily a diagnostic procedure that was used to evaluate hemodynamics, ventricular function, and coronary anatomy, Although diagnostic catheterization and percutaneous coronary intervention(PCI) are done by percutaneous puncture rather than incision, and under local rather than general anesthesia, they can cause a variety of adverse events, ranging from minor problems without long-term sequelae to major complications requiring immediate corrective action. The risk of death from diagnostic CC is shallow, less than 0.1%. Most of the deaths are not directly related to the procedure but to other factors such as acute illness, cardiogenic shock, septic shock, cardiac arrhythmia, or post-surgical complications. The risk of stroke is also very low, around 0.07%. The risk of pericardial effusion or tamponade is also very low, around 0.04%. PCI or bypass surgery is a procedure that is performed to restore blood flow to the heart muscle when there is a significant narrowing or blockage of a coronary artery. It can be done after CC, especially if there is an iatrogenic coronary dissection that a stent or a balloon cannot treat. The risk of needing PCI or bypass surgery is also very low, around 0.06% (Carrozza, 2012).

The post-catheterization check is crucial for assessing the catheterization site for signs of bleeding, pseudo aneurysm, arteriovenous fistula, or vascular compromise. Factors like advanced age, female gender, low BMI, and anticoagulants increase the risk of local bleeding, and Fluoroscopy reduces complications (Kalyanasundaram & Shishehbor, 2010).

Patient safety reduces the risk of unnecessary harm associated with health care to an acceptable minimum. An adequate minimum refers to the collective notions of current knowledge, resources available, and the context in which care was delivered, weighed against the risk of non-treatment or alternative treatment (Slawomirski, Auraaen, & Klazinga, 2017).

CC is generally a safe procedure, but some possible risks include bleeding, infection, contrast reaction, vascular injury, arrhythmia, stroke, and myocardial infarction (Cahill, Clarke, Simpson, & Stables, 2015).

CC is a procedure that inserts a catheter into a blood vessel to diagnose or treat heart conditions like coronary artery disease, heart valve disease, or arrhythmias; however, it carries risks such as minor bleeding, infection, side effects, abnormal heart rhythm, blood clots, damage to the heart, heart attacks, and side effects from X-rays (AHA, 2023).

The safety checklist originated after the Boeing Model 299 crashed during its inaugural test flight in 1935 due to a pilot error, since then, safety checklists have been adopted across various domains, including aviation and healthcare ,in the UK, a systematic study of a healthcare checklist was conducted in 2004, The implementation of a care bundle, which included a checklist, significantly reduced central line infections in the intensive care unit, the design of patient safety checklists aims to incorporate relevant safety steps while allowing flexibility in content and operation , When adequately implemented, checklists can foster effective team communication and enhance patient safety, However, challenges related to implementation and compliance persist ,It is crucial to recognize the importance of human factors in health care settings and realize the potential benefits of safety checklists and team briefings , in summary, safety checklists play a vital role in promoting patient safety, but overcoming implementation challenges and emphasizing human factors remain essential (Cahill et al., 2015).

2.4 Nursing Knowledge and Competence

This section focuses on cardiac nursing knowledge and competence in after CC care. It identifies studies that assess nurses' understanding of procedural risks, recognition of complications, and adherence to safety protocols.

Mahmood, Ibrahim, Hassan, and Abdulgani (2021) evaluated the after CC patient care knowledge of 110 nurses working at Mosul Hospital. The data was gathered using a questionnaire primarily focused on skill, general knowledge, and demographic data. The findings indicated that age and awareness of complications were significantly correlated, but no significant correlation was found between gender, years of service, education level, or experience; the investigation concluded that although the sample percentage is high, the outcomes are unacceptable.

(Hussein, Dawood, & Mohammed, 2022) conducted a study that examined the knowledge and practice of 30 nurses at Al-Sader Teaching Hospital in Basra City regarding patient safety following CC. Most nurses, 86.6% females, had 1-10 years of experience. The study suggests implementing educational training programs, focusing on CC and patient safety, and establishing postgraduate studies specializing in CC nursing.

(Henedy et al., 2019) conducted a study that assessed cardiac nurses' knowledge and practice regarding patient safety after CC. The results showed that nurses with more than five years of experience had better practice scores, and baccalaureate nurses had higher knowledge scores. The study recommends that administrative and nursing leaders provide educational seminars, offer standardized protocols, and assess newly trained nurses for high-quality nursing care.

(Jabr, Taha, & Metwally, 2022) A study evaluated cardiac nurses' after CC patient safety knowledge and practices. The findings indicated that practice scores were higher for nurses with over five years of experience, and the knowledge scores of baccalaureate nurses were higher than those of diploma and technical institute nurses. According to the report, nursing and administrative executives should conduct educational seminars.

(Panicker, 2022) A study conducted on 108 United Arab Emirates cardiac nurses found that 64.81% had moderate knowledge, 15.74% had adequate knowledge, and 19.44% had poor knowledge. Age, job experience, and years in the cardiac unit were significant factors affecting knowledge, but not gender or qualification.

2.5 Best Practices in Post-Catheterization Care

This section reviewed literature that identifies and promotes best practices after CC nursing care, explores evidence-based guidelines, protocols, and interventions to optimize patient safety outcomes, and considers studies evaluating specific nursing interventions' effectiveness in preventing complications.

CC is a procedure that involves inserting a catheter into a vein or artery, usually from the groin or neck, and guiding it to the heart (Portal, 2020).

After CC nursing care is essential to ensure patient safety and avoid problems such as bleeding, hematoma, infection, arrhythmia, or contrast nephropathy. Assessing the patient's medical history, giving prescriptions, keeping an eye out for symptoms, using compression devices, immobilizing the injured leg, and giving instructions to the patient and their family for post-catheterization care and discharge management are all examples of best practices (Naidu et al., 2021).

Several studies indicate that some nursing measures can minimize or avoid problems during CC. These measures include patient education, infection prevention techniques, standardized protocols, risk assessment tools, and innovative technologies. These strategies lower bleeding, encourage medication adherence and self-care, and guarantee consistent care delivery (Henedy et al., 2019).

(Bangalore et al., 2021) Avoid using nonemergency magnetic resonance imaging examination in the 4 to 6 weeks after stent implantation. MRI affects ferromagnetic materials via attraction, creating the potential for a projectile effect or the potential to move in space; in addition, ferromagnetic materials may act as antennae for the pulsed radiofrequency energy used during MRI and heat, creating the potential for local thermal damage and vascular injury or disruption of the stent coatings (polymeric coatings or drug components of drug-eluting stents.

(AHA, 2023) published post-procedure evidence-based best practices that Accelerated intravenous corticosteroids are effective alternatives to extended oral corticosteroid prophylaxis in patients with contrast allergy; Alternative access should be considered for patients (e.g., access using the dominant radial artery, distal transradial artery, ulnar artery, or femoral artery).

(Rao et al., 2021) patients with uncomplicated PCI procedures should be considered for same-day discharge after four or more hours of monitoring; consensus documents guide patient selection and readiness for discharge.

(Elgazzar, 2018) used quasi experimental research investigating the effects of creating guidelines for nurses on the protection of CC patients, by choosing sample of 51 nurse was working at CC Care unit, CCU and ER, Departments ,the researcher used 2 tools,

the first one about nurse's knowledge about patients' safety after CC and socio demographic data, the second tool was nursing care for patients' after CC ,research results showed that most of nurses have highly performance and satisfactory knowledge related to patients' safety for CC after implementing the learning guidelines than pre learning ,which reflected positive correlation between nurse's qualification, experience and knowledge after learning guidelines with significant difference regarding experience ,and a strong positive link between the performance of the studied nurses and their qualifications with respect to the application of the post-learning guidelines ,finally, in post-learning guideline implementation, a strong link between performance and patient safety knowledge , which can be concluded as learning guidelines improved nurse's knowledge, performance and care of patients' after CC.

A very interesting study was conducted by (Rolley, Salamonson, Dennison, & Davidson, 2010) on nursing care practices following a PCI. In an integrative literature review and current clinical recommendations, the researcher explains the priority of treatment and practice for cardiac nurses. The researcher applied a 116-item web-based survey of cardiovascular nurses using email lists of experienced cardiovascular nursing organizations and a safe online data collection system. 148 respondents entering the study, all respondents were (RN) with an average of 12.3 years of experience in the nursing job; psychosocial treatment has low priority over other activities, such as ambulation time following PCI, sheath removal procedures, pain management, and patient positioning, respondents considered. Moreover, they need to gain knowledge of psychosocial care. The survey identified several patterns of practice and a range of educational needs.

2.6 Communication and Collaboration

Examine research emphasizing the importance of communication and collaboration among healthcare teams in ensuring patient safety after CC. Investigate how effective interdisciplinary communication contributes to the timely identification and management of potential issues.

Communication and collaboration among healthcare teams are essential for providing quality and safe care to patients, especially after complex procedures such as CC; according to the literature, communication errors and human failures are considered the primary source of patient harm, using standardized tools and protocols to ensure clear and accurate information transfer, encouraging feedback and learning from errors (Schnipper, Fitall, Hall, Gale, & March, 2021).

Therefore, team training focusing on communication and creating psychologically safe environments is required. This can facilitate challenging communication and teamwork scenarios, prevent patient safety risks, and increase team performance perception (Dietl, Derksen, Keller, & Lippke, 2023).

Effective interdisciplinary communication can contribute to the timely identification and management of potential issues by Making Team Members aware of the professional roles and responsibilities of other team members, Communicating effectively with patients, families, and other healthcare professionals, and Building relationships to plan, implement, and evaluate safe care (Jakubowski & Perron, 2018).

Some of the communication interventions that have been shown to improve patient safety and quality of care are Situation, Background, Assessment, and Recommendation (SBAR). This structured communication technique helps to clarify and organize information

during handoff, Debriefing, a process of reflecting and discussing what went well and what can be improved after a clinical event or simulation, a rapid response team, a multidisciplinary team that any staff member can activate to respond to deteriorating patients and provide immediate assessment and treatment (Schnipper et al., 2021).

2.7 Educational Initiatives for Cardiac Nursing

This section explored the literature on educational programs and initiatives designed to enhance cardiac nursing knowledge and skills and identify studies assessing the impact of continuing education, simulation training, and competency-based programs on nurses' ability to provide safe and effective post-catheterization care.

Cardiac nursing is a specialized field that requires advanced knowledge and skills to provide high-quality care for patients with cardiovascular diseases and conditions

educational programs and initiatives for cardiac nursing aim to enhance the competency, confidence, and performance of nurses in various settings, such as acute care, critical care, primary care, and prevention (Fitzsimons et al., 2021).

The Cardiovascular Nursing Education Associates (CNEA) offers online courses, live educational events, and organizational training solutions for cardiac and acute and critical care nurses (CNEA, 2024).

The Preventive Cardiovascular Nurses Association (PCNA) provides online learning, webinars, symposiums, and local programs for nurses who specialize in cardiovascular risk reduction and disease management (PCNA, 2024).

The Board of Certification for Emergency Nursing (BCEN) offers online cardiovascular training courses for nurses who work in emergency settings (BCEN, 2023).

The National Heart, Lung, and Blood Institute (NHLBI) develops health education and awareness programs to improve public health and prevent and treat heart, lung, blood, and sleep diseases and disorders (NHLBI, 2022).

Some of the studies that have evaluated the effectiveness and outcomes of educational programs and initiatives for cardiac nursing are: A survey that examined the varied role, scope of practice, and education of cardiovascular nurses in European Society of Cardiology(ESC)-affiliated countries and found that there was a demand for further education and training in specific areas, such as acute care and prevention of cardiovascular disease ,the study concluded that there is a 7% increase in 30-day mortality for each increase in a nurse's workload by one patient, but this mortality is decreased when a hospital has a more significant proportion of bachelor-prepared nurses ,in hospitals where 60% of the nurses are bachelor degree trained, and where nurses are caring for no more than six patients on average, there is a 30% reduction in mortality compared to hospitals where only 30% of nurses had bachelor's degrees and cared for an average of eight patients ,barriers to the professional development of nurses include costs of training, travel, and time away from work, according to an online survey of 672 nurses based in the USA (Fitzsimons et al., 2021).

A randomized controlled trial of the effectiveness of a blended learning program for CC nurses, this study compared the effects of a blended learning program (consisting of e-learning and face-to-face sessions) with a traditional lecture-based program on the knowledge, attitude, and self-efficacy of CC nurses, the results showed that the blended learning group had significantly higher scores on knowledge, attitude, and self-efficacy than the lecture group and that the blended learning program was well received by the participants (Watkins & simulation, 2020).

A Meta-Analysis Study Simulation-Based Learning in Higher Education examined the effect of a competency-based education program (consisting of lectures, case studies, skill demonstrations, and simulations) on the knowledge, skills, and attitudes of nurses working in the cardiac intensive care unit; the results showed that the competency-based education group had significantly higher scores on knowledge, skills, and attitudes than the control group and that the competency-based education program was feasible and acceptable for the nurses (Chernikova et al., 2020).

A study by (Hamed et al. (2023) implemented a patient safety educational program for 40 nurses working in CC units in Egypt. The program aimed to improve nurses' performance for patients after CC. The results showed a significant improvement in nurses' total knowledge and performance scores in the post-program and follow-up phases compared to the pre-program phase.

A study by (Jabr et al., 2022) evaluated the impact of an educational intervention on nurses' knowledge and practice of after CC care for 50 nurses working in a university hospital in Egypt; the intervention consisted of lectures, demonstrations, and practical sessions on topics such as indications, contraindications, complications, and nursing care of after CC patients, the results indicated a significant improvement in nurses' knowledge and practice scores after the intervention.

2.8 Conclusion

Summarize the key findings from the literature review, emphasizing the current state of knowledge and practices in cardiac nursing related to patient safety after CC, identify gaps or areas requiring further investigation, and set the stage for the subsequent chapters of your

thesis or dissertation**.** An updated study found a positive relationship between the knowledge and practice of cardiac nurses regarding patient safety following CC**;** the study emphasized that nurses with the necessary knowledge and experience can assist in inpatient rehabilitation (Hussein et al., 2022).

Chapter Three

Methodology

3.1 Introduction

This chapter illustrated the study's research methodology, including the research design, setting, population, sampling technique, sample size, inclusion and exclusion criteria, data collection tools, validity and reliability, ethical considerations, and data analysis methods.

3.2 Study Design

The study design is a quantitative, cross-sectional, descriptive study design used to achieve the aim of the study. This design is appropriate to this study because Quantitative research involves collecting numerical data and analyzing it to understand relationships and trends. Quantitative analysis and cross-sectional design can help answer research questions related to socioeconomic factors, health conditions, and public perceptions of social issues. Cross-sectional studies provide a population snapshot at a specific moment, assessing prevalence and correlations. Descriptive studies collect data without manipulating variables, focusing on social attitudes or behaviors. Combining quantitative analysis, cross-sectional design, and a descriptive study approach can be suitable for specific research questions, such as health condition prevalence, demographic factors, or public opinion. Quantitative research has advantages but can sometimes be insufficient in explaining complex topics due to superficiality, narrow focus, structural bias, and lack of context. Precision in operational definitions may not adequately represent complex concepts, and standardized procedures

may lead to incorrect conclusions. Additionally, it may overlook historical and cultural contexts (Bhandari, P. ,2023**).**

3.3 Study Setting

After receiving ethical approval from the following hospitals, the study was carried out from November 2023 to March 2024 at a total of 11 hospitals located throughout the Palestinian Southern, Central, and Northern West Bank. which are spread around different cities and which offer CC patients health services and nursing care., the study included nongovernmental hospitals such as AL-Ahli and Al-Mizan hospitals. In Bethlehem City, the Bethlehem Arab Society for Rehabilitation Hospital was part of the study. In Ramallah City, the Istishari Arab Hospital was included. In Nablus City, the Alnajah National University Hospital, Specialized Arab Hospital, and Nablus Specialized Hospital were part of the study. In Jenin City, Ibn Sina Specialized Hospital and Alrazi Hospital were included. The governmental hospitals included in the study were Hebron Government Hospital in Hebron City and the Palestinian Medical Complex in Ramallah City.

3.4 Study Population

The target population refers to the entire group of individuals or elements to whom the research findings are intended to apply. This population encompasses all possible participants who meet the criteria defined by the research objectives. Reasons for Selecting the target population relevance to research objectives and potential impact by selecting a broad and appropriate target population, the findings can be generalized to a larger group, enhancing the study's impact and applicability and certain research questions are relevant to

populations with specific characteristics (e.g., age, gender, profession), making it necessary to define the target population accordingly. Reasons for selecting the accessible population is feasibility and logistical constraints and sampling accessible population allows for a manageable sample size, which is essential for conducting thorough and reliable research. It ensures that data collection and analysis are feasible within the study's scope. Because there is no data about the number of cardiac nurses working in CC units in Palestine, the researcher visited and contacted 11 hospitals. The total population includes 250 nurses distributed in all cardiac departments in Palestinian governmental and nongovernmental hospitals holding a diploma, baccalaureate, High diploma master, or doctorate.

3.5 Study Sample

This study used a non-probability sampling technique, specifically a convenience sample method, to select cardiac nurses who were easily accessible and readily available for inclusion. This approach is often used for its simplicity and accessibility, especially when time and resources are limited (Nikolopoulou, K,2023).

3.6 Sample Size

In determining the appropriate sample size for this study, several critical parameters considered. The total population size was identified as 250 cardiac nurses. To achieve statistically significant results, a sample size of 152 was selected. This decision was based on the need for a 95% confidence level, corresponding to a Z-score of 1.96, which is a standard choice for social sciences research. Additionally, we adopted a conservative estimate for the

population proportion at 50% to ensure a robust sample size calculation. The margin of error, calculated at approximately 4.98%, was deemed acceptable for the scope of this study. This margin allows for a reasonable degree of accuracy while maintaining feasibility in terms of data collection efforts. These parameters collectively ensure that the sample size is both statistically valid and practically manageable, providing a solid foundation for the subsequent analysis. The study sample was distributed among governmental and nongovernmental hospitals in Palestine.

3.7 Inclusion Criteria

1. who have at least two years of general nursing diploma.
2. Full-time employee.
3. Nurses with at least six months of experience dealing with Cardiac patients.

3.8 Exclusion Criteria

1. Nurses not registered with the Palestinian Nursing and Midwifery Association.
2. RN working in the non-cardiac Intensive Care Unit.

3.9 Data Collection of the Study

Data were collected using an electronic Google form questionnaire after obtaining the approval of the Ministry of Health, non-government hospitals, and Arab American University ethical boards. However, the researcher visited and met the administration hospitals and cardiac nurses on the morning shift to increase awareness and encourage participants as much as possible, and distributed electronic questionnaires to all nurses working at cardiac

departments, the questionnaire took to fill out about 5-7 minutes. Jawad Abu Sabha 2021 from Palestine used the questionnaire in a previous study at Arab American University, which is valid. The questionnaire consists of three parts:

Part 1. This section contains 33 questions that gather general demographic information and level of hospitals measures. The questions cover:

- General demographics: gender, age, marital status, and qualifications.
- Professional details: current position, type of hospital, monthly salary, and current department.
- Cardiac care specifics: availability of continuous courses for cardiac care at the institution, participation in such courses, the last course attended, years of experience in nursing, years of experience in cardiac care departments, and years of experience in the current department.
- Department-specific information for cardiac nurses.

Part 2. This section contains 22 questions to assess nurses' Knowledge of CC and its complications, along with other instructions that should be explained to patients. The Participants were asked to answer (√) at their Squire of choice. The answer options were strongly agreed, agree, Neutral, Strongly Disagree, and strongly Disagree.

Part 3. This section includes 13 questions designed to evaluate nurses' practices regarding patient safety after cardiac catheterization (CC). Nurses were instructed to mark their responses with a check (√). The answer options ranged from Strongly Agree, Agree, Neutral, Disagree, to Strongly Disagree.

3.10 Validity and Reliability of the Tool

The questionnaire, initially developed underwent a rigorous validation and reliability assessment process by Jawad Abu Sabha in 2021 graduated from Arab American University(AAUP) as critical care nurse, to ensure its validity, the questionnaire was reviewed by four academic nursing doctors and research experts. These experts provided detailed feedback on various aspects of the questionnaire, including its clarity, relevance, and comprehensiveness. Based on their comments, necessary modifications were made to improve the overall quality and effectiveness of the questionnaire.

In addition to expert validation, the internal consistency reliability of the questionnaire was evaluated using Cronbach's alpha coefficient. This statistical measure confirmed that the questionnaire items had a high level of consistency, indicating that the instrument is reliable for research purposes.

3.11 Analyzing Method

Data was analyzed using "Statistical Package for Social Sciences" (SPSS version 24). After question coding and purification. The study extensively checked the data for coding and input errors to avoid contradictions. The mean, median, and standard deviation were used to depict numerical data. Quantitative data were frequencies and percentages. Encoding the questionnaire, entering the data, checking data quality, and building frequency tables for all study variables, knowledge, practice, and hospital measure scores of different persons according to demographic characteristics were compared with an independent-sample t-test. A p-value of less than 0.05 indicates a significant difference and is compared using one-way

ANOVA. the researcher used frequencies and descriptive summaries for statistical analysis of questionnaire data.

3.12 points of the Likert Scale

A Likert scale is a rating scale that allows respondents to express their level of agreement, frequency, importance, quality, or likelihood with a statement or a question. It usually consists of five or seven points, ranging from strongly agree to strongly disagree, or always to never, very important to unimportant, and so on. Each point is assigned a numerical value, such as 1 to 5 or 1 to 7, to measure the intensity or strength of the response (Pritha & Nikolopoulou, 2023).

The purpose of adding information about a Likert scale in research or surveys is to gauge respondents' attitudes, perceptions, or opinions on specific statements or questions. By providing a range of responses from, for example, "strongly agree" to "strongly disagree," researchers can quantitatively measure the degree of consensus or divergence among participants. This method helps in understanding the distribution of opinions and allows for statistical analysis to derive meaningful insights from the data collected.

Table 3. Points of Likert scale

Very high	High	Moderate	Low	Very low
5	4	3	2	1

3.13 Ethical Considerations

The research was granted permission to be conducted in the cardiac departments of the Palestinian Southern, Central, and Northern West Bank governmental hospitals by the Palestinian Ministry of Health, the ethical board of nursing faculty in the AAUP, and the administration of the nongovernmental approval hospitals. Participants gave the researcher their verbal agreement before any data were collected. All participants provided informed consent before completing the online electronic questionnaire. The consent form explained the goals, methods, risks, benefits, and voluntary nature of the study. Participants had the choice to withdraw from the study at any time without consequences. The study ensured confidentiality and privacy for all participants. Personal or identifying information, such as names, email addresses, or IP addresses, was not collected during the survey.

The data was securely stored on a server accessible exclusively to the researcher and supervisor, ensuring participants' privacy. Data was anonymized and aggregated for analysis and reporting, adhering to a strict non-discrimination policy. The study utilized suitable statistical methods to mitigate potential confounding variables or biases. Participants were assured that their information would remain confidential and solely used for research purposes. This study upheld ethical research standards, prioritizing participant contributions and respecting their rights and privacy.

Chapter Four

Results of the Study

4.1 Introduction

Cardiac catheterization (CC) plays a crucial role in diagnosing and treating cardiovascular conditions. Understanding the knowledge and practices of cardiac nurses, as well as hospital measures for patient safety following CC, is essential for optimizing patient outcomes. This study aimed to investigate these aspects, addressing several key research questions. Specifically, it explored the depth of cardiac nurses' knowledge and their implementation of best practices post-CC. Additionally, it examined hospital protocols and safety measures designed to enhance patient care and minimize risks post-procedure by illuminating these areas, this study contributes valuable insights into improving cardiac care quality and patient safety in clinical settings, this chapter answered research questions.

4.2 Socio-Demographic and Professional Data of Participants and Level of Hospital Measures for Patients' Safety

4.2.1 Socio-Demographic Characteristics of Participants

Several systematic steps were undertaken to determine the total number of distributed questionnaires for this study. Initially planning involved deciding the desired sample size based on the study's objectives, statistical considerations, and confidence level. Following this, a sampling approach, such as a non-probability sampling technique, specifically a convenience sample method, was chosen to identify eligible participants or hospitals to receive the questionnaires. Subsequently, the questionnaires were distributed to these

selected entities electronically. Throughout this process, meticulous tracking of distributed questionnaires was maintained to ensure accuracy in data collection. Verification procedures were then implemented to double-check that the actual count of distributed questionnaires matched the initially planned sample size and distribution strategy. Finally, it was crucial to meticulously document the total number of questionnaires distributed, detailing any adjustments made or reasons for discrepancies encountered during distribution. Adhering to these steps rigorously ensured precise recording and appropriate reporting of the total number of distributed questionnaires in the methodology section of the study.

During the main study, n= 250 electronic questionnaires were distributed, and n= 152 participants completed the questionnaires, with a response rate of 95%. According to Table 4.1, most participants were male 73%, while 27 % were female. The majority of nurses were between the 36 to 40 years' age group, 30.3%, followed by the 26 to 30 age group, 24.3%, then the 31 to 35 age group, 24.3 %, and lastly, above 44 years old, 6.6%. The majority of participants are married, 81.6%. Most nurses have a bachelor's degree (48%), while a diploma (24.3%). Most nurses are RN, 55.3%, while qualified nurses 17.1%. Although most cardiac nurses worked at Non-governmental hospitals, 73.7 %, 26.32% in a governmental hospital; moreover, 44.7% of the nurses worked in a cardiac care unit. Most nurses' salaries were between 3000 and 4000 shekels, and only 20.4% were above 5000 shekels.

Table 4.1: Socio-Demographic Characteristics of Participants (n=152)

	Variable	**Sub variable**	**N**	**(%)**
1	Gender	Male	111	73
		Female	41	27
2	Nurses age	21 – 25 years	15	9.9
		26- 30 years	37	24.3
		31 – 35 years	36	23.7
		36 – 40 years	46	30.3
		41- 45 years	8	5.3
		More than 45 years	10	6.6
3	Marital status	Single	28	18.4
		Married	124	81.6
4	Qualification	Diploma	30	19.7
		Bachelors	73	48
		High diploma	12	7.9
		Master	37	24.3
5	Current position	Qualified Nurse	33	21.7
		Registered Nurse	97	63.8
		Head Nurse Assistant	11	7.0
		Head Nurse	11	7.0
6	Type of the Hospital	Governmental	36	23.7
		Non-governmental/National	23	15.1
		Private	93	61.2
7	Monthly salary	less than 3000	7	4.6
		3000-4000	69	45.4
		4000-5000	45	29.6
		more than 5000	31	20.4
8	Department you worked in	Emergency	14	9.2
		Cardiac care	68	44.7
		Intensive care	44	28.9
		CC	14	9.2
		Others	12	7.9

4.2.2 Professional Data of Cardiac Nurses

The study, as reflected in Table 4.2 provides a comprehensive analysis of institutional resources, training experiences, and professional characteristics among 152 cardiac nurses, offering valuable insights into their professional development and departmental environments. A significant majority (78.3%) of nurses reported access to continuous courses for cardiac care, highlighting a strong commitment to ongoing education and skill enhancement in cardiac nursing. Moreover, two-thirds (66.4%) of nurses actively participated in these courses, indicating substantial uptake in training opportunities, though a minority did not engage in such initiatives. Nearly all nurses (98%) affirmed the availability of ECG sheets at all times, underscoring their critical role in effective cardiac monitoring and patient care. Statistical measures revealed an average of 11.22 years of overall nursing experience among nurses, with specialized experience in cardiac care averaging 4.92 years. The stable tenure of 4.98 years in current departments suggests familiarity with protocols and patient populations. In patient care, nurses reported managing an average of 1.81 patients with complications after cardiac catheterization in the past month, alongside 9.58 patients experiencing complications post-catheterization, highlighting the challenges of cardiac procedures. Departments were equipped with essential resources, including beds (average of 14.62), cardiac monitors (average of 10.79), and ECG machines (average of 1.97), crucial for maintaining high standards of care despite potential variations in resource availability impacting workflow. Training participation analysis indicated consistent interest among nurses, with significant participation in cardiac care courses in recent years, reflecting a proactive approach to professional development. These findings underscore the importance

of ongoing education and resource availability in supporting cardiac nurses' professional growth and optimizing patient outcomes in specialized healthcare settings.

Table 4.2: Professional data of cardiac nurses (n=152)

No.	Question	No (%)	Yes (%)
9	Does your hospital have continuous courses for cardiac care?	119 (78.3%)	33 (21.7%)
10	Have you participated in cardiac care courses?	51 (33.6%)	101 (66.4%)
11	Does the department where you work have ECG sheets available all the time?	3 (2%)	149 (98%)

No.	Question	Min	Max	Mean	SD
12	The number of years of experience in the nursing profession	1	27	11.22	6.44
13	The number of years of experience in cardiac care departments	1	15	4.92	4.42
14	The number of years of experience in the department you are currently working in is	1	16	4.98	3.70
15	The number of patients with complications after CC and under your responsibility during the past month	0	33	1.81	4.16
16	The number of patients who had complications after performing CC	0	30	9.58	3.25
17	The number of beds in the department in which you work in	0	33	14.62	8.61
18	The number of cardiac monitors in the department you work in	0	32	10.79	8.23
19	The number of ECG machines in your department	0	5	1.97	0.90

No.	Question	Less than one year (%)	1-3 years (%)	4-5 years (%)
20	When did you participate in cardiac care courses?	61 (40.1%)	47 (30.9%)	44 (28.9%)

4.2.3 Level of Hospital Measures among Cardiac Nurses about Patients' Safety after CC.

The following Table 4.3 results answered research question number (1) What is the level of hospital measures among cardiac nurses about patients' safety after CC? The result was intermediate determined by assigning the categories to establish a clear and systematic approach to categorizing the mean scores into different levels (e.g., low, intermediate, high). This process typically involves defining cutoff points for each level based on the distribution of the mean scores. Through these steps.

First, identify the range of mean scores by determining the minimum and maximum scores in your data set. Next, establish cutoff points that separate the different levels. For example, a mean score of ≤ 2.33 would be categorized as low, a mean score between 2.34 and 3.66 as intermediate, and a mean score of ≥ 3.67 as high. These cutoff points are illustrative and should be adjusted according to the distribution and spread of your data. Finally, assign each mean score to the corresponding level based on the defined cutoff points.

For instance, if the mean scores between 2.34 and 3.66 were categorized as "intermediate," this would explain why certain items, such as 7, 8, and 13, were labeled as "intermediate." Here's a suggested set of cutoff points for illustration: Low: Mean score $\leq$ 2.33, Intermediate: $2.34 \leq$ Mean score ≤ 3.66, High: Mean score ≥ 3.67. here, the means and the standard deviations were calculated according to the dimensions of nurses' Hospital

measures about patients' safety after CC, as shown in According to table 4.3 the mean score of nurses' hospital measures about patient safety after CC is at an intermediate level between (2.55 – and 3.67). Most nurses strongly agreed about nurse hospital measures item Number 13, which has a high mean (3.67±1.03). Moreover, the participants agree with item Number 4, which also has an intermediate mean of 2.55 ± 1.08 .

The results from Table 4.3 evaluated hospital measures concerning patient safety post-cardiac catheterization (CC), the total mean score was 3.13(S=0.83 illustrate the perceptions of cardiac nurses regarding Hospital measures. The highest mean score was observed for the statement affirming the sufficiency of policies, standards, and systems of cardiac care to protect patients after operations, with a mean score of 3.67 (SD = 1.03). Following closely, the head of the department's consistent follow-up on the condition of the patient's post-CC operations received a mean score of 3.66 (SD = 1.04). Personal protective equipment availability was rated at 3.59 (SD = 1.01), indicating confidence in hospital resources. Conversely, lower mean scores were reported for aspects such as continuous education provision (mean = 2.55, SD = 1.08) and monitoring of nurses' knowledge by hospital administrators (mean = 2.98, SD = 1.11). These scores provide a nuanced view of perceived strengths and areas for improvement in hospital protocols related to patient safety post-CC. These findings collectively suggest areas where hospital enhancements could further optimize after CC patient care and nursing practices.

Table 4.3: Mean and Standard Deviation of The Sample Respondents for The Nurses' Hospital Measures About After CC

No	Hospital measures	Mean	SD	level
1.	hospital administrators and observers monitor the extent of nurses' knowledge of cardiac care	2.98	1.11	Intermediate
2.	Nurses participate in courses/workshops about CC and possible complications	2.63	1.08	Intermediate
3.	A committee in the hospital monitors and follows up on the nurses' work in dealing with patients before and after the operation	2.85	1.24	Intermediate
4.	The Department of Continuing Education is responsible for running continuous cardiac care courses in my hospital.	2.55	1.08	Intermediate
5.	This hospital is well prepared in terms of knowledge, training, and equipment necessary to take care of patients after CC	3.22	1.28	Intermediate
6.	There is a special form for patients before and after they undergo CC operations	3.25	1.38	Intermediate
7.	Personal protective equipment needed to handle patients is available in the hospital at all times.	3.59	1.01	Intermediate
8.	The head of the department follows up on the condition of all patients who undergo CC operations	3.66	1.04	Intermediate
9.	A nurse who cares for a CC patient with complications will write an incident report and submit it to the administration.	3.12	1.35	Intermediate
10.	There is periodic monitoring of the files of patients after CC by the Quality Committee	2.69	1.25	Intermediate

No	Hospital measures	Mean	SD	level
11.	The head of the department is reviewed by the administration about each incident report submitted for complications after CC in the department	3.43	1.16	Intermediate
12.	The ALDRETE score is measured before and after the patient enters the operating room	2.99	1.30	Intermediate
13.	I believe that the policies, standards, and systems of cardiac care are sufficient to protect patients after the operation	3.67	1.03	Intermediate
	Total	3.13	0.83	**Intermediate**

Table 4.4 shows that the dimensions measuring the extent of nursing knowledge and practice and hospital measures scores of CCs are highly reliable. This means that the questionnaire was a reliable and valid instrument to explore knowledge, performance, and practices. The questionnaire was self-administered.

Table 4.4: Cronbach Alpha for each Part

Dimensions	number of phrases	Cronbach alpha
Knowledge	22	0.80
Practice	13	0.88
Hospital measures	13	0.92
All tools	48	0.90

From Table 4.5, the knowledge score shows M 3.48 (SD= 0.44). It indicates that cardiac nurses have intermediate knowledge about patients' safety after CC. The practice score shows a high practice M 4.15(SD = 0.56). It indicates that the nurses' perception of

their hospital measures was intermediate about patients' safety after CC (a mean of 3.13 with an SD of 0.83).

The level of nurses' knowledge, practice, and hospital measures regarding patient safety after CC was intermediate, with M 3.56 (SD=0.44).

Table 4.5: Mean and Standard Deviation of The Sample Respondents for The Dimensions of Nurses About Patients' Safety After CC

	number of phrases	**Mean**	**SD**	**Level**
Knowledge	22	3.48	0.44	Intermediate
Practice	13	4.15	0.56	High
Hospital Measures	13	3.13	0.83	Intermediate
`All tools	48	3.56	0.42	Intermediate

4.3 The Level of Knowledge Among Cardiac Nurses about Patients' Safety after Cardiac Catheterization

1. The following Table 4.6 answered research question number (2); What is the current level of knowledge among cardiac nurses regarding patient's safety after CC by DTRA? The means and the standard deviations were calculated according to the nurses' dimensions regarding patients' safety after a CC, as shown in Table 4.6. According to Table 4.6, the mean score of cardiac nurses' knowledge about patient safety after CC is between (2.45 – 4.03). The majority of cardiac nurses strongly agreed with item number 20, which has a high mean (4.03±0.96). Moreover, the participants agree a sentence in the negative form with item number 9, which has an intermediate mean of 2.45 ± 1.25.

Table 4.6: Mean and standard deviation of the sample respondents for the cardiac nurses' knowledge about patient's safety after CC

No.	Knowledge	Mean	SD	Level
1	The formation of a blood clot is one of the main complications of the operation site of CC	3.74	1.11	High
2	The serum creatinine level should be checked immediately after CC	3.46	1.34	Intermediate
3	One of the complications associated with removing the wound sheath is the formation of air embolism.	2.95	1.06	Intermediate
4	The effect of the radioactive dye on the kidneys appears one week after the operation.	3.01	1.13	Intermediate
5	The presence of swelling at the site of the operation is one of the most important signs of the formation of a thrombus at the site of the CC operation.	3.67	1.05	High
6	The limb from which the operation was performed must be immobilized for at least 12 hours.	2.99	1.19	Intermediate
7	After the CC operation, the patient must be kept lying on the bed at a 45-degree angle	3.72	0.81	High
8	When there is a subcutaneous hemorrhage, the extremities of the body of the CC should be raised.	3.56	1.00	Intermediate
9	Intravenous fluids should not be given immediately after CC	2.45	1.25	Intermediate
10	The patient is prevented from taking thrombolytic or anticoagulant on the day of the operation only	2.63	1.19	Intermediate
11	When the pulse disappears in the limb in which the operation was performed, this indicates the formation of a blood clot	3.52	1.06	Intermediate

No.	Knowledge	Mean	SD	Level
12	After the catheterization, if the patient suffers from chest pain and changes in the electrocardiogram, this indicates a heart attack as a complication of the catheterization.	3.77	0.90	High
13	An increase in the number of ventricular contractions in the heart on the electrocardiogram is a complication that may occur after CC	3.93	0.84	High
14	A hernia can occur in the artery in which a stent or balloon has been placed, even if it is appropriate for the patient's situation	3.89	0.81	High
15	A stroke is a complication of CC	3.63	1.00	Intermediate
16	Blood clot is one of the most important complications that occur to the patient after the catheterization that was made from the Transradial	3.54	0.93	Intermediate
17	There are more complications occur after catheterization from the Transradial than from the complications of catheterization from the femoral	2.50	1.15	Intermediate
18	Patients who have had stent implants should follow a special diet	4.01	0.75	High
19	Heart patients should stay away from unsaturated fats	3.58	1.08	Intermediate
20	The good cholesterol is HDL (high-density lipoprotein)	4.03	0.96	High
21	Obese patients are more likely to develop complications after CC	3.97	0.84	High
22	After CC, the patient is advised to do light sports activities to restore heart activity.	3.81	0.97	High
	Total	3.48	0.44	**Intermediate**

4.4 The Level of Practice Among Cardiac Nurses About Patients' Safety After Cardiac Catheterization

The following table results answered research question number (3) What is the current level of practice among cardiac nurses regarding patient's safety after CC by DTRA? Here, the means and standard deviations were calculated according to the dimensions of nurses' practice about patients' safety after CC, according to Table 4.7, the mean score of nurses' practice regarding patient safety after CC is high (3.74 – 4.43). Most nurses strongly agreed about nurse practice item number 24, which has a high mean (4.43±0.73). Moreover, the participants strongly agreed with item number 32, which also has a high mean of 3.74 ± 1.16.

Table 4.7: Mean and Standard Deviation of The Sample Respondents for The Nurses' Practice About After CC

No	Practice	Mean	SD	level
23	I explain the care I will take after the operation	4.35	0.70	high
24	I monitor the catheter site to see if bleeding or hematoma under the skin occurs	4.43	0.73	high
25	I monitor skin color and temperature	4.42	0.68	high
26	I monitor the patient's vital signs every 15-30 minutes for two hours directly after the operation	4.19	0.96	high
27	I assess the patient's pain stability	4.31	0.68	high
28	I monitor the patient by doing an ECG	4.32	0.79	high
29	I place the patient in a lying position on the back after the operation	3.81	1.24	high

No	Practice	Mean	SD	level
30	I encourage the patient to increase fluid intake	4.27	0.65	high
31	I monitor the quantity of the fluid the patient drinks and the quantity the patient excretes in the urination process (input and output)	4.13	0.93	high
32	I encourage the patient to cough and monitor if there is any discomfort in it	3.74	1.16	high
33	I check the heart rate from the lower part of the limb from the place of the operation	4.12	0.84	high
34	I give appropriate instructions to the patient after the operation about the diet that he must follow	4.16	0.98	high
35	I give the patient appropriate instructions after the operation about the appropriate sports that he must do to maintain heart activity	4.12	0.94	high
	Total	4.15	0.56	**high**

4.5 Participants' Demographics Variables and Their Level of Knowledge and Practice and Hospital Measures About Patient Safety After Cardiac Catheterization

The following table results answered research question number (3). Is there a significant difference between the cardiac nurses' socio-demographic characteristics (age, gender, marital status,) and professional experience, and their knowledge and practice regarding patient safety after CC by DTRA؟ To see the significant relationship between the demographic variables and the nurse's knowledge, practice, and hospital measures scores dimensions and hospital measures among nurses about patients after CC, the results are depicted in Table 4.8 shows a significant association between (Nurses' knowledge, practice, and hospital measures scores) and nurse age in years. The older nurse whose age is more

significant than 45 years has positive and high Nurse knowledge and practice and hospital measures scores compared with the younger nurses' age (P-values <0.05). Moreover, there is a significant association between nurses' knowledge, practice, and hospital measure scores for nurses and hospital type. The nurses working in governmental hospitals have a positive and high knowledge and practice and hospital measures scores regarding patient safety after CC (p-value ≤ 0.05).

Table 4.8: The dimensions among cardiac nurses about patients 'safety after CC scores grouped by demographic characteristics.

	Knowledge		**Practice**		**hospital measure**		**Total**	
Variable	Mean ± SD	P	Mean ± SD	P	Mean ± SD	p	Mean ± SD	p
Gender								
Male	3.50±0.44	.17	4.16±0.56	.54	3.04±0.85	.03	3.55±0.41	.81
female	3.39±0.42		4.10±0.55		3.36±0.74		3.58±0.47	
Age in years								
21 – 25	3.06±0.18	.01	3.88±0.64	0.01	3.50±0.79	.01	3.41±0.4	0.02
26- 30	3.53±0.37		4.09±0.38		3.44±0.67		3.66±0.35	
31 – 35	3.43±0.45		4.04±0.59		3.10±0.7		3.50±0.42	
36 – 40	3.55±0.47		4.22±0.64		2.82±0.64		3.54±0.47	
41- 45	3.49±0.11		4.43±0.34		2.92±1.11		3.59±0.39	
≥ 45	3.59±0.61		4.58±0.24		2.98±0.90		3.69±0.52	
Marital Status								
Single	3.36±0.5	.1	4.0±0.5	0.1	3.46±0.79	.2	3.56±0.44	.9
Married	3.49±0.4		4.18±0.5		3.05±0.82		3.56±0.42	
Qualification level								
Diploma	3.42±0.51	.06	4.22±0.5	.7	3.68±0.6	.09	3.70±0.4	.2
Bachelors	3.55±0.51		4.26±0.5		3.64±0.7		3.72±0.4	
High diploma	3.63±0.21		4.33±0.3		3.83±0.6		3.87±0.4	
Master	3.79±0.46		4.42±0.6		4.15±0.6		3.88±4	

	Knowledge		Practice		hospital measure		Total	
Monthly income in shekels								
< 3000	3.23±0.5	.5	4.40±0.5	.06	3.70±0.7	.1	3.82±0.3	.3
3000-4000	3.34±0.8		4.23±0.5		3.64±0.8		3.75±0.4	
4000-5000	3.52±0.5		4.18±0.6		3.50±0.6		3.68±0.4	
≥ 5000	3.66±0.3		4.15±0.5		3.87±0.6		3.74±0.3	
Current Position								
Qualified Nurse	3.30±0.3	.1	4.35±0.4	.1	3.09±0.2	.2	3.60±0.4	.1
Registered Nurse	3.26±0.4		3.40±0.3		3.15±0.2		3.75±0.4	
Head Nurse Assistant	3.32±0.2		4.37±0.4		3.35±0.4		3.72±0.3	
Head Nurse	3.35±0.4		4.38±0.2		3.50±0.5		3.73±0.5	
Department you work on								
Emergency	3.63±0.5	.05	4.32±0.6	.11	3.85±0.7	.15	3.87±0.4	.01
Cardiac care	3.41±0.5		4.29±0.6		3.56±0.8		3.72±0.4	
Intensive care	3.47±0.3		4.09±0.6		3.58±0.4		3.61±0.2	
CC	3.57±0.4		4.10±0.5		3.64±0.7		3.70±0.3	
Others	3.11±0.4		3.25±0.2		3.57±0.4		3.27±0.9	
Hospital type								
Governmental	3.46±0.3	.01	4.21±0.5	.01	3.66±0.4	.01	3.76±0.4	0.01
Non-governmental/National	3.44±0.4		4.10±0.5		3.46±0.6		3.75±0.3	
Private	3.36±0.4		4.02±0.8		3.55±0.2		3.73±0.4	

4.6 Correlations

The relationship between (Nurses' knowledge practice and hospital measures scores) among nurses about patients after CC.

The following table 4.9 results answered research question number (5). What is the relationship between Nurses' knowledge, practice, and hospital measures scores among nurses about patients after CC? We will use the Pearson correlation (r) between the three variables (Knowledge, practice, and Hospital measure) to answer the above equation.

From the following table, the association between knowledge and practice is weak (r=0.584). The association between hospital measures and knowledge is 0.221, and the association measure between hospital measures and practice is 0.159. There is a positive correlation between the hospital measures, knowledge, and practice variables (which indicates a moderately positive linear relationship that hospital measures share with practice and knowledge.)

We conclude that a positive correlation is a relationship between variables in which an increase in one variable is associated with an increase in the other. All the correlations between hospital measures variables are positive with (Nurses' knowledge, practice, and hospital measures scores) variables, even if they are weak. The results indicate that knowledge and practice will move in the same direction as the hospital measures, i.e. if one increases, the others will also increase.

Table 4.9: Correlations(r)

Correlations=r					
		Knowledge	Practice	hospital measures	Total
Knowledge	Pearson Correlation	1	.584**	.221**	.799**
Practice	Pearson Correlation	.584**	1	.159*	.718**
hospital measures	Pearson Correlation	.221**	.159*	1	.691**
Total	Pearson Correlation	.799**	.718**	.691**	1
**. Correlation is significant at the 0.01 Level (2-tailed).					
*. Correlation is significant at the 0.05 Level (2-tailed).					

Chapter Five

Discussion, Conclusion, Recommendations, and Limitations

5.1 Introduction to Discussion

This chapter discussed the results of the current study and compared them with studies in a similar area.

The transradial technique for CC is recommended because it causes fewer problems, faster hemostasis time, lower expenses, and decreased mortality; nonetheless, it is linked to a hematoma, AV fistula, pseudo aneurysm, perforation, and arterial spasm (Khodabandehlooie, Saleh, Hosseini, & Research, 2023).

CC is safe for patients and can save them from life-threatening conditions, but it still has a possible risk for complications; these complications are divided into two main parts: minor complications and major complications that may cause death. The incidence of complications and mortality is less than 2% and 0.08%, so nurses must improve their knowledge and practice when providing care to patients after CC (Tavakol, Ashraf, & Brener, 2012).

CC is an invasive treatment for heart conditions, causing potential complications like infection, injury, pain, blood clots, and kidney damage. Expert nurses are crucial for safe procedures, patient education, and procedure videos to ensure well-being and prevent complications.(Jabr et al., 2022)

5.2 Socio-Demographic and Professional Data and Level of Hospital Measures Variables Comparison

Concerning demographic data, the majority of the participants of the study are males, like studies (Yaqoob, Barolia, Noor, & Nazar, 2019) and (Mahmood et al., 2021), but (Panicker, 2022) (Jabr et al., 2022) (Hussein et al., 2022) (Feroze et al., 2017) (Henedy et al., 2019) studies, the majority of the participants are females.

From the researcher's point of view, these results are because the intensive care departments where the study was conducted need careful staffing considerations. Most hospitals in Palestine usually employ males more than females in these departments because females have some long-term holidays, such as maternity leave, and this may negatively affect the care provided to patients in these departments. Most hospitals in Palestine employ female nurses in pediatric neonate and maternity departments, as they will need to hire new nurses to make up for the shortage and retrain them in intensive care.

The majority of cardiac nurses in the study were between the 30 to 40 age group (30.3%), which goes in line with studies (Panicker, 2022), (Jabr et al., 2022) which shows that (56.4%) of the study participants were between 31 to 40 years age, this reflects those hospitals choose nurses who are middle age to work in these departments because they are full of vitality and energy, and can provide the required care in a highly demanding environment. The majority of study participants were married (81.6%), which agreed with (Panicker, 2022), who showed (that (76.8%) of the participants were married; this reflects that the job can encourage marriage.

The study results show that most participants have bachelor's degrees (48%). It is evident that most of the nurses have a Bachelor's degree 48% however, this disagrees with

(Feroze et al., 2017), who found that most nurses have diplomas (48.5%) and bachelor's degrees (22.8%). It also disagrees with those who found that most of the study sample have diploma degrees. From the researcher's point of view, these results are supportive of the ages of the participants. As mentioned, the ages are primarily middle age; here, most participants have a bachelor's degree. This means that the trend in hospitals is to hire nurses with knowledge based on a scientific basis, that is, academic follow-up and scientific development, to provide the best care for the patient based on a clear scientific basis.

Most cardiac nurses worked at private hospitals; 61.2%, 23.7% at governmental hospitals, and 15.1% worked in non-governmental hospitals. This indicates that private hospitals contain more cardiac care departments than government hospitals; this is because heart care is one of the specialized departments that require specialized medical interventions and because the financial returns for these medical services related to the heart are very high, so private hospitals resort to investing in this field. Therefore, it turns out that The number of cardiac nurses in national or private hospitals is higher than in government hospitals.

Most of the nurses, 44.7%, have previous experience in a cardiac care unit, which suggests a high demand for specialized nursing care in heart-related medical services, followed by 28.9% in intensive units, indicating the critical need for skilled nurses in areas that require constant and intensive patient monitoring Therefore, previous experiences in cardiac care departments can reflect the results of knowledge and practices related to patient safety after CC. Therefore, the effect was evident in these results since most nurses have previous experience caring for cardiac patients, like (the study where the majority of the participants, 35%, have prior job experience.

Most nurses, 45.4% earn a salary between 3000 and 4000 shekels. This range might reflect the standard compensation for nurses with a certain level of experience or qualifications in this region. On the other hand, only 20.4% (n=31) have salaries above 5000 shekels, which could point to a smaller group of highly experienced, specialized, or senior nursing staff within the workforce; this agrees with the last report 2023 of the Palestinian Central Bureau of Statistics (PCBS) the average daily wage for wage employees aged 15 years and above in Palestine was approximately 143.0 NIS, with variations across different regions (PCBS 2023).

These tables highlight the variations in job roles and remuneration within the nursing profession and could indicate the levels of experience, specialization, and responsibilities assigned to different nursing roles. They also shed light on the economic aspects of the nursing profession in the context of this data set. Understanding these dynamics is crucial for workforce planning and policy-making in healthcare.

Most of the participants 78.3% mentioned that the hospitals did not have a continuous course of cardiac care, despite most of the participants 66.4% having already participated in cardiac care courses, which means their hospitals this study is in line with a previous study conducted in Menoufia University Hospital, Egypt by (Hamed, Shehata, Soliman, & Elwan, 2023) which found that most of the nurses 85% have already participated in cardiac care courses, and that, most of the participants 40.1% participated in cardiac care before one year it means have fresh knowledge and experience.

According to the characteristics of the participant's department, the average number of patients with complications after CC and under your responsibility during the past month indicates that, on average, there were about two complications per month, with a standard

deviation of approximately 4. This wide standard deviation suggests a high variability in the number of complications among the patients.

Most participants (98%) mentioned having ECG sheets in their departments. This high percentage implies that ECG monitoring is a standard practice and is readily accessible for patient care. The data suggests that while there is a protocol for monitoring patients via ECG, a significant number of complications are still occurring, which could warrant further investigation into the causes and potential improvements in patient care protocols. The availability of ECG sheets indicates that departments are well-equipped to diagnose and monitor cardiac events, which is crucial for patients after procedures like CC.

5.3 Cardiac Nurse's Knowledge and Practice

The current study quantitatively assessed nurses' knowledge and practices regarding patient safety after CC.

Knowledge Score: The mean score of 3.48 with a standard deviation (SD) of 0.44 suggests that the nurses have a good grasp of the necessary knowledge for patient safety after CC. The relatively low SD indicates that this knowledge is consistent among the nurses, which is crucial for maintaining a standard level of care. These findings align with a previous study conducted at Dubai Hospital in the United Arab Emirates by (Panicker, 2022) where among 108 cardiac nurses, 64.81% had moderate knowledge, 15.74% had adequate knowledge, and 19.44% had poor knowledge. Similarly, a study conducted in Punjab, India, by Feroze et al. (2017) found that most nurses possessed a good level of knowledge regarding patient safety post-cardiac catheterization. This is consistent with the findings of Arathy (2011), who conducted a study in Trivandrum and found that nurses had a good

understanding of patient safety post-cardiac catheterization. Additionally, the results are in agreement with a study by Ali et al. (2015).

However, our findings contradict those of a study conducted in Egypt by Mohammed Hasballah et al. (2019), which found that all nurses had poor knowledge. This discrepancy is also supported by a study conducted in Shebien El Koom, Menoufia Governorate, Egypt, by Henedy and El-Sayad (2020), who reported that approximately 45% of their study sample had poor knowledge about cardiac catheterization.

Practice Score: For the practice dimension, the overall practice score mean is 4.15 with an SD of **0.56,** which means that nurses' practice was high for patients' safety after CC; the majority of nurses strongly agreed about nurse practice item "I monitor the catheter site if bleeding or hematoma under the skin occurs " which have a high, mean (4.43±0.73). Moreover, the participants strongly agree with the item "I encourage the patient to cough and monitor if there is any discomfort in it, "which have also a high mean of 3.74 ± 1.16, indicating that the nurses understand the theory and apply it effectively in their practical work. The higher SD compared to the knowledge score might suggest a slightly broader variation in practice, possibly due to individual differences in executing procedures or situational factors.

These findings align with a previous study conducted in the Cardiac Care Units at Zagazig University Hospitals in 2022. In that study, 66% of the 50 nurses surveyed demonstrated a satisfactory level of practice regarding cardiac catheterization (Jabr et al., 2022).

However, the current study disagrees with several other studies. For instance, a 2022 study conducted at Al-Sader Teaching Hospital in Basra City on 30 nurses working in the

medical ICU and cardiac medical ward found a poor mean level of practice (Hussein et al., 2022). Similarly, a 2019 study at a tertiary care hospital in Karachi, Pakistan, assessed 70 nurses' knowledge and practices regarding patient care following cardiac catheterization and found that 87.1% of the nurses exhibited unsatisfactory practices (Yaqoob et al., 2019).

Moreover, the current study's findings also contradict a 2019 study conducted in cardiac care units, intermediate cardiac care units, and the cardiac and chest surgery department at the University Hospital at Shebien El Koom, Menoufia Governorate, Egypt. This study assessed 40 cardiac nurses and found that more than half (55%) had inadequate practice levels (Henedy et al., 2019). Additionally, a study conducted at the Punjab Hospital of Cardiology in Lahore, Pakistan, from December 1, 2016, to March 31, 2017, assessed 171 female nurses and found poor practice levels regarding patient safety post-cardiac catheterization (Feroze et al., 2017). These discrepancies highlight the variability in practice levels among cardiac care nurses across different regions and healthcare settings.

Hospital Measures Perception: The mean score of nurses' hospital measures about after CC is at an intermediate level between (2.55 – and 3.67). Most nurses strongly agreed about nurse hospital measures item "I believe that the policies, standards, and systems of cardiac care are sufficient to protect patients after the operation "with a high mean (3.67±1.03). Moreover, the participants agree with the item "The Department of Continuing Education is responsible for running continuous courses of cardiac care in the hospital where I work," which also has an intermediate mean of 2.55 ± 1. 08. This score is lower than the practice score, hinting at possible areas for improvement in hospital policies or support systems. The higher SD reflects a more significant disparity in perceptions, which could stem from varied nurse experiences or expectations. The data indicates that the nurses possess

adequate knowledge and demonstrate good practice regarding patient care after CC. However, there seems to be room for enhancing hospital measures to support these practices further. Healthcare facilities must address these variations to ensure that all patients receive the highest standard of care.

5.4 The Relationship Between Knowledge, Practice and Hospital Measures

In this study, the correlations between knowledge, practice, hospital measures, and the overall total score were evaluated using Pearson Correlation, the analysis revealed several significant relationships. Firstly, there was a strong positive correlation between knowledge and practice ($r = .584$, $p < .01$), indicating that higher levels of knowledge among nurses are associated with better practices. Additionally, knowledge showed a very strong positive correlation with the total score ($r = .799$, $p < .01$), underscoring the critical role of knowledge in enhancing overall performance.

However, the correlation between knowledge and hospital measures was weaker but still significant ($r = .221$, $p < .01$), suggesting that while knowledge contributes to better institutional measures, the relationship is not as robust. Similarly, the correlation between practice and hospital measures was also weak but significant ($r = .159$, $p < .05$), indicating a slight improvement in hospital measures with better nursing practices.

Moreover, practice had a strong positive correlation with the total score ($r = .718$, $p < .01$), highlighting its significant impact on overall performance. Lastly, the correlation between hospital measures and the total score was strong ($r = .691$, $p < .01$), indicating that improved hospital measures contribute significantly to the overall score. These findings emphasize the importance of enhancing both knowledge and practice among nurses to

achieve better institutional measures and overall performance in post-cardiac catheterization care.

The current study agreed with a new study conducted by Hussein, Dawood, and Mohammed (2022) about Nurses' Knowledge and Practice Toward After CC Patients' Safety and found a positive relationship between knowledge and practice.

Another descriptive cross-sectional study was conducted by Nguyen & Le (2021) from December 2019 to June 2020 in three general and specialist hospitals in Ho Chi Minh City, Vietnam. The study was founded. A moderately positive correlation between knowledge and practice regarding patient safety after Coronary angiography or PCI was identified in this study (PR=1.27, 95% CI [1.09 – 1.47], p=0.005).

Kharhunai and Das (2021) conducted another descriptive research study in hospitals in Guwahati, Assam, India. The study found a Low positive correlation between knowledge and practice.

The current study agrees with a descriptive-analytical cross-sectional study conducted by (Yaqoob et al., 2019) at a tertiary care hospital in Karachi, Pakistan. that found an association between practices and overall knowledge scores.

Nurses who scored excellent and adequate in the knowledge scores were carrying out somewhat satisfactory practices.

5.5 The Relationship Between Demographic Variables with Knowledge and Practice Dimensions

The current study found that male nurses scored somewhat higher in knowledge and practice than female nurses. In contrast, female nurses scored higher in institutional

measures, indicating a focus on patient safety. These findings align with a previous study conducted at a tertiary care hospital in Karachi, Pakistan, by Yaqoob et al. (2019), which found no significant difference in knowledge scores between male and female nurses.

Furthermore, the current study found statistically significant differences in nurses' knowledge, practice, and institutional measures scores based on age. Older nurses, specifically those over 45, had significantly higher scores in knowledge, practice, and institutional measures compared to younger nurses (p-values < 0.05). Interestingly, younger nurses, particularly those between 21 and 25, had lower knowledge and practice scores but better institutional measures. This finding contrasts with the Yaqoob et al. (2019) study, which found no statistically significant differences in knowledge scores between these age groups.

Marital status did not substantially influence cardiac nurses' knowledge, practice, or institutional measures. This finding is consistent with Hassan & Research (2017), who found no significant difference in nurses' knowledge about patient safety post-cardiac catheterization and their level of education (p-value = 0.924). However, Feroze et al. (2017) found a positive correlation between nurses' knowledge and level of education ($p = 0.024$), and Karthi, InigoSherlinJoy, & Jemima (2021) found a significant association between knowledge level and demographic variables, additional qualifications, and total years of experience.

Moreover, a descriptive cross-sectional study conducted from December 2019 to June 2020 at various hospitals in Ho Chi Minh City, Vietnam, found an association between educational level, workplace, and knowledge (PR = 1.87-1.92, $p < 0.01$) and practice (PR =

1.18-1.35, $p < 0.05$) regarding patient safety after coronary angiography or percutaneous coronary intervention among Vietnamese nurses.

Previous experience in emergency departments was associated with higher scores, indicating potential differences in training and support. Additionally, nurses in government institutions performed better, suggesting differences in resources, facilities, or organizational culture. Understanding these criteria can help healthcare institutions support nursing personnel in providing high-quality care. These findings highlight the importance of experience, age, and institutional context in shaping nurses' understanding and practices related to patient safety. It is encouraging to see that older nurses and those in governmental hospitals are contributing positively to patient care, which agrees with a study conducted by Nguyen & Le (2021) that found an association between the number of years working in the cardiac specialty and practice.

5.6 Conclusion

The current study found that nurses have enough knowledge about patients' safety after CC. It employed a quantitative, cross-sectional technique and a descriptive design. They are aware that HDL, or high-density lipoprotein, is considered good cholesterol since it can reduce the risk of stroke and heart disease. In order to ensure patient safety and enhance nursing expertise, the study suggests that nurses should obtain more certifications.

Furthermore, nurses have a great deal of experience with patient safety following CC and are skilled in explaining the process to patients. The level of practice rose along with a rise in nurses' knowledge, which had an impact on this. This demonstrated how crucial it is for nurses to become more qualified in order to safeguard patients.

5.7 Recommendation

The current study proposes comprehensive strategies to enhance nurses' knowledge and practice concerning patient safety after cardiac catheterization across three distinct levels: operational, educational, and national.

At the operational level within hospitals, several key recommendations are highlighted. These include strengthening the role of the Continuous Education Committee to actively monitor and bolster nurses' educational advancements. Additionally, integrating the ALDRETE score into hospital policies for cardiac catheterization laboratories aims to standardize post-procedure patient monitoring. The study also advocates for the development of tailored forms for both pre- and post-cardiac catheterization procedures, facilitating thorough patient care documentation. Furthermore, implementing a robust monitoring system to track patient outcomes post-procedure is proposed to enhance overall patient safety. Finally, establishing a mandatory training protocol mandates that all nurses in cardiac care departments complete at least one course specifically focused on cardiac catheterization.

On the educational front, efforts are recommended to encourage cardiac care nurses to engage with international healthcare institutions, fostering continuous learning and professional development. Mandating that nurses in cardiac care units hold at least a bachelor's degree ensures a baseline level of academic qualification conducive to specialized patient care. Moreover, updating nursing curricula to include the latest Basic Life Support (BLS) and Advanced Cardiovascular Life Support (ACLS) protocols ensures that nurses are equipped with essential life-saving skills.

At the national level, advocacy efforts are directed towards the Palestinian Ministry of Health to institute training courses specifically tailored to enhance nurses' knowledge and

practice related to patient safety in cardiac care units. Regular reviews of national policies and protocols concerning cardiac catheterization are recommended to align practices with global standards and World health organization recommendations. Additionally, promoting local research initiatives on cardiac catheterization aims to continuously improve understanding and practices within the field, contributing to enhanced patient outcomes and healthcare quality overall.

5.8 Limitations

The current study encountered several limitations during the collection of study questionnaires and its analysis, which are outlined as follows:

Firstly, the study's sample was limited to nurses exclusively within specific departments, namely the cardiac and intermediate cardiac care units. While this focused approach allowed for detailed exploration within these critical areas, it may not fully represent the entirety of the nursing population in Palestine.

Secondly, significant time constraints posed by ongoing healthcare challenges, particularly those exacerbated by the impact of war, greatly affected the research process. The limited availability of time posed challenges in terms of conducting thorough data collection and analysis.

Thirdly, there was a potential hospital selection bias as the study did not encompass all government and non-governmental hospitals in Palestine. Access was restricted to a single hospital with cardiac catheterization services, further compounded by mobility restrictions during the war, particularly affecting access to certain areas.

Lastly, financial costs associated with research activities, including transportation, data collection, and analysis, were considerable. These financial constraints may have influenced the study's scope and sample size.

In conclusion, while the study provides valuable insights into nurses' knowledge and practices regarding patient safety after cardiac catheterization in Palestine, it is crucial to acknowledge these limitations when interpreting the findings. Future research endeavors should strive for broader representation across multiple hospitals and adopt more comprehensive data collection methods to enhance the generalizability and robustness of findings.

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Appendices

This chapter will include all study approval papers and the study self-administered questionnaire.

Appendix (1) IRB Approval

Arab American University- Palestine
Deanship of Scientific Research
IRB committee
Tel: 04-241-8888, ext 1196
E-mail: irb.aaup@aaup.edu

الجامعة العربية الامريكية- فلسطين
عمادة البحث العلمي
لجنة أخلاقيات البحث العلمي
تلفون: 1196 ext 04-241-8888
البريد الالكتروني: irb.aaup@aaup.edu

IRB Approval Letter

Study Title: Cardiac Nurses Knowledge and Practice Toward Patient's Safety After Cardiac Catheterization by Distal Trans Radial Access at Palestinian Hospitals

Submitted by: Ayman Magid Islaimi

Date received: 13th May 2023

Date reviewed: 12th June 2023

Date approved: 12th June 2023

Your Study titled "**Cardiac Nurses Knowledge and Practice Toward Patient's Safety After Cardiac Catheterization by Distal Trans Radial Access at Palestinian Hospitals**" With archived number 2023/A/113/N was reviewed by the Arab American University IRB committee and was approved on 12th June 2023

Reham Khalaf-Nazzal, MD, PhD
IRB committee chairman
Arab American University of Palestine

General Conditions:

1. Valid for 4 months from date of approval.
2. It is important to inform the committee with any modification of the approved study protocol.
3. The committee appreciates a copy of the research when accomplished.

لجنة أخلاقيات البحث العلمي في الجامعة العربية الامريكية

IRB at Arab American University

Appendix (2) Governmental Hospital Approval

State of Palestine
Ministry of Health
Education in Health and Scientific
Research Unit

دولة فلسطين
وزارة الصحة
وحدة التعليم الصحي
والبحث العلمي

Ref.: .....
Date:.....

الرقم: ٢٠٢١/٥٥٨/٥٥٢
التاريخ: ٢٠٢١/١١/٤

عطوفة الوكيل المساعد لمجمع فلسطين الطبي المحترم،،،
الوكيل المساعد لشؤون المستشفيات والطوارئ المحترم،،،
تحية واحترام،،،

الموضـــوع: تسهيل مهمة بحث

يرجى تسهيل مهمة الطالب: أيمن ماجد احمد اسليمي – ماجستير تمريض العناية المكثفة– الجامعة العربية الامريكية، بعنوان:

"Cardiac nurses knowledge and practice toward patent's safety after cardiac catheterization by distal trans radial access at Palestinian hospitals "

حيث سيقوم الطالب بجمع معلومات عن طريق تعبئة استبانة الدراسة من قبل الكادر التمريضي (بعد اخذ موافقتهم)، وذلك في:

- مجمع فلسطين الطبي
- مستشفى عاليه

مع العلم ان مشرف الدراسة: د. عماد فشافشة.
على ان يتم الالتزام بالمحافظة على اخلاقيات البحث العلمي وسرية المعلومات، وعدم التعرض للمعلومات التعريفية للمشاركين.
على ان يتم تزويد الوزارة بنسخة PDF من نتائج البحث، التعهد بعدم النشر لحين الحصول على موافقة وزارة الصحة.

مع الاحترام،،،

د. عبد الله القواسمي
رئيس وحدة التعليم الصحي والبحث العلمي

نسخة: عميد كلية الدراسات العليا المحترم/ الجامعة العربية الامريكية

Telfax.:09-2333901 scientificresearch.dep@gmail.com تلفاكس: 09-2333901

Appendix (3) Private and National Hospital Approval

IBN SINA SPECIALIZED HOSPITAL
مستشفى ابن سينا التخصصي

ISH Research Application Form for Ethical Approval
(Non-Experimental Research)

Instructions :

1) Submit one (1) original and (1) copy of the research proposal to Head of Ethics Committee.
2) Instructions to fill the application form
   a) The application must be clearly legible
   b) All sections of the application form must be completed
   c) Typing or block capitals are recommended
   d)Write "Not Applicable" wherever appropriate

1) Project Title :

Full Title
Cardiac Nurses Knowledge And Practice Toward Patient's Safety After Cardiac Catheterization By Distal Trans Radial Access At Palestinian Hospitals

Short Title
Cardiac Nurses Knowledge And Practice Toward Patient's Safety After Cardiac Catheterization By Distal Trans Radial Access At Palestinian Hospitals

2) Type of the Project :

☐Drug Study ☐Device Study (attach device form) ☐ Chart/Records Review
☐Biomedical Research [*]Health Related Research ☐ Community-Based
☐Other: _____

3) Investigator Information:

Name:ayman magid ahmed islaimi
University/Institution: **Arabic American university AAUP**
Email:aymanmagid@gmail.com
Contact Number:0599132070
Expected start date:18.02.2024
Expected completion date:1.03.2024

4) Attached Needed

Investigator CV	*☐Yes	☐No
Study Proposal	*☐Yes	☐No
Consent Form	*☐Yes	☐No
Data Collection Tools	*☐Yes	☐No
Informed Consent (Arabic & English)	*☐Yes	☐No

5) Information Confidentiality

Your signature indicates that you agree to abide by all policies, procedures, regulations and laws governing the ethical conduct of the non-human research. And I agree to keep the data that will be collected from the hospital secured.

Investigator Signature: _____

- For Non Experimental Research only

Code:GLD.12.2/1	Type: NC / 01	Issue No.: 01/01	Issue Date: 20/06/2021

IBN SINA SPECIALIZED HOSPITAL
مستشفى ابن سينا التخصصي

For ISH – HR Department Use			
Receiving Date	18-02-2024	Application completed	☑Yes ☐No
HR Department Note	IRB - Proposal for research - صورة الهوية - السيرة الذاتية - تسهيل مهمة بحثية - نسخة من الاستبيان تم استلام التالية :		
Transfer Date	18-02-2024	HR Department Stamp	دائرة الموارد البشرية
For ISH - Ethics Committee Use			
Receiving Date	18/02/2024	Research Approval	☑Yes ☐No

Head of Ethics Committee Comment:

لا مانع من دراستها بشرط الموافقة
مع خالص الشكر

Head of Ethics Committee Signature: _____ IBN SINA SPECIALIZED HOSPITAL Ethics Committee **Date:** 18/2/2024

For ISH - CEO Use

CEO Comment:

CEO Signature: _____ **Date:** 18/2/2024

مركز البحث العلمي السريري
Clinical Research Centre

CLINICAL RESEARCH CENTER
BETTER CARE THROUGH RESEARCH!

Approval date: 2023-10-16
Ref: CRC_2023_0095

Subject: Approval to conduct a research project at An-Najah National University Hospital

Dear Mr. Ayman Islaimi,

I am writing this letter to grant you permission to conduct your research project titled "Cardiac Nurses Knowledge And Practice Toward Patient's Safety After Cardiac Catheterization By Distal Trans Radial Access At Palestinian Hospitals". I hope your study will provide new insights and contribute the advancement of knowledge and evidence. Furthermore, I would like to emphasize the importance of adhering to the ethical guidelines set forth by the hospital throughout the research process.

On behalf of An-Najah National University Hospital, I extend my best wishes and support for your research endeavors.

Sincerely,

Sa'ed H. Zyoud, Ph.D.
Clinical Toxicology
Director of Clinical Research Center

CC:
Chief Medical Officer
Chief Nursing Officer

Note: this approval letter is not valid unless signed and stamped by the CRC and the Chief Medical Officer of An-Najah National University Hospital

From: Murad Amro <qualityadvisor@ahli.org>
Sent: Wednesday, January 24, 2024 9:35:34 PM
To: Imad Hussein Deeb Fashafsheh <imad.fashafshi@aaup.edu>
Cc: Dr.Yousef Takrori
<g.manager@ahli.org>; basaafeen@yahoo.com <basaafeen@yahoo.com>
Subject: Re: تسهيل مهمه بحثيه

تحية طيبة،

بعد الاطلاع على موضوع بحث تخرج طالب ماجستير العناية المكثفة السيد**: أيمن اسليمي،** والمعنون **بالمعرفة والممارسات لدى ممرضي القلب في اقسام العناية القلبية حول سلامة المرضى بعد القسطرة القلبية عن طريق شريان اليد وشريان اليد البعيد،** فإن هذا الموضوع ذو قيمة علمية يمكن ان يسهم في تحسين مستوى سلامة المرضى بعد إجراء القسطرة القلبية.

يسعدنا ان نبلغكم موافقتنا على ارسال الرابط الإلكتروني للدراسة للممرضين العناية القلبية، من خلال مدير التمريض ورئيس القسم، والمشار اليه بالعنوان التالي:

https://docs.google.com/forms/d/e/1FAIpQLSf0Kf4H5_ppLFuABJSPk6mwm0eJp1TWxAZAh57e-ImFpPa2bQ/viewform?usp=pp_url

مع مراعاة احترام رغبة الممرضات والممرضين في قسم العناية القلبية بالمشاركة في الدراسة أو الانسحاب أو الاحجام عن المشاركة في أي وقت.

كما نهيب بالطالب مراعاة واحترام أنظمة وقوانين المستشفى واتباع أخلاقيات البحث العلمي بما في ذلك الخصوصية والسرية والكرامة وعدم الإيذاء.

ونتطلع الى أن تشاركونا نتائج وتوصيات دراستكم.

مع تمنياتنا له بالتوفيق

a

akram.shahroor <akram.shahroor@sah.ps>

إلى: أنا ،ethical.committee ،HR

تحية طيبة

يعد الاطلاع على اهداف الدراسة ومنهجية البحث العلمي للدراسه
فانه لا مانع من البدء بجمع البيانات حسب الاستبيان المرفق من حضرتكم

مع الاحترام

Akram Shahroor
Training & Educational Officer

palestine, Nablus, Rafedia
T.: +970 2353 000
F.: +970 2353 020
M.: +972 599 132 481
akram.shahroor@sah.ps
www.sah.ps

Appendix (4) Permission to use the Tool

Name: Ayman Magid Islaimi
Address: Palestine, Hebron, Idna P762]
Email Address: aymanmagid@gmail.com
Phone Number: 0599132070
Date: 7.1.2023

Researcher's Name: Jawad Sha'ban Abu Sabha
Researcher's Title: Palestine, Hebron, Yatta, P783.
Dear Mr.Abu Sabha

I hope this letter finds you well. My name is Ayman Magid Islaimi], and I am a master student in intensive care nursing at Arab American University. I am currently working on a research project titled [Cardiac Nurses Knowledge and Practice Toward Patient's Safety After Cardiac Catheterization by radial and Distal Trans Radial Access At Palestinian Hospitals], which aims to determine the variables that could reduce cardiac catheterization complications by identifying nurses' Knowledge and perception of Practice level and their contributing factors connected to patient safety post cardiac catheterization.

I recently came across your noteworthy research paper titled "[Nurses' Knowledge, Attitudes, and Practices of Patients' Safety After Cardiac Catheterization]" published in [Arab American University], where you utilized a questionnaire as part of your data collection process. I was particularly impressed by the design and applicability of the questionnaire in your study.

After thorough consideration, I believe that the questionnaire used in your research would be an invaluable tool for my own study. Given its relevance to my research objectives, I am writing to kindly request your permission to use and adapt the questionnaire for my research project.

I assure you that the questionnaire will be used solely for the purposes outlined in my research proposal, and all due credits will be given to you as the original creator of the questionnaire. Additionally, I am committed to sharing the results of my research with you once the study is completed.

To facilitate this process, I have attached a copy of my research proposal and an outline of how I plan to use the questionnaire. If you have any specific conditions or considerations regarding the use of the questionnaire, please do not hesitate to let me know. I highly value your expertise, and your guidance on this matter would be immensely appreciated.

I understand that you have a busy schedule, and I appreciate your time and consideration of my request. I look forward to your positive response.
Thank you for your attention to this matter.
Sincerely,
Ayman Magid Islaimi
Your Signature,

Dear Ayman Magid Islaimi

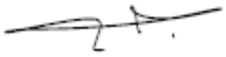
Thank you for reaching out, and I appreciate your interest in my research. I am pleased to hear that you found the questionnaire from my study valuable for your own research project. As a fellow researcher, I am happy to support your work.

Regarding your request to use and adapt the questionnaire, I grant you permission to do so. Please feel free to incorporate it into your study as outlined in your research proposal. I am confident that your work will contribute to the advancement of knowledge in this field.

I commend your commitment to giving proper credit, and I look forward to learning about the results of your study. If you have any further questions or need additional guidance, do not hesitate to reach out.

Best wishes for the success of your research, and thank you for considering my work as a valuable resource.

Sincerely, Jawad Sha'ban Abu Sabha



Appendix (5) Questionnaire

تحية طيبة وبعد

نموذج موافقة مستنيرة على المشاركة في بحث علمي

انت اي مدعو للمشـــاركة في بحث علمي يقوم به الباحث **ايمن اســـليمي** أحد طلاب الماجســـتير في الجامعة العربية الامريكية، كلية الدراسات العليا في برنامج **ماجستير تمريض العناية المركزة**، نحن نتطلع الى الافادة العلمية من خلال دراسة يقوم بها فريق البحث حول قياس مدى **(المعرفة والممارسات لدى ممرضي القلب في اقسام العناية القلبية حول سلامة المرضى بعد القسطرة القلبية عن طريق شريان اليد وشريان اليد البعيد.)** ولقد تم اختياركم كجزء من عينة الدراسة بطريقة عشوائية، لذا نضع بين يدكم هذا الاستبيان راجين تقديم المساعدة، وذلك بالإجابة عن فقرات الاستبيان بدقة وموضـــوعية لما له أثر كبير في الحصـــول على نتائج دقيقة، علماً بأن كل ما يذكر في اجابتكم ســيكون موضـــع احترام وســوف يعامل بســرية تامة ولن يســتخدم الا لأغراض البحث العلمي فقط، وعليه لا داعي لكتابة الاســم او اية معلومات تدل على شخصكم الكريم.

إن فريق البحث على استعداد لتزويدكم بنتائج هذه الدراسة في حال الطلب مع الشكر الجزيل لتعاونكم.

للاستفسار يمكنكم الاتصال:

0599132070

او المراسلة عبر البريد الالكتروني:

aymanmagid@gmail.com

فريق البحث: ايمن اسليمي

اشراف: الدكتور عماد فشافشة

القسم الاول: الرجاء وضع (√) في (□) المناسب:

البيانات الشخصية:

1. الجنس: □ ذكر □ انثى
2. العمر: □25-21 □ 30-26 □35-31
   □40-36 □45-41 □ أكثر من 45
3. الحالة الاجتماعية: □ أعزب □ متزوج □ غير ذلك
4. المؤهل العلمي: □ دبلوم متوسط □ بكالوريوس □ بكالوريوس+دبلوم عالي متخصص
   □ ماجستير □ دكتوراه □ غير ذلك/حدد.....
5. المنصب الحالي: □ ممرض مؤهل □ ممرض قانوني
   □ مساعد رئيس قسم □ رئيس قسم □ غير ذلك/حدد.....
6. نوع المستشفى: □ حكومي □ غير حكومي/أهلي □ خاص
7. الراتب الشهري: □ اقل من 3000 □ 4000-3000
   □ 5000-4000 □ أكثر من 5000 □ غير ذلك/حدد.....
8. اخر قسم الذي عملت به سابقا: □ الطوارئ □ العناية القلبية
   □ القسطرة القلبية □ العناية المكثفة □ غير ذلك/حدد.....
9. هل يوجد في مؤسستك دورات مستمرة خاصة بالعناية القلبية؟ □ نعم □ لا
10. هل شاركت في دورات خاصة بالعناية القلبية؟ □ نعم □ لا
11. اخر دورة شاركت بها: □ اقل من سنة □ من 1-3 سنوات □ من 4-5 سنوات □أكثر من 5 سنوات
12. عدد سنوات الخبرة في مهنة التمريض: ___ __سنة
13. عدد سنوات الخبرة في اقسام العناية بالقلب: _____سنة

14.عدد سنوات الخبرة في القسم الذي تعمل به حالياً: _____ سنة

معلومات خاصة بالقسم الذي تعمل به:

15. عدد المرضى اللذين حصلت معهم مضاعفات بعد ان قاموا بالقسطرة القلبية وكانوا تحت مسؤوليتك خلال الشهر الماضي ___

16. عدد المرضى اللذين حصلت معهم مضاعفات بعد ان قاموا بالقسطرة القلبية في القسم الذي تعمل به خلال الشهر الماضي ____

17.عدد الاسرّة في القسم الذي تعمل به_____

18.عدد اجهزة مراقبة القلب في القسم الذي تعمل به (cardiac monitors) _____

19.عدد اجهزة تخطيط القلب في القسم الذي تعمل به_____

20.هل يتوفّر في القسم الذي تعمل به اوراق اجهزة تخطيط القلب في كل وقت: □ نعم □ لا

العبارات بالجدول التالي تهدف الى قياس معايير المستشفى اللازمة بالعناية القلبية

الرقم	معايير المستشفى	أوافق بشدة	اوافق	لا أعلم	أعارض	اعارض بشدة
1.	مدير ومراقبو المستشفى يراقبون مدى معرفة الممرضين الطبية بالعناية القلبية					
2.	يشارك الممرضين في دورات/وورش عمل حول القسطرة القلبية والمضاعفات الممكن حصولها					

.3	تقوم لجنة بالمستشفى بمتابعة ومراقبة عمل الممرضين حول التعامل مع المرضى قبل وبعد العملية					
.4	تقوم دائرة التعليم المستمر بعمل دورات مستمرة للعناية القلبية في المستشفى الذي أعمل به					
.5	هذا المستشفى معد جيداً من ناحية المعرفة والتدريب والتجهيزات اللازمة لحماية المرضى بعد القسطرة القلبية					
.6	هناك استمارة خاصة بالمرضى قبل وبعد خضوعهم لعمليات القسطرة القلبية					
.7	معدات الحماية الشخصية اللازمة للتعامل مع المرضى متوفرة في المستشفى في جميع الأوقات					
.8	يقوم رئيس القسم بمتابعة حالة جميع المرضى اللذين يخضعون لعمليات القسطرة القلبية					
.9	يقوم الممرض الذي يعتني بمريض لديه مضاعفات من القسطرة القلبية بكتابة تقرير حادثة وتسليمه للإدارة					
.10	هناك مراقبة دورية لملفات المرضى اللذين يخضعون للقسطرة القلبية من قبل لجنة الجودة					
.11	يتم مراجعة رئيس القسم من قبل الادارة حول كل تقرير حادثة يتم تقديمه للمضاعفات بعد القسطرة القلبية بالقسم					

12.	يتم قياس ALDERT Scoreقبل وبعد دخول المريض الى غرفة العملية					
13.	سياسات ومعايير وأنظمة العناية القلبية كافية لحماية المرضى بعد خضوعه لعملية القسطرة القلبية					

أي ملاحظات أخرى تود اضافتها:

_____

الرجاء وضع (√) في (□) الذي يلائمك في الأقسام التالية:

القسم الثاني: قياس مدى المعرفة التمريضية للقسطرة القلبية:

الرقم	المعرفة	أوافق بشدة	اوافق	لا أعلم	أعارض	اعارض بشدة
1.	من المضاعفات الاساسية في مكان عملية القسطرة القلبية هو تكون خثرة دموية					
2.	يجب فحص مستوى الكرياتنين بالدم مباشرة بعد عملية القسطرة القلبية					
3.	من المضاعفات المصاحبة لإزالة ضمادة الجرح هو تكون انسداد هوائي (air embolism)					
4.	تأثير الصبغة الاشعاعية على الكلى يظهر بعد اسبوع من العملية					
5.	وجود انتفاخ مكان العملية من اهم العلامات لتكون خثرة مكان عملية القسطرة القلبية					

.6	يجب ابقاء الطرف الذي اجريت منه العملية مثبت لمدة لا تقل عن 12 ساعة					
.7	بعد اجراء القسطرة القلبية يجب ابقاء المريض مستلقياً على السرير بزاوية 45 درجة					
.8	عند وجود نزف دموي تحت الجلد يجب رفع الطرف الذي اجريت به القسطرة القلبية					
.9	.يجب عدم اعطاء السوائل الوريدية بعد اجراء القسطرة القلبية مباشرة					
.10	يمنع المريض من اخذ مميعات الدم في يوم العملية فقط					
.11	عند اختفاء النبض في الطرف الذي اجريت به العملية فهذا يدل على تكون خثره دموية					
.12	بعد اجراء القسطرة إذا عانى المريض من الم في الصدر وتغيرات على تخطيط القلب فهذا يدل على حدوث جلطة قلبية من مضاعفات القسطرة					
.13	ارتفاع عدد انقباضات البطين في القلب على التخطيط الكهربائي للقلب هو من المضاعفات التي قد تحدث بعد القسطرة القلبية					
.14	يمكن ان يحدث فتق في الشريان الذي تم وضع شبكية او بالون به حتى لو كان مناسب لوضع المريض					
.15	حدوث جلطة دماغية هو من مضاعفات القسطرة القلبية					

.16	الخثرة الدموية هي من اهم المضـــاعفات التي تحدث للمريض بعد عملية القســـطرة التي تم اجراءها من اليد					
.17	هناك مضاعفات تحدث بعد القسطرة من شريان اليد أكثر من مضاعفات القسطرة من الفخذ					
.18	المرضـى الذي تم وضـع شـبكيات لهم يجب ان يتبعوا حمية غذائية خاصة					
.19	يجب ابعاد مرضـــى القلب عن الدهون غير المشبعة					
.20	الكوليسترول الجيد هو HDL					
.21	المرضـى الذين يعانون من السمنة هم اكثر من غيرهم عرضـة لحدوث مضـاعفات بعد عملية القسطرة القلبية					
.22	ينصح المريض بالقيام بنشاطات رياضية خفيفة لإعادة نشاط القلب بعد عملية القسطرة القلبية					

القسم الثالث: قياس مدى الممارسة التمريضية لمرضى القسطرة القلبية:

الرقم	الممارسة	أوافق بشدة	اوافق	لا أعلم	أعارض	اعارض بشدة
23	اشـرح للمريض الرعاية التي سـأقوم بها بعد العملية					
24	أراقب مكان القسـطرة اذا حدث نزيف او تجمع دم تحت الجلد					
25	أراقب لون الجلد ودرجة الحرارة					

26	أراقب العلامات الحيوية للمريض كل 15-30 دقيقة لمدة ساعتين بعد اجراء العملية مباشرة					
27	أقوم بتقييم مدى استقرار الالم لدى المريض					
28	أراقب المريض بعمل تخطيط القلب					
29	أضع المريض على وضع الاستلقاء على الظهر بعد العملية					
30	أقوم بتشجع المريض لزيادة شرب السوائل					
31	أراقب مقدار ما يشـرب المريض من سـوائل و مقدار ما يخرجه المريض في عملية التبول					
32	أقوم بتشجيع المريض على السعال ومراقبة ان كان هناك عدم راحة بالسعال					
33	أفحص نبضـــات القلب من المنطقة السـفلية من الطرف الذي اجريت منه العملية					
34	أعطي ارشـــادات مناســبة للمريض بعد العملية حول الحمية الغذائية التي يجب عليه اتباعها					
35	أعطي المريض ارشـــادات مناســبة بعد العملية حول التمارين الرياضـــية المناســبة التي يجب عليه القيام بها للحفاظ على نشاط القلب					

Questionnaire:
Demographic characteristics of participants

	Variable	**Sub variable**
1	Gender	Male
		Female
2	Nurses age	21 – 25 years
		26- 30 years
		31 – 35 years
		36 – 40 years
		41- 45 years
		More than 45 years
3	Marital status	Single
		Married
		Other
4	Qualification	Diploma
		Bachelors
		High diploma
		Master
		PhD
5	Current position	Qualified Nurse
		Registered Nurse
		Head Nurse Assistant
		Head Nurse
6	Type of the Hospital	Governmental
		Non-governmental/National
		Private
7	Monthly salary*	less than 3000
		3000-4000
		4000-5000
		more than 5000
8	Department you work in	Intensive Cardiac care
		Intermediate cardiac care

Averages of Professional Experience of Participant Nurses

9	Does your hospital have continuous courses for cardiac care?
10	Have you participated in cardiac care courses?
11	when you have participated in cardiac care courses
12	Number of years of experience in the nursing profession
13	Number of years of experience in cardiac care departments
14	The number of years of experience in the department you are currently working in is

Characters of the Participant's Department

15	The number of patients with complications after CC and under your responsibility during the past month is
16	The number of patients who had complications after performing cardiac
17	The number of beds in the department in which you work is
18	The number of cardiac monitors in the department you work in is
19	The number of ECG machines in your department is
20	Does the department where you work have ECG sheets available all the time

Hospital Measures

NO	Hospital measures
1.	hospital administrators and observers monitor the extent of nurses' knowledge of cardiac care
2.	Nurses participate in courses/workshops about CC and possible complications
3.	A committee in the hospital monitors and follows up on the nurses' work in dealing with patients before and after the operation
4.	The Department of Continuing Education is responsible for running continuous cardiac care courses in my hospital.
5.	This hospital is well prepared in terms of knowledge, training, and equipment necessary to take care of patients after CC
6.	There is a special form for patients before and after they undergo CC operations
7.	Personal protective equipment needed to handle patients is available in the hospital at all times.
8.	The head of the department follows up on the condition of all patients who undergo CC operations
9.	A nurse who cares for a CC patient with complications will write an incident report and submit it to the administration.
10.	There is periodic monitoring of the files of patients after CC by the Quality Committee
11.	The head of the department is reviewed by the administration about each incident report submitted for complications after CC in the department
12.	The ALDRETE score is measured before and after the patient enters the operating room
13.	I believe that the policies, standards, and systems of cardiac care are sufficient to protect patients after the operation

No.	Knowledge
1	The formation of a blood clot is one of the main complications of the operation site of CC
2	The serum creatinine level should be checked immediately after CC
3	One of the complications associated with removing the wound sheath is the formation of air embolism.
4	The effect of the radioactive dye on the kidneys appears one week after the operation.
5	The presence of swelling at the site of the operation is one of the most important signs of the formation of a thrombus at the site of the CC operation.
6	The limb from which the operation was performed must be immobilized for at least 12 hours.
7	After the CC operation, the patient must be kept lying on the bed at a 45-degree angle
8	When there is a subcutaneous hemorrhage, the extremities of the body of the CC should be raised.
9	Intravenous fluids should not be given immediately after CC
10	The patient is prevented from taking thrombolytic or anticoagulant on the day of the operation only
11	When the pulse disappears in the limb in which the operation was performed, this indicates the formation of a blood clot
12	After the catheterization, if the patient suffers from chest pain and changes in the electrocardiogram, this indicates a heart attack as a complication of the catheterization.
13	An increase in the number of ventricular contractions in the heart on the electrocardiogram is a complication that may occur after CC
14	A hernia can occur in the artery in which a stent or balloon has been placed, even if it is appropriate for the patient's situation
15	A stroke is a complication of CC
16	Blood clot is one of the most important complications that occur to the patient after the catheterization that was made from the Transradial
17	There are more complications occur after catheterization from the Transradial than from the complications of catheterization from the femoral
18	Patients who have had stent implants should follow a special diet
19	Heart patients should stay away from unsaturated fats
20	The good cholesterol is HDL (high-density lipoprotein)
21	Obese patients are more likely to develop complications after CC
22	After CC, the patient is advised to do light sports activities to restore heart activity.

No	Practice
23	I explain the care I will take after the operation
24	I monitor the catheter site to see if bleeding or hematoma under the skin occurs
25	I monitor skin color and temperature
26	I monitor the patient's vital signs every 15-30 minutes for two hours directly after the operation
27	I assess the patient's pain stability
28	I monitor the patient by doing an ECG
29	I place the patient in a lying position on the back after the operation
30	I encourage the patient to increase fluid intake
31	I monitor the quantity of the fluid the patient drinks and the quantity the patient excretes in the urination process (input and output)
32	I encourage the patient to cough and monitor if there is any discomfort in it
33	I check the heart rate from the lower part of the limb from the place of the operation
34	I give appropriate instructions to the patient after the operation about the diet that he must follow
35	I give the patient appropriate instructions after the operation about the appropriate sports that he must do to maintain heart activity

الملخص

مقدمة: قسطرة القلب عن طريق شريان اليد الكعبري القريب والبعيد هي أداة تداخلية متوفرة في بعض المستشفيات وهي إجراء جديد بدأ في عام 2017، ثم هناك إجراءات قديمة مثل القسطرة الكلاسيكية وهي قسطرة القلب عن طريق الشريان الفخذي، ان مسؤولية ممرض القلب هي ضمان رعاية جيدة للمرضى، والسلامة ومنع المضاعفات نتيجة لقاء الرعاية الصحية. تهدف هذه الدراسة إلى تقييم معرفة ممرض القلب وإدراكه للممارسة فيما يتعلق بسلامة المريض بعد قسطرة القلب عن طريق شريان اليد الكعبري القريب والبعيد في وحدات القلب في المستشفيات الفلسطينية.

المنهج: الكمي المقطعي، دراسة وصفية أجريت عام 2023، جُمعت البيانات عن طريق زيارة المستشفيات واخذ موافقة ادارة المستشفيات لتوزيع الاستبيان الالكتروني. بلغ حجم العينة 152 ممرض وممرضة يعملون في اقسام العناية القلبية، وتم ملء 152 استبيان. تم استخدام الإصدار 24 من برنامج التحليل الاحصائي SPSS من اجل تحليل البيانات وتم استخدام الإحصاء الوصفي وارتباط بيرسون واختبار t في تحليل البيانات الناتجة.

النتائج: أظهرت الدراسة أن ممرضي القلب لديهم المعرفة الكافية حول سلامة المرضى بعد قسطرة القلب، وكانت درجة المعرفة متوسط 3.48 مع 0.44. SD تظهر درجة الممارسة ممارسة عالية تعني 4.15 مع 0.56. SD وبالتالي يشير إلى أن تصور الممرضين تجاه إجراءاتهم المؤسسية كان جيدًا فيما يتعلق بسلامة المرضى بعد قسطرة القلب (متوسط 3.13 مع انحراف معياري 0.83). وكان مستوى معرفة الممرض وممارسته والتدابير المؤسسية تجاه سلامة المريض بعد قسطرة القلب جيدًا بمتوسط درجة 3.56 (متوسط) و0.44. = SD.

الخلاصة: هناك علاقة ذات دلالة إحصائية بين (معرفة الممرضين، وممارستهم، ودرجات التدابير المؤسسية) وعمر التمريض بالسنوات. حيث يتمتع الممرض الأكبر سنًا التي يزيد عمره عن 45 عامًا بإيجابية ودرجة عالية من المعرفة وإدراك الممارسة والتدابير المؤسسية مقارنةً بعمر الممرضات الأصغر سنًا)قيم(P <0.05) . علاوة على ذلك، هناك ارتباط مهم بين معرفة الممرضين وإدراكهم للممارسة ودرجات التدابير المؤسسية ونوع المستشفى. حيث ان الممرضون الذين يعملون في المستشفيات الحكومية لديهم معرفة إيجابية عالية، وإدراك الممارسة والتدابير المؤسسية فيما يتعلق

بسلامة المريض بعد قسطرة القلب مقارنة بالممرضين الذين يعملون في المستشفيات الخاصة والأهلية (قيمة $p \geq 0.05$).

التوصية: إنشاء نظام مراقبة لحالة المرضى بعد قسطرة القلب لتحسين نتائج سلامة المرضى وتعزيز لجنة التعليم المستمر وتمكين أدوارها لمتابعة الوضع التعليمي للممرضين أيضا، وأخيرا وضع بروتوكول لجميع الممرضين الذين سيتم قبولهم للعمل في أقسام العناية بالقلب يجب أن يكون لديه دورة واحدة على الأقل حول قسطرة القلب.