

# Knowledge regarding Myocardial Infarction (MI) among the Nurses in Dhaka, Bangladesh

Sabina Yesmin, Atikur Rahman, Fahmida Akter, Shekh Salma Jahan & Abu Ansar Md Rizwan

## Abstract

To get a successful management result for myocardial infarction, qualified and skilled healthcare providers are needed as well as standardized care policies. Therefore, this study was carried out to evaluate Bangladeshi nurses' understanding of myocardial infarction. For this, a cross-sectional descriptive type of study was carried out. A practical sampling method was used. A 300-person sample was used. A semi-structured questionnaire was used for data gathering. The ethical standard was upheld. The hospital administration and staff provided written approval after being fully informed. Data was gathered using several factors. The bulk of respondents fell between the 26–30 age range, according to the study of demographic data. The majority of responses were women (90 percent). Seventy percent of the nurses had earned a diploma in nursing science and midwifery. 43.33 percent of respondents have five to six years of professional experience. Additionally, the findings indicated that 30% of respondents had an outstanding understanding of MI, 20% had very high knowledge, 20% had fair knowledge, 13.3% had ordinary knowledge, and 16.67% had poor knowledge. Even though the study found that the majority of respondents had great knowledge, extra training is advised to advance their understanding and contribute to the particular profession.



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## Introduction

Myocardial infarction is one of the conditions caused by cardiovascular disease, which is a worldwide public health issue. Myocardial infarction is caused by various obstructing factors, including coronary heart disease, which is characterized by blood flow obstruction brought on by plaque buildup in the coronary arteries, or less commonly, other obstructive causes. Myocardial infarction can appear clinically as anything from a small coronary incident to a scenario that poses a life-threatening risk or abrupt death (Mendis et al., 2010). Coronary artery blockage deprives the myocardium of oxygen. Myocardial cell loss and necrosis can result from the myocardium receiving insufficient oxygen for an extended period (Ojha and Dhamoon, 2021). Myocardial infarctions come in three different varieties. These include unstable angina, ST-Segment Elevation Myocardial Infarction (STEMI), and Non-ST Segment Elevation Myocardial Infarction (NSTEMI). Most individuals frequently picture a STEMI when they think about myocardial infarction. When a coronary artery is blocked and a significant piece of the heart muscle stops receiving blood, a STEMI happens. It is a severe heart attack that has the potential to do major harm. In contrast to a STEMI, an NSTEMI only results in a partial blockage of the afflicted coronary artery. When one of the heart's arteries tightens to such an extent that blood flow stops or is significantly decreased, it is known as a coronary spasm (coronary artery spasm) (Roland, 2020). Cardiovascular disease myocardial infarction has a distinct etiology, which affects risk factors and treatment options. Myocardial infarction risk factors can be divided into those that can be changed and those that cannot. While smoking, hypertension, diet, physical inactivity, increased serum cholesterol, and obesity is some of the more frequently reported modifiable risk factors, age, sex, family history, and genetic variables are non-modifiable risk factors. Cardiovascular disease myocardial infarction has a distinct etiology, which affects risk factors and treatment options. Myocardial infarction risk factors can be divided into those that can be changed and those that cannot. While smoking, hypertension, diet, physical inactivity, increased serum cholesterol, and obesity is some of the more frequently reported modifiable risk factors, age, sex, family history, and genetic variables are non-modifiable risk factors (National Heart Lung and Blood Institute, 2017). Myocardial infarction symptoms include chest discomfort, breathlessness, and irregular heartbeat. Sweating, nausea, vomiting, anxiety, exhaustion, weakness, stress, depression, etc. are other symptoms (Hollar, Hartness, and Doering, 2015). The repercussions of myocardial infarction can manifest right away or take time to manifest. Heart rhythm problems, heart block, and infarct site can all contribute to these complications. Additionally, there is a risk of stroke due to problems with the heart's ability to pump blood efficiently, bleeding after anticoagulation, or clots that are transported from the heart during PCI (Percutaneous Coronary Intervention). Insufficient blood pumping by the heart results in cardiogenic shock. Long-term effects could include heart failure, which would cause the heart muscle's ability to pump to be weakened and the size of the current muscle to enlarge (Reed, Rossi, and Cannon, 2017; Kasper et. al, 2015). Medical care must be provided right away in cases of myocardial infarction. The goal of treatment is to keep as much heart muscle as feasible while averting subsequent issues. Whether a myocardial infarction is a STEMI or NSTEMI affects the course of treatment. Aspirin, which stops blood from clotting, and nitro-glycerin, which relieves chest pain, are two medications that can be taken right away to treat a myocardial infarction. To increase the heart's demand for oxygen, nitro-glycerin and anti-hypertensive medications such as beta-blockers, ACE inhibitors, or calcium channel blockers may also be used to lower blood pressure (Lei Lu et. al, 2015). The foundation of nursing is a body of knowledge that has been directly synthesized from physical, biological, and social science. Nursing is uniquely applied as a humanistic discipline that cares for people wherever they are while recognizing their need for health care to stay healthy and function at their highest potential. The multidisciplinary cardiac team's success in treating MI depends on the nurse's contribution. To stop future cardiac

damage, defects, and complications and to aid patient recovery, nurses collaborate with nursing management, educate, and counsel patients. In the entire world, cardiovascular diseases (CVD) are the main cause of death. WHO (2021) estimates that 17.9 million deaths from CVDs occurred in 2019, or 32% of all deaths worldwide. Heart attack (MI) and stroke were to blame for 85% of these fatalities. Over the past few decades, non-communicable chronic disease prevalence and related mortality have significantly increased in Bangladesh. Bangladesh experienced rapid urbanization during the past few decades as a result of the country's rapid economic development, modernization, industrialization, advancement of education, and employment opportunities. The effects of increasing urbanization and expansion raise concerns that the prevalence of cardiovascular disease may climb further as a result of sedentary behavior patterns, smoking, poor diets, and labor-saving technologies (Chowdhury et. al, 2018). The nurse tending to a patient who has suffered a myocardial infarction or who is at risk for one must comprehend the underlying causes of infarction and be able to spot both its subtle and more prominent symptoms. Recovery requires quick assessment and quick action. To handle such acute circumstances, nurses must be knowledgeable and skilled. By identifying errors in performance, concepts, and settings, monitoring and evaluating nurses' competence can help to ensure greater performance in the future. Therefore, it is crucial to understand the extent of nurses' myocardial infarction expertise to raise the standard of nursing care. This study was carried out for that reason.

### Methodology

To gauge the nurses' level of myocardial infarction knowledge, a descriptive cross-sectional study was done. A reputable cardiovascular disease institute in Dhaka city was chosen for this study. The six-month trial period ran from December 2021 through May 2022. Through the use of a practical non-probability sampling technique, the study samples were chosen. A sample of nurses who agreed to take part in the study was chosen. Before the questionnaire was finalized, the pretest was conducted with 20 samples at another cardiovascular facility. Through the use of a semi-structured questionnaire, data were gathered. The respondents signed a written informed consent before the interview. Data analysis was carried out utilizing SPSS version 24.0. A grade was assigned to the participant's responses to knowledge questions. The maximum score for the sum of the answers to these questions was 100 percent. Excellent (80% to 100%), very good (70% to 79%), good (60% to 69%), average (50% to 59%), and poor (below 50%) were the categories used to describe the degree of knowledge.

### Results

**Table 01: Socio-demographic characteristics of the respondents (n=300)**

Variables	Frequency	Percentage
<b>Age group</b>		
26-60 years	150	50.00
31-35 years	90	30.00
36-40 years	40	13.33
41-45 years	20	6.67
<b>Sex</b>		
Male	30	10.00
Female	270	90.00
<b>Educational Qualification</b>		
Diploma	210	70.00
B.Sc.	20	6.67
Post Basic	40	13.33
M.Sc./MPH	30	10.00
<b>Professional experience</b>		
>6 years	80	26.67
5-6 years	130	43.33
3-4 years	30	10.00
1-2 years	60	20.00

According to the study's findings, 50.0% of nurses were between the ages of 26 and 30; 30.0% were between the ages of 31 and 35; 13.33 percent were between the ages of 36 and 40, and 6.67 percent were between the ages of 41 and 45. It shows that the majority of nurses were between the ages of 26 and 30, and the minority was between the ages of 41 and 45. Ninety percent (90%) of the responses were female. Seventy percent of the 300 respondents have earned a Diploma in Nursing Science and Midwifery, 6.67 percent have earned a B.Sc. in Nursing (Basic), 13.33 percent have earned a B.Sc. in Nursing (Post Basic), and 10 percent have earned an MSc in Nursing/MPH. 43.33 percent of respondents have experience ranging from five to six years (Table 01).

**Table 02: Distribution of nurses' knowledge of myocardial infarction (MI) (n=300)**

Variables	Frequency	Percentage
<b>Concept of myocardial infarction (MI)</b>		
Inflammation of the heart muscle	70	23.33
Death of myocardial tissues due to the inadequate blood supply	160	53.34
The heart muscle becomes unable to pump blood	60	20.00
Blood clots in the heart	10	3.33
<b>Another term for myocardial infarction (MI)</b>		
Atrial fibrillation	50	16.67
Heart failure	50	16.67
Heart attack	170	56.66
Myocarditis	30	10.00
<b>Types of myocardial infarction (MI)</b>		
STEMI and NSTEMI	260	86.67
Obstructive and non-obstructive	10	3.33
Left ventricular and right ventricular	30	10.00
<b>Risk factors of myocardial infarction (MI)</b>		
Smoking	290	96.67
Anemia	10	3.33
<b>Sign of myocardial infarction (MI)</b>		
Bradycardia	60	20.00
Tachycardia	180	60.00
Decrease respiration rate	60	20.00
<b>Symptoms of myocardial infarction (MI)</b>		
Wheezing	10	3.33
Fainting	20	6.67
Fatigue	10	3.33
Chest pain	260	86.67
<b>Characteristics of chest pain in myocardial infarction (MI)</b>		
Burning	200	66.66
Colicky	60	20.00
Aching	20	6.67
Crushing	20	6.67
<b>Radiation of chest pain in myocardial infarction (MI)</b>		
Upper abdomen	50	16.67
Left shoulder and arm	220	73.33
Both shoulders	30	10.00
<b>Complications within 24 hours of myocardial infarction (MI)</b>		
Cardiogenic shock	120	40.00
Myocarditis	90	30.00
Ventricular fibrillation	90	30.00
<b>Complications of myocardial infarction (MI)</b>		
Multiple organ failure	60	20.00
Arrhythmias	160	53.33
Left ventricular rupture	80	26.67
<b>Vital signs of myocardial infarction (MI)</b>		
Blood pressure and pulse	290	96.67
Respiration	10	3.33
<b>Diagnostic tests to confirm myocardial infarction (MI)</b>		
ECG	100	33.33
Troponin	140	46.67

Echocardiogram	60	20.00
<b>Regular nursing intervention for myocardial infarction (MI)</b>		
Monitoring blood sugar	20	6.67
Administering medication and monitoring response	280	93.33
<b>Drug for myocardial infarction (MI)</b>		
Nitroglycerin	130	43.33
Morphine	10	3.34
Aspirin	130	43.33
Diuretics	30	10.00
<b>Surgical interventions for myocardial infarction (MI)</b>		
Coronary Artery Bypass Grafting	150	50.00
Cardio Pulmonary Bypass	70	23.33
Myotomy	80	26.67
<b>Nursing diagnosis for myocardial infarction (MI)</b>		
Acute pain related to tissue ischemia	210	70.00
Tissue ischemia related to the clot	70	23.33
Fluid deficient related to vomiting	20	6.67
<b>Main preventive measure for myocardial infarction (MI)</b>		
Diet modification	300	100
<b>Instruction should be given by a nurse to MI patient</b>		
Stop activity	20	6.66
Do exercise	230	76.67
Minimize rest	50	16.67

According to the majority of nurses who responded (53.33 percent) (Table 02), myocardial tissue death in MI is caused by insufficient blood flow. Only 10% of respondents correctly identified myocarditis as another name for MI, while 56.66% of respondents stated they had a heart attack. More than 80% of nurses selected STEMI and NSTEMI as their preferred MI subtypes. According to 96.67% of nurses, smoking increases the risk of MI. Bradycardia, according to 20.00 percent of nurses, and tachycardia, according to 60 percent, are indicators of MI. Chest discomfort was cited by the majority of respondents (86.67%) as the main MI symptom. According to two-thirds of the respondents, burning chest pain is a hallmark of MI. Within 24 hours of MI, 40.00 percent of patients responded to cardiogenic shock, 30.00 percent to myocarditis, and 30.00 percent to ventricular fibrillation as the sequelae. Arrhythmias were cited by more than half (53.33 percent) of responders as the main MI complication. The majority of respondents (96.67%) said that the vital indicators of MI were blood pressure and pulse. According to 46.67% of respondents, the diagnostic test that should be used to evaluate MI is troponin. Aspirin and nitroglycerin are the drugs initially given to MI patients, according to 86.66 percent of respondents, and coronary artery bypass grafting is the surgical intervention for MI, according to 50% of nurses. The majority of nurses (93.33 percent) said that administering medication and monitoring response is the regular nursing intervention for MI patients. Dietary changes, according to all of the responders, are the primary defense against MI. The majority of nurses (76.67 percent) recommend exercise as a way to prevent MI (Table 02).

**Table 03: Distribution of nurses' level of knowledge of myocardial infarction (MI) based on scoring (n=300)**

Level of knowledge	Frequency	Percentage
Excellent	90	30.00
Very good	60	20.00
Good	60	20.00
Average	40	13.33
Poor	50	16.67

Based on scoring, 30.00% of nurses had an excellent level of knowledge, 20.00% had very good, 20.00% had good, 13.33% had average and the rest 16.67% had a poor level of knowledge of myocardial infarction (MI) (Table 03).

## Discussion

The study's objective was to evaluate nurses' understanding of MI. According to the current study, 70.0% of nurses had high or excellent knowledge of MI. This finding differs from one from descriptive research Preetha and Smitha did in India in 2019. They revealed that the majority of staff nurses (63.77 percent) had an average level of awareness of MI. The number of years of experience and the staff nurses' knowledge scores was significantly correlated with one another. The majority of the nurses (38%) only had two to four years of experience. Only 3.1% of the staff nurses who were chosen had extra training in cardiology. Because they were chosen from a hospital that specialized in cardiovascular care and had more clinical experience than 4-6 years, the nurses in the current study, however, had solid information regarding the management of MI. According to a study conducted in Sudan by Jaralnabi et al. (2018), the majority of nurses lacked the knowledge necessary to demonstrate proficiency in MI prevention and treatment. The understanding of MI prevention and treatment is more advanced in the current trial than in the comparator study. Due to the nurses' greater practical experience, it appears that the majority of nurses in the current study had outstanding knowledge about MI prevention and good knowledge about MI treatment. The conclusion of the comparison study was determined to be the result of the study nurses having less training than expected. Elbashir and Elfakir (2016) did a study in Sudan that revealed the nurse's familiarity with the initial medications used in acute myocardial infarction emergency care. According to the study's findings, the knowledge score was lower than the benchmark. because the nurses who were chosen had received inadequate training. Furthermore, there was a lack of understanding of the early medications used to treat MI, according to the current study. Additionally, Parbati Dahal's (2013) descriptive study on nurses' knowledge of myocardial infarction in Nepal is contrasted with the current study. Elbashir and Elfakir (2016) did a study in Sudan that revealed the nurse's familiarity with the initial medications used in acute myocardial infarction emergency care. According to the study's findings, the knowledge score was lower than the benchmark. because the nurses who were chosen had received inadequate training. Furthermore, there was a lack of understanding of the early medications used to treat MI, according to the current study. Additionally, Parbati Dahal's (2013) descriptive study on nurses' knowledge of myocardial infarction in Nepal is contrasted with the current study. As a result of working at cardiovascular hospitals and frequently interacting with MI patients, the majority of nurses had outstanding knowledge in this area, according to the study's findings. However, it was discovered in the comparison study that, out of 50 respondents, the majority had little to no awareness of myocardial infarction. Poor knowledge was caused by a lack of in-service educational programs and training about the care of patients with MI, according to Parbati Dahal. The current study is quite similar to one done by Al-Ftlawy (2014), with the exception that it evaluated the knowledge of 38 Iranian nurses regarding the care given to a patient with MI. According to the results, 42.1% had good knowledge, 42.1% had moderate knowledge, and 15.8% had inadequate knowledge. Because the majority of the nurses were chosen from the Critical Care Unit and had between one and nine years of work experience, the study found that nurses had good knowledge. The majority of participants in the current study were found to have outstanding expertise, and this conclusion was explained by the fact that they frequently worked with MI patients.

## Conclusion

Cardiovascular disease is a global public health concern that can lead to a variety of illnesses, including myocardial infarction. Nurses need to be aware and experienced to address such urgent situations. Monitoring and assessing nurses' competence can help to assure better performance by finding flaws in performance, concepts, and situations. The results of this study show that although nurses have a good degree of knowledge of myocardial infarction, there is still room for improvement. To upgrade their expertise, nurses should be encouraged to take part in training on MI and related health issues. To generalize the results, a bigger sample size investigation of a comparable kind is advised in several hospitals.

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## Conflict of interest

The authors claimed they had no competing interests in this work. Permission to publish All of the authors of this article have given their consent for it to be published.

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