Assessment of Nurses' Knowledge and Practice Regarding Thrombolytic Therapy among Patients with Acute Myocardial Infarction

Ghonem Elsayed Ghonem[1]; Manal Salah Hassan[2]; Yosreah Mohamed Mohamed[3]; & Samia Hussieny

1- *Assistant Lecturer in Medical Surgical Nursing Department/Faculty of Nursing /Suez Canal University/Egypt.*
2- *Professor in Medical Surgical Nursing Department/Faculty of Nursing /Ain Shams University/Egypt.*
3- *Assistant Professor in Medical Surgical Nursing Department/Faculty of Nursing /Ain Shams University/Egypt.*
4- *Assistant Professor in Medical Surgical Nursing Department/Faculty of Nursing / Suez Canal University /Egypt.*

Abstract

Background: Thrombolytic therapy is the established treatment for acute myocardial infarction and nurses are considered the first professionals who interact and assess the patients and give the prescribed treatment. So, it is important for nurses to have sufficient knowledge and practice on thrombolytic therapy to manage patients' medications competently. **Aim of the study:** Assess the nurses' knowledge and practice regarding thrombolytic therapy among patients with acute myocardial infarction, **Design:** descriptive research design was used in the study. **Setting:** The current study was carried out at Critical Care Units affiliated to the Suez Canal University Hospital, **Subject:** A convenient sample of all available staff nurses (40 nurses) who were working at the previously mentioned settings, **Tools of data collection:** The data were collected using two tools named nurses' knowledge assessment questionnaire and nurses' observational checklist. **Result,** 95% and 82.5 % of studied nurses had unsatisfactory level of knowledge and practice respectively about thrombolytic therapy among patients with acute myocardial infarction. **Conclusion,** nurses in critical care unite had unsatisfactory level of knowledge and practice regarding thrombolytic therapy among acute myocardial infarction patients. Recommendation, implementation of educational program to improve nurses' knowledge and practice about thrombolytic therapy among patients with acute myocardial infarction.

Key words:- knowledge, Practice, Thrombolytic therapy, Acute myocardial infarction.

1. Introduction

Cardiovascular diseases are the most common causes of death worldwide, representing 32% of all global deaths in 2019. Of these deaths, 85% were due to heart attack and stroke **(WHO, 2021).** Coronary artery disease which accounts for nearly one-third to one-half of all the cases of CVDs is reported to be one of the major causes of death in developing and middle east countries. Acute myocardial infarction (AMI) is the most common cause of death in the world **(Mansouri, et al., 2014; Sanchis-Gomar, et al., 2016)**.

Cardiovascular diseases have remained the leading causes of death globally in the last 15 years **(WHO, 2017)**. While the most cause of death in Egypt in 2016 are ischemic heart diseases with percent increase (28.1%) from 2005 to 2016 **(IHME, 2018)**.

Coronary artery disease is the term applied to obstruction of blood flow through the coronary arteries to the heart muscle cells, typically from atherosclerosis. Blood flow reduction resulting from coronary artery disease (CAD) can cause angina and progress to **myocardial infarction** or sudden death if blood flow is not restored *(Williams & Hopper, 2011).*

Acute myocardial infarction (AMI) is one of the leading causes of death worldwide. The prevalence of the disease approaches three million people worldwide with more than one million deaths in the United States annually. Myocardial infarction is defined as myocardial necrosis in a clinical setting consistent with myocardial ischemia. AMI can be divided into two categories, non-ST-segment elevation MI (NSTEMI) and ST-segment elevation MI (STEMI) *(Nascimento et al, 2019).*

Thrombolytic therapy is the easiest and most effective treatment for AMI. Thrombolytics or fibrinolytics are a group of medications used in the management and treatment of dissolving intravascular clots. They are in the plasminogen activator class of drugs *(Ali, et al., 2014; & Baig& Bodle 2020).*

The goal of thrombolytic therapy is to quickly restore blood flow to the tissue served by the blocked vessel. Delays in reestablishing circulation may result in ischemia and permanent tissue damage. The therapeutic effect of thrombolytics is greater when they are administered no later than 4 hours after clot formation occurs *(Adams, et, al., 2014).* Safe and accurate medication administration is a challenging and vital nursing responsibility. *(Perry et al., 2014).*

The nurse plays an effective and great role in different types of care for the patients. there is no doubt that the nurse who works in the critical care units must be qualified enough for these tasks in addition to his general duties, therefore, nurses must have a good scientific background about the profession and details related to coronary artery disease and critical care to detect patients' problems, to which make the appropriate decision for and proper medication administration *(Hanson & Haddad, 2021; Osman etal., 2019).*

Significance of the study:

Acute myocardial infarction is considered one of the leading causes of death in globally and thrombolytic therapy is still a common reperfusion therapy for AMI patients in Egypt *(Nascimento et al, 2019; &*

Baig& Bodle 2020). Critical care nurses possess pivotal role in the assessment of patient with AMI, providing treatment and other related nursing considerations **(Perry et al., 2014)**.

Thereby, it's important to assess nurses' knowledge and practice regarding thrombolytic therapy for AMI patients.

The aim of the study:

The present study aimed to assess nurses' knowledge and practice regarding thrombolytic therapy among patients with acute myocardial infarction.

Research question:

- Are nurses had satisfactory level of knowledge and practice regarding thrombolytic therapy among patients with acute myocardial infarction?

2. Subject and Methods

Study design: descriptive research design was used in this study.

The subjects of study: Convenient sample of all available nurses (40) was utilized in this study

Study setting: The present study was carried out at Critical Care Units affiliated to the Suez Canal University Hospital in Ismailia, Egypt**.**

Tools of data collection:

Data were collected using the two following tools

Tool (1) **Nurses' knowledge Assessment Questionnaire**

This tool consisted of true or false, multiple – choice assessment tool. It was adapted from **(Eweas et al., 2016)** to assess nurse's knowledge regarding management of thrombolytic therapy among patients with acute myocardial infarction in Arabic language. It was composed of two parts

Part (1): Demographic and work-related data: -

It included six questions regarding nurses' demographic and work-related data such as, age, education, years of experience in nursing and experience in critical care unit and attending training courses.

Part (2): **Nurses' knowledge Assessment Questionnaire**

It was composed of 25 items divided into 5 subscales as follows**: -**

- **Subscale (1):** General concepts of Thrombolytic medications, 7 questions

- **Subscale (2):** Indication and contraindication of thrombolytic medications, 3 questions
- **Subscale (3):** Complications of thrombolytic medications, 4 Questions.
- **Subscale (4):** Administration of thrombolytic medications, 4 Questions.
- **Subscale (5):** Nursing role regarding thrombolytic medications, 7 Questions.

Scoring system of Nurses' knowledge Assessment Questionnaire

The total score of nurses' knowledges for the 25 questions ranged from 0 to 25. The respondents were given one point for each correct answer and zero for incorrect answers. A total score below 75% was considered unsatisfactory, while those equal to or above 75% were considered satisfactory **(Eweas et al., 2016)**.

Validity and reliability of the Tool:

Reliability of the Nurses' knowledge Assessment Questionnaire was done using alpha Cronbach's coefficient to assess the internal consistency of the tool and its value was **(0.77)**.

Tool (2) Nurses' practice observational checklist

It was adapted from **(Eweas et al., 2016)**, it was used to assess nurses' practices related to administration of thrombolytic therapy for AMI patients by infusion pump. It was written in the English language to be collected by the researcher. It was composed of 3 subscales which included 43items divided as the following**: -**

Subscale (1): Thrombolytic therapy preparation procedures which involved three parts.

A. Patient's preparation before drug administration which included 14 steps of practical skills.

B. Nurse preparation steps which included 2 steps of practical skills.

C. Thrombolytic therapy medication preparation steps which included 4 steps of practical skills.

Subscale (2): Thrombolytic drug Administration Procedures .

Administration procedures for thrombolytic therapy medications given through an infusion pump it included 9 steps of practical skills.

Subscale (3): Post – thrombolytic drug administration procedures.

Post – thrombolytic therapy infusion administration steps included 14 steps of practical skills

- 13 steps for general post procedure phase.
- One step for documentation phase.

Scoring system of Nurses' practice observational checklist

The total score of the nursing practices was ranged from 0 to 43 of the 43 steps. The possible choice for each step was done or not done. Each nurse was given one point for done step and zero for not done step. A total score

Administrative design:

An official permission for collection of data in University Hospital was obtained and addressed by the hospital administrative board by formal letter submission from the Dean of the Faculty of Nursing. Meeting was held between the researcher and the nursing administrative personnel to make them aware of the study aim and research objectives, as well as in order to get better

Field work:

The study data collection was performed over three months period started from 1st of April 2019 to the end of Jun 2019. The researcher collected data from nurses working in critical care units affiliated to the University Hospital in Ismailia, Egypt.

- An interview form was designed by researcher who visited the selected setting and requested from nurses to participate in the study through face-to-face interviews

of 75% and more was considered satisfactory, while a score below 75% was considered unsatisfactory **(Eweas et al., 2016)**.

Validity and reliability of the tool:

Cooperation during the research implementation phase.

Ethical considerations:

The ethical research considerations in this study included the following:

Approval of the ethical committee affiliated to faculty of nursing.

-The researcher clarified the aim of the study and the objectives to the sample of nurses to be involved in the study nurses included in the study prior to starting.

-Nurses were informed that they had the right to accept or refuse participation in the study and had the right to withdraw from the study at any time.

-Confidentiality and anonymity were assured, as well as nurse protection from hazards.

-Each nurse was subjected to written consent prior to study participation after simple clarification of the aim and study expected outcomes. Also, each nurse was aware of the importance of his/her participation.

using Statistical Package for the Social Sciences (SPSS version 20). Correlations were used to test relationships between

different variables. P value was set at ≤0.05 for significant results.

The statistical techniques were used includes

- Percentage.
- Mean score.
- Standard deviation SD.
- Paired T test.
- Repeated measures of ANOVA test.
- Confidence interval and proportion probability of error (P- value) .

3. Results

Table (1): shows that 60% of studied nurses' age was from 20 to <30 year with mean 26.01±3.32. As regard the level of education, the technical institute was the highest percent with 67.5% followed by bachelor's degree 30%. Regarding the mean of years of experience in nursing was 5.22±2.64 and the mean of years of experience in CCU was2.72±1.66.

Figure (1) Illustrates that 55 % of studied nurses had less than three years of experience in CCU.

Figure (2): Shows that, more than half of studied nurses (67.5 %) hadn't attended courses regarding thrombolytic therapy.

Figure (3): shows that, 5% of studied nurses had satisfactory level of knowledge regarding thrombolytic therapy, while 95 % of them had unsatisfactory level of knowledge regarding thrombolytic therapy.

Table 2 shows that the mean of studied nurses knowledge regarding general pharmacological concepts thrombolytic therapy was 3.775 ±1.25, mean of knowledge regarding Indication and contraindication was .950± 0.719, mean of knowledge regarding complication of thrombolytic therapy was2.37±0.806, mean of knowledge regarding administration of thrombolytic therapy was 2.67± 0.693, mean of knowledge regarding Nursing role related to thrombolytic therapy was 3.67 ± 1.163, and the mean of total knowledge regarding thrombolytic therapy was 13.45 ± 2.08.

Figure (4), shows that, 17.5% of studied nurses had satisfactory level of practice regarding thrombolytic therapy, while 82.5 % of them had unsatisfactory level of practice regarding thrombolytic therapy.

Table 3 shows that the mean of studied nurses practice during preparation phase of thrombolytic therapy was 12.10±2.48, mean of practice during administration phase of thrombolytic therapy was 4.70±1.39, mean of practice during post infusion phase of thrombolytic therapy was 7.25±1.89, and the

mean of nursing practice regarding thrombolytic therapy throughout all phases of administration was 24.05 ±4.06.

4. Discussion:

Acute myocardial infarction is a medical emergency which requires emergency management and is a major cause of death and disability worldwide. More than 90% of myocardial infarction caused by acute thrombotic obstruction in coronary artery which causing abruption of blood flow in the obstructed artery and tissue necrosis. Thrombolytic therapy is the easiest and most effective treatment for AMI after cardiac intervention **(El-sayead, (2017); Li et al., (2016) & Mykhaylichenko et al, (2016)**.

The ultimate success of AMI treatment through thrombolytic therapy and saving the patients' life derives from not only the time window, but also the efficiency of nursing procedure **(Wu et al., 2017).** Thereby, the nurse is a vital and important part of health care system. Medication administration process is considered as nursing practice daily component and core nursing action. So, its important to assess nurses' knowledge and practice regarding thrombolytic therapy among acute myocardial infarction patients **(Ahamed & Hassan, 2017).**

The present study showed that more than half of the subjects were in the age group from twenty to less than thirty years old with a mean age 26.01±3.32. Concerning gender, more than half of the subjects were females, this result could be explained in the light of the fact that majority of the nurses in Egypt are females. As regards level of education, more than two thirds of the studied nurses had technical degree. Concerning years of experience, mean years of experience for studied subjects were 5.22 ± 2.64, and more than half of studied subjects had less than 3 years of experience in the cardiac care unit.

Also, most of the studied nurses didn't take courses regarding administration of thrombolytic therapy. This result may be due to the workload and prolonged work hours, they didn't care for attending courses regarding thrombolytic therapy.

These results were in accordance with a study done by **Al-Youssif, et al, (2013)**, who "assessed nurses' experiences toward perception of medication administration" which concluded that about two thirds of studied nurses are female, more than half of studied nurses aged between 26-30 years old and most of them had between one to five years of experience. Also, these results were

supported by a study done by **Ltheeth & Abbas, (2017)** who illuminated that most of nurses had technical degree in nursing.

Focusing on the training courses, the result of this study was in accordance with the results of study done by **Hussien, & Al-Ganmi, (2013)** who assessed nurses' knowledge regarding cardiogenic shock for patients in cardiac care unit and revealed that few nurses were participating in training courses. These findings are in accordance with a study done by **Lamkhede, (2014); Rodrigues Júnior & Gasparino, (2017)** who revealed that the majority of nurses had not received training on vasoactive drugs related to their critical care work.

Regarding years of experience in cardiac care unit, the current study was in concordance with a study performed by **Younis, (2014)** who depicted that most of nurses working in critical care units had between 1-4 years of experience.

Focusing on level of knowledge of studied nurses, the results of present study revealed that most studied nurses who are working in critical care units had unsatisfactory level of knowledge regarding thrombolytic therapy among acute myocardial patients. This result may be due

to, the nurses, particularly those works in bedside care are overworked because of the nursing shortage in the nursing staff. Therefore, they have limited time to enhance their knowledge about thrombolytic therapy.

The findings of the current study were in agreement with **Ayorinde & Alabi, (2019)** who studied "perception and contributing factors to medication administration errors among nurses in Nigeria" and showed decreased level of nurses' pharmacological knowledge.

Also, **El-sayead etal., (2017)** revealed that, more than half of studied nurses had unsatisfactory level of knowledge regarding management of acute myocardial infarction within the golden hours, and this care includes information about the administration thrombolytic therapy. Additionally, **Mohammed et al., (2019)** revealed that the total score of Cardiac Care Unit nurses' knowledge about drugs affecting blood coagulation was poor before implementation of the teaching program.

Regarding the knowledge subitems, the current study depicts that, more than half of the studied nurses obtained the correct answers regarding knowledge about general concepts of thrombolytic medications, with

the highest percentage of right answer being related to knowledge about the definition of thrombolytic therapy as the highest percent. Similarly, **Eweas et al., (2016)** reported that, the majority of studied nurses knew the definition of thrombolytic therapy, its types and criteria of choice. This result might be due to, the nurses in critical units try to know the basic knowledge about medications.

Concerning indication of thrombolytic therapy administration, the present study depicted that more than half of studied nurses had gotten the correct answer. On the same line **Hamato & Mukhtar (2015)** in their study about "nurses' knowledge and practice regarding nursing care for myocardial infarction patients" revealed that, more than half of studied nurse knew typical indications for immediate thrombolytic medication. Furthermore, **Khalil et al., (2018)** reported that more than half of studied nurses in Coronary Care Unit obtained right answer to question about indication of thrombolytic therapy.

However, **Mustafa & Aboanja, (2017)** in their study about "nurse's competence regarding Initial management of patient with acute coronary syndrome" reported that more than half of studied nurses revealed unsatisfactory knowledge about

indication of thrombolytic therapy. Moreover, **Mustafa & Elfaki, (2016)** conducted a study aimed to determine "nurses' knowledge about initial drugs used during emergency management of acute myocardial infarction" reflected that most of nurses had poor level of knowledge about indication of thrombolytic agents

Regarding contraindication of thrombolytic therapy, the current study result showed that less than half of studied nurses had correct answer about contraindication of thrombolytic therapy. On the same line, **Khalil et al., (2018)** reported that less than half of studied nurses in Coronary Care Unit obtained right answer to question about contraindication of thrombolytic therapy. Additionally, **Mustafa & Elfaki, (2016)** reported that, most of nurses had poor level of knowledge about contra-indication of thrombolytic agents. This result may be due to, the studied nurses didn't attend sufficient educational courses about thrombolytic therapy.

However, **Hessaen & Fadlalmola, (2020)** in their study to assess nurse's knowledge and practice regarding streptokinase administration for acute myocardial infarction patients reported that more than half of the studied nurses had good

level of knowledge about the contraindications of streptokinase for MI patients in public hospital. Additionally, **Hamato & Mukhtar (2015)** reported that, about two thirds of studied nurses knew contra-indication of streptokinase.

Concerning complications and adverse reactions of thrombolytic therapy, more than half of the nurses had correct answer. the result of the current study agreed with **Mustafa & Aboanja, (2017)** who reported that more than half of nurses shows good information about streptokinase side effect and **Hamato & Mukhtar, (2015)** who founded that more than two thirds of studied nurses knew side effect of streptokinase. This result may be due to the frequent administration of thrombolytic therapy in critical units so, the nurses in these areas have chances to observe side effect and complications of these drugs.

On the same way, higher percentage was concluded by **Khalil et al., (2018)** who reported that the majority of studied nurses obtain correct answer about the adverse effect of thrombolytic therapy and **Baby et al., (2019)** in the study aimed to assess emergency nurses' knowledge about tissue plasminogen activator therapy and their perception about barriers for thrombolysis

revealed that all of studied nurses obtained correct response regarding side effect of thrombolytic therapy.

In contrast with the current study result, **Mustafa & Elfaki, (2016)** and **Khalil et al., (2018)** who reflected that the majority of nurses had poor level of knowledge about complication of thrombolytic agents.

Concerning nurse's knowledge about administration of thrombolytic therapy such as dose and route of administration of streptokinase in the current study, about than two thirds of studied nurses had the correct answer. On the same context **Hessaen & Fadlalmola, (2020)** illuminated that, all studied nurses got the correct answer regarding route of administration of streptokinase. Additionally, **Baby et al., (2019)** reported that, more than half of studied nurses obtained right responds related to dose and maximum dose of alteplase.

Regarding nurses' knowledge about nursing role of thrombolytic medications, the current study revealed that more than half of studied nurses had the correct answer, in the same line **Hamato & Mukhtar, (2015)** in their assessment study reported that more than two thirds of studied nurses knew drug given immediately and observation for

streptokinase. Also, **Eweas et al., (2016)** reported that, most of studied sample obtained correct answer regarding observation during administration of streptokinase.

Concerning nurses' total practice regarding administration of thrombolytic therapy, the present study results revealed that, the majority of studied nurses had unsatisfactory level of practices related to administration of thrombolytic therapy among acute myocardial infarction patients. This result could be attributed to lack of knowledge related to thrombolytic therapy, level of education as more than half of nurses were technical institution graduates, and shortage of nursing staff in critical care areas.

The finding of the current study was in agreement with **Khalil et al., (2018)** in their assessment study showed that the majority of studied nurses had unsatisfactory practical level regarding streptokinase administration in pre, during and after administration. Furthermore, the result of current study agreed with **Westbrook et al., (2011)** a study aimed to assess administration of intravenous thrombolytic therapy and role of correct procedure and nurses experience, the study result reflected unsatisfactory level of nurses' knowledge and skills.

Moreover, **Mohamed et al., (2020)** found that, most of the studied nurses had an inadequate level regarding care for patient with cardiogenic shock include medication administration. Also, the current study result supported with the result of study done by **Sambu et al., (2018)** which revealed that, most of studied nurses in coronary care unit had poor and unsatisfied performance regarding administration of thrombolytic therap.

On the other hand, **Hessaen & Fadlalmola (2020)** in their study of assessment of nursing knowledge and practice regarding streptokinase administration for myocardial infraction patients in coronary care units revealed that most of studied nurses had satisfactory practical level regarding administration of streptokinase. Also, the current study result disagreed with result of, **El- Sayed et al (2017),** denoted that, about most of studied nurses had satisfactory level of practice regarding management of acute myocardial infarction patient within the golden hours included administration of thrombolytic therapy.

Regarding the studied nurses' practice subitems, the nurses practice regarding administration of thrombolytic

therapy for patient of AMI in CCU, divided to three phases- pre, during, and after procedure. Concerning pre- procedure of administration of thrombolytic therapy, the present study confirmed that; more than half of studied nurses had the correct practice. Additionally, the majority of studied nurses had monitor blood pressure to ensure that systolic blood pressure is more than 80mmhg & less than 180mmhg, and diastolic below 110mmhg despite treatment, connect the patient to monitor, measure vital signs, check intravenous access device, and obtain 12 lead ECG.

While less than half of the studied nurses had correct practice about ensuring that ECG shows abnormal ST elevation of 2 mm or more in at least 2 standard leads 2 adjacent precordial leads not including V1, the QRS width is 0.16 seconds (4 small squares) or less, wash their hands before procedure, check patient's 7 rights of medication administration, and explain procedure to the patient and obtain consent. Several factors may have relevance to this finding are inadequate knowledge regarding administration of thrombolytic therapy, increased number of patients, inadequate staffing and absence of advancing courses regarding ECG.

On the same line, the study of **Ishag & Awad (2017)** that aimed to assess nurses competence regarding patients with acute myocardial infarction receiving streptokinase and found that the studied nurses had correct practice regarding to do 12 lead ECG, given pain killers according to policy, intervention after drug side effects, check vital signs when patient arrive before medication administration, connect patient to monitor and checked prescribed drugs.

On the other hand, **Sambu et al., (2018)** founded that more than half of studied nurses in the Coronary Care Unit had poor performance regarding regular checkup of vital signs, regular performance of 12 lead ECG and connect patient with monitor. Also, the result of the present study disagreed with the result of study done by **Hessaen & Fadlalmola, (2020)** which denote that most of studied nurses given the patient explanation about streptokinase administration that is ethical and protected them self.

Regarding care provided during thrombolytic therapy administration phase, the current study results showed that less than two thirds of studied nurses had correct practice. Regarding to subitems of this phase, the majority of studied nurses kept

antidysrhythmic drugs and the emergency cart readily available. Additionally, more than two thirds of studied nurses assessed infusion site for hematoma or bleeding during the first hour, maintained continuous cardiac monitoring during the infusion and checked ECG monitor for reperfusion arrhythmias. Moreover, less than two thirds of studied nurses monitored vital signs, assessed infusion site for hematoma or bleeding every 30 minutes for the next 2 hours and assessed pulses, color, sensation, and temperature of both extremities with each vital sign check.

The current study results are in agreement with study done by **Eweas et al., (2016)** who found that most of studied nurses maintain continuous cardiac monitoring during the infusion, assess infusion site for hematoma or bleeding, and monitor vital signs. Also, **Allawy et al., (2020)** found that the majority of studied nurses monitor ECG through intravenous administration of high alert medication and on the prescribed interval and obtain baseline vital signs continuously.

Additionally, **Hessaen & Fadlalmola, (2020)** showed that the majority of studied nurses in CCU in public hospitals do vital signs and continue monitoring cardiac rhythm as proper role of nurses

during administration, maintaining slow infusion to detect reaction and monitoring the patients to prevent allergic during administration of streptokinase. Also, they founded that the studied nurses administered streptokinase properly in phase of during procedure more than pre and after administration of streptokinase.

In contrast with the current study results **Khalil et al., (2018)** revealed that the majority of studied nurses didn't adhere to guidelines of administration phase of streptokinase such as keeping antidysrhythmic drugs and the emergency cart readily available for treatment of significant ventricular dysrhythmias, assess infusion site for hematoma or bleeding, assess pulses, color, sensation, and temperature of both extremities with each vital sign check, and didn't check ECG monitor for reperfusion arrhythmias. Also, **Allawy et al., (2020)** founded that most of studied nurses didn't monitor IV site closely redness or infiltration and didn't check peripheral circulation during drug administration.

Focusing on post-procedure of thrombolytic therapy administration, current study result showed that most of studied nurses assess vital signs, distal pulses, and

infusion site, and around two thirds of them obtain 12 lead ECG after 1 hour, assess for reperfusion dysrhythmias, and assess for changes in level of consciousness, assess manifestations of increased intracranial pressure, reinforce the need to keep the extremity straight and immobile and assess puncture sites for bleeding, while, less than half of studied nurses maintained bed rest for 6 hours and kept the head of the bed at or below 15 degrees, assessed body fluids including urine and vomitus for evidence of bleeding, and documented the patient responses to treatment and the procedure.

The result of current study supported by **Khalil et al., (2018)** who revealed that the majority of studied nurses assess vital signs, distal pulses, and infusion site, obtain 12 lead ECG after 1 hour, assess for reperfusion dysrhythmias after administration of streptokinase.

Moreover, the results of the present study were congruent with **Eweas et al., (2016)** who concluded that most of studied nurses assessed the cardiac enzymes after 6 hours**,** puncture sites for bleeding, obtain 12 lead ECG after 1 hour, assessed for reperfusion dysrhythmias and any change in consciousness after administration of streptokinase.

In contrast with present study result, **Hessaen & Fadlalmola, (2020)** reported that all studied nurses document time of thrombolytic administered and more than half of them didn't monitor all injection site. Also, results of study done by **Allawy et al., (2020)** were disagree with the current study results which revealed that, mor than half of studied nurses record the date and time of starting the infusion and record the date and time.

Furthermore, **Eweas et al., (2016)** were disagreed with the current results as they concluded that all of studied nurses kept documentation of procedure, and most of them maintained patients bed rest for 6 hours and kept the head of the bed at or below 15 degrees and assess body fluids including urine and vomitus for evidence of bleeding, while more than half of studied nurses didn't reinforce the need to keep the extremity straight and immobile.

5. Conclusion.

Based on the findings of the present study, it can be concluded that, nurses in critical care unit at Suez Canal University Hospital had unsatisfactory level of knowledge and practice regarding thrombolytic therapy among acute myocardial infarction patients.

6. Recommendations

1- Implement educational program regarding group of thrombolytic medications for nurses in critical care units

2- The nurses' performance in relation to administration of thrombolytic therapy should be monitored regularly.

Table (1) Percentage distribution of the studied nurses according to their demographic characteristics (n=40).

Variables	Total subjects	
	N	%
Age (Years)		
20 - < 30 years	24	60
30 - < 40 years	16	40
Mean±SD	26.01±3.32	
Range	22-35	

Gender		
Male	15	37.5
Female	25	62.5
Education		
Bachelor's degree in nursing	12	30
Technical Institute of nursing	27	67.5
Secondary nursing education	1	2.5
Years of experience in nursing		
Mean±SD	5.22±2.64	
Range	1-13	
Years of experience in cardiac care unit		
Mean±SD	2.72±1.66	
Range	1-8	

n: sample size; N: frequency; %: percent; SD: standard deviation
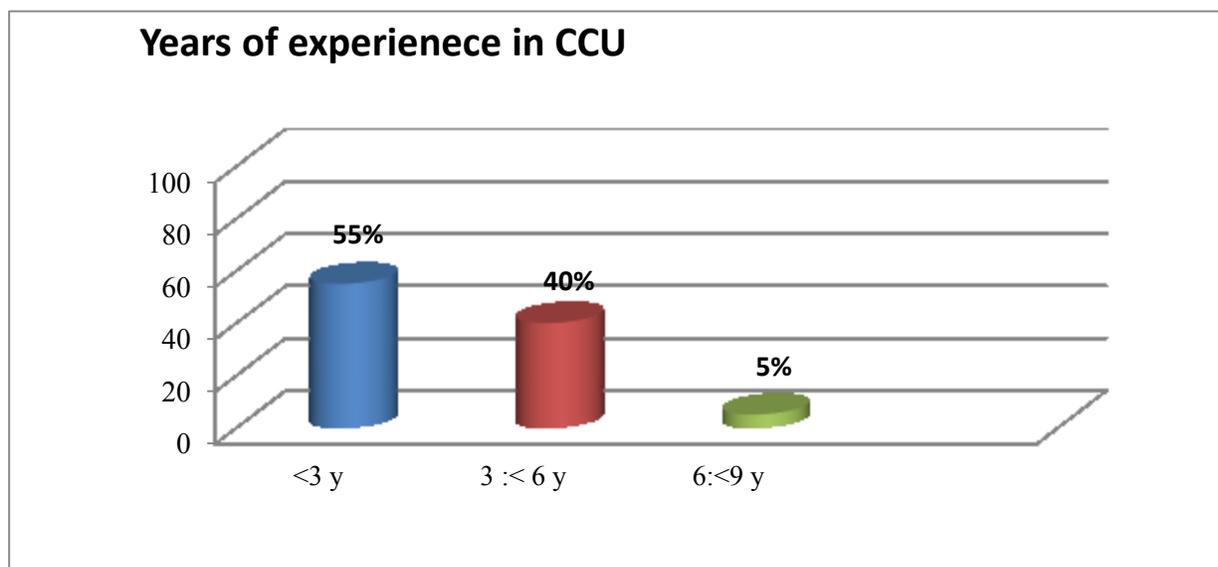
Figure (1): Distribution of studied nurses according to their years of experience in CCU (n=40).

Training Courses Attendence

32.5%

67.5%

- yes
- no
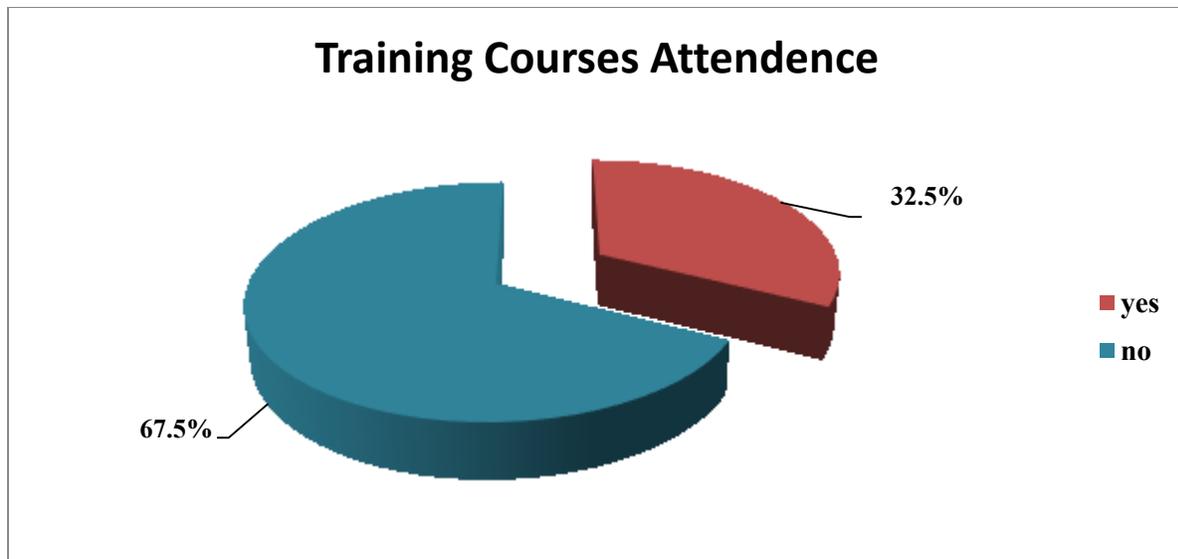
Figure (2): Percentage distribution of studied nurses according to thrombolytic therapy course attendance (n=40).

**Nurses knowledge**

5%

95%

- Satisfactory
- Unsatisfactory
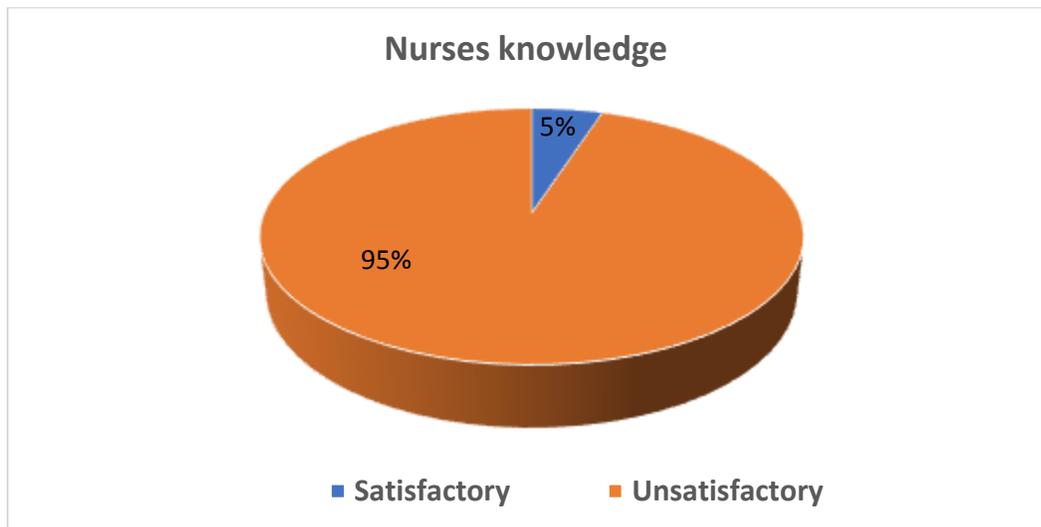
Figure (3): Distribution of studied nurses as related to satisfactory and unsatisfactory level of knowledge regarding thrombolytic therapy (n= 40).

Table (2): distribution of studied nurses according to mean score of 'knowledge regarding thrombolytic therapy (n=40).

Nurses' knowledge	Mean	SD
General pharmacological concepts (7 questions)	3.775	1.25
Indication and contraindication (3questions)	.950	0.719
Complication (4 Questions)	2.37	0.806
Administration (4 Questions)	2.67	0.693
Nursing role (7 Questions)	3.67	1.163
Total Score (25 Questions)	13.45	2.08

Nurses Practice

17.5%

82.5%

■ Satisfactory ■ Unsatisfactory
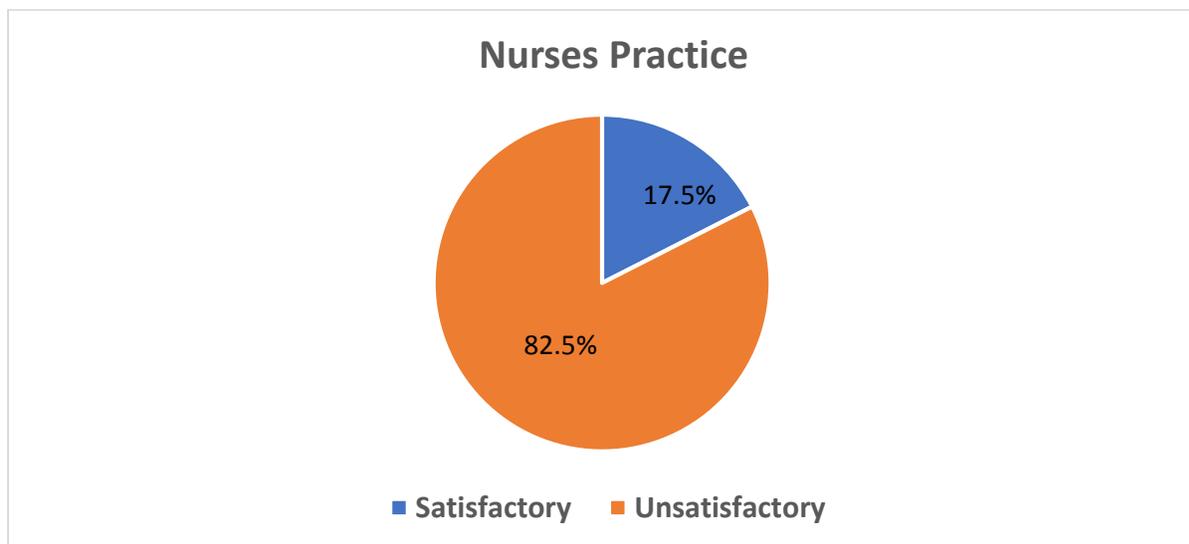
Figure (4): **Distribution of studied nurses related to satisfactory and unsatisfactory level of total practice regarding thrombolytic therapy (n=40)**

Table (3) distribution of studied nurses according to mean score of practice regarding thrombolytic therapy (n=40).

Nursing practices	Mean	SD
Preparing phase	12.10	2.48
Administration phase	4.70	1.39
Post infusion	7.25	1.89
Total Score	24.05	4.06

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