Effect of Training Program on Nursing Performance regarding Emergency Management of Acute Myocardial Infarction Patients

[1]Samar Abd-Elhai Abd-Elghani Shetaia , [2]Marwa Mostafa Ragheb , [3] Sabah Saeed Mohamed and [4] Samah EL-Sayed Ghonaem

(1) M.Sc. Nursing, Faculty of Nursing - Benha University, 2017, (2) Professor of Medical Surgical Nursing, Faculty of Nursing - Benha University and (3-4) Assistant professor of Medical Surgical Nursing - Faculty of Nursing - Benha University.

Abstract

Background: Acute Myocardial Infarction (AMI) is a medical emergency requiring immediate intervention, nurses play a vital role in management of an AMI. They must respond rapidly and efficiently to patients who are experiencing symptoms of AMI. **Aim:** The present study aimed to evaluate the effect of training program on nurse's performance regarding emergency management of myocardial infarction patients. **Research design:** Quasi experimental design**. Setting:** Cardiology care unit at Benha University Hospital. **Subject:** A convenient sample of 50 nurses was worked at the previously mentioned setting at the time of data collection. **Tools of data collection:** Two tools were used, I. Self-administered questionnaire sheet to assess nurses' knowledge regarding acute myocardial infarction and II. Nurses' observational checklists to assess practice. **Results:** Less than one third of studied nurse have good level regarding total knowledge of emergency management of MI before implementing program However, post implementation, increase to fifth of them then slightly decrease during follow-up, concerning to practice level less than one third of studied nurses were having satisfactory level of practice pre implementation the program, however, post implementation, increased to about two thirds of them were having satisfactory level then slightly decreased during follow-up. Also, there was a positive statistical correlation between total knowledge scores and total practice score pre, post & follow-up training program implementation. **Conclusion:** Application of the training program has a positive effect on nurses' performance regarding emergency management for MI patients. Recommendations: Conduction of periodic training sessions to improve practices about assessment and management of patients with AMI which will improve nurses' level of performance.

Keywords: Emergency Management, Myocardial infarction, Nursing Performance, Training program

Introduction

Acute myocardial infarction is a major cause of death and disability worldwide. The ability to recognize the clinical presentation of AMI is critical to achieving timely reperfusion and the reduction of mortality and morbidity associated with misdiagnosed AMIs. Cardiac tissue can best be salvaged within the first 2 hours after the onset of angina symptoms, the earlier the myocardium is revascularized, the better are the chances of survival **(Basavanthappa, 2020).**

Emergency management of myocardial infarction is very necessary to avoid the complications and recurrent attack. The advent of coronary care units and early reperfusion therapy has substantially decreased in-hospital mortality rates and has improved the outcome in survivors of the acute phase of MI. Complications of MI include arrhythmic,

mechanical, and inflammatory, as well as left ventricular mural thrombus. In addition to these broad categories, right ventricular infarction and cardiogenic shock are other possible complications of acute MI **(Werf & Dennis, 2021).**

The nursing management involved in AMI is critical and systematic, and efficiency is needed to implement the care for a patient with AMI. Critical care nurses are in a unique position to promote evidence-based practice during emergency management of AMI. Deeper insight into the unique role of nurses in the ED will promote understanding of what type of knowledge, skills, and attitudes are required to provide the services that will contribute to improved quality of care for chest pain patients **(Morton & Fontaine, 2021).**

Significance of the Study:

Similar to other Arab countries, coronary artery diseases (CAD) are a common heath problem in Egypt. It is the commonest cause of death among Egyptians. 49% of them had ST-elevation myocardial infarction (STEMI) according to **(Reda, 2021).** Trends in CVD mortality in the last few years show a minor reduction due to preventive efforts especially against smoking, an operational action plan to reduce the burden of tobacco use **(Abdul Rahim, Sibai, & Khader, 2019).**

There is need to seek evidence about performance of nurses and it is necessary to improve the level of performance of first-line health workers or those who are continuously in contact with the clients, community and patients at different levels of health care system of study area. Therefore, the objectives of this study were evaluating the effect of training program on nurse's performance.

Aim of this study:

The present study aimed to evaluate the effect of training program on nurses' performance regarding emergency management of myocardial infarction patients.

Research Hypothesis

H1- Nurses' knowledge improves after implementing training program regarding emergency management of myocardial infarction patients.

H2- Nurses' practice improves after implementing training program regarding emergency management of myocardial infarction patients.

Subjects and Methods

Research design:

Quasi- experimental research design was followed to achieve the aim of this study. Quasi-experimental used usually to evaluate the effect of an ongoing program on one or more indicators of output or outcome. It have two characteristics they make before and after (pretest-posttest). a quasi-experiment does not rely on random assignment. Instead, subjects are assigned to groups based on non-random criteria. Quasi-experimental design is a useful tool in situations where true experiments cannot be used for ethical or practical reasons **(Urden, et al., 2019).**

Setting:

This study was conducted in Coronary Care Unit at Benha University Hospital. Coronary Care Unit department is located in the medical building on the third floor which consists of two rooms each room has 6 beds totally 12 beds.

Subjects:

A convenient sample of all available nurses (50) with different sex, age, level of education and years of experience who provide nursing

care for patients with myocardial infarction, working in previously mentioned setting.

Tools of data collection:

Data were collected through the use of the following tools:

Tool I- Self-administered questionnaire sheet:

This tool was designed by the researcher and was written in Arabic language based on scientific related literature such as **Basavanthappa, (2015), Lanken et al., (2018) and Urden et al., (2019).** It included two parts as the following:

Part I: Demographic characteristics of the studied nurses:

Included questions related to personal characteristics of the study subjects which compose of (6) question. Questions were related to age, gender, education level, marital status, years of experience in Coronary Care Units and attendance of training courses regarding managing acute myocardial infarction patient.

Part II: Nurses' knowledge about emergency management of acute myocardial infarction:

It was used to assess nurses' knowledge regarding acute myocardial infarction emergency management. It consists (35) MCQ questions covering four main parts:

➢ First part: knowledge about heart anatomy and physiology, Basic knowledge about AMI definition, causes, risk factors, signs, symptoms and complications (10 questions).
➢ Second part: knowledge about medical management (drug therapy), Thrombolytic therapy (7 questions).
➢ Third part: knowledge about ECG (13question).

➢ Fourth part: knowledge about nursing management of MI patient (5 questions).

Scoring system for knowledge:

For each information question correct answer was scored by one, while incorrect answer was scored by zero. The answer of nurses were evaluated using model answer prepared by the researcher from literature review. These score were transformed into score percent as follow:

The total knowledge scores ranged from 0-35, they were evaluated as follows:

• ≥75% :100% was considered good level of knowledge (≥25 : 35score)
• ≥60% : < 75 % was considered average level of knowledge (≥19 : < 25 score).
• < 60% was considered poor level of knowledge (< 19 score).

Tool II- Nurses' practice observational checklists: this tool was adapted from **Lynn & LeBon, (2019),** and modified by the researcher. It was used to assess the nurses' level of practices regarding management of patient with acute myocardial infarction it was included:

1. Nurses' practices regarding oxygen therapy administration (24 items)
2. Nurses' practices regarding peripheral intravenous infusion (thrombolytic therapy) (24 items).
3. Nurses' practices regarding electrocardiographic procedure (32 items)
4. Nurses' practices regarding defibrillation (28 items)
5. Nurses' practices regarding advanced CPR (48 items).

Scoring system for practice:

Related to observation checklist items, the item done was scored one and not done was scored zero for each item, the score of these

items were summed up and divided by the total of items, giving a mean score of the part. These score were transformed into score percent as follow:

The total practice scores ranged from 0:156, they were evaluated as follows:
- ≥75% :100% was considered satisfactory level of practice (≥117: < 156 score).
- < 75% was considered unsatisfactory level of practice (< 117 score).

Validity & Reliability:

Tools of data collection were developed after reviewing the national and international Literatures related to the study, this tools adopted and modified by the researcher then tested for content validity by a panel of seven experts in the field of medical surgical nursing two of them was assistant professor and three lecturers at the faculty of Nursing, Benha University , one assistant professor at the faculty of Nursing, Helwan University and one lecturer at the faculty of medicine, Tanta university reviewed the tools for clarity, relevance, comprehensiveness, understanding, applicability and simplicity for implementation and some modification were applied accordingly.

Reliability test was made by using Cronbach's Alpha test

Tool	No of questions	Cronbach's Alpha
Knowledge	35	0.982
Practice	156	0.978

Ethical Consideration:
All relevant ethical issues were taken into consideration including the following:

- The research approval was obtained from Faculty of Nursing at Benha University to the directors of Benha University Hospital before starting with the program. The aim of the study was explained to each nurse and then an oral consent for participation in the study was obtained from each one of them. Ensuring nurse's privacy and confidentiality of the collected data during the study. Voluntary participation as they were given an opportunity to refuse the participation, and they were assured that there information would be used for research purposes only. They have a right to withdrawal from the study at any time without introducing any reason.

Pilot study:
A pilot study was carried out on 10% of the total sample (5nurses) recruited to test the clarity and applicability of the tools, as well as to estimate the time needed for data collection. According to the results obtained from data analysis the necessary minor modification was done prior to data collection. nurses who participated in the pilot study were included in study sample because there is minor modification.

Fieldwork:
Sampling and data collection were started and completed during the period from the beginning of June 2020 to the end of February 2021 during morning shift 3 times weekly.

➢ Three month for pre-program data collection (from the beginning of June 2020 to the end of August 2020).
➢ Three months for program implementation & immediate evaluation post implementing the

program (from the beginning of September 2020 to the end of November 2020).

➢ Three months follow-up program implementation (from the beginning of December to the end of February 2021)

It passed through the following phases

Phase 1: Assessment Phase:

The researcher introduced herself to the studied sample and gave them a brief idea about the aim of the study. Then oral consent was obtained from each nurse in the study. Pre -tests were done to assess the level of knowledge and practices of the study group concerning nursing management of patients with myocardial infarction and to help in developing the training program according to results. Observing nurses' performance in order to fill performance checklist sheets of the studied nurses **(Tool II)**. Then Structural Interview sheets **(Tool I)** were filling in the nurses' room after interviewing each nurse individually. The average time taken to fill out the form for each nurse was 15 to 20 minutes.

Phase II: Planning phase:

The researcher assessed the educational needs for the nurses regarding myocardial infarction by reviewing literature and internet searching for relevant information to construct the training program under the guidance of the supervisors. The main aim was to improve knowledge and practices of nurses regarding nursing emergency management of patients with myocardial infarction. A simple colored Arabic booklet was developed for nurses covering all items related to myocardial infarction, its management and containing colored pictures clarifying each step in all procedures.

The Educational booklet includes theoretical part which containing anatomy and physiology of the heart, myocardial infarction definition, signs and symptoms, complications, risk factor, medical & nursing management of myocardial infarction and practical part which containing different nursing procedures related to myocardial infarction management including: oxygen therapy administration, peripheral intravenous infusion (thrombolytic therapy), electrocardiographic procedure, defibrillation and advanced CPR.

Phase III: Implementation phase:

The training program of this study has been carried out in nurses' room in the coronary care unit at Benha University Hospital. The implementation of the program was within the schedule of the nurses working hours. The subjects were divided into small groups (10 groups), each group consist of five nurses, according to the total number of nurses (50). The program was conducted through five sessions divided into 3 session for theoretical part and 2 session for practical part, and the duration of each session was about 45 minutes at the morning shift(10 am).

1st session: was about 45 minutes in which nurses acquired knowledge about objectives of training program, knowledge about anatomy and physiology of heart, definition of myocardial infarction, causes, signs & symptoms, risk factors, complications. Lecture and group discussion were used as teaching method, colored posters and handout were given to nurses after that, nurses were evaluated through post-test.

2nd session: was about 45 minutes, nurses acquired knowledge about electrocardiogram, how to read ECG paper.

3rd session: was about 45 minutes, nurses acquired knowledge about treatment, nursing management for myocardial infarction patients and different types of medication ,precautions must take before given medications and side effect of medication.

4th session: - was about 45 minutes in which nurses acquired skills and practice regarding nursing role before, during & after oxygen therapy administration, medication administration (thrombolytic therapy) and steps of ECG monitoring.

5th session: - was about 45 minutes in which nurses acquired skills and practice regarding nursing role before, during & after steps of manual defibrillation and advanced CPR.

Phase VI : Evaluation phase:

The evaluation phase focused on determining the effect of the program through nurses' interview questionnaire and observational checklists using the same tools in pre-program assessment (**Tool I Part II& Tool II**). The evaluation done by the following phases:

Immediate phase, directly after implementing the program (post-test) and continued for 3 months from the beginning of September 2020 to the end of November 2020. The results compared to the pretest results to evaluate the impact of the program on knowledge and practices of the nurses.

Three months later(follow-up phase), after three months from posttest and continued for three months from the beginning of December to the end of February 2021.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 27, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test ($\chi 2$). For comparison between means of three related groups (pre, immediate post and three months post educational intervention), F value of was calculated for parametric data and ($\chi 2$ value) of Friedman test was calculated for non-parametric data. (**Dawson &Trapp, 2020**) .

Results:

Table (1): This table clarifies that, 60% of studied nurses between 18 - 30 years old, 58% were female, 72% were married, 40 % of them < 5 years of experience in CCU . Regarding to their educational level, 56% of studied nurses of them were studied at Nursing Technical Institute. The table also reveals that 66% were not taken training course in CCU.

Table (2): This table reveals that the results related to nurses' knowledge there was highly statistically significant in all items of mean and stander deviation pre, post &follow-up program implementation.

Figure (1): This figure illustrates that, 20% of studied nurses were having good knowledge pre implementation of the program. However, post implementation, 40% of studied nurses were having good knowledge and 36% of them having good knowledge in follow-up regarding myocardial infarction total knowledge.

Table (3): This table reveals that the results related to total nurses' practice there was highly statistically significant in all items of mean and

stander deviation pre, post &follow-up program implementation.

Figure (2): This figure illustrates that, only 30% of studied nurses were having satisfactory level pre implementation of the program. However, post implementation, 66% of studied nurses were having satisfactory level and 58% of them were having satisfactory level during follow-up of the program.

Table (4): This table reveals that there was highly statistically significant in relations between total knowledge scores and age, gender, marital status, years of experience and educational level pre, post & follow-up training program implementation p<0.001.

Table (5): This table reveals that there was highly statistically significant in relations between total practice scores and age, gender, years of experience in CCU, educational level pre, post & follow-up training program implementation p<0.001.

Table (6): This table reveals that, there was positive statistical correlation between total knowledge scores and total practice score pre, post & follow-up training program implementation.

Table (1): Distribution of Demographic Characteristics of the Studied Nurses, (N=50).

Demographic data	The studied sample (N=50)	
	No.	**%**
Age		
18 – 30	30	60
31 – 40	20	40
Mean ± SD	**26.14 ± 5.099**	
Gender		
Male	21	42
Female	29	58
• **Marital status**		
Single	8	16
Widow	2	4
Married	36	72
Divorced	4	8
• **Years of experience in CCU**		
< 5	20	40
5: 10	22	44
≥ 10 -	8	16
Mean ± SD	**1.76 ± 0.716**	
• **Educational level**		
Diplome of Nursing	2	4
Nursing Technical Institute	28	56
Bachelor of Nursing	18	36
Postgraduate Studies	2	4
• **Attend training course**		
Yes	17	34
No	33	66

Effect of Training Program on Nursing Performance regarding Emergency Management of Acute Myocardial Infarction Patients

Table (2): Mean Score of Nurses' Knowledge regarding emergency Management of Myocardial Infarction pre, post & follow-up training program implementation, (N=50).

| Total Nurses Knowledge items	Mean ± SD			F-test	P-value
	Pre	**post**	**Follow-up**		
- General knowledge about heart anatomy and MI	3.8400±3.65536	6.3200±3.01993	4.9870±2.98640	87.84	0.000**
-Medical management of MI	2.8000±3.68117	7.4400±4.01101	6.4330±3.98501	97.95	0.000**
-ECG knowledge	4.9400±4.04268	9.9200±5.70299	7.4580±4.98009	85.36	0.000**
-Nursing management of MI	1.7200±1.80747	3.2800±1.34073	2.1780±1.22803	96.24	0.000**
Total knowledge	13.3000±13.18668	25.9600±14.07466	21.0560±13.19953	95.57	0.000**
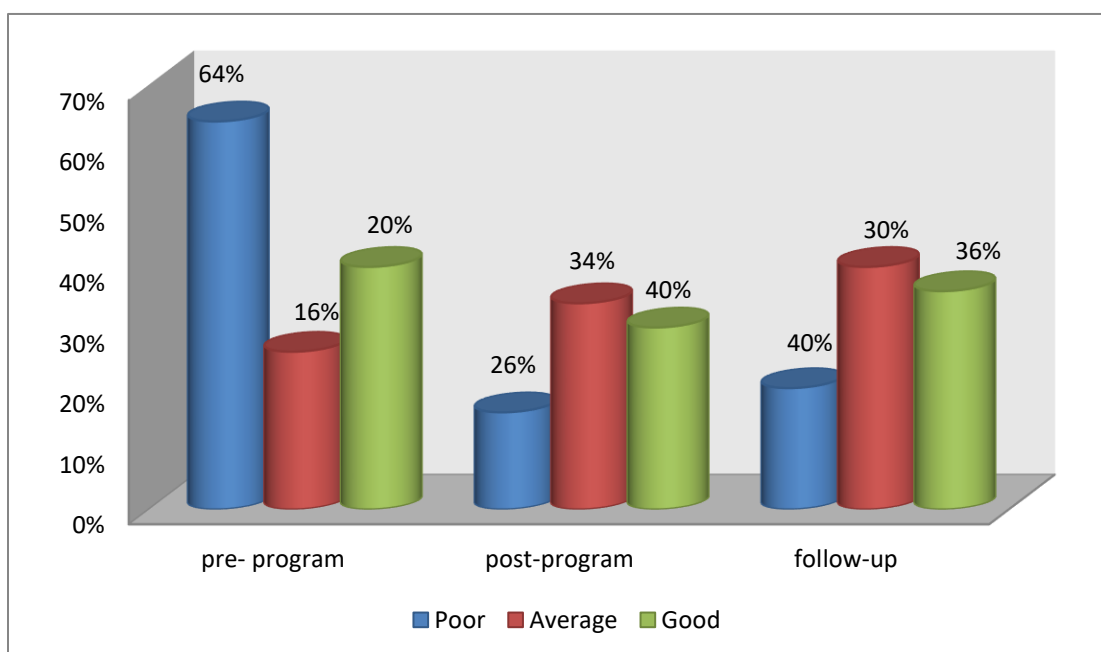
Figure (1): Distribution of the Total knowledge scores among the studied sample pre, post & follow-up training program, (N=50).

Table (3): Mean score of Nurses Practice regarding Myocardial Infarction, (N=50).

Total Nurses practices items	Mean ± SD			F-test	P-value
	Pre	Post	Follow -up		
Oxygen Therapy	7.3000±7.36304	15.6200±9.99978	11.5410±8.98979	75.54	0.001**
Thrombolytic therapy	7.0000±9.47607	18.3200±11.26570	10.5740±10.27560	80.78	0.001**
ECG procedure	4.9400±4.04268	9.9200±5.70299	6.8720±5.100022	79.58	0.001**
Manual defibrillator	10.0800±10.91439	18.2600±11.43537	12.5420±11.11525	89.54	0.000**
Advanced CPR	9.2000±11.03612	18.3200±11.26570	12.1470±11.11121	69.98	0.001**
Total practice	38.5200±42.8323	80.440±49.66954	53.6760±46.591872	90.74	0.000**
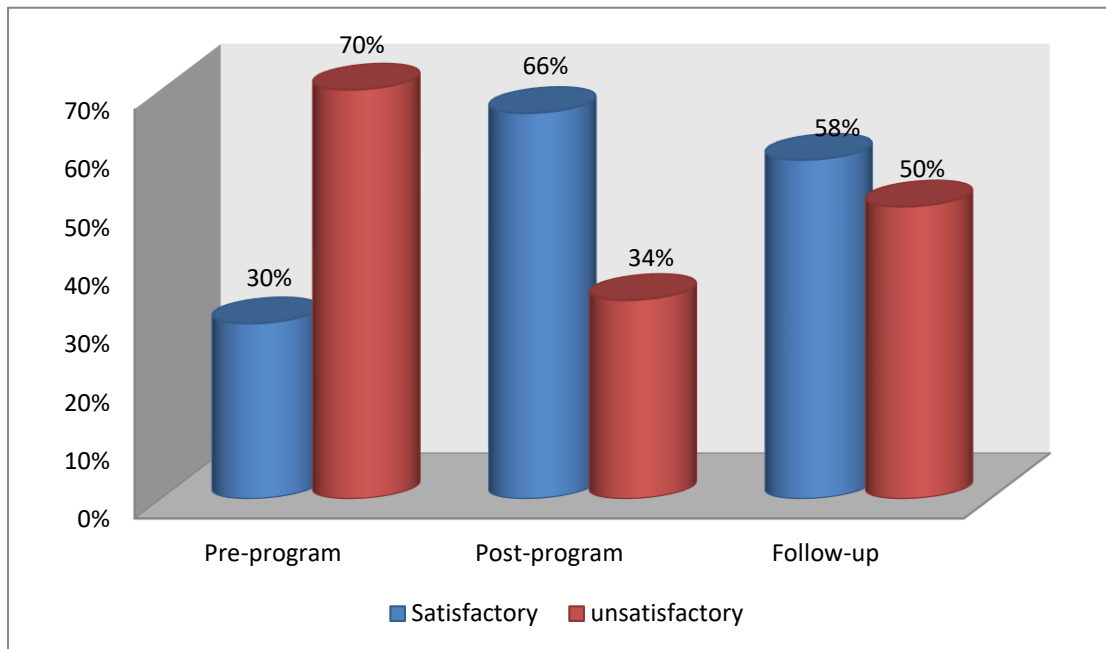
Figure (2): Distribution of Total practice scores among the studied sample pre, post & follow-up training program implementation, (N=50).

Effect of Training Program on Nursing Performance regarding Emergency Management of Acute Myocardial Infarction Patients

Table (4): Relations between Total knowledge Scores and their socio-demographic data among the studied sample pre, post & follow-up training program implementation, (N=50).

Socio-demographic data	Pre Poor No.	%	Average No.	%	Good No.	%	Post Poor No.	%	Average No.	%	Good No.	%	Follow-Up Poor No.	%	Average No.	%	Good No.	%
●Age:																		
- 18 - 30	20	40	8	16	2	4	13	26	14	28	3	6	15	30	13	26	2	4
- 31 - 40	12	24	0	0	8	16	0	0	3	6	17	34	5	10	2	4	13	26
χ2 P value	12.083 0.001**						29.081 0.000**						27.901 0.000**					
● Gender																		
Male	4	8	8	16	9	18	13	26	2	4	6	12	11	22	6	12	4	8
Female	28	56	0	0	1	2	0	0	15	30	14	28	9	18	9	18	11	22
χ2 P value	25.514 0.000**						31.938 0.000**						28.970 0.000**					
●Marital status																		
- Single	3	6	5	10	0	0	6	12	2	4	0	0	2	4	6	12	0	0
- Widow	2	4	0	0	0	0	0	0	2	4	0	0	1	2	1	2	0	0
- Married	23	46	3	6	10	20	7	14	9	18	20	40	15	30	6	12	15	30
- Divorced	4	8	0	0	0	0	0	0	4	8	0	0	2	4	2	4	0	0
χ2 P value	19.076 0.005						26.056 0.000**						24.811 0.000**					
●Years of experience in CCU																		
- < 5	12	24	3	6	5	10	4	8	11	22	5	10	10	20	8	16	2	4
- ≥5: 10	13	26	4	8	5	10	8	16	6	12	8	16	9	18	5	10	8	16
- ≥ 10 -	7	14	1	2	0	0	1	2	0	0	7	14	1	2	2	4	5	10
χ2 P value	2.894 0.354						13.064 0.001**						9.896 0.006					
●Educational level																		
- School of Nursing	2	4	0	0	0	0	0	0	0	0	2	4	0	0	1	2	1	2
- Nursing Technical Institute	17	34	6	12	5	10	11	22	6	12	11	22	10	30	10	20	8	16
- Bachelor of Nursing	13	26	0	0	5	10	0	0	11	22	7	14	10	20	4	8	4	8
- Postgraduate Studies	0	0	2	4	0	0	2	4	0	0	0	0	0	0	0	0	2	4
χ2 P value	15.867 0.013						20.475 0.000**						18.970 0.000**					
● Attending Training course	7	14	5	10	5	10	6	12	2	4	9	18	5	10	1	2	7	14
χ2 P value	5.680 0.042						7.370 0.027						6.133 0.049					

Table (5): Relations between Total Practice Scores and their socio-demographic data among the studied sample pre, post & follow-up training program implementation, (N=50).

Socio-demographic data	Total Observation Scores											
	Pre				Post				Follow-Up			
	Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
●Age:												
- 18 - 30	16	32	14	28	7	14	23	46	10	20	20	40
- 31 - 40	19	38	1	2	10	20	10	20	15	30	5	10
χ2 P value	3.803 0.050				9.921 0.001**				7.981 0.001**			
● Gender												
- Male	6	12	15	30	0	0	21	42	4	8	17	34
- Female	29	58	0	0	17	34	12	24	21	24	8	16
χ2 P value	18.652 0.000**				29.592 0.000**				24.375 0.000**			
●Marital status												
- Single	2	4	6	12	0	0	8	16	1	2	7	14
- Widow	2	4	0	0	1	2	1	2	1	2	1	2
- Married	27	54	9	18	16	32	20	40	21	42	15	30
- Divorced	4	8	0	0	0	0	4	8	2	4	2	4
χ2 P value	8.160 0.008				10.174 0.009				9.681 0.005			
●Years of experience												
- < 5	16	32	4	8	0	0	20	40	8	16	12	24
- 5: 10	12	24	10	20	10	20	12	24	9	18	13	26
- ≥ 10 -	7	14	1	2	7	14	1	2	8	16	0	0
χ2 P value	4.621 0.094				21.793 0.000**				19.872 0.000**			
● Educational level												
- School of Nursing	2	4	0	0	2	4	0	0	1	2	1	2
- Nursing Technical Institute	15	30	13	26	13	26	15	30	13	26	15	30
- Bachelor of Nursing	18	36	0	0	2	4	16	32	10	20	8	16
- Postgraduate Studies	0	0	2	4	0	0	2	4	1	2	1	2
χ2 P value	11.042 0.005				16.837 0.000**				14.987 0.000**			
● Attending Training course	9	18	8	16	7	14	10	20	8	16	9	18
χ2 P value	0.591 0.322				3.569 0.060				2.147 0.042			

Table (12): Correlations between Total Knowledge Scores and Total Practice Score among the studied sample pre, post & follow-up training program implementation, (N= 50).

Variables	Total Knowledge Scores					
	Pre		Post		Follow-up	
	r	P	r	P	r	p
- Total practice Scores	0.428	0.001**	0.533	0.001**	0.499	0.001**

Discussion

Nurses play a vital role in management of an AMI. They must respond rapidly and efficiently to patients who are experiencing symptoms of AMI, Nurses must quickly work to their patient, administer sublingual nitroglycerin and aspirin if indicated, obtain a 12-lead ECG, and notify the physician. American heart association provides guidelines for treatment of AMI that help to improve mortality rates. These guidelines have become the standard of care for many hospitals nationwide **(Lewis et al., 2019).**

Therefore, this study was carried out to evaluate the effect of training program on nurses' performance regarding emergency management of myocardial infarction patients. Discussion of the finding will cover the following main parts: first part concerned with demographic characteristics of nurses under study, second part concerned with nurses' knowledge regarding emergency management myocardial infarction, third part concerned with nurses' level of practice regarding emergency management of myocardial infarction, fourth part concerned with relation between demographic characteristics and nurses' knowledge and practice, and fifth part concerned with correlations between total knowledge scores and

total practice score among the studied sample pre and post training program.

In relation to the age, based on the results of the present study, the study revealed that more than half were aged from 18 to 30 years old. This may be due to the majority of nurses work power providing direct care for the patient in nursing field in our study are young female while higher age category senior nurses perform administrative role.

This finding is in agreement with **Gupta & Dias, (2020),** whose study entitled "Effectiveness of Simulated Demonstration Regarding Defibrillation Technique on Knowledge and Practice Among Nurses", their study indicated that three fifth of the studied sample were between the age group of (26-30) years old while the present study disagree with **Laradhi, (2019)** whose study "Assessment of nurses' performance regarding medication administration for patient with myocardial infarction" they revealed that more than half of their study age group from 30 years and above**.**

Concerning level of education, it was found that more than half of the studied nurses had nursing technical institute degree. This reflects that the most of the nurses have not good opportunity to continue their education. This result is consistent with **Laxman (2016),** who conduct Study entitled

(knowledge of staff nurses regarding use of defibrillators in intensive care units) and revealed that around two thirds (63%) of the studied sample were have diplome of nursing.

It was noted that about two third of the studied sample had not attending training courses. This may be due to lacking motivation and inability of some nurses to attend training courses due to lacking of nurses staff number. This is in agreement with **Hussien, Khalil& Yousef, (2018),** who found that all of studied sample didn't receive any training courses. Also this agreed with **Lemma (2017),** who found that more than two thirds of the studied nurses hadn't attended training courses

In relation to knowledge about heart anatomy & physiology, and myocardial infarction. The current study revealed that there was highly statistically significant difference pre, post & follow-up program implementation between all items. This lack of knowledge may be due to great number of nurses not attending any training course. Moreover, after implementation of the training program the improvement was shown in nurses' knowledge mean score regarding all aspects of the program. Also the follow up mean score (after 3 months) had shown some decline but they were still significantly higher compared to preprogram level. This decline in the total mean scores of nurses' knowledge in the follow phase is normal and expected finding and interpreted that the majority of nurses have no time to refresh their knowledge , so this finding recommended that periodic refreshing courses should be planned and implemented for nurses.

This result is in the same line with **Al-Janabi & Al-Ani (2017),** who conducted a study entitled "Nurses knowledge towards cardio pulmonary resuscitation at Al-Najaf city's teaching hospital" and whose found that more than three quarters of

the studied sample had unsatisfactory level of knowledge regarding myocardial infarction.

Regarding nurses' knowledge of AMI medical management, the present study showed there was highly statistically significant difference pre, post & follow-up program implementation, the lack of nurses' knowledge in this study may be due to the fact that majority of them hold nursing diploma and most of medical and nursing books are written in English and their learning in Arabic. Moreover, the nurses may not use the independent self-learning.

This result is agreed with **Mustafa, et al., (2018),** who conducted a study on "Effectiveness of Education Program on Nurse's Competences during Emergency Management of patients with AMI at critical care units and emergency department" found that more than one third of the studied sample had poor knowledge regarding initial medical management and more than half of them had poor knowledge regarding thrombolytic agents before training program.

Regarding to nurses' knowledge about ECG making, and ECG interpretation: the current study represented that there was highly statistically significant difference pre, post & follow-up program implementation between all items of ECG making, and ECG interpretation. This may be due to the poor interesting of nursing personnel in learning and understanding ECG and its interpretation. And the general concept that it's not a nursing concern. In addition to that the nursing programs didn't focus on ECG interpretation.

Moreover, after implementation of the training program the improvement was shown in nurses' knowledge mean score regarding ECG. Also the follow up mean score (after 3 months) had shown some decline.

This finding is contradiction with **AL-Husaunawy, (2017),** who study entitled "Evaluation of Nurses Knowledge and Practice of

Electrocardiogram Toward Adolescent Patient ", found that great improvement in knowledge score level after implementing of educational program.

Regarding nurses' knowledge of nursing management, the present study showed there was highly statistically significant difference pre, post & follow-up program implementation. The lack of nurses' knowledge in this study may be due to absence of pre-employment orientation programs, in-service training and courses. Moreover, the nurses may not use the independent self-learning. Moreover, after implementation of the training program the improvement was shown in nurses' knowledge mean score regarding nursing management. Also the follow up mean score (after 3 months) had shown some decline.

This result also in agreement with **Rushdy, Morsy, & Elfeky (2018),** who conducted a study entitled "Effectiveness of Educational Program on Nurses' knowledge and practice regarding care of patients connected to intra- aortic balloon pump (IABP)at Cairo university hospitals", and found that the majority of the studied nurses had unsatisfactory level of knowledge regarding nursing care of patient connected to IABP.

This result disagreed with **Mustafa, et al., (2018),** in a study entitled as "Nurses' Attitude with Physician Collaboration during Management of Patient with Acute Myocardial Infarction Using Thrombolytic Agent at Public Teaching Hospitals in Khartoum State",and stated that more than half of nurses had satisfactory level of knowledge about nursing management before education program.

Regarding nurses' total knowledge related to emergency management of myocardial infarction about less than third of studied nurse have good level regarding total knowledge of emergency management of MI before implementing program However, post implementation, increase to about

half of them then decrease to more than one third during follow-up and this result the answer of first hypothesis. The reasons for lack of knowledge to AMI management may be related to lack of: staff nurse, continuing educational programs or sessions about this therapeutic intervention, supervision, continuous evaluation of nurses' practice, and cooperation between multidisciplinary health team members (nurses-physicians). Also nurses' exhaustion due to increased work load which may hinder their ability to read and update their knowledge. This finding was supported by **Abbas (2017),** who found that total knowledge of nurses was improved after education program.

The present study showed that there was highly statistically significant difference pre, post & follow-up program implementation between all items of nurses practice regarding oxygen therapy administration. This is agreed with **Lemma, (2017),** who found that more than half of the studied sample had poor practice level regarding oxygen therapy.

The present study showed that there was highly statistically significant difference pre, post & follow-up program implementation between all items of nurses practice regarding intravenous infusion therapy. This result may be due to lack of practical training courses about how to use high alert medications especially thrombolytic agents such as streptokinase and ATP drugs. This result agreed with **Fayazi, Abdi, Sayadi & Rostami (2018),** who conducted a study entitled "effect of cardiac intensive nurses' performance in using intravenous Streptokinase for patients with acute myocardial infarction patients", found that more than half of the studied sample practice was poor before implementing training program.

The present study showed that there was highly statistically significant difference pre, post &

follow-up compared to pre-training program implementation and this is agreed with **AL-Husaunawy, (2017),** who conducted a study entitled "Evaluation of Nurses' Knowledge and Practical of Electrocardiogram toward Adolescent Patient", and found that the majority of the sample had poor practice regarding ECG before training program implementation.

The present study showed that there was highly statistically significant difference pre, post & follow-up program implementation between all items of nurses practice regarding defibrillation. This may be due to the common belief that the doctor job. This finding agreed with **Abd El Naeem et al., (2018),** who study entitled "Effect of Teaching Program on Knowledge and skills Regarding Automatic External Defibrillation among Emergency Unit" and reported that the majority of the studied nurses have poor practice level regarding defibrillation before implementing teaching program.

The present study showed that there was highly statistically significant difference pre, post & follow-up compared to pre-training program implementation. This may be due to the majority of the studied nurses had experience less than five years. This result agreed with **Kizza, (2018),** who study entitled "Nurses' knowledge and practices related to myocardial infarction pain assessment in critically ill patients at Mulago Hospital" and he reported that, nurses in this study had lack of education on assessment tools with percentage of 82.4%, poor documentation of CPR before education program.

Concerning total nurses' practice regarding caring of patients with AMI, the present study showed that about one third of studied nurses were having satisfactory level of practice pre implementation the program. However, post implementation, increase to about more than two third of them were having satisfactory level then

decrease to about more than half during follow-up and this result the answer of second hypothesis.. The reasons of unsatisfactory practice level in the current study may be related to increased number of patients and work load. In addition, nurses' practices were based on traditions and imitations and this could be overcome through continuous training courses and supported experience. This result in the same line with **Ryan, (2017),** who found that nurses performance was improved after training program.

The current study revealed that there is highly statistically significant relation between age with total knowledge and practice, this mean that the young nurses didn't have satisfactory level of knowledge this might be because lack of knowledge and practice for recently graduated nurses. This finding was supported by **Abbas (2017),** who conducted a study entitled "Evaluating Nurses' Practices Concerning Chest Pain Management for Patients in The Emergency Unit", and found that there was a high significant relation between nurses level of knowledge and their age. also this result agree with that of **Reda (2021),** who revealed significant relationship between nurses' knowledge and their age.

The current study revealed that there is highly statistical significant relation between level of education with total knowledge, this may be due to the basic knowledge received during academic years, which is different than that received by technical institute nurses

This result agree with that of **Qaddumi & Khawaldeh, (2018),** who revealed significant relationship between nurses' knowledge and education level. This finding was disagreed with **Shamsuddin & Shafie, (2017),** who found that, no statistically significant relation between qualification and nurses' knowledge.

This result revealed that there was highly statistically significant in relations between total

practice and years of experience in CCU and educational level. This may be due to that working for long time in CCU affect positively on nurses performance and acquired them a lot of experience in dealing with myocardial infarction patients. This result agree with **Qaddumi & Khawaldeh, (2018),** who study entitled "Evaluation of nurses' practices provided to the patients who undergo open heart surgery", and revealed that there was significant statistical association between nurses' practice and their years of experience.

The results of the current study documented that, there was positive statistical correlation between total knowledge scores and total practice score pre, post & follow-up training program implementation. This means that the lack of nurses knowledge scores effects on their practice regarding care for patient with myocardial infarction.

So, we can concluded that the lack of nurses knowledge affects negatively on their practice regarding management for MI patients and all new nurses require training programs in coronary care unit and continuing nursing education regarding care for MI patients.

This finding was consistent with **Lui, So & Fong, (2016),** who study entitled "Knowledge and attitudes regarding management of myocardial infarction among nurses in Hong Kong medical units), and founded that there was positive correlation between knowledge level and practice. While this finding dis agreed with **Yava, (2018),** who conducted a study entitled "Effect of an educational program on nurses knowledge and practice regarding myocardial infarction management", and revealed that there was no statistical correlation between knowledge level and practice.

Conclusion:

There was a statistically significant difference in knowledge and practice of the studied sample between pre, post and follow-up implementation of the training program (P<0.001). Also nurses' age, gender and educational level were found significantly related with both knowledge and practices at pre, post & follow-up implementation of training program. While, there was positive statistical correlation between total knowledge scores and total practice score pre, post & follow-up training program implementation P<0.001.

Recommendation:

Conduction of periodic training sessions to improve practices about assessment and management of patients with AMI which will improve nurses' level of performance.

References:

Abbas, A.D. (2017). Evaluation of Nurses Practices Concerning Chest Pain Management for Patients in the Emergency Unit. Kufa Journal for Nursing Science. 4 (1), p.7.

Abd -Elnaeem, M.M., Mohamed, N.T., Mohammed, M.A., and Abd El-Aziz, M.A. (2018). Effect of Teaching Program on Knowledge and skills Regarding Automatic External Defibrillation among Nurses Working in Emergency Unit. Journal of Nursing and Health Science, 5 (1), PP.8-15.

Abdul Rahim HE, Sibai A., and Khader Y. (2019). Health in the Arab world: a view from within 2 Non- communicable diseases in the Arab world. The Lancet , vol. 2017, P. 34-45.

AL-Husaunawy, A.A. (2017). Evaluation of Nurses Knowledge and Practical of Electrocardiogram toward Adolescent Patient, IOSR Journal of Nursing and Health Science (IOSR-JNHS), 4 (4). Ver. II, PP 10-16.

Al-Janabi, M.A., and Al-Ani, B. A., (2017). Assessment of Nurses' Knowledge towards Cardiopulmonary Resuscitation at Al-Najaf

City's Teaching Hospital. Journal of Kufa for Nursing Science. 4 (1), P.1-10.

Basavanthappa, BT. (2015). Medical Surgical Nursing, 31ded, Jaypee Brothers Publishers, London, vol 1, pp 637-647.

 Basavanthappa, BT. (2020). Medical Surgical Nursing, 2nded, Jaypee Brothers Publishers, **Philadelphia**, pp 520- 525.

Dawson B.D., and Trapp R.G., (2020). Reading the medical literature: Basic & Clinical Biostatistics. Lange Medical Book/ McGraw – Hill. Medical Publication Division, New York. 4th ed., Ch. 7-9, PP 161-218 and Ch. 13, PP 305-314.

Fayazi, S., Abdi, M., Sayadi, N., and Rostami, S. (2018). Effect of cardiac intensive nurses' performance in using intravenous Streptokinase for patients with acute myocardial infarction patients. Cardiovascular Nursing Journal. 1 (3), pp. 52-58. URL: http://journal.icns.org.ir/article-1-86-en.html. Accessed at: 10-11-2021.

Gupta, V., and Dias, R., (2020). Effectiveness of Simulated Demonstration Regarding Defibrillation Technique on Knowledge and Practice Among Nurses. International Journal of Science and Research (IJSR). 3 (6), pp.720-727.

Hussien, A., Khalil, N., and Yousef, W. (2018). Implantable Cardiac Devices Critical Care Nurses' Knowledge and Practices in Different CCUS, Lambert Academic Publishing: Pp. 70.

Kizza, I.B. (2018). Nurses' knowledge and practices related to myocardial infarction pain assessment in critically ill patients at Mulago Hospital [dissertation]. Uganda [Muhimbili University], pp.65-70.

Lanken, P.N., Kohl, B.A., Hanson, C.W. & naker, S. (2018). The Intensive Care Unit Manual, 2nd Ed., **Saunders**, an Imprint of Elsevier Inc., United State of America, pp. 769-774.

Laradhi, O. (2019). Assessment of nurses' performance regarding medication administration for patient with myocardial infarction, master thesis, medical surgical nursing, faculty of nursing, Ain shams university. Pp. 70-75.

Laxman, G.B. (2016). Study of knowledge of staff nurses regarding use of defibrillators in intensive care units, Indian Journal of Basic and Applied Medical Research; 4(1), Pp. 298-306.

Lemma, G. (2017). Assessment of Nurses Knowledge, Attitude and Practice about Oxygen Therapy at Emergency Departments of one Federal and three Regional Hospitals in Addis Ababa, Ethiopia. Original article.

 Lewis, S.L., Dirksen, S.R., Heitkemper, M.M., and Bucher, L. (2019). Medical Surgical Nursing Assessment and Management of Clinical Problem, 9th ed, Mosby Elsevier, Canada, pp. 757, 754, 759.

 Lui, L.Y.Y., So, W.K.W., and Fong, D.Y.T. (2016): Knowledge and attitudes regarding pain management among nurses in Hong Kong medical units. Journal of Clinical Nursing 17:2014-2021.

 Lynn, P., and LeBon, M. (2019): Skill Checklists for Taylor's Clinical Nursing Skills, A Nursing Process Approach 7th ed, Elsevier, USA, PP. 270, 277, 280, 285-290.

Morton, P. G., and Fontaine, D, K. (2021): Essentials of Critical Care Nursing: A Holistic Approach: 10th Ed. Wolters Kluwer Health/Lippincott Williams & Wilkins, pp.173.

Mustafa, H. E., Nimeiri, M., Bolad, A., and Khalil, S. (2018): Effectiveness of Education Program on Nurse's Competences during Emergency Management of patients with AMI at critical care units and emergency department at Public Teaching Hospitals in Khartoum State, Al Neelain Medical Journal, 3 (11) ISSN 1858-627.

Reda, A. (2021). The pattern of risk-factor profile in Egyptian patients with acute coronary syndrome. Cardiovasc J Af. Vol.22, pp.87-94.

Rushdy, T., Morsy, W., and Elfeky, H. (2018). Nurses' knowledge and practice regarding care of patients connected to intra- aortic balloon pump at Cairo university hospitals. Egyptien Nursing Journal. Vol (7)1, pp 150-157.

Ryan, T.J. (2017). Initial Evaluation Management of Suspected Acute Coronary Syndrome in the Emergency Department, Boston University School of Medicine chest pain discomfort, Eur Heart J, Vol.9, pp.1140-1149.

Shamsuddin, A.F., and Shafie, S.D. (2017). Knowledge of Nurses in the Preparation and Administration of Intravenous Medications, Procedia - Social and Behavioural Sciences 60, pp. 602-609. Malaysia.

Urden, L.D., Staey, K.M., and Lough, M.E. (2019). Priorities in Critical Care Nursing, 6"ed, Elsevier, USA. Pp. 338, 339, 340, 341, 349, 250.

Qaddumi, J., and Khawaldeh, A. (2018): Pressure ulcer prevention knowledge among Jordanian nurses: a cross-sectional study. BMC nursing, 13(1), 6.

Werf F., Dennis V. (2021). Management of acute myocardial infarction in patients presenting with ST-segment elevation. 9th ed. Philadelphia: Lippincott Co., 1132-37.

Yava, A., (2018). Knowledge and Attitudes of Nurses about Pain Management in Turkey. International Journal of Caring Sciences. 6(3), 495-505.

تأثير البرنامج التدريبي على أداء الممرضات فيما يتعلق بإدارة الطوارئ لمرضى احتشاء عضلة القلب

سمر عبدالحى عبدالغنى شتاية– مروة مصطفى راغب- صباح سعيد محمد – سماح السيد غنيم

احتشاء عضلة القلب حالة مهددة للحياة تحدث عندما ينقطع تدفق الدم إلى عضلة القلب فجأة ، مما يتسبب في تلف الأنسجة. ويحدث هذا عادة نتيجة انسداد في واحد أو أكثر من الشرايين التاجية. وذلك الانسداد ينتج بسبب تراكم الدهون والكوليسترول وهو المسمى الطبي للأزمة القلبية.لذلك هدفت هذه الدراسة إلى تقييم فعالية برنامج تدريبي على أداء أعضاء هيئة التمريض تجاه العناية الطارئة لمرضى احتشاء القلب. وقد أجريت الدراسة في وحدة رعاية القلب بمستشفى بنها الجامعي على 50 من أعضاء هيئة التمريض, حيث كشفت النتائج أنه فيما يتعلق بمعلومات أعضاء هيئة التمريض ، وجد أن أقل من ثلث أعضاء هيئة التمريض لديه مستوى جيد قبل تنفيذ البرنامج بينما كان حوالى نصف أعضاء هيئة التمريض لديه مستوى جيد بعد تنفيذ البرنامج وأكثر من ثلثهم كان لديهم معلومات جيدة أثناء متابعة البرنامج. وفيما يتعلق بمهارات أعضاء هيئة التمريض ، فإن حوالى ثلث أعضاء هيئة التمريض الخاضعون للدراسة كان لديهم مستوى المهارة مُرضٍ قبل البرنامج ، بينما أكثر من نصفهم كان لديهم مستوى مُرضٍ بعد البرنامج وأثناء المتابعة. كما أوصت الدراسة على تزويد أعضاء هيئة التمريض ببرامج تدريبية مستمرة مع إرشادات قائمة على الأدلة لتحسين معارفهم وممارساتهم المتعلقة بالرعاية الطارئة لمريض احتشاء القلب.