

ASSESSMENT OF NURSES' KNOWLEDGE REGARDING THE
MANAGEMENT OF MYOCARDIAL INFARCTION IN EMERGENCY UNITS
OF SECONDARY HOSPITALS IN PESHAWAR

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Abstract

Acute myocardial infarction (AMI) is a leading cause of morbidity and mortality worldwide and requires rapid, evidence-based management. Nurses working in emergency units are often the first healthcare professionals to assess and manage patients with suspected MI; therefore, their knowledge and clinical competence are critical determinants of patient outcomes.

Objective:

This study aimed to assess the level of knowledge among nurses regarding the management of myocardial infarction in emergency units of selected secondary hospitals in Peshawar and to identify key areas of knowledge deficiency to inform future educational interventions.

Methods:

A descriptive cross-sectional study was conducted among 74 registered nurses working in the emergency departments of three secondary hospitals in Peshawar. Data were collected using a validated self-administered questionnaire adapted from Mali and Singh (2024). The tool assessed demographic characteristics and knowledge related to MI symptom recognition, pathophysiology, electrocardiogram (ECG) interpretation, pharmacological management, and immediate nursing interventions. Data were analyzed using SPSS version 27.

Results:

The majority of nurses demonstrated moderate to good overall knowledge of myocardial infarction management, particularly regarding symptom recognition, risk factors, and commonly used medications. However, substantial knowledge gaps were identified in specialized clinical areas. Nearly half of the participants (47.3%) reported limited or no knowledge of ECG interpretation, and 52.7% demonstrated inadequate understanding of Levine's sign. Inconsistencies were also observed in patient education practices and routine ECG review.

Conclusion:

Although nurses possessed a foundational understanding of MI management, significant deficiencies exist in advanced assessment and diagnostic skills. Targeted training programs, particularly in ECG interpretation and clinical

assessment, are urgently needed to strengthen emergency nursing practice and improve patient outcomes in secondary-level healthcare settings.

INTRODUCTION

Acute Myocardial Infarction (AMI) is one of the most critical medical emergencies and remains a leading cause of morbidity and mortality worldwide. It is defined as the irreversible necrosis of myocardial tissue resulting from prolonged ischemia due to obstruction of coronary blood flow (StatPearls, 2023; StatPearls, 2024). The burden of myocardial infarction continues to increase globally, accounting for approximately 32% of deaths related to cardiovascular diseases (World Health Organization [WHO], 2024). The severity of AMI and its life-threatening complications, such as arrhythmias, cardiogenic shock, and heart failure, demand rapid recognition and immediate, evidence-based management to minimize myocardial damage and improve patient survival (O'Gara et al., 2013; AHA/ACC/ACEP/NAEMSP/SCAI, 2025).

Early management of AMI focuses on prompt assessment, rapid pain relief, restoration of coronary blood flow, and continuous monitoring for complications. According to current clinical guidelines, the immediate management of AMI includes the administration of aspirin, oxygen therapy when indicated, continuous electrocardiographic (ECG) monitoring, pain control, and early reperfusion strategies such as thrombolysis or percutaneous coronary intervention (O'Gara et al., 2013; AHA/ACC/ACEP/NAEMSP/SCAI, 2025). Timely implementation of these interventions significantly reduces myocardial injury, shortens hospital stay, and lowers mortality rates.

Nurses play a central and indispensable role in the management of patients with AMI, particularly in emergency units where patients first present with symptoms. Nurses are often the first healthcare professionals to assess the patient, recognize the signs and symptoms of myocardial infarction, obtain vital signs, perform ECGs, administer initial medications, and initiate life-saving interventions (NurseTogether, n.d.; Nurseslabs, 2024). Their knowledge, clinical judgment, and ability to respond swiftly directly influence the quality of care and patient outcomes.

Despite the availability of evidence-based guidelines, numerous studies have reported significant variation

in nurses' knowledge and competence regarding the management of myocardial infarction. Research conducted in different healthcare settings has shown that a considerable proportion of nurses possess only moderate or inadequate knowledge, particularly in areas such as ECG interpretation, recognition of atypical MI symptoms, pharmacological management, and identification of early complications (Basrah Teaching Hospitals, 2022; Jing et al., 2020; NIH, 2023; Smith et al., 2022). Inadequate knowledge at this critical stage of care can lead to delayed diagnosis, inappropriate interventions, and increased risk of adverse outcomes.

The challenge is more pronounced in secondary-level hospitals, where access to specialized cardiology services, advanced diagnostic facilities, and continuous professional development programs may be limited. In these settings, emergency nurses often bear the primary responsibility for early detection, stabilization, and initiation of treatment for AMI patients (Science Publishing Group, 2021; Pati et al., 2024). Consequently, any deficiency in nurses' knowledge or clinical competence can have serious implications for patient safety and survival.

In Pakistan, particularly in the Khyber Pakhtunkhwa province, secondary hospitals serve a large segment of the population and are frequently the first point of contact for patients experiencing acute cardiac events. However, there is limited empirical evidence regarding the level of knowledge among nurses working in emergency units of secondary hospitals in this region. Without a clear understanding of nurses' knowledge and practice gaps, it is difficult to design effective educational interventions and improve the quality of emergency cardiac care.

Therefore, this study was undertaken to assess the knowledge of nurses regarding the management of myocardial infarction in emergency units of selected secondary hospitals in Peshawar. By identifying specific areas of knowledge deficiency, the findings of this study aim to provide a foundation for the development of targeted educational programs, capacity-building initiatives, and evidence-based

strategies to strengthen emergency nursing practice and improve patient outcomes.

1.2 Background of the Study

Acute Myocardial Infarction (AMI), commonly known as a heart attack, is a major global health problem and one of the most frequently occurring cardiovascular diseases. It represents a medical emergency in which blood supply to a part of the heart muscle is significantly reduced or completely obstructed, leading to ischemia and subsequent irreversible myocardial tissue damage (Cleveland Clinic, n.d.; StatPearls, 2023). The progression from ischemia to infarction occurs rapidly, as myocardial cells can tolerate oxygen deprivation for only a short period before cellular necrosis begins. Therefore, immediate recognition and timely clinical intervention are essential to prevent extensive myocardial damage, reduce complications, and improve survival outcomes (O'Gara et al., 2013; AHA/ACC/ACEP/NAEMSP/SCAI, 2025).

The global prevalence of cardiovascular diseases continues to rise, with myocardial infarction contributing significantly to morbidity and mortality worldwide. According to the World Health Organization (2024), cardiovascular diseases account for approximately 32% of all global deaths, making them the leading cause of mortality. Low- and middle-income countries bear a disproportionate burden of this disease, largely due to limited healthcare resources, delayed diagnosis, and inadequate access to specialized cardiac care services. The increasing incidence of AMI places a substantial strain on healthcare systems and highlights the urgent need for effective prevention strategies, early diagnosis, and high-quality emergency management.

Nurses working in emergency units serve as the primary caregivers and the frontline providers of care for patients presenting with symptoms of myocardial infarction. Their responsibilities are extensive and require a high level of clinical competence, critical thinking, and technical skill. Emergency nurses are expected to promptly assess patients, recognize both typical and atypical manifestations of myocardial infarction, perform rapid diagnostic procedures such as electrocardiography, administer prescribed medications, provide continuous monitoring, and initiate life-saving interventions (NurseTogether, n.d.;

Nurseslabs, 2024). The quality of nursing care delivered during the initial hours of myocardial infarction is a decisive factor in determining patient outcomes, including survival, extent of myocardial damage, and long-term functional recovery.

Effective nursing management of myocardial infarction requires not only sound theoretical knowledge but also the ability to apply evidence-based clinical guidelines in fast-paced and often stressful emergency settings. Current guidelines emphasize rapid pain relief, continuous ECG monitoring, oxygen therapy when indicated, administration of antiplatelet agents such as aspirin, timely initiation of reperfusion therapy, and vigilant monitoring for life-threatening complications such as arrhythmias, cardiogenic shock, and heart failure (O'Gara et al., 2013; AHA/ACC/ACEP/NAEMSP/SCAI, 2025). Nurses must also provide emotional support to patients and their families, educate them about risk factors and lifestyle modifications, and ensure continuity of care following the acute phase of illness. Despite the critical importance of nursing competence in the management of myocardial infarction, numerous studies have documented substantial gaps in nurses' knowledge and clinical performance. Research conducted in various healthcare settings indicates that many nurses demonstrate only average or unsatisfactory levels of knowledge, particularly in areas such as ECG interpretation, identification of atypical symptoms in women and elderly patients, pharmacological management, and recognition of early complications (Basrah Teaching Hospitals, 2022; Jing et al., 2020; NIH, 2023; Smith et al., 2022). These deficiencies contribute to delays in diagnosis, suboptimal clinical decision-making, and increased risk of adverse patient outcomes.

The challenge is particularly evident in secondary-level hospitals, which often serve as the first point of contact for large populations, especially in resource-limited regions. In such facilities, access to advanced diagnostic equipment, specialized cardiology services, and continuous professional development programs may be limited. Consequently, emergency nurses in secondary hospitals frequently carry a disproportionate responsibility for early diagnosis, stabilization, and initiation of treatment for patients with myocardial infarction (Science Publishing

Group, 2021; Pati et al., 2024). Without adequate training and up-to-date knowledge, nurses may struggle to implement evidence-based practices effectively, further widening the gap between clinical guidelines and actual patient care.

In Pakistan, and particularly in the province of Khyber Pakhtunkhwa, secondary hospitals play a vital role in the healthcare system, serving large and diverse populations. However, there is a paucity of empirical research examining the knowledge and competencies of nurses regarding myocardial infarction management within these settings. Understanding the current level of nurses' knowledge and identifying specific areas of deficiency are essential for designing targeted educational interventions, improving clinical practice, and strengthening the overall quality of emergency cardiac care.

Therefore, the present study focuses on assessing nurses' knowledge regarding the management of myocardial infarction in emergency units of selected secondary hospitals in Peshawar. The findings of this study are expected to provide valuable insights into existing knowledge gaps and to support the development of structured training programs, capacity-building initiatives, and policy recommendations aimed at improving patient outcomes and enhancing the standard of cardiac care in emergency settings.

1.3 Rationale of the Study

The rationale of this study is grounded in the urgent need to strengthen the quality of emergency cardiac care by addressing the persistent knowledge gaps among nurses regarding the management of myocardial infarction. Although considerable research has been conducted globally on myocardial infarction and its management, much of the existing literature has focused primarily on tertiary-level hospitals, specialized cardiac centers, and critical care units, where healthcare professionals benefit from greater access to advanced technology, specialized physicians, and continuous professional training (Jing et al., 2020; NIH, 2023; Smith et al., 2022).

In contrast, relatively limited attention has been directed toward secondary-level hospitals, particularly in low- and middle-income countries such as Pakistan. These hospitals often serve as the primary healthcare facilities for large segments of the population,

especially in semi-urban and rural areas. Emergency units in such hospitals are frequently the first point of contact for patients experiencing acute cardiac events, including myocardial infarction. However, these facilities typically operate with fewer specialized resources, limited access to cardiologists, and constrained opportunities for continuous professional development among nursing staff (Science Publishing Group, 2021; Pati et al., 2024).

Nurses working in emergency units of secondary hospitals therefore carry a substantial responsibility for the early detection, stabilization, and management of myocardial infarction. Their ability to accurately recognize symptoms, perform timely assessments, interpret diagnostic findings such as ECGs, administer appropriate medications, and initiate life-saving interventions is crucial for preventing complications and reducing mortality. Yet, evidence from previous studies suggests that nurses in such settings may lack adequate training and up-to-date knowledge to perform these tasks effectively (Basrah Teaching Hospitals, 2022; Jing et al., 2020).

Furthermore, several factors contribute to variations in nurses' competence, including differences in educational background, years of clinical experience, exposure to in-service training programs, and availability of standardized clinical guidelines within healthcare institutions. Nurses who lack access to structured continuing education programs are more likely to rely on outdated practices, which can compromise patient safety and quality of care (NIH, 2023; Smith et al., 2022).

Given these challenges, there is a critical need for empirical data that specifically examines the knowledge levels of nurses working in emergency units of secondary hospitals. Without such data, healthcare administrators and policymakers cannot effectively design targeted training programs or allocate resources to areas of greatest need. The present study seeks to fill this gap by systematically assessing nurses' knowledge regarding myocardial infarction management in secondary hospital emergency settings in Peshawar.

By identifying specific areas of knowledge deficiency, this study provides a foundation for developing evidence-based educational interventions, refresher courses, and institutional policies aimed at strengthening nursing competencies. Ultimately, the

findings of this study are expected to contribute to narrowing the gap between clinical guidelines and actual practice, enhancing the quality of emergency cardiac care, and improving survival outcomes for patients suffering from myocardial infarction.

1.4 Aim of the Study

The aim of this study was to assess the level of knowledge among nurses regarding the management of myocardial infarction in emergency units of selected secondary hospitals in Peshawar. In addition, the findings of the study were intended to serve as a basis for the development of an educative tool to enhance nurses' competencies and strengthen the quality of emergency cardiac care.

1.5 Objectives of the Study

The specific objectives of the study were:

1. To evaluate the level of knowledge regarding the management of myocardial infarction among nurses working in emergency units of selected secondary hospitals in Peshawar.
2. To identify specific domains and areas where knowledge gaps exist among staff nurses concerning the management of myocardial infarction.
3. To generate evidence that can support the development of targeted educational interventions and training programs for nurses in emergency settings.

1.6 Research Question

This study was guided by the following research question:

What is the level of knowledge among staff nurses regarding the nursing management of myocardial infarction in emergency units of selected secondary hospitals in Peshawar?

METHODOLOGY

3.1 Study Design

This study employed a **descriptive cross-sectional research design** to assess the existing level of knowledge regarding the management of myocardial infarction among nurses working in emergency units of selected secondary hospitals in Peshawar. This

design was chosen because it allows for the efficient assessment of participants' knowledge and the identification of knowledge gaps at a single point in time without manipulating any study variables. The design is particularly appropriate for describing trends and patterns of knowledge in healthcare settings.

3.2 Study Setting

The study was conducted in the emergency departments of three secondary-level hospitals located in Peshawar, Khyber Pakhtunkhwa:

- Sifwat Ghayyur Memorial Hospital
- Naseerullah Babar Memorial Hospital
- Molvi Ameer Shah Memorial Hospital

These hospitals were selected because they provide emergency services to large populations and represent typical secondary-level healthcare facilities within the region.

3.3 Study Population and Sample Size

The study population consisted of registered nurses employed in the emergency departments of the selected hospitals. A total of **74 nurses** participated in the study and were included in the final analysis.

3.4 Sampling Technique

A **convenience sampling technique** was used to recruit participants. Nurses who were present in the emergency units during the period of data collection and who met the inclusion criteria were invited to participate in the study.

3.5 Eligibility Criteria

Inclusion Criteria

- Registered nurses with at least **one year of experience** in emergency or critical care units
- Nurses who agreed to participate voluntarily and provided written informed consent

Exclusion Criteria

- Nurses who were on leave during the data collection period
- Nurses who had participated in myocardial infarction-specific training within the previous one month

3.6 Data Collection Instrument

Data were collected using a structured, self-administered questionnaire adapted from **Mali and Singh (2024)**. The questionnaire consisted of two main sections:

1. **Demographic Information:** age, gender, educational qualification, years of experience, and training history
 2. **Knowledge Assessment Section:** eighteen multiple-choice questions addressing symptom recognition, pathophysiology, ECG interpretation, emergency interventions, and pharmacological management related to myocardial infarction
- The instrument had previously been validated in similar studies and was considered reliable for assessing nurses' knowledge of myocardial infarction management.

3.7 Data Collection Procedure

Formal approval was obtained from the relevant institutional authorities and hospital administrations before data collection. The purpose of the study was explained to all participants, and they were assured of confidentiality, anonymity, voluntary participation, and their right to withdraw at any time without any consequences. Written informed consent was obtained from each participant prior to data collection. The questionnaires were distributed and collected on the same day to ensure a high response rate.

3.8 Data Analysis Procedure

Data were entered and analyzed using **Statistical Package for Social Sciences (SPSS) version 27**. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize demographic characteristics and knowledge scores.

Knowledge levels were classified as follows:

- **Good Knowledge:** $\geq 66.8\%$ correct responses
- **Average Knowledge:** 33.4% – 66.7% correct responses
- **Poor Knowledge:** $< 33.3\%$ correct responses

3.9 Ethical Considerations

Ethical approval for the study was obtained from the Ethical Review Committee of the Post Graduate College of Nursing, Hayatabad, as well as from the administrative authorities of each participating hospital. Participants' confidentiality and anonymity were strictly maintained throughout the study. All data were stored securely and used solely for academic purposes. The study involved no physical or psychological risk to participants.

3.10 Summary

This chapter described the methodology employed in the study, including the research design, setting, population, sampling technique, data collection instrument, procedures, data analysis, and ethical considerations. The chosen methodology provided a systematic and ethical framework for assessing nurses' knowledge of myocardial infarction management in emergency units of secondary hospitals in Peshawar.

RESULTS

4.1 Introduction

This chapter presents the findings of the study, which aimed to assess the level of knowledge regarding the management of myocardial infarction among nurses working in emergency units of selected secondary hospitals in Peshawar. The results are organized into three main sections: demographic characteristics of the participants, nurses' knowledge related to myocardial infarction, and reported clinical practice behaviors.

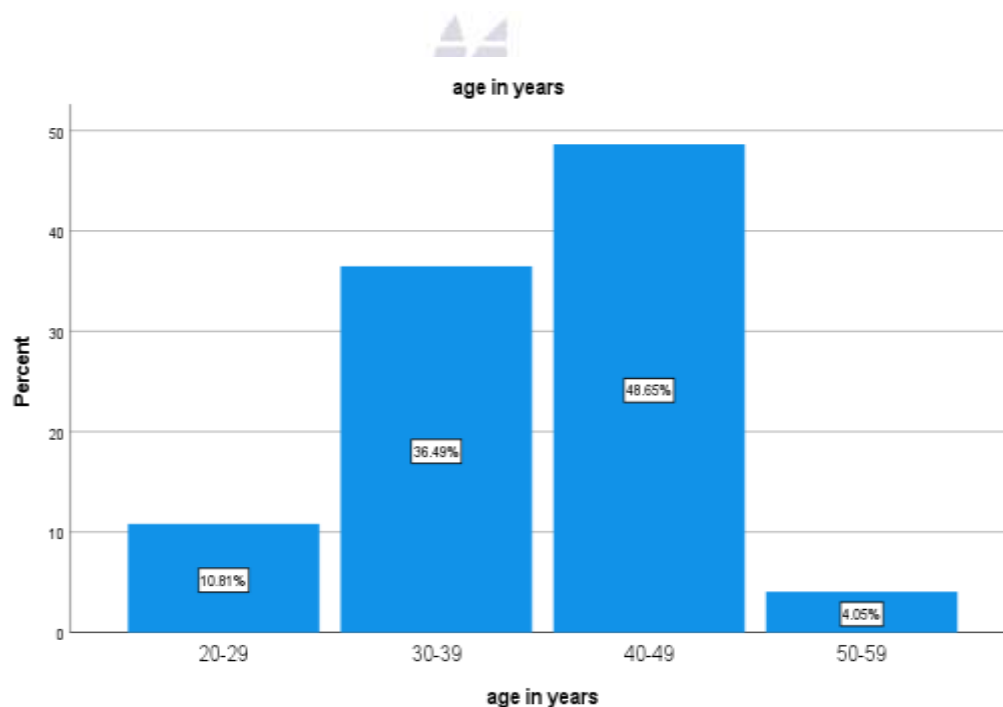
4.2 Demographic Characteristics of the Participants

| S. No | Variables | Options | Frequency | Percentage |
|-------|-----------------------------|-------------|-----------|------------|
| 1 | Age (in years) | 20-29 | 8 | 10.8% |
| | | 30-39 | 27 | 36.5% |
| | | 40-49 | 36 | 48.6% |
| | | 50-59 | 3 | 4.1% |
| 2 | Years of Experience in Unit | 1 and below | 10 | 13.5% |

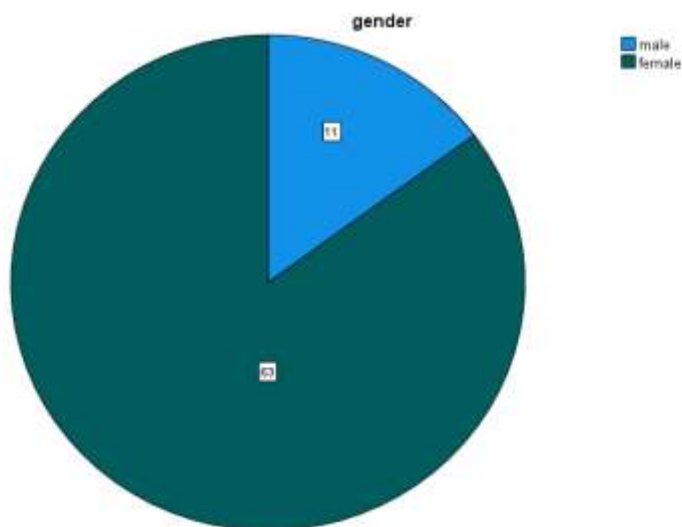
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|---|-------------------------------|--------------------|----|-------|
| | | 2-3 | 30 | 40.5% |
| | | 4-5 | 18 | 24.3% |
| | | 6 and above | 16 | 21.6% |
| 3 | Total Years of Nursing Exp. | 5 and below | 8 | 10.8% |
| | | 6-10 | 7 | 9.5% |
| | | 11-15 | 17 | 23.0% |
| | | 16-20 | 19 | 25.7% |
| | | 21 and above | 23 | 31.1% |
| 4 | Gender | Male | 11 | 14.9% |
| | | Female | 63 | 85.1% |
| 5 | Highest Nursing Qualification | Diploma in Nursing | 51 | 68.9% |
| | | BSN | 18 | 24.3% |
| | | MSN | 5 | 6.8% |

A total of 74 nurses participated in the study. The demographic profile of the participants is presented in Table 4.1.

Nearly half of the respondents (48.6%) were aged between 40 and 49 years, followed by those aged 30–39 years (36.5%). Only 10.8% of participants were aged 20–29 years, while 4.1% were between 50–59 years.



Regarding gender distribution, the majority of participants were female (85.1%), while 14.9% were male



In terms of professional qualifications, 68.9% of nurses held a **Diploma in Nursing**, 24.3% had completed a **Bachelor of Science in Nursing (BSN)**, and 6.8% possessed a **Master of Science in Nursing (MSN)** degree.

With respect to experience in the current unit, the largest proportion (40.5%) had 2–3 years of experience, followed by 24.3% with 4–5 years, 21.6%

with 6 years or more, and 13.5% with 1 year or less of experience.

Total nursing experience revealed that 31.1% of participants had 21 years or more of professional experience, 25.7% had 16–20 years, 23.0% had 11–15 years, 9.5% had 6–10 years, and 10.8% had 5 years or less.

4.3 Nurses’ Knowledge Regarding Myocardial Infarction Management

| S. No | Questions | Options | Frequency | Percentage |
|-------|--|---|-----------|------------|
| 1 | Confidence in identifying risk factors for MI | No Knowledge/Not Confident | 2 | 2.7% |
| | | Limited Knowledge/Limited Confidence | 14 | 18.9% |
| | | Moderate Knowledge/Moderately Confident | 28 | 37.8% |
| | | Good Knowledge/Confident | 19 | 25.7% |
| | | Expert Knowledge/Very Confident | 11 | 14.9% |
| 2 | Confidence in identifying major symptoms of MI | No Knowledge/Not Confident | 4 | 5.4% |
| | | Limited Knowledge/Limited Confidence | 10 | 13.5% |
| | | Moderate Knowledge/Moderately Confident | 22 | 29.7% |
| | | Good Knowledge/Confident | 20 | 27.0% |
| | | Expert Knowledge/Very Confident | 18 | 24.3% |
| 3 | | No Knowledge/Not Confident | 6 | 8.1% |

| | | | | |
|---|---|---|----|-------|
| | Understanding pathophysiology of MI | Limited Knowledge/Limited Confidence | 11 | 14.9% |
| | | Moderate Knowledge/Moderately Confident | 23 | 31.1% |
| | | Good Knowledge/Confident | 18 | 24.3% |
| | | Expert Knowledge/Very Confident | 16 | 21.6% |
| 4 | Knowledge about Levine's sign | No Knowledge/Not Confident | 15 | 20.3% |
| | | Limited Knowledge/Limited Confidence | 24 | 32.4% |
| | | Moderate Knowledge/Moderately Confident | 23 | 31.1% |
| | | Good Knowledge/Confident | 10 | 13.5% |
| | | Expert Knowledge/Very Confident | 2 | 2.7% |
| 5 | Ability to interpret ECG changes (ST-segment elevation) | No Knowledge/Not Confident | 19 | 25.7% |
| | | Limited Knowledge/Limited Confidence | 16 | 21.6% |
| | | Moderate Knowledge/Moderately Confident | 21 | 28.4% |
| | | Good Knowledge/Confident | 10 | 13.5% |
| | | Expert Knowledge/Very Confident | 8 | 10.8% |
| 6 | Understanding purpose/function of nitroglycerin | No Knowledge/Not Confident | 9 | 12.2% |
| | | Limited Knowledge/Limited Confidence | 19 | 25.7% |
| | | Moderate Knowledge/Moderately Confident | 29 | 39.2% |
| | | Good Knowledge/Confident | 14 | 18.9% |
| | | Expert Knowledge/Very Confident | 3 | 4.1% |
| 7 | Knowledge of calcium channel blockers & ACE inhibitors | No Knowledge/Not Confident | 9 | 12.2% |
| | | Limited Knowledge/Limited Confidence | 20 | 27.0% |
| | | Moderate Knowledge/Moderately Confident | 27 | 36.5% |
| | | Good Knowledge/Confident | 11 | 14.9% |
| | | Expert Knowledge/Very Confident | 7 | 9.5% |
| 8 | Knowledge about thrombolytic agents | No Knowledge/Not Confident | 3 | 4.1% |
| | | Limited Knowledge/Limited Confidence | 21 | 28.4% |
| | | Moderate Knowledge/Moderately Confident | 27 | 36.5% |
| | | Good Knowledge/Confident | 15 | 20.3% |

| | | | | |
|----|--|---|----|-------|
| | | Expert Knowledge/Very Confident | 8 | 10.8% |
| 9 | Understanding stable vs unstable angina | No Knowledge/Not Confident | 5 | 6.8% |
| | | Limited Knowledge/Limited Confidence | 15 | 20.3% |
| | | Moderate Knowledge/Moderately Confident | 21 | 28.4% |
| | | Good Knowledge/Confident | 18 | 24.3% |
| | | Expert Knowledge/Very Confident | 15 | 20.3% |
| 10 | Knowledge of primary analgesics for MI pain | No Knowledge/Not Confident | 2 | 2.7% |
| | | Limited Knowledge/Limited Confidence | 16 | 21.6% |
| | | Moderate Knowledge/Moderately Confident | 22 | 29.7% |
| | | Good Knowledge/Confident | 16 | 21.6% |
| | | Expert Knowledge/Very Confident | 18 | 24.3% |
| 11 | Confidence in immediate nursing actions for suspected MI | No Knowledge/Not Confident | 5 | 6.8% |
| | | Limited Knowledge/Limited Confidence | 11 | 14.9% |
| | | Moderate Knowledge/Moderately Confident | 24 | 32.4% |
| | | Good Knowledge/Confident | 22 | 29.7% |
| | | Expert Knowledge/Very Confident | 12 | 16.2% |
| 12 | Understanding goals of cardiac rehabilitation | No Knowledge/Not Confident | 5 | 6.8% |
| | | Limited Knowledge/Limited Confidence | 10 | 13.5% |
| | | Moderate Knowledge/Moderately Confident | 24 | 32.4% |
| | | Good Knowledge/Confident | 24 | 32.4% |
| | | Expert Knowledge/Very Confident | 11 | 14.9% |

The findings revealed that nurses generally demonstrated moderate to good knowledge regarding myocardial infarction management. High levels of confidence and understanding were observed in key areas such as identification of MI symptoms, recognition of risk factors, and understanding of MI pathophysiology.

However, several important knowledge gaps were identified. More than half of the nurses (52.7%) reported limited or no knowledge of Levine’s sign, an important clinical indicator of myocardial infarction. Furthermore, nearly half of the participants (47.3%)

demonstrated limited or no ability to interpret ECG changes, particularly ST-segment elevation, which is critical for early diagnosis and timely intervention.

Knowledge related to pharmacological management, including the use of nitroglycerin, calcium channel blockers, ACE inhibitors, thrombolytic agents, and analgesics, was mostly within the moderate range. Although many nurses showed basic familiarity with these medications, only a small proportion demonstrated expert-level knowledge.

4.4 Nurses’ Reported Clinical Practice Behaviors

In relation to clinical practice behaviors, most nurses reported that they frequently assessed patients' vital signs and provided oxygen therapy when required. These findings indicate good adherence to immediate nursing care protocols for myocardial infarction.

However, deficiencies were noted in more advanced and specialized practices. Over 40% of participants reported that they **rarely or never** reviewed ECGs. In addition, patient education activities, including counseling on diet modification, medication adherence, lifestyle changes, and emotional support, were inconsistently performed, with many nurses reporting only occasional engagement in these important aspects of care.

4.5 Summary of Findings

The results indicate that while nurses working in emergency units possess a foundational level of knowledge regarding myocardial infarction management, significant gaps exist in specialized diagnostic skills and consistent clinical practice. These deficiencies highlight the urgent need for targeted educational programs and ongoing professional development to strengthen emergency cardiac care services in secondary-level hospitals.

DISCUSSION

5.1 Introduction

This chapter discusses the major findings of the study in relation to existing literature and examines their implications for nursing practice, education, and healthcare policy. The purpose of the discussion is to interpret the results obtained from the assessment of nurses' knowledge regarding the management of myocardial infarction in emergency units of selected secondary hospitals in Peshawar.

5.2 Interpretation of Key Findings

The results of the present study indicate that nurses working in emergency units possess an overall **moderate to good level of knowledge** regarding myocardial infarction management. Participants demonstrated adequate understanding of core concepts, including the identification of MI symptoms, recognition of risk factors, comprehension of MI pathophysiology, and knowledge of commonly used medications such as nitroglycerin, ACE inhibitors, and analgesics. These findings are

consistent with previous studies which reported that nurses generally maintain reasonable theoretical knowledge due to repeated clinical exposure to cardiac emergencies (Kareem, 2023; Sharma & Ida, 2021).

Despite this foundational knowledge, the study revealed **substantial deficiencies in specialized diagnostic and assessment skills**. Nearly half of the participants reported limited or no knowledge of ECG interpretation, particularly in identifying ST-segment elevation, which is essential for early MI diagnosis and timely intervention. This finding aligns with research conducted in Ethiopia and Malaysia, where nurses demonstrated insufficient competence in ECG interpretation, especially among diploma-qualified staff (BMC Nursing, 2024; Jamanhari et al., 2023). These deficits represent a serious concern, as delayed recognition of ECG abnormalities can lead to postponed reperfusion therapy and increased myocardial damage.

Similarly, the limited understanding of Levine's sign observed among more than half of the participants reflects inadequate emphasis on classical clinical indicators of myocardial infarction in both education and clinical training. Al-Khaqani (2023) reported comparable results, noting that although nurses perform routine emergency assessments, many lack familiarity with specific MI-related physical signs that can facilitate early recognition.

The study also identified gaps between theoretical knowledge and clinical practice. While nurses frequently monitored vital signs and provided oxygen therapy—indicating good adherence to immediate MI care protocols—many did not consistently review ECGs or provide comprehensive patient education. Comparable findings were reported in studies conducted in Pakistan and Iraq, which highlighted deficiencies in patient counseling, secondary prevention strategies, and continuity of care following acute cardiac events (Shabbir et al., 2021; Abd-Elhai et al., 2023).

5.3 Influence of Educational Level and Training

The predominance of diploma-qualified nurses in the present study likely contributes to the observed knowledge and practice gaps. Research consistently demonstrates that higher academic qualifications,

such as BSN and MSN degrees, are associated with stronger critical thinking, improved assessment skills, and better clinical decision-making in cardiac emergencies (Jamanhari et al., 2023). Furthermore, limited access to continuous professional development programs in secondary hospitals may restrict opportunities for nurses to update their competencies and adopt evidence-based practices.

5.4 Implications for Nursing Practice and Patient Outcomes

The findings underscore the presence of a **theory-practice gap**, where nurses demonstrate acceptable conceptual understanding but lack the advanced diagnostic and interpretive skills required for optimal MI management. Without addressing these deficiencies, patients remain at risk of delayed diagnosis, inappropriate intervention, and poorer clinical outcomes. Strengthening ECG training, expanding simulation-based learning, and implementing structured in-service education programs are essential strategies supported by the literature for improving emergency nursing performance and patient survival (PubMed, 2012; PubMed, 2025).

CONCLUSION, LIMITATIONS, AND RECOMMENDATIONS

6.1 Conclusion

This study concludes that nurses working in the emergency units of secondary hospitals in Peshawar possess an overall **moderate to good level of knowledge** regarding the management of myocardial infarction. The findings demonstrate that participants have substantial understanding of myocardial infarction symptoms, risk factors, pathophysiology, pharmacological management, and immediate nursing care. These competencies are essential for effective emergency response and patient stabilization. However, the study also identified significant deficiencies in specialized clinical competencies, particularly in **electrocardiogram (ECG) interpretation**, recognition of **Levine's sign**, and consistent delivery of patient education. These areas are critical for early diagnosis, timely intervention, and prevention of complications. The presence of these knowledge and practice gaps indicates a persistent **theory-practice divide** within emergency nursing care.

Addressing these deficiencies through structured educational interventions, continuous professional development, and enhanced clinical training is essential to improve the quality of emergency cardiac care and patient outcomes in secondary-level healthcare facilities.

6.2 Limitations of the Study

Despite its valuable findings, this study has several limitations:

1. The study relied on **self-reported data**, which may not accurately reflect actual clinical competence.
2. The research was conducted in **selected secondary hospitals**, limiting the generalizability of the findings to other healthcare settings.
3. The **sample size (n = 74)** may not fully represent the entire population of emergency nurses in the region.
4. The study did not include **direct observation of clinical practice**, which could have provided a more objective assessment of nursing performance.
5. The questionnaire did not address all aspects of myocardial infarction management, such as **long-term rehabilitation and follow-up care**.

6.3 Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. **Regular training programs and workshops** should be implemented with a specific focus on ECG interpretation and early recognition of myocardial infarction.
2. **Continuous professional development opportunities** should be expanded, particularly for diploma-qualified nurses, to strengthen cardiac care competencies.
3. **Standardized myocardial infarction management protocols** should be implemented and consistently enforced in emergency units.
4. **Simulation-based training** should be incorporated into in-service education to enhance nurses' confidence and performance in high-risk emergency situations.
5. Nurses should be encouraged to pursue **advanced cardiac life support (ACLS)** certification and other specialized cardiac training programs.

6. Future research should include **observational studies** to evaluate actual nursing practice and intervention effectiveness.

7. Hospitals should ensure the availability of **educational materials**, including clinical guidelines, checklists, and informational booklets, to support evidence-based practice.

REFERENCES

- Abd-Elhai, R., Hassan, M., & Shabaan, F. (2023). *Nurses' performance regarding care of patients with acute myocardial infarction*. Journal of Nursing and Health Science.
- AHA/ACC/ACEP/NAEMSP/SCAI. (2025). *2025 ACC/AHA/ACEP/NAEMSP/SCAI guideline for the management of patients with acute coronary syndromes*. Circulation.
- Al-Khaqani, M. (2023). *Assessment of nurses' knowledge of myocardial infarction physical signs*. International Journal of Nursing Studies.
- Basrah Teaching Hospitals. (2022). *Assessment of nurses' knowledge regarding myocardial infarction in Basrah Teaching Hospitals*. ResearchGate.
- BMC Nursing. (2024). *Evaluation of ECG interpretation competency among emergency nurses*.
- Cleveland Clinic. (n.d.). *Heart attack: Symptoms & treatment*.
- Jamanhari, R., Ismail, S., & Rahman, A. (2023). *Cardiac knowledge and clinical competency among diploma and degree nurses*. Malaysian Journal of Nursing.
- Jing, X., Zhang, Y., Chen, L., & Wu, J. (2020). *Identifying educational needs and knowledge gaps in healthcare professionals for effective management of acute myocardial infarction*.
- Kareem, H. (2023). *Emergency nurses' knowledge of myocardial infarction management*. Journal of Emergency Nursing.
- Mali, P., & Singh, S. (2024). *Assessment of the knowledge and practice on nursing management of myocardial infarction and angina among staff nurses with a view to develop an informational booklet*. Worldwide Journals.
- NIH. (2023). *Suboptimal knowledge and care of patients with acute coronary syndrome among nurses working in selected hospitals*. PubMed Central.
- NurseTogether. (n.d.). *Myocardial infarction: Nursing diagnoses, care plans, assessment & interventions*.
- Nurseslabs. (2024). *Myocardial infarction nursing care plans*.
- O'Gara, P. T., Kushner, F. G., Ascheim, D. D., et al. (2013). *2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction*. Journal of the American College of Cardiology.
- Pati, P., Mohanty, R., & Sahoo, S. (2024). *Knowledge of early signs and emergency management of myocardial infarction among nurses*. Worldwide Journals.
- PubMed. (2012). *Simulation-based training in cardiac emergency care*.
- PubMed. (2025). *Advances in ECG training for emergency nursing practice*.
- Science Publishing Group. (2021). *Initial management of myocardial infarction among nurses in critical care units*.
- Shabbir, S., Ahmed, N., & Hussain, M. (2021). *Emergency nurses' preparedness for cardiac emergencies in Pakistan*. Pakistan Journal of Nursing.
- Sharma, P., & Ida, R. (2021). *Nursing knowledge and outcomes in acute cardiac care*. International Journal of Nursing Practice.
- Smith, A., Johnson, L., & Carter, B. (2022). *Nurses' myocardial infarction knowledge: Recent studies*.
- StatPearls. (2023). *Acute myocardial infarction*. NCBI Bookshelf.
- StatPearls. (2024). *Acute myocardial infarction (nursing)*. NCBI Bookshelf.
- World Health Organization. (2024). *Cardiovascular diseases (CVDs)*.