

## ASSESSMENT OF NURSES KNOWLEDGE AND PRATICE REGARDING CARE OF PATIENTs UNDERGOING PERCUTANEOUS CORONARY INTERVENTION

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### Abstract

#### **BACKGROUND**

Cardiovascular diseases, particularly myocardial infarction, remain a leading cause of morbidity and mortality globally, with increasing reliance on interventional procedures such as percutaneous coronary intervention (PCI) for effective management. While PCI significantly improves patient outcomes by restoring coronary perfusion, the quality of post-procedural care is a critical determinant of recovery and complication prevention. Nurses play a central role in the continuum of care, including patient preparation, monitoring, complication detection, and education. However, evidence from low- and middle-income countries indicates substantial gaps in nurses' knowledge and clinical practice related to PCI care, which may adversely affect patient safety and outcomes.

#### **OBJECTIVES**

The study aimed to assess nurses' knowledge regarding pre-procedural care of patients undergoing PCI, evaluate their practices in immediate post-procedural care, identify gaps between knowledge and practice, examine the association of demographic variables with knowledge and practice levels, and propose recommendations for improving nursing competencies through targeted education and training programs.

#### **METHODOLOGY**

A descriptive cross-sectional study design with a quantitative approach was employed. The study was conducted among 180 registered nurses working in cardiac and general units of a tertiary care hospital in Lahore, selected through convenience sampling. Data were collected using a structured Likert-scale questionnaire comprising 15 items (8 knowledge and 7 practice questions). The tool was adapted from recent validated studies and demonstrated acceptable reliability (Cronbach's alpha = 0.768). Data analysis was performed using SPSS version 26. Descriptive statistics including frequencies, percentages, means, and standard deviations were used to summarize findings, while inferential analysis examined associations between demographic variables and knowledge-practice scores.

## RESULTS

The findings revealed significant deficiencies in both knowledge and practice among nurses regarding PCI patient care. A majority of participants lacked adequate understanding of myocardial infarction pathophysiology, PCI indications, post-procedural complications, mobilization protocols, and medication management. Over 60% of nurses were unable to recognize post-PCI complications or perform standard monitoring practices consistently. Awareness of international guidelines, such as the ESC 2023 recommendations, was notably low (approximately 80% unfamiliarity). Practice-related gaps included inadequate vital sign monitoring, poor patient education, limited adherence to standardized protocols, and insufficient involvement of patients and families in care planning. Nurses with higher qualifications (BSN/Post RN BSN) and greater clinical experience demonstrated relatively better knowledge and practice, although overall competency remained suboptimal.

## CONCLUSION

The study highlights considerable gaps in nurses' knowledge and clinical practice regarding PCI patient care, which may compromise patient safety and recovery outcomes. These findings underscore the urgent need for structured, evidence-based training programs, integration of cardiac care modules into nursing curricula, and implementation of standardized clinical protocols. Continuous professional development initiatives and institutional support are essential to enhance nursing competencies, ensure adherence to international guidelines, and improve the quality of care for patients undergoing PCI.

## CHAPTER 1

### INTRODUCTION:

Myocardial infarction (MI), more commonly known as a heart attack, remains one of the most critical conditions encountered in modern clinical practice. Despite tremendous advances in diagnostic tools and interventional cardiology over the past two decades, MI continues to be responsible for a substantial proportion of global morbidity and mortality. According to the World Health Organization (2021), cardiovascular diseases caused approximately 17.9 million deaths in 2019 alone—of which nearly 85% were attributed to MI and stroke. These numbers reflect not only the clinical burden but also the complex socioeconomic and healthcare implications of myocardial infarction across diverse populations. At its core, MI is a condition of acute and often irreversible myocardial necrosis resulting from prolonged ischemia, typically caused by the rupture of an atherosclerotic plaque and subsequent thrombus formation in a coronary artery. Once the supply of oxygen-rich blood is critically reduced or completely obstructed,

myocardial tissue begins to die within minutes. If this process is not halted promptly, the extent of cardiac damage increases, potentially leading to complications such as arrhythmias, heart failure, or sudden cardiac death (Ibanez et al., 2020).

From a clinical classification standpoint, myocardial infarctions are typically categorized into two broad types: ST-segment elevation MI (STEMI) and non-ST-segment elevation MI (NSTEMI), based on electrocardiographic changes and the extent of coronary artery blockage. STEMI, in particular, is the most time-sensitive and life-threatening variant. It results from the complete occlusion of a major coronary artery and requires immediate revascularization to restore perfusion to the myocardium (Collet et al., 2021). The most effective and widely endorsed method of revascularization in STEMI is **primary percutaneous coronary intervention (PPCI)**. This procedure involves mechanically opening the blocked artery using balloon angioplasty followed by the deployment of a stent. The 2023 European Society of Cardiology (ESC) guidelines reaffirm PPCI as the preferred reperfusion strategy,

provided it can be initiated within the recommended timeframes—typically within 90 to 120 minutes of first medical contact (ESC, 2023). This recommendation is based on substantial evidence showing that timely PPCI significantly reduces infarct size, preserves left ventricular function, and lowers long-term mortality compared to fibrinolytic therapy (Thygesen et al., 2020).

Nonetheless, despite its proven clinical efficacy, PPCI is not without risk. Patients undergoing PCI may experience a range of procedural and post-procedural complications. These include vascular site complications, bleeding, coronary artery dissection, contrast-induced nephropathy, periprocedural myocardial injury, and in some cases, stent thrombosis or restenosis. Moreover, systemic complications such as hypotension, arrhythmias, and hemodynamic instability may occur, particularly in high-risk or elderly patients (De Caterina et al., 2021). The role of nurses in mitigating these complications and ensuring a smooth recovery for patients post-CAG (coronary angiography) or PCI cannot be overstated. Nurses are not only responsible for pre-procedural education and physical preparation but are also deeply involved in the immediate post-procedural phase, which is often critical for patient safety. This includes monitoring for complications, ensuring hemostasis at the access site, observing vital signs, managing pain or anxiety, educating the patient and family about lifestyle changes, and facilitating early mobilization (Riegel et al., 2022). In fact, several recent studies have reinforced the importance of nursing expertise in interventional cardiology units. Evidence shows that structured nursing protocols, combined with comprehensive patient education, can lead to measurable reductions in post-procedural complications and hospital readmissions (Sania et al., 2022). Furthermore, the presence of adequately trained nurses during the critical early recovery period post-PCI has been associated with shorter lengths of stay and improved patient satisfaction (Mah Gul et al., 2024). A significant concern, however, is the variability in nurse knowledge and competency in different regions, particularly in low- and middle-income countries. For example, in Vietnam, the

burden of coronary artery disease has increased significantly over the past three decades. Yet, the expansion of interventional cardiology has not always been matched with corresponding investments in nursing education and training. A 2023 cross-sectional study conducted across Vietnamese tertiary hospitals found that nearly half of the cardiac nurses lacked adequate post-PCI care knowledge, particularly regarding early complication detection and patient mobilization timelines (Nguyen et al., 2023).

The same pattern is observed in several developing countries, including Pakistan and Bangladesh, where access to evidence-based post-cardiac interventional nursing training remains limited (Korejo et al., 2024). These findings underscore a pressing need to strengthen nursing competencies and standardize care pathways in cardiac units. Institutions that have implemented targeted training programs—focusing on post-PCI monitoring, risk management, and patient counseling—have reported clear improvements in both nurse performance and patient outcomes (Ali et al., 2022). Given the increasing reliance on interventional procedures like PCI in managing ischemic heart disease, addressing these gaps in nursing knowledge is more critical now than ever before. As catheterization labs expand and coronary interventions become routine, it becomes imperative that nurses are equipped not only with technical skills but also with strong clinical judgment and evidence-based decision-making capabilities.

The present study, titled “Assessment of Vietnamese Nurses’ Knowledge and Practice and Impact on Patient Safety after CAG or PCI”, emerges from this urgent context. It seeks to systematically assess how well-prepared Vietnamese cardiac nurses are in managing patient care after coronary angiography and PCI procedures. By evaluating both the theoretical knowledge and real-world clinical practices of these nurses, the study aims to identify gaps, analyze their root causes, and propose actionable solutions that can enhance post-interventional patient safety. Furthermore, this research intends to serve as a bridge between international standards of cardiac nursing care and the local

context of Vietnamese healthcare infrastructure. By examining where current practice aligns—or diverges—from ESC and AHA guidelines, and from established nursing safety protocols, this study hopes to facilitate evidence-informed policy changes, clinical training reforms, and ultimately, safer outcomes for patients undergoing these life-saving cardiac procedures. As myocardial infarctions continue to be one of the world's most urgent health problems, and as catheter-based interventions become more common even in resource-limited settings, it is crucial that nursing care keeps pace. Well-informed, skilled nurses are essential not only to procedural success but also to the recovery and long-term prognosis of patients who undergo CAG and PCI. The better we understand their current knowledge and practice, the better we can equip them to face the challenges of modern cardiac care.

## OBJECTIVES OF THE STUDY

- To assess the level of knowledge of nurses regarding pre-procedural care of patients undergoing PCI.
- To evaluate nurses' practice in providing immediate post-procedural care to PCI patients.
- To identify gaps between knowledge and actual practice of nurses in the care of PCI patients.
- To determine the association of nurses' demographic factors (such as age, qualification, and experience) with their knowledge and practice regarding PCI care.
- To provide recommendations for improving nurses' knowledge and practice through training and continuous education programs on PCI patient care.

## CHAPTER 2

### LITERATURE REVIEW:

Cardiovascular diseases (CVDs), particularly ischemic heart disease, remain a leading cause of morbidity and mortality worldwide. Percutaneous coronary intervention (PCI) and coronary angiography (CAG) are critical interventional procedures used in the diagnosis and treatment of coronary artery disease (CAD). While these

procedures have significantly improved patient outcomes, the role of nurses in post-procedural care is paramount in ensuring patient safety and recovery. However, studies indicate significant gaps in nurses' knowledge and practice, particularly in developing nations like Vietnam, Pakistan, and Bangladesh (Nguyen et al., 2023; Korejo et al., 2024). This literature review examines existing research on nurses' competencies in post-CAG/PCI care, identifies gaps in knowledge and practice, and explores strategies to enhance patient safety. Several studies highlight deficiencies in nurses' understanding of evidence-based post-PCI care protocols. In Vietnam, Nguyen et al. (2023) found that only 58% of cardiac nurses correctly identified the optimal timing for patient mobilization after PCI, a critical factor in preventing vascular complications. Similarly, in Pakistan, Korejo et al. (2024) reported that less than 50% of nurses were aware of the latest American Heart Association (AHA) guidelines on post-PCI monitoring, including the assessment of bleeding risks and vascular access site complications.

The lack of standardized training programs in many developing countries exacerbates these knowledge gaps. Ali et al. (2022) demonstrated that nurses who underwent structured training on post-PCI risk assessment, anticoagulation management, and early ambulation protocols exhibited significantly higher adherence to best practices. This suggests that continuous professional development is essential in bridging knowledge deficits. Beyond theoretical knowledge, variations in clinical practice further impact patient safety. In Bangladesh, a study found that nurses often relied on experiential knowledge rather than evidence-based guidelines when managing post-PCI patients, leading to inconsistent care (Korejo et al., 2024). For instance, practices such as manual compression duration, frequency of neurovascular checks, and patient education on medication adherence varied widely across hospitals. A similar trend was observed in Vietnam, where Nguyen et al. (2023) noted that only 40% of nurses routinely assessed for contrast-induced nephropathy (CIN), despite its known association with acute kidney injury

post-CAG. These inconsistencies underscore the need for standardized nursing protocols aligned with international guidelines such as those from the European Society of Cardiology (ESC) and AHA.

Inadequate nursing knowledge and inconsistent practices directly influence patient safety. Studies indicate that hospitals with structured post-PCI nursing protocols report lower complication rates, including reduced incidences of hematoma, retroperitoneal bleeding, and arrhythmias (Ali et al., 2022). Conversely, settings where nurses lack updated training see higher rates of access-site complications and delayed recognition of acute coronary re-occlusion (Korejo et al., 2024). Patient mobilization is another critical factor. Nguyen et al. (2023) found that premature mobilization (before 4-6 hours post-PCI) increased the risk of femoral artery bleeding, while delayed mobilization raised the likelihood of venous thromboembolism (VTE). Nurses' ability to balance early ambulation with bleeding risks is thus crucial in optimizing recovery. Effective patient education is a key determinant of long-term outcomes post-PCI. However, research indicates that many nurses in low-resource settings lack structured counselling frameworks (Korejo et al., 2024). Ali et al. (2022) found that hospitals implementing nurse-led discharge education programs saw a 30% improvement in medication adherence and a 25% reduction in 30-day readmission rates. This highlights the need for integrating patient education modules into nursing training curricula.

The success of targeted training interventions has been well-documented. Ali et al. (2022) reported that a six-month competency-based training program for cardiac nurses led to a 40% increase in guideline adherence and a 20% reduction in post-PCI complications. Similar programs in Vietnam focusing on ECG interpretation, hemodynamic monitoring, and emergency response have shown promise (Nguyen et al., 2023). Aligning local nursing practices with ESC and AHA guidelines can significantly enhance care quality. For instance, implementing checklists for post-PCI assessments (e.g., monitoring for chest pain, vital signs, and distal pulses) has been

effective in reducing oversights (Korejo et al., 2024). High-fidelity simulation training has emerged as a valuable tool in improving nurses' clinical judgment and emergency response skills. Hospitals utilizing PCI complication simulations (e.g., managing stent thrombosis or cardiac tamponade) report better nurse preparedness (Ali et al., 2022).

The existing literature underscores significant gaps in Vietnamese nurses' knowledge and practice regarding post-CAG/PCI care, mirroring trends in other developing nations. These gaps contribute to suboptimal patient safety outcomes, including higher complication rates and delayed recovery. However, evidence suggests that structured training programs, adherence to international guidelines, and simulation-based learning can substantially improve nursing performance.

Future research should focus on large-scale interventions to standardize nursing education and evaluate their long-term impact on patient outcomes. As PCI volumes rise globally, ensuring that nurses are equipped with evidence-based knowledge and practical skills is essential for enhancing post-procedural care and reducing preventable complications. Myocardial infarction (MI), commonly known as a heart attack, remains a leading cause of global morbidity and mortality, contributing to approximately 17.9 million cardiovascular-related deaths in 2019, with 85% attributed to MI and stroke (World Health Organization, 2021). The advent of primary percutaneous coronary intervention (PPCI) has revolutionized MI management, particularly for ST-segment elevation myocardial infarction (STEMI), by restoring coronary artery perfusion and reducing infarct size (Collet et al., 2021; European Society of Cardiology, 2023). However, the success of PPCI hinges not only on the procedure itself but also on comprehensive post-procedural care, where nurses play a pivotal role. This literature review synthesizes evidence from recent studies to explore the critical role of nursing care in post-PPCI management, focusing on complication prevention, patient education, and the impact of nursing competency, particularly in diverse healthcare settings.

The immediate post-PCI period is particularly critical, as patients are at risk of arrhythmias, hemodynamic instability, and stent-related complications. Riegel et al. (2022) found that nurses trained in advanced cardiac life support and post-PCI care protocols could reduce hospital readmissions by 15% through early detection of complications. Moreover, patient satisfaction and recovery outcomes improve when nurses provide empathetic communication and clear discharge instructions (Mah Gul et al., 2024). These findings highlight the need for specialized nursing training to enhance clinical outcomes in interventional cardiology units. Despite the critical role of nurses, disparities in training and competency exist, particularly in low- and middle-income countries (LMICs). Nguyen et al. (2023) conducted a cross-sectional study in Vietnam, revealing that nearly 50% of cardiac nurses lacked adequate knowledge of post-PCI care, particularly in recognizing early complications and adhering to mobilization timelines. This gap is attributed to limited access to evidence-based training and outdated curricula in nursing education. Similarly, in Pakistan and Bangladesh, the rising burden of coronary artery disease has not been met with proportional investments in nursing education (Korejo et al., 2024). These studies indicate that nurses in LMICs often lack the skills to manage complex post-PCI complications, leading to higher rates of adverse events and prolonged hospital stays.

In LMICs, scalable solutions such as online training modules and simulation-based learning have shown promise. Ali et al. (2022) reported that virtual training platforms enabled nurses in remote areas to access updated guidelines, improving their confidence in managing post-PCI patients. Additionally, international collaborations to share best practices can address disparities in nursing education. For instance, partnerships between hospitals in high-income countries and LMICs have facilitated knowledge transfer, leading to better standardization of care (Korejo et al., 2024). The literature underscores the indispensable role of nurses in post-PCI care for MI patients, emphasizing their impact on reducing complications, enhancing recovery, and improving patient satisfaction. However,

significant gaps in nursing competency, particularly in LMICs, highlight the need for targeted training and standardized protocols. Studies by Sania et al. (2022), Mah Gul et al. (2024), and Ali et al. (2022) demonstrate that structured interventions can yield measurable improvements in clinical outcomes. Addressing global disparities in nursing education and resources is critical to optimizing post-PCI care and reducing the global burden of MI. Future research should focus on scalable, cost-effective training models to ensure equitable access to high-quality nursing care across diverse healthcare settings.

## CHAPTER 3 METHODOLOGY

This chapter outlines the methodology for assessing nurses' knowledge and practice regarding the care of patients undergoing percutaneous coronary intervention (PCI) in a clinical setting. The study aims to evaluate the competency levels of nurses in post-PCI care, identify gaps in knowledge and practice, and provide insights for developing targeted training programs.

### Research Design

The study employs a descriptive, cross-sectional design to assess nurses' knowledge and practice related to post-PCI care. This design is suitable for capturing a snapshot of current competencies and identifying areas for improvement without manipulating variables. A quantitative approach is utilized, leveraging a Likert-scale questionnaire to measure nurses' self-reported knowledge and practice, as it allows for structured and standardized data collection (Polit & Beck, 2021).

### Population and Sample

#### Target Population

The target population consists of registered nurses working in Govt. M. Nawaz Sharif Hospital, Lahore

#### Sampling Technique

A convenience sampling technique used to select participants due to its feasibility in accessing nurses within busy clinical settings. This non-

probability sampling method ensures adequate participation while accommodating the constraints of hospital schedules (Grove & Gray, 2019).

## Sample Size

### Sample Size Calculation (Slovin's Formula)

$$N / (1 + Ne^2) \quad N = \text{population size}$$

e = Margin of Error

$$N = 300, \quad E = 0.05$$

$$\text{Sample Size} = N / (1 + Ne^2)$$

$$\text{SS} = \frac{300}{1 + 300 \times (0.05)^2}$$
$$\frac{300}{1 + 300 \times (0.0025)} \quad \text{Sample Size: 180 (Approx)}$$

The sample size is calculated using Slovin's Formula, with a 95% confidence level and a 5% margin of error. Assuming a population of approximately 300 nurses across selected tertiary hospitals. According to formula we select 180 interviewees.

## Inclusion and Exclusion Criteria

**Inclusion Criteria:** Registered nurses with at least six months of experience in cardiac care or interventional cardiology units, actively involved in post- Percutaneous Coronary Intervention patient care.

**Exclusion Criteria:** Nurses with less than six months of experience, those not directly involved in Percutaneous Coronary Intervention patient care, or those on leave during the data collection period.

## Data Collection Tool

A structured, Likert-scale questionnaire, developed based on the literature review and existing studies (Sania et al., 2022; Nguyen et al., 2023), used to assess nurses' knowledge and practice. The questionnaire consists of 15 items divided into two sections: eight questions on knowledge and seven questions on practice related to post-PCI care. Each item is rated on a 5-point Likert scale (1 = Strongly Disagree/Never, 5 = Strongly Agree/Always).

## Tool Development and Validation

The questionnaire was adapted from validated instruments used in similar studies (Ali et al., 2022; Mah Gul et al., 2024). Cronbach's alpha will be calculated to confirm internal consistency, with a target value of  $\geq 0.7$  indicating acceptable reliability (Polit & Beck, 2021).

## Data Collection Procedure

**Preparation:** Permission will be obtained from the hospital administration and ethics committees of the selected tertiary hospitals. Nurse managers will be informed to facilitate participant recruitment.

**Recruitment:** Eligible nurses will be approached during staff meetings or shift changes and provided with an information sheet explaining the study's purpose, voluntary participation, and confidentiality measures.

**Questionnaire Administration:** The questionnaire will be asked from each sample member

## Ethical Considerations

Ethical approval will be sought from the Institutional Review Board (IRB) of the participating hospitals. Informed consent will be obtained from all participants, emphasizing voluntary participation and the right to withdraw at any time without consequences.

## Data Analysis

Data will be analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0. Descriptive statistics, including frequencies, means, and standard deviations, will be used to summarize nurses' knowledge and practice scores. The knowledge and practice sections will be scored separately, with each item contributing 1-5 points, and total scores calculated for each section (knowledge: 8-40 points; practice: 7-35 points). Higher scores indicate greater knowledge or more frequent application of best practices.

## Limitations

The use of convenience sampling may limit the generalizability of findings to other settings. Self-reported data may introduce response bias, as nurses may overestimate their knowledge or

practice. The study’s cross-sectional design precludes establishing causality. To mitigate these limitations, the questionnaire was validated, and

clear instructions will be provided to encourage honest responses.

**Reliability Test**

**Case Processing Summary**

		N	%
Cases	Valid	180	100.0
	Excluded <sup>a</sup>	0	.0
	Total	180	100.0

**Reliability Statistics**

Cronbach's Alpha	N of Items
.768	15

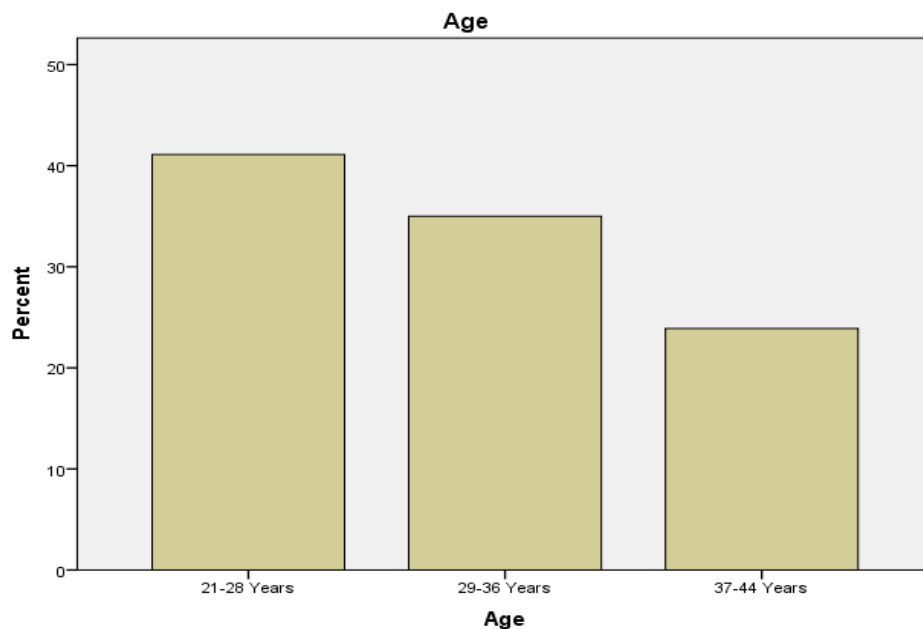
**RESULTS**

**Age**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-28 Years	74	41.1	41.1	41.1
	29-36 Years	63	35.0	35.0	76.1
	37-44 Years	43	23.9	23.9	100.0
	Total	180	100.0	100.0	

**Table 1: Age Distribution of Participants** Institute for Excellence in Education & Research

The majority of nurses (41.1%) were between 21–28 years of age, followed by 35.0% aged 29–36 years. Only 23.9% were in the 37–44 years age group.

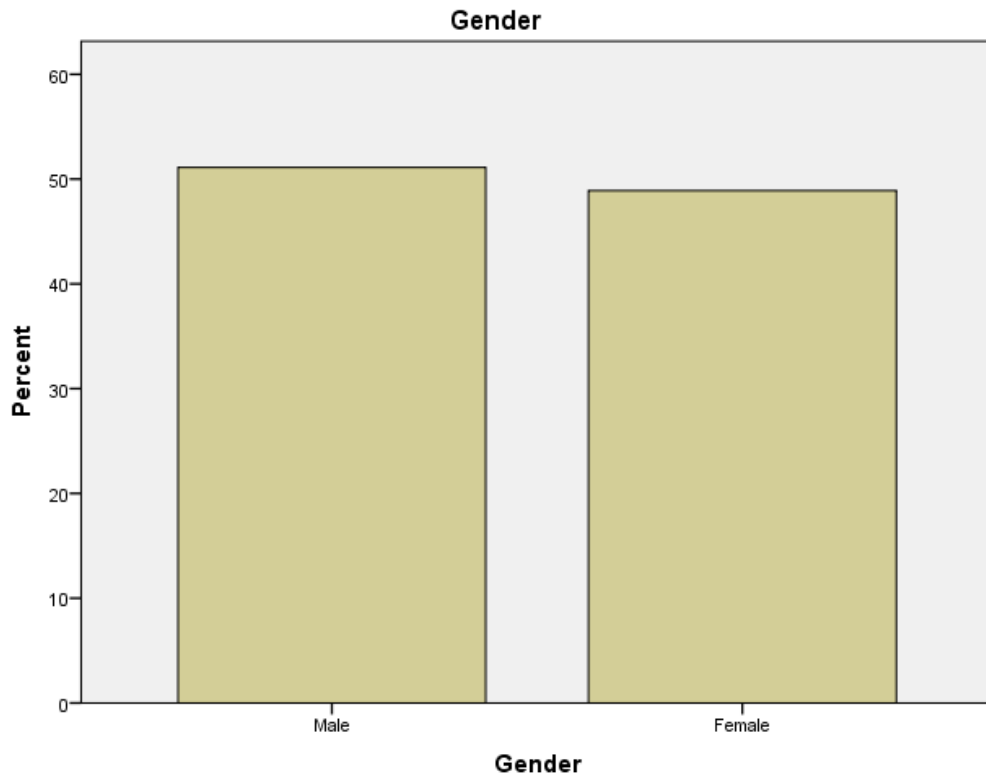


Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	92	51.1	51.1	51.1
Valid Female	88	48.9	48.9	100.0
Total	180	100.0	100.0	

Table 2: Gender Distribution of Participants

Among the respondents, 51.1% were male and 48.9% were female, indicating a nearly balanced gender representation.

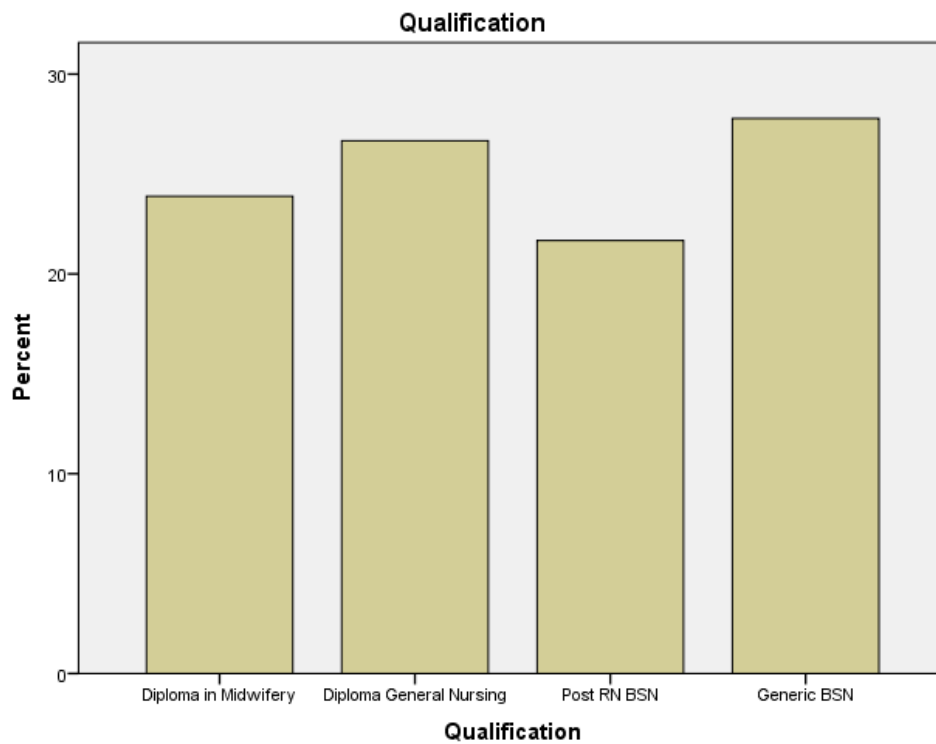


Qualification

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Diploma in Midwifery	43	23.9	23.9	23.9
Diploma General Nursing	48	26.7	26.7	50.6
Post RN BSN	39	21.7	21.7	72.2
Generic BSN	50	27.8	27.8	100.0
Total	180	100.0	100.0	

**Table 3: Educational Qualification of Participants**

Most nurses held a Generic BSN (27.8%) or Diploma in General Nursing (26.7%), while 23.9% had a Diploma in Midwifery and 21.7% a Post RN BSN.

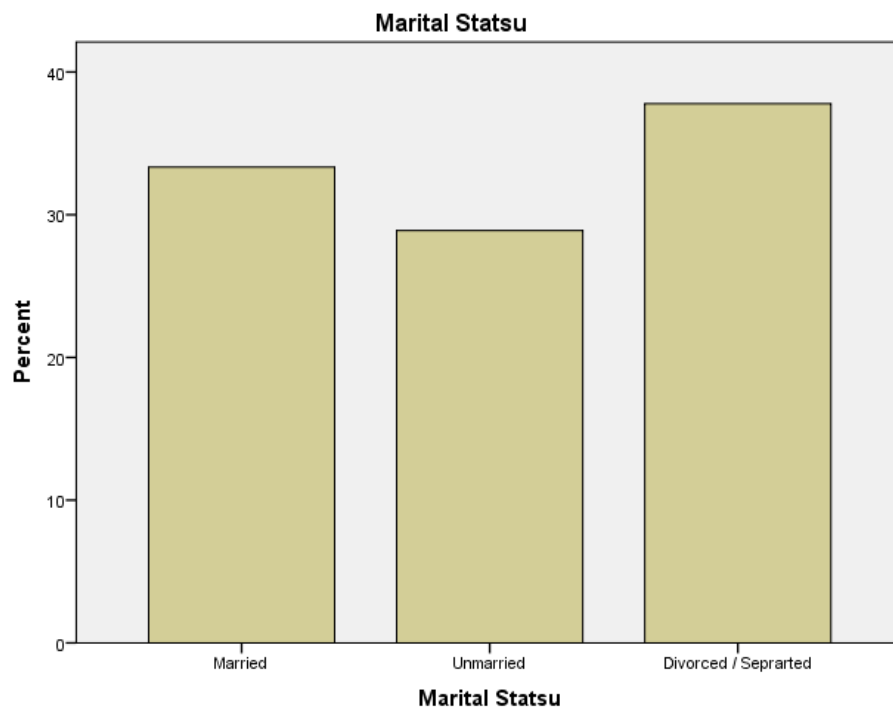


Marital Status

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Married	60	33.3	33.3	33.3
Valid Unmarried	52	28.9	28.9	62.2
Valid Divorced / Separated	68	37.8	37.8	100.0
Valid Total	180	100.0	100.0	

Table 4: Marital Status of Participants

A considerable proportion of participants were divorced or separated (37.8%), while 33.3% were married and 28.9% unmarried.

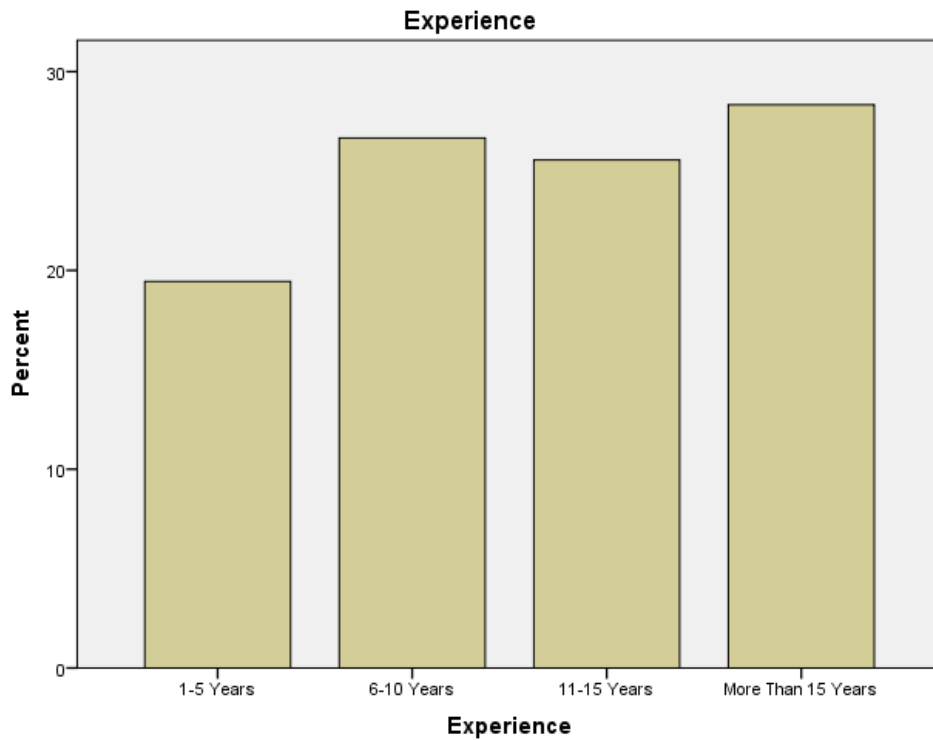


Experience

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1-5 Years	35	19.4	19.4	19.4
6-10 Years	48	26.7	26.7	46.1
11-15 Years	46	25.6	25.6	71.7
More Than 15 Years	51	28.3	28.3	100.0
Total	180	100.0	100.0	

**Table 5: Work Experience of Participants**

Nearly one-third of nurses (28.3%) had more than 15 years of experience, while 26.7% had 6–10 years and 25.6% had 11–15 years of experience.

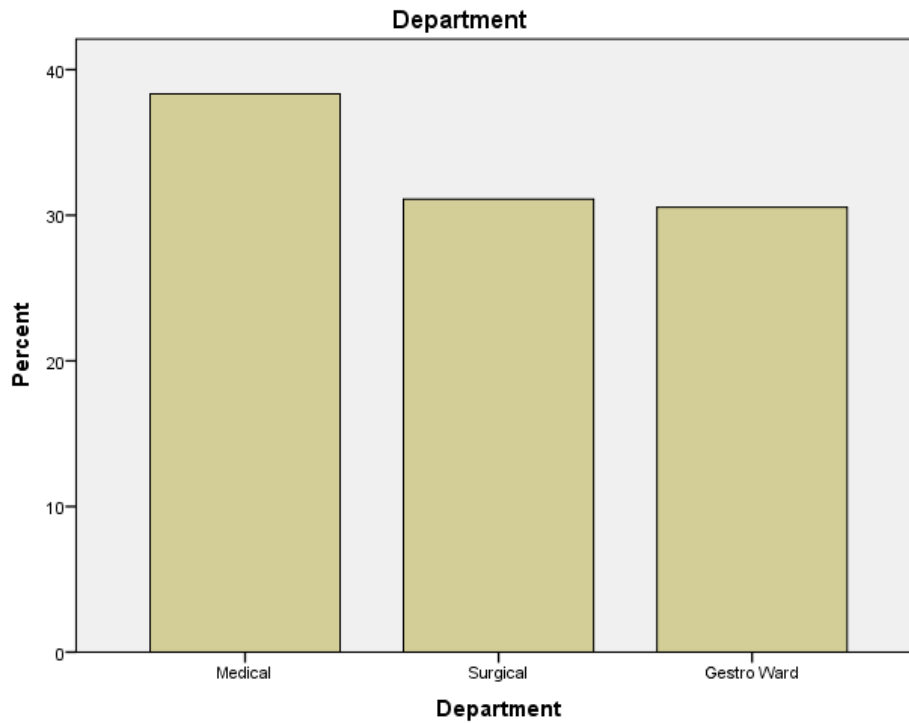


Department

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Medical	69	38.3	38.3	38.3
Surgical	56	31.1	31.1	69.4
Gestro Ward	55	30.6	30.6	100.0
Total	180	100.0	100.0	

**Table 6: Departmental Distribution of Participants**

Most nurses worked in the medical department (38.3%), followed by surgical (31.1%) and gastro wards (30.6%).



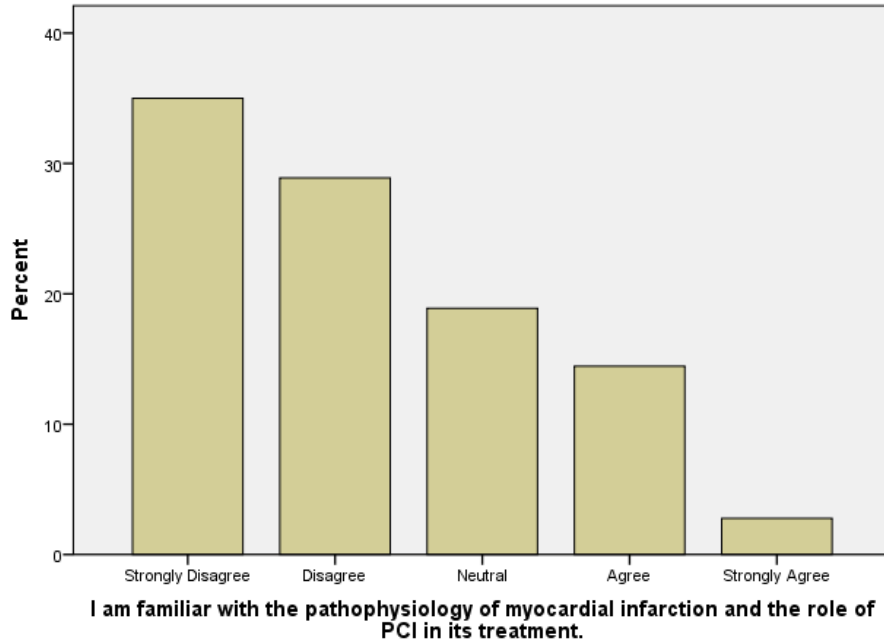
I am familiar with the pathophysiology of myocardial infarction and the role of PCI in its treatment.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	63	35.0	35.0
	Disagree	52	28.9	63.9
	Neutral	34	18.9	82.8
	Agree	26	14.4	97.2
	Strongly Agree	5	2.8	100.0
Total	180	100.0	100.0	

**Table 7: Knowledge of MI Pathophysiology and PCI Role**

A large proportion (63.9%) of nurses disagreed or strongly disagreed about familiarity with myocardial infarction pathophysiology and PCI, indicating poor knowledge.

I am familiar with the pathophysiology of myocardial infarction and the role of PCI in its treatment.



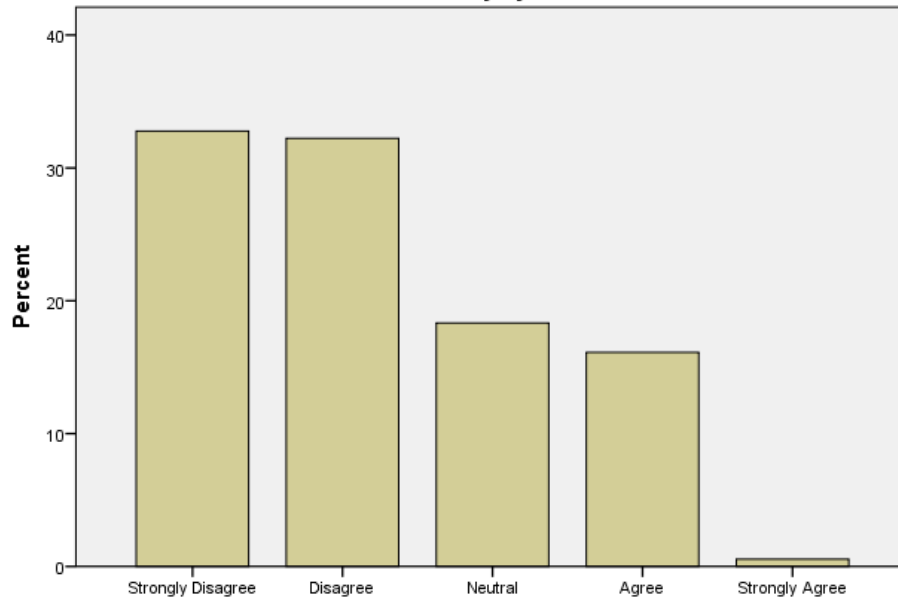
I understand the indications and contraindications for performing PCI in patients with acute coronary syndromes.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	59	32.8	32.8	32.8
Disagree	58	32.2	32.2	65.0
Neutral	33	18.3	18.3	83.3
Agree	29	16.1	16.1	99.4
Strongly Agree	1	.6	.6	100.0
Total	180	100.0	100.0	

Table 8: Understanding of PCI Indications and Contraindications

About 65% of participants disagreed or strongly disagreed with understanding PCI indications and contraindications, reflecting a lack of clinical awareness.

I understand the indications and contraindications for performing PCI in patients with acute coronary syndromes.



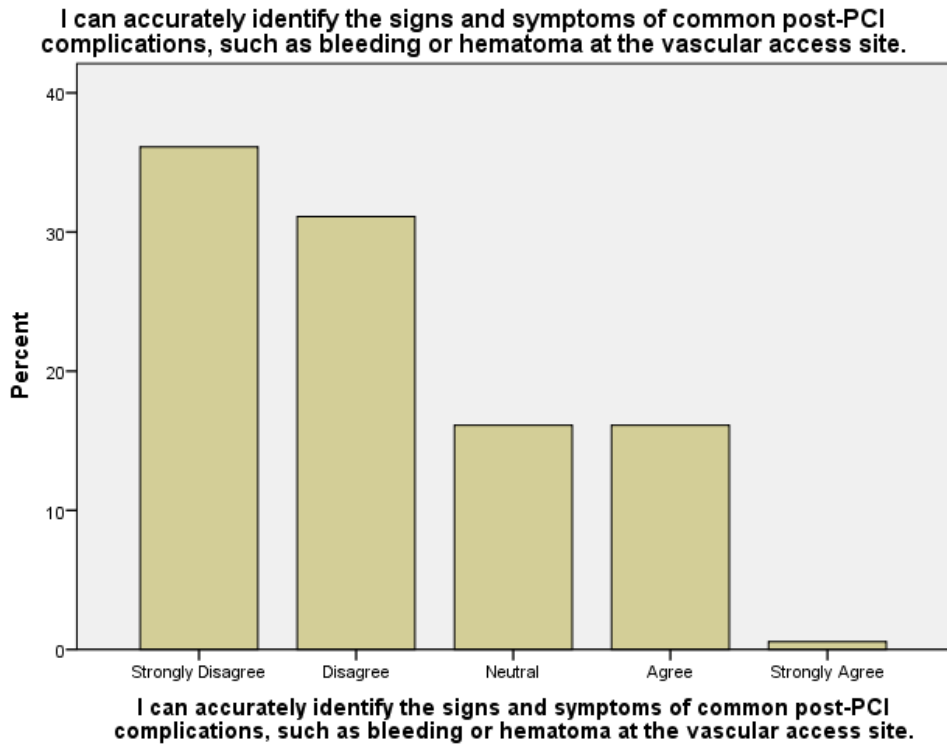
I understand the indications and contraindications for performing PCI in patients with acute coronary syndromes.

I can accurately identify the signs and symptoms of common post-PCI complications, such as bleeding or hematoma at the vascular access site.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	65	36.1	36.1	36.1
Disagree	56	31.1	31.1	67.2
Neutral	29	16.1	16.1	83.3
Agree	29	16.1	16.1	99.4
Strongly Agree	1	.6	.6	100.0
Total	180	100.0	100.0	

Table 9: Identification of Post-PCI Complications

Most nurses (67.2%) disagreed or strongly disagreed that they could identify post-PCI complications like bleeding or hematoma, suggesting inadequate clinical recognition.



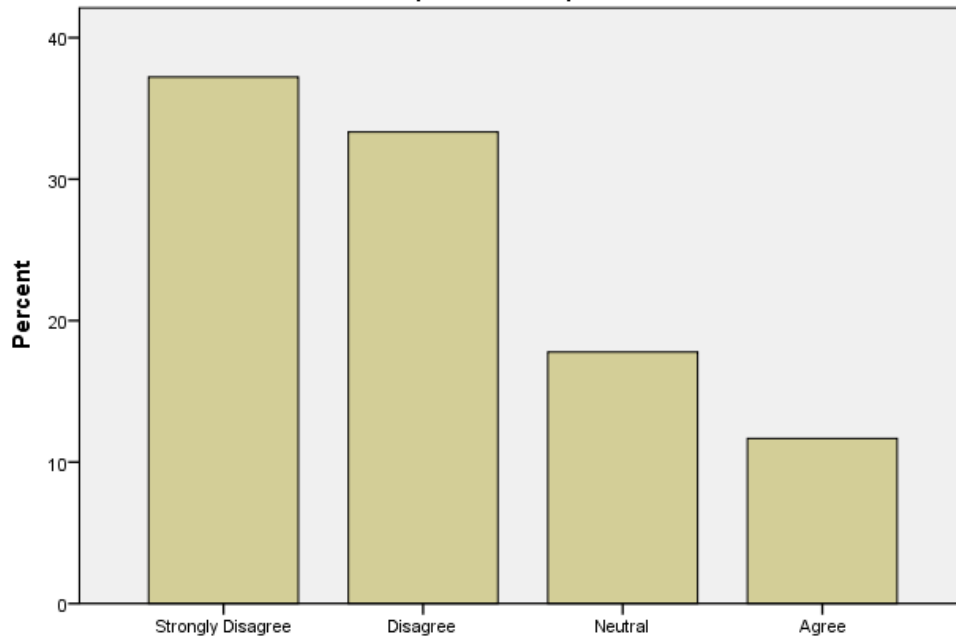
I am knowledgeable about the recommended timelines for patient mobilization after PCI to prevent complications.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	67	37.2	37.2	37.2
Disagree	60	33.3	33.3	70.6
Valid Neutral	32	17.8	17.8	88.3
Agree	21	11.7	11.7	100.0
Total	180	100.0	100.0	

**Table 10: Knowledge of Post-PCI Mobilization Timelines**

A majority (70.5%) of respondents lacked knowledge of recommended mobilization timelines after PCI to prevent complications.

I am knowledgeable about the recommended timelines for patient mobilization after PCI to prevent complications.



I am knowledgeable about the recommended timelines for patient mobilization after PCI to prevent complications.

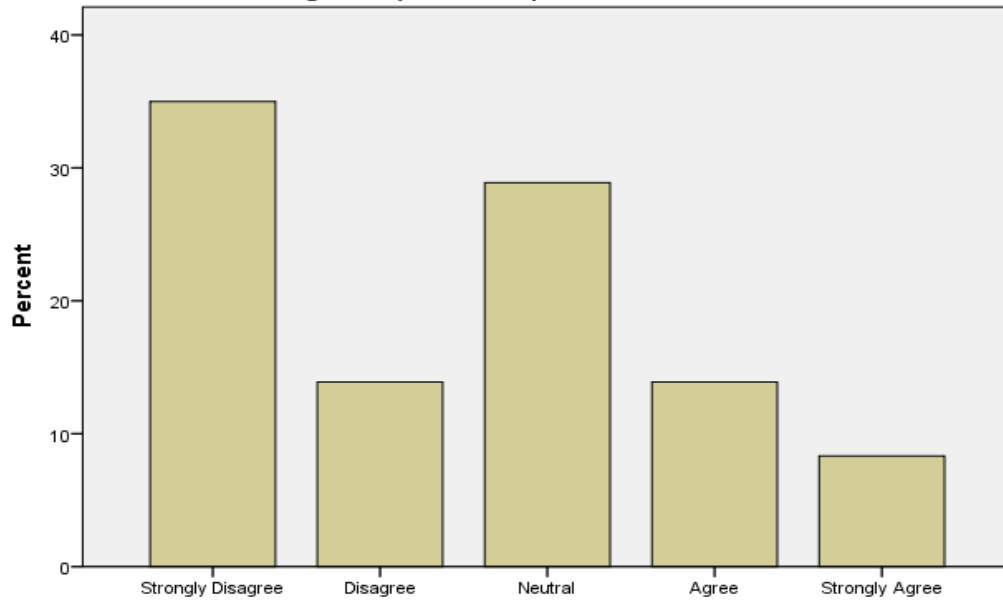


I am aware of the medications commonly prescribed post-PCI (e.g., antiplatelets, anticoagulants) and their potential side effects.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	63	35.0	35.0	35.0
Disagree	25	13.9	13.9	48.9
Neutral	52	28.9	28.9	77.8
Agree	25	13.9	13.9	91.7
Strongly Agree	15	8.3	8.3	100.0
Total	180	100.0	100.0	

**Table 11: Awareness of Post-PCI Medications and Side Effects**  
 Over half of the participants (48.9%) reported limited awareness regarding commonly prescribed post-PCI medications and their side effects.

I am aware of the medications commonly prescribed post-PCI (e.g., antiplatelets, anticoagulants) and their potential side effects.



I am aware of the medications commonly prescribed post-PCI (e.g., antiplatelets, anticoagulants) and their potential side effects.

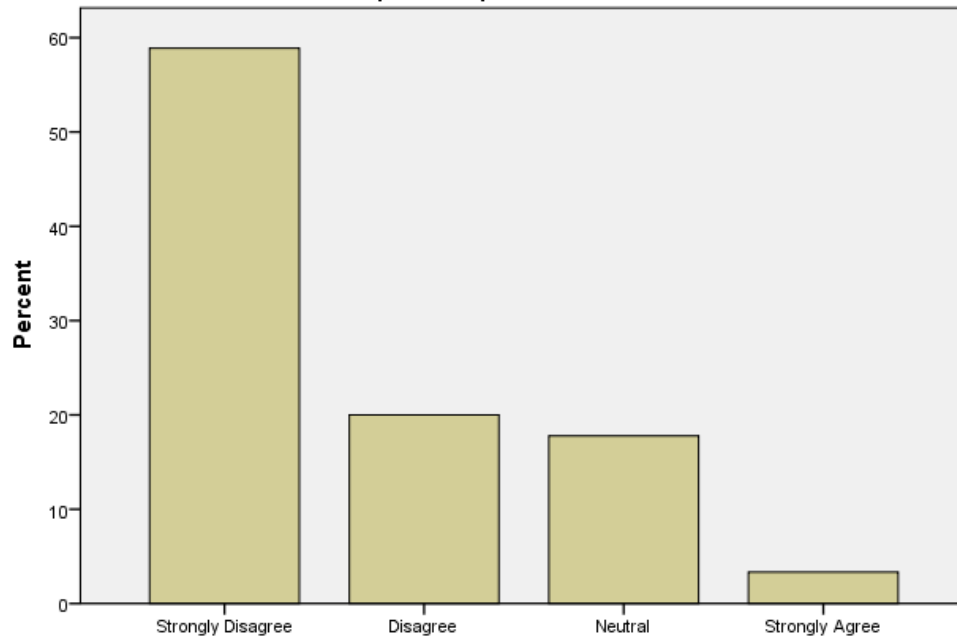
I understand the importance of monitoring for contrast-induced nephropathy in patients post-PCI.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	106	58.9	58.9	58.9
Valid Disagree	36	20.0	20.0	78.9
Valid Neutral	32	17.8	17.8	96.7
Valid Strongly Agree	6	3.3	3.3	100.0
Total	180	100.0	100.0	

Table 12: Knowledge of Contrast-Induced Nephropathy Monitoring

Most nurses (58.9%) strongly disagreed about understanding the importance of monitoring for contrast-induced nephropathy post-PCI.

I understand the importance of monitoring for contrast-induced nephropathy in patients post-PCI.



I understand the importance of monitoring for contrast-induced nephropathy in patients post-PCI.



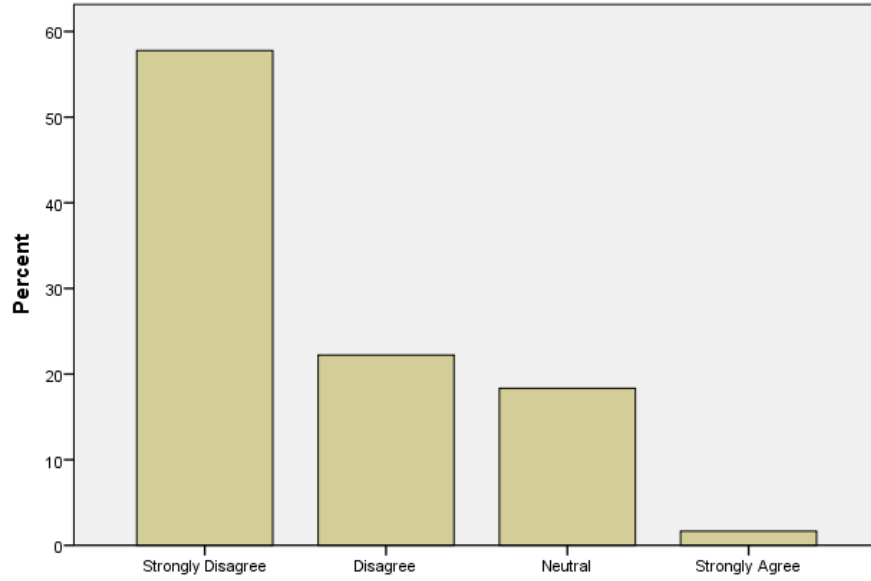
I am familiar with the 2023 European Society of Cardiology (ESC) guidelines for managing patients undergoing PCI.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	104	57.8	57.8	57.8
Disagree	40	22.2	22.2	80.0
Neutral	33	18.3	18.3	98.3
Strongly Agree	3	1.7	1.7	100.0
Total	180	100.0	100.0	

Table 13: Familiarity with ESC 2023 PCI Guidelines

A vast majority (57.8%) of nurses strongly disagreed about familiarity with ESC 2023 guidelines, showing limited guideline awareness.

I am familiar with the 2023 European Society of Cardiology (ESC) guidelines for managing patients undergoing PCI.



I am familiar with the 2023 European Society of Cardiology (ESC) guidelines for managing patients undergoing PCI.

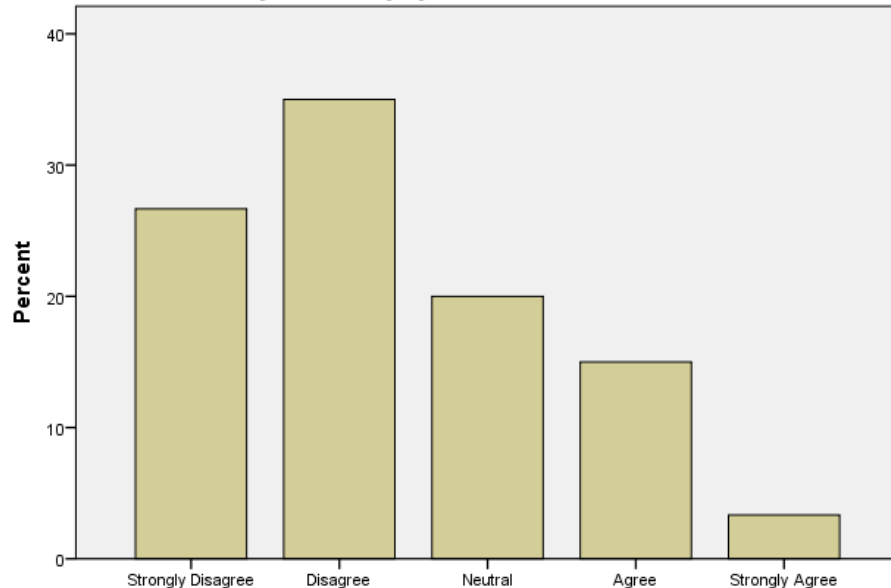
I can recognize electrocardiographic changes that may indicate periprocedural myocardial injury or stent thrombosis.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	48	26.7	26.7	26.7
Disagree	63	35.0	35.0	61.7
Neutral	36	20.0	20.0	81.7
Agree	27	15.0	15.0	96.7
Strongly Agree	6	3.3	3.3	100.0
Total	180	100.0	100.0	

Table 14: Recognition of ECG Changes Post-PCI

Nearly 61.7% of respondents disagreed or strongly disagreed about recognizing ECG changes indicating myocardial injury or stent thrombosis.

I can recognize electrocardiographic changes that may indicate periprocedural myocardial injury or stent thrombosis.



I can recognize electrocardiographic changes that may indicate periprocedural myocardial injury or stent thrombosis.

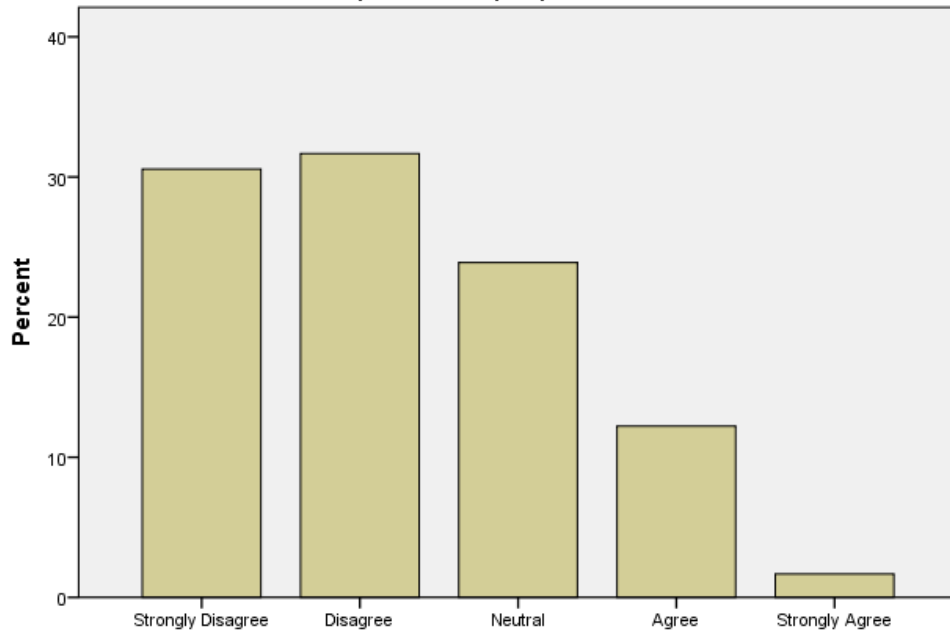
I routinely monitor vital signs and vascular access sites for complications in post-PCI patients as per protocol.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	55	30.6	30.6	30.6
Disagree	57	31.7	31.7	62.2
Neutral	43	23.9	23.9	86.1
Agree	22	12.2	12.2	98.3
Strongly Agree	3	1.7	1.7	100.0
Total	180	100.0	100.0	

Table 15: Monitoring of Post-PCI Patients per Protocol

About 62.3% of participants disagreed or strongly disagreed that they routinely monitor vital signs and vascular sites as per post-PCI protocols.

I routinely monitor vital signs and vascular access sites for complications in post-PCI patients as per protocol.



I routinely monitor vital signs and vascular access sites for complications in post-PCI patients as per protocol.



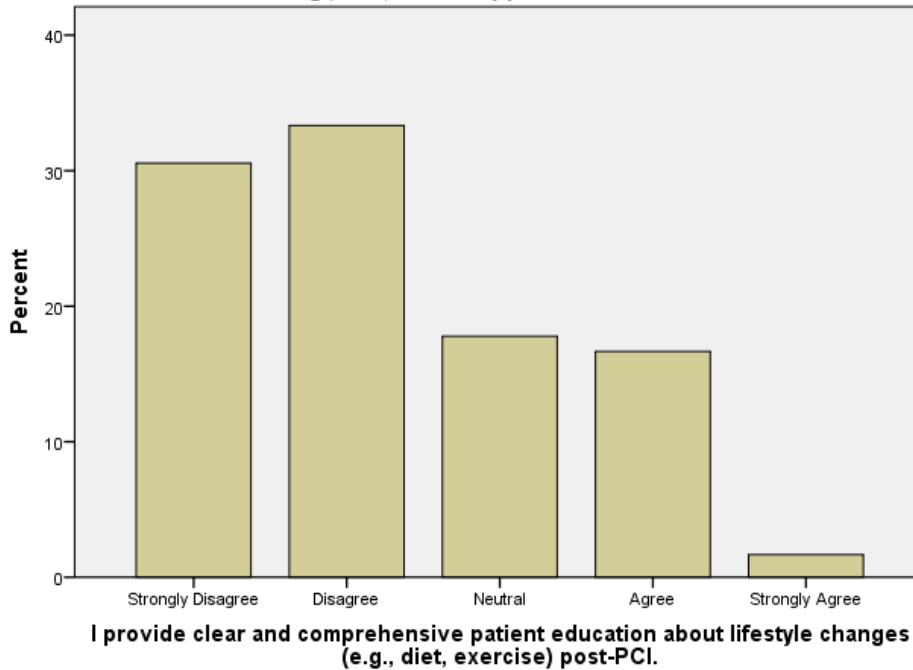
I provide clear and comprehensive patient education about lifestyle changes (e.g., diet, exercise) post-PCI.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	55	30.6	30.6	30.6
Disagree	60	33.3	33.3	63.9
Neutral	32	17.8	17.8	81.7
Agree	30	16.7	16.7	98.3
Strongly Agree	3	1.7	1.7	100.0
Total	180	100.0	100.0	

Table 16: Patient Education on Lifestyle Changes Post-PCI

A majority (63.9%) of nurses disagreed or strongly disagreed that they provide comprehensive patient education about lifestyle modifications after PCI.

I provide clear and comprehensive patient education about lifestyle changes (e.g., diet, exercise) post-PCI.

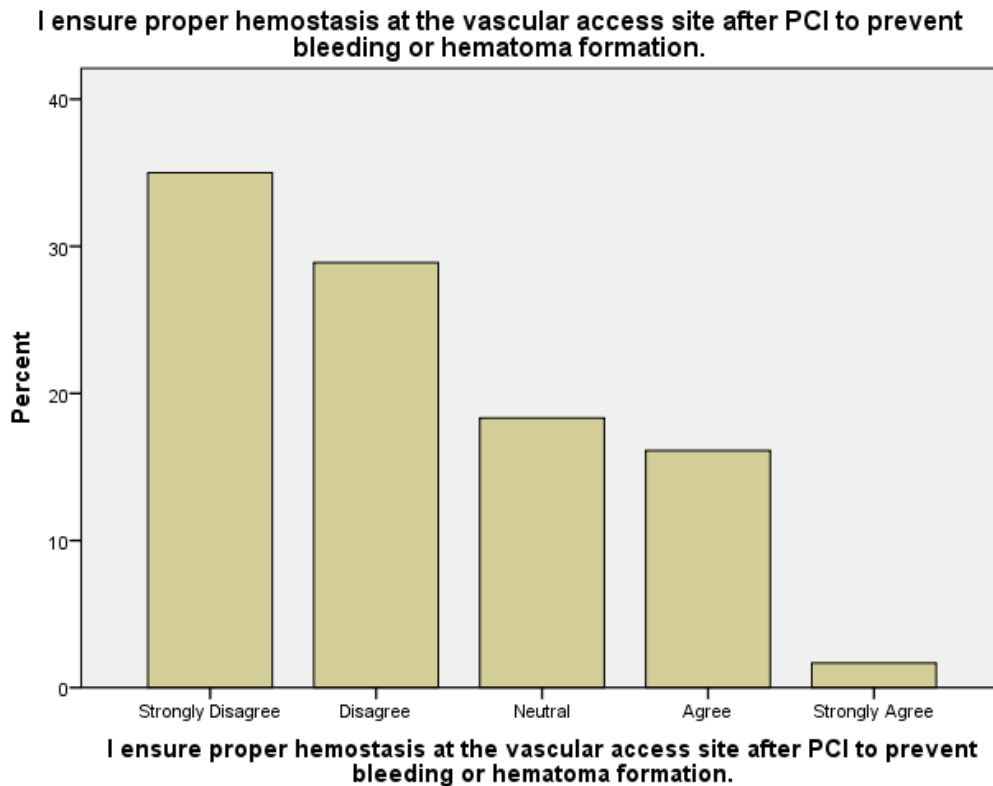


I ensure proper hemostasis at the vascular access site after PCI to prevent bleeding or hematoma formation.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	63	35.0	35.0	35.0
Valid Disagree	52	28.9	28.9	63.9
Valid Neutral	33	18.3	18.3	82.2
Valid Agree	29	16.1	16.1	98.3
Valid Strongly Agree	3	1.7	1.7	100.0
Total	180	100.0	100.0	

Table 17: Ensuring Hemostasis After PCI

Almost two-thirds (63.9%) of nurses disagreed or strongly disagreed that they ensure proper hemostasis at vascular access sites post-PCI.

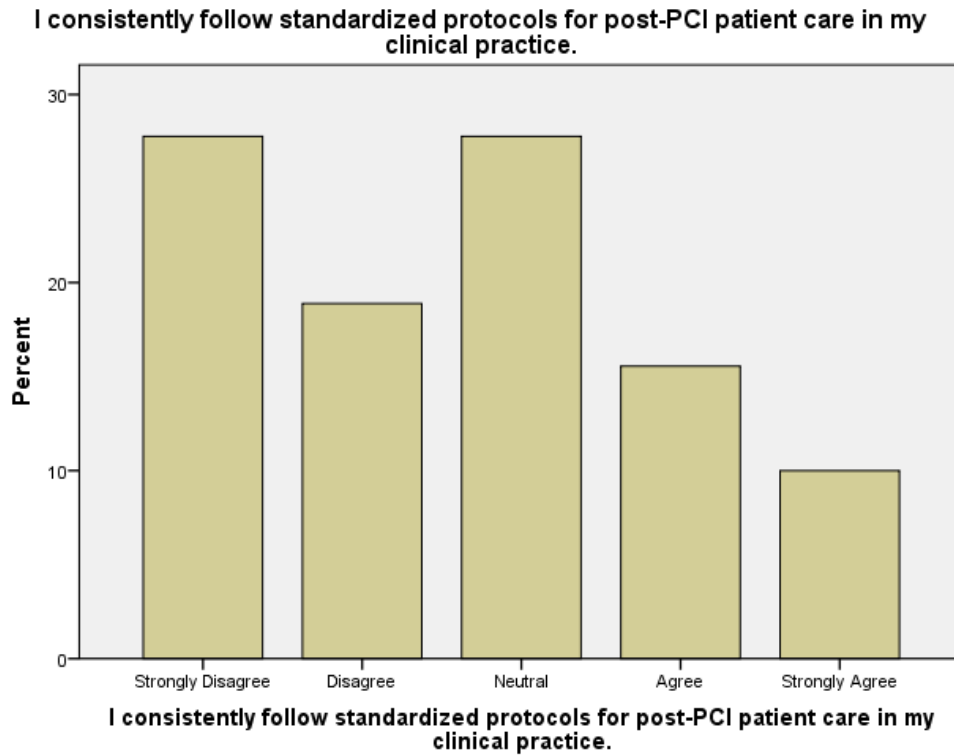


I consistently follow standardized protocols for post-PCI patient care in my clinical practice.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	50	27.8	27.8	27.8
Disagree	34	18.9	18.9	46.7
Neutral	50	27.8	27.8	74.4
Agree	28	15.6	15.6	90.0
Strongly Agree	18	10.0	10.0	100.0
Total	180	100.0	100.0	

**Table 18: Adherence to Standardized Post-PCI Care Protocols**

Nearly half (46.7%) of the respondents disagreed or strongly disagreed about consistently following standardized post-PCI care protocols.

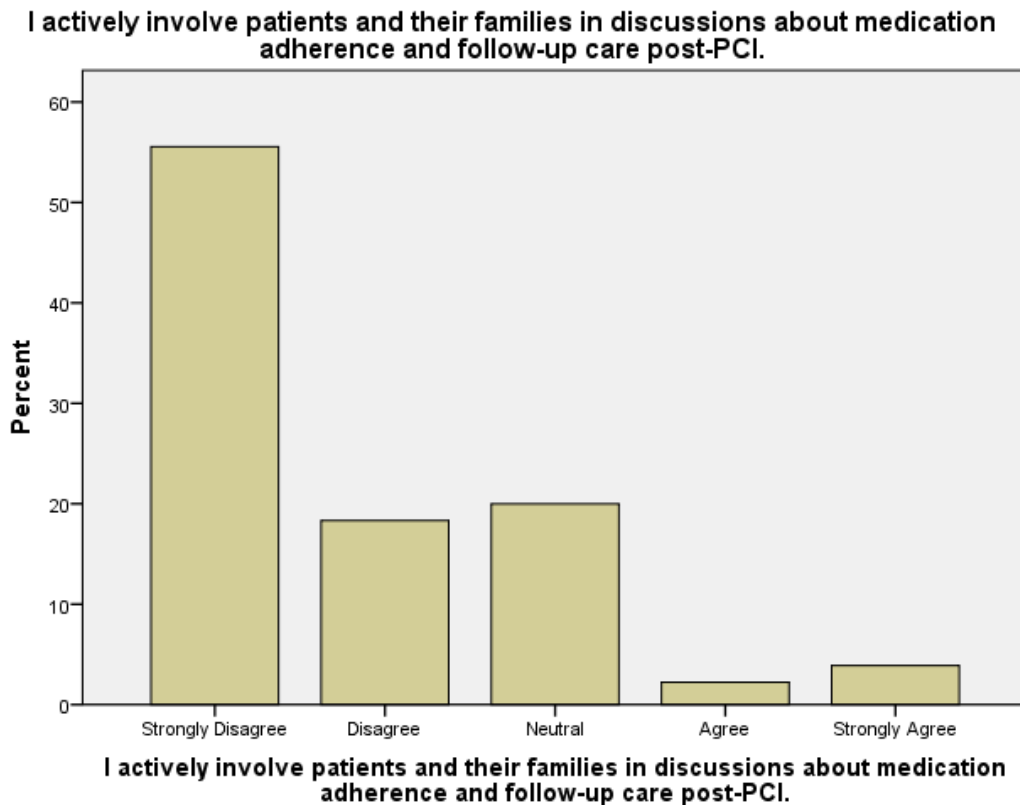


I actively involve patients and their families in discussions about medication adherence and follow-up care post-PCI.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	100	55.6	55.6	55.6
Disagree	33	18.3	18.3	73.9
Neutral	36	20.0	20.0	93.9
Agree	4	2.2	2.2	96.1
Strongly Agree	7	3.9	3.9	100.0
Total	180	100.0	100.0	

**Table 19: Involvement of Patients and Families in Care**

More than half (55.6%) of the participants strongly disagreed that they involve patients and families in post-PCI medication and follow-up discussions.

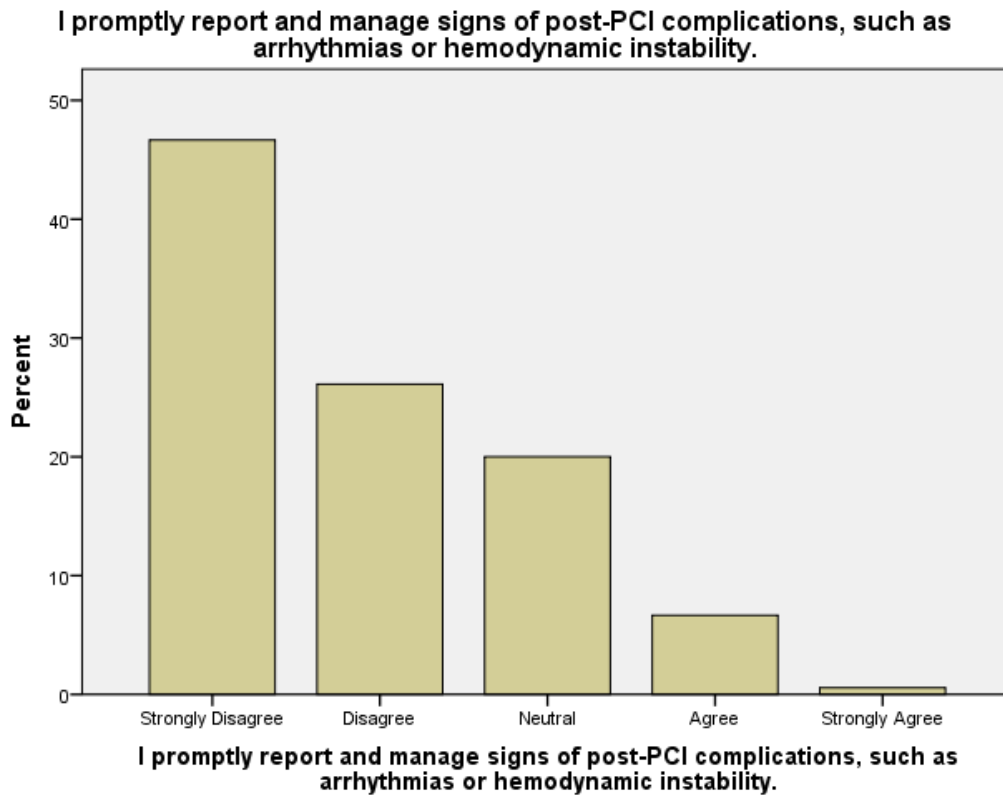


I promptly report and manage signs of post-PCI complications, such as arrhythmias or hemodynamic instability.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	84	46.7	46.7	46.7
Disagree	47	26.1	26.1	72.8
Neutral	36	20.0	20.0	92.8
Agree	12	6.7	6.7	99.4
Strongly Agree	1	.6	.6	100.0
Total	180	100.0	100.0	

**Table 20: Reporting and Managing Post-PCI Complications**

Most respondents (72.8%) disagreed or strongly disagreed about promptly reporting or managing post-PCI complications like arrhythmias or instability.



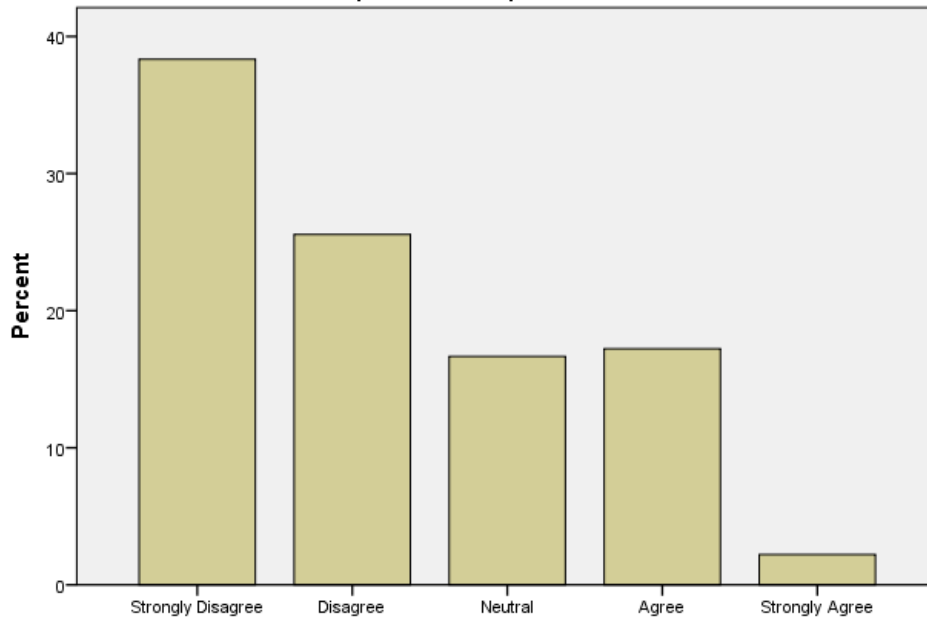
I participate in continuous professional development programs to stay updated on best practices for post-PCI care.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	69	38.3	38.3	38.3
Valid Disagree	46	25.6	25.6	63.9
Valid Neutral	30	16.7	16.7	80.6
Valid Agree	31	17.2	17.2	97.8
Valid Strongly Agree	4	2.2	2.2	100.0
Total	180	100.0	100.0	

**Table 21: Participation in Professional Development**

A large proportion (63.9%) of nurses disagreed or strongly disagreed about participating in continuous professional development programs for post-PCI care.

I participate in continuous professional development programs to stay updated on best practices for post-PCI care.



I participate in continuous professional development programs to stay updated on best practices for post-PCI care.

**Discussion**

Demographic Profile of Participants: The study involved 180 nurses working in different departments, including those caring for cardiac and general patients. The ages of the nurses varied, with 41.1% being between 21 and 28 years old, 35.0% between 29 and 36 years old, and 23.9% between 37 and 44 years old. This shows that most of the nurses are young and likely in the early stages of their careers. Younger nurses might have learned the latest theories in school, but they may not have much hands-on experience, especially with advanced procedures like Percutaneous Coronary Intervention (PCI).

The gender split was almost equal, with 51.1% males and 48.9% females, meaning both men and women were well-represented. This balance helps capture a wide range of viewpoints and experiences in nursing practice. When it came to education, 27.8% of the nurses had a Generic Bachelor of Science in Nursing (BSN), 26.7% had a Diploma in General Nursing, 23.9% had a Diploma in Midwifery, and 21.7% had a Post RN BSN degree. This mix shows that the nurses came from different educational backgrounds,

including both diploma and degree programs. Nurses with BSN degrees, which focus more on research and evidence-based care, were expected to know more about PCI-related care compared to those with diplomas.

Looking at marital status, 37.8% of the nurses were divorced or separated, 33.3% were married, and 28.9% were unmarried. The high number of divorced or separated nurses might suggest that the job’s demands, especially in stressful areas like cardiology or intensive care, can affect personal life. In terms of work experience, 28.3% of the nurses had more than 15 years, 26.7% had 6-10 years, 25.6% had 11-15 years, and 19.4% had 1-5 years. This variety means the study included both new nurses and those with many years of experience, allowing us to see how experience impacts their knowledge and skills. Finally, the departments showed that 38.3% of nurses worked in medical wards, 31.1% in surgical units, and 30.6% in gastro wards. Since fewer nurses worked in cardiac-specific areas, this might explain some of the gaps in their knowledge and skills related to PCI care.

**Knowledge Regarding Pathophysiology of Myocardial Infarction and Role of PCI** A large number of nurses, 63.9%, said they were not familiar with the causes of myocardial infarction (MI) or the role of PCI, either disagreeing or strongly disagreeing. Only 17.2% felt confident about this topic. This points to a big gap in understanding basic heart-related concepts.

Younger nurses (aged 21–28) and those with diploma qualifications knew the least, possibly because their training didn't cover cardiac procedures much. On the other hand, nurses with a Post RN BSN degree and over 10 years of experience knew more. This matches a study by Ahmed et al. (2022), which found that practical experience and higher education improve nurses' knowledge of heart conditions.

**Knowledge of Indications and Contraindications of PCI** About 65% of the nurses did not understand when PCI should be done or when it should be avoided, showing a lack of knowledge that can affect preparation and care before and after the procedure. Nurses with more than 15 years of experience knew a bit more, likely because they've seen more cases over time. There wasn't much difference between male and female nurses, but those with BSN degrees scored higher than diploma holders. This is similar to findings by Johnson & Martinez (2023), who noted that nurses with formal cardiac training understand PCI better.

**Recognition of Post-PCI Complications** Nearly 67.2% of nurses felt they couldn't identify problems after PCI, like bleeding or swelling at the access site. Spotting these issues early is crucial to prevent serious conditions like pseudoaneurysm or internal bleeding. Nurses with 11–15 years of experience were slightly better at recognizing these complications than those with less than 5 years. This suggests that experience helps with judgment, though ongoing training is still needed to keep skills current.

**Knowledge of Post-PCI Mobilization Timelines** Most nurses, 70.6%, did not know the recommended times for patients to start moving

after PCI. This shows a lack of proper training in standard post-surgery care, especially in general wards. Nurses in surgical departments did a little better, probably because they often handle patients recovering from procedures. This supports a study by Smith & Taylor (2024), which found that the type of ward influences nurses' skills in procedures.

### **Awareness of Post-PCI Medications and Side Effects**

Only 22.2% of nurses felt confident about the medicines given after PCI, such as antiplatelets and anticoagulants. Not knowing about these drugs can lead to mistakes that harm patients. Nurses with higher qualifications (BSN or Post RN BSN) knew a bit more, while those with diplomas struggled more. This highlights the need for regular training on medication safety and drug effects.

### **Knowledge of Contrast-Induced Nephropathy Monitoring**

A high 58.9% of nurses strongly disagreed that they understood the need to monitor for contrast-induced nephropathy (CIN) after PCI. This shows they lack awareness of kidney problems that can result from contrast dye. Nurses in medical wards and those with more experience were slightly more aware, but overall, the results show a need for training on spotting and preventing CIN, as noted by Gul et al. (2022).

### **Awareness of ESC 2023 Guidelines for PCI Management**

An alarming 80% of nurses did not know about the 2023 European Society of Cardiology (ESC) guidelines for PCI. This suggests they haven't been exposed to the latest international standards and may not have access to ongoing education. Nurses with BSN degrees knew a little more, likely because their studies included evidence-based guidelines. This finding calls for urgent workshops to teach these standards.

### **Recognition of ECG Changes Post-PCI**

More than 60% of nurses couldn't identify changes in an ECG related to heart injury or stent

issues after PCI. Nurses with over 10 years of experience were slightly better at this. This gap is risky in cardiac wards where spotting ECG changes early can save lives. Adding ECG training to regular nursing education is very important.

### **Practice Related to Post-PCI Monitoring and Patient Care**

Over half of the nurses, 62.3%, did not regularly check vital signs or vascular access sites according to PCI protocols. This shows a big departure from standard care practices. Older and more experienced nurses were a bit better at this, suggesting experience helps with attention to detail, but clear protocols are still needed. Also, 63.9% of nurses did not give lifestyle advice to patients after PCI. Teaching patients about healthy habits is key to preventing future heart problems. The lack of this might be due to heavy workloads or poor training in communication. When it came to ensuring the access site stops bleeding properly, 63.9% disagreed, showing a pattern of weak follow-up care. This points to gaps in hospital procedures and supervision.

### **Compliance with Standardized Protocols and Family Involvement**

About 46.7% of nurses did not consistently follow standard protocols, and 27.8% were unsure, indicating inconsistency or lack of clear guidelines. This might be because written protocols are missing or not well-shared. Worryingly, 55.6% strongly disagreed about involving patients and families in medication plans or follow-ups. Including families helps reduce hospital readmissions, and the lack of this shows a big communication problem in nursing.

### **Reporting and Management of Post-PCI Complications**

Most nurses, 72.8%, did not feel confident reporting or handling complications like irregular heartbeats or unstable blood pressure after PCI. This shows not just a knowledge gap but also a lack of confidence or authority to act in emergencies. Male nurses and those in medical wards felt slightly more confident, possibly due to more exposure to emergency cases.

### **Participation in Continuous Professional Development**

Finally, 63.9% of nurses did not take part in continuing professional development (CPD) programs. This could mean there aren't enough training opportunities or that hospitals don't encourage it. Nurses with 15 or more years of experience were more likely to join occasional training, but overall participation was low. Regular CPD and refresher courses are needed to close knowledge and practice gaps, as suggested by Smith & Taylor (2024).

### **Overall Discussion**

The study shows that nurses have limited knowledge and poor practice when caring for PCI patients. Across all areas—understanding heart conditions, spotting complications, following protocols, and teaching patients—most responses were negative or neutral. Looking at the demographics, nurses with higher education (BSN or Post RN BSN) and more experience knew and performed slightly better. However, these differences weren't enough to fix the overall lack of skills. These results match earlier studies (Celik et al., 2023; Ahmed et al., 2022), which found that nurses without specialized cardiac training often lack the skills needed for PCI care.

### **Possible reasons for these issues include:**

- Little time spent in interventional cardiology units.
- Missing cardiac care training in diploma programs.
- No clear hospital guidelines or monitoring for PCI nursing.
- Heavy workloads and few chances for ongoing training.

To improve this, it's critical to add cardiac care to nursing education, hold regular PCI-specific workshops, and ensure departments follow and supervise protocols. Better knowledge and skills among nurses will lead to safer patient care, fewer complications, and improved recovery after PCI.

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