

Educational Program for Myocardial Infarction Patients after Primary Percutaneous Coronary Intervention at Outpatient Clinic, Heart Hospital Assiut University, Egypt

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Abstract: Primary percutaneous coronary intervention (PPCI) is an emergent percutaneous catheter intervention in the setting of ST elevation myocardial infarction (MI).

Aim of the study assess, develop, Implement and evaluate an educational program for patients' about MI and PPCI to reduce complications after PPCI

Subjects and methods: Quasi-experimental research design has been utilized in this study. The study included 150 patients underwent PPCI. A structured interview form was conducted, structured into three parts included personal data, patients' knowledge about MI, PPCI and reported practices. The educational program was conducted from Jun 2017 until August 2018.

Results: It was found that 58.0% of patients had poor knowledge, 32.7% had fair and 9.3% had good about MI and PPCI. While 60.7 % of patients never practice any kind of exercise, 83.3% of patients were smoker. Total scores of knowledge and reported practice throughout intervention program phases improved from a pre-program. This increase was highly statistically significant ($p=0.005$). However, there was slightly decline through follow up testes in some items.

Conclusion: it was concluded that MI patients underwent PPCI had poor knowledge and reported practices related to PPCI.

Recommendations: Distribution of the health education booklet had been made, containing basic and important instructions for MI patients when leaving hospital.

Keyword: Primary percutaneous coronary intervention, ST elevation myocardial infarction, Educational program.

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I. Introduction

Myocardial infarction (MI), commonly known as a heart attack, occurs when blood flow decreases or stops to a part of the heart, causing damage to the heart muscle. The most common symptom is chest pain or discomfort which may travel into the shoulder, arm, back, neck, or jaw. Often it is in the center or left side of the chest and lasts for more than a few minutes. The discomfort may occasionally feel like heartburn. Other symptoms may include shortness of breath, nausea, feeling faint, a cold sweat, or feeling tired (Mehta 2014).

Primary percutaneous coronary intervention (PPCI): an emergent percutaneous catheter intervention in the setting of STEMI, without previous fibrinolytic treatment, and preferred reperfusion strategy in patients with STEMI, PPCI is now the preferred treatment of choice for patients with STEMI and now makes up more than 97% of reperfusion treatment for patients with a final diagnosis of STEMI. Coronary angioplasty is widely practiced and has a number of risks, however, major procedural complications are bleeding, infection, allergic, death, stroke, heart attack are uncommon (Harold2013).

Home coming can be a stressful event for the patient, the spouse and family. A successful recovery and return to work, depression, anxiety, and weakness, and concern regarding sexual performance are all common patients concerns during the recovery phase after primary percutaneous intervention.

Nurses represent a large proportion of health care community. They play a vital role in treatment as they are close to the patients and their families during all the process of disease. It is a matter of great

importance for nurses to meet the rehabilitative care needs of patients through education, support, supervision and reinforcement (**Zhang 2011**).

Nursing education in cardiac rehabilitation can improve health outcomes and reduce the risk of a new cardiac event. A health educational program organized by nurses for patients after a cardiac event or surgery improves patients' knowledge of their illness and awareness of behavioral changes to prevent a new event or readmission to hospital (**Kaddal 2016**).

Educational program after percutaneous coronary intervention was associated with a significant reduction in mortality rates. These findings add support to published clinical practice guidelines, performance measures, and insurance coverage policies that recommend educational program for patients after percutaneous coronary intervention (**Goel 2011**).

Significance of the study:

According to the latest World Health Organization data published in 2017 coronary heart disease deaths in Egypt reached 126,312 or 24.58% of total deaths. The age adjusted Death Rate is 216.82 per 100,000 of population ranks Egypt 18 in the world(**WHO 2017**).

In Assiut University Hospital, department of cardiology, The incidence of hospital admission for Acute myocardial infarction (MI) from August 2015 to August 2016 about 800 cases 300 of them underwent primary percutaneous coronary intervention (PPCI), (25 to 30 patient by month). They discharged after 2-5 days from coronary care unit (**Coronary care unit, Assiut University hospital Egypt 2016**).

Aim of the study

Reduce myocardial infarction patients' complications after primary percutaneous coronary intervention (PPCI).

Research Hypothesis.

- [1]. Lack of patients' knowledge about primary percutaneous coronary intervention (PPCI).
- [2]. Educational program will improve patients' knowledge and reported practice after primary percutaneous coronary intervention (PPCI).
- [3]. Educational program will help in reducing complication after primary percutaneous coronary intervention (PPCI).

Subjects and Methods

Study design:

Quazi-experimental research design has been utilized in this study.

Setting.

The study was conducted in cardiovascular outpatient clinics at Heart Hospital ,Assiut University Egypt.

Sample and Sampling:

Convenient sample of 150 patient participated in the current study

Study tool

A structured interview form was conducted after reviewing the relevant literature to elicit information. It was structured into three parts.

The first part:

It included personal data such as patient's name, residence, address, telephone number, date of operation, age , sex, marital status, level of education and occupation.

The second Part:

It included (19) questions regarding patients' knowledge about myocardial infarction, percutaneous coronary intervention and lifestyle pattern. (14) questions about assessment of lifestyle pattern as following.

▪ **Patients' knowledge about the myocardial infarction:**

It included (6) questions as (Definition, symptoms, main cause, risk factors, actions that must be taken if there is chest pain, and types of treatment).

▪ **Patients' knowledge about primary percutaneous coronary intervention (PPCI):**

It included (8) questions as (Definition, appropriate reperfusion strategy, advantage, medication must be taken after PPCI, complications and how to reduce these complications).

▪ **Patients' knowledge about reported practice:**

It included (5) questions as (smoking hazard, benefits of smoking cessation , return to work, return of sexual activity and precautions when resumption of sexual activity)

▪ **Assessment of reported practice :**

It included (14) questions regarding patients' assessment of lifestyle pattern (is the patient take in his diet foods that contain fiber, fruits and vegetables, food rich in fat, take a lot of sugars or sugar products, a lot of salt, drink tea or coffee. Practice any kind of exercise, how many hours he spend in his exercise, practice exercises under the supervision of a physician, types of exercise and benefit of exercise. Also is he smoker now and if he intend to quit smoking).

Scoring system for knowledge: The total score of knowledge were 19 grads it developed as one grad for each correct answer and zero for each incorrect answer. For each area of knowledge, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score as the following. Poor < 50%, Fair 50% < 70%, Good >70%.

Scoring system for reported practice: the responses always, fair and poor were respectively scored 3,2 and 1. the scores of the items were summed-up and the total divided by the number of the items, these scores were converted into a percent score as the following. Inadequate< 50% and adequate<50%.

Third Part:

Patient health assessment which include:

A- Medical history:

As Risk factors - family history - Past complain - Medication - drugs and surgical intervention presenting symptoms of coronary artery disease.

B- Physical examination:

- Inspection of Face- Jugular veins- Thorax- Nail beds- Abdomen- Lower extremities.
- Palpation (Pulse- Capillary refill- Lower limb edema- blood Pressure)
- Psychological problems

The educational program

The researchers designed the proposed educational program based on review of relevant literature about myocardial infarction, primary percutaneous coronary intervention.

General objective of the program:

To reduce myocardial infarction patients' complications after primary percutaneous coronary intervention (PPCI).

The program phases

1. Assessment phase :

The researchers developed this program to improve patients knowledge to change their lifestyle pattern after primary percutaneous coronary intervention to reduce complications .So the program media were prepared.

2. Planning phase:

The arrangement of conducting the program done during this phase; the sessions and time of the program decided .The study sample were 150 patient received the educational program. In this phase other facilities were arranged as teaching place, teaching methods audiovisual aids and handout.

Teaching time :

The time of teaching was decided before patient discharge and the coordination between the researchers and participant.

Teaching place:

The first and second sessions were conducted at cardiology outpatient clinics before discharge from the hospital, the follow up sessions were in cardiology clinics

Teaching methods and media:

It was prepared before implantation of the educational program; simple teaching methods were used as lecture, discussion and brain storming, simple materials as pictures, videos, and handout.

Implementation phase:

The educational program conducted in the period from first of June 2017 until the end of August 2018. An orientation to the program and its purpose was done and the participant were informed about the time and place of session taken; Pretest was used before implementation of the educational program to assess the patient knowledge. Orientation to the program and pretest, were done in the first session. Teaching the content of the program was done in the second session. The post test was done in the third session. The post test was implemented by repeating the same format of the pretest to determine the effect of the implementation program. The first session take about 20 to 25 minute, the second session take about 50 to 60 minute, and the third session about 15 to 20 minute. Finally The researchers and participant decided the time of the next sessions for follow up after 1, 3,6,12 months. for every patient. The program were done individually for each patient.

4 -Evaluation phase:

Immediately after program implementation as well as after 1,3,6,12 months the patient's knowledge has been evaluated by the researchers through filling the tool.

Methodology

Preparatory phase and administrative design:

- An official approval was obtained from the Dean of the Faculty of Nursing, Assiut University to the head of the Heart Hospital at Assiut University Egypt, to carry out the study explained the purpose of the study, and asking for permission to conduct the study.

Pilot Study:

After developing the necessary tool of the study. A Pilot study included 10% of patients was carried out to ensure clarity and applicability of the developed tool, and to estimate the time required to fill the questionnaire. Based on the results of the pilot study, the necessary modifications were done Patients included in the pilot study were excluded from the study sample.

Ethical consideration:

Research proposal will be approved from Ethical committee in the Faculty of Nursing at Assiut University. There is no risk for study subject during application of the research. The study will follow common ethical principles in clinical research. Confidentiality and anonymity will assured. Study subject have the right to refuse to participate and or withdraw from the study without rational any time. Study subject privacy will be considered during collection of data. Agree to participant in this study (oral agreement).

Statistical analysis:

Date entry and data analysis were done using SPSS version 19 (Statistical Package for Social Science). Data were presented as number, percentage, mean+-standard deviation. Chi-square test and Fisher Exact test were used to compare qualitative variables. P-value considered statistically significant when P < 0.05.

II. Results

Table (1): Distribution of personal data of studied patients at Heart Hospital Assiut University Egypt (2017) No.(150).

personal characteristics	No.	%
Age:(years)		
< 50	65	43.3
≥ 50	85	56.7
Mean ± SD (Range)	49.86 ± 9.16 (35.0-67.0)	
Sex:		
Male	116	77.3
Female	34	22.7
Residence:		
Urban	75	50.0
Rural	75	50.0
Marital status:		
Single	15	10.0
Married	101	67.3
Widow	34	22.7
Level of education:		
Illiterate	32	21.3
Read and write	30	20.0

Basic education	20	13.3
Secondary education	41	27.3
University education	27	18.0

Table (2) Medical history and medication of myocardial infarction studied patients at Heart Hospital at Assiut University Egypt (2017). No.(150).

Item	Pre test	
	No.	%
Family history:		
Hadn't family history	53	35.3
Cardiovascular disease before the age of 55 years	80	53.3
Hypertension	17	11.3
Patient's Past complain:#		
Hadn't past complain	145	96.7
Heart failure	4	2.7
Coronary artery disease	1	0.7
Patient's Present history :#		
Hypertension (high blood pressure)	51	34.0
Unhealthy diet	95	63.3
Diabetes Mellitus	38	25.3
Physical inactivity	53	35.3
Tobacco use	125	83.3
Medication:		
No medication	115	76.7
Nitrates +Aspirin	35	23.3

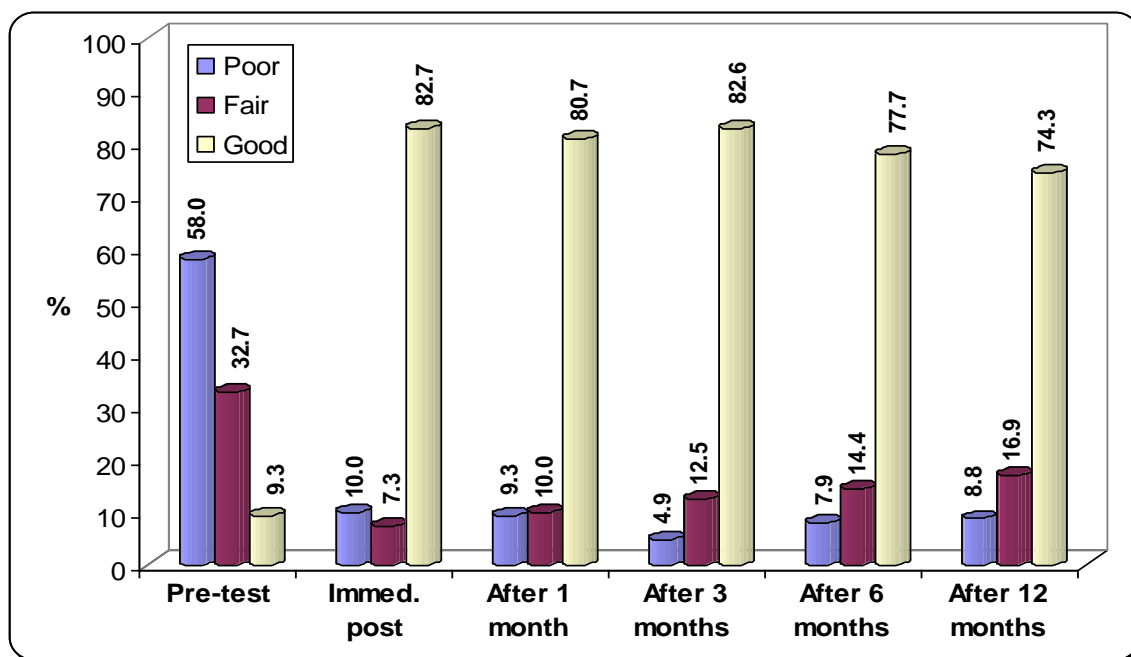
More than one answer

Table (3): Relationship between personal data and total score of knowledge of myocardial infarction studied patients at Heart Hospital at Assiut University Egypt (2017) (No.150) .

Item	Knowledge level						P-value
	Poor (n= 87)		Fair (n= 49)		Good (n= 14)		
	No.	%	No.	%	No.	%	
Age:(years)							
< 50	35	53.8	21	32.3	9	13.8	0.241
≥ 50	52	61.2	28	32.9	5	5.9	
Sex:							
Male	64	55.2	41	35.3	11	9.5	0.398
Female	23	67.6	8	23.5	3	8.8	
Residence:							
Urban	41	54.7	22	29.3	12	16.0	0.019*
Rural	46	61.3	27	36.0	2	2.7	
Marital status:							
Single	13	86.7	0	0.0	2	13.3	0.068
Married	57	56.4	36	35.6	8	7.9	
Widow	17	50.0	13	38.2	4	11.8	
Level of education:							
High education	9	33.3	13	48.1	5	18.5	0.021*
Secondary education	22	53.7	12	29.3	7	17.1	
Basic education	12	60.0	8	40.0	0	0.0	
Read and write	20	66.7	9	30.0	1	3.3	
Illiterate	24	75.0	7	21.9	1	3.1	
Occupation:							
Employee	11	36.7	14	46.7	5	16.7	0.117
Farmer	8	61.5	5	38.5	0	0.0	
Housewife	20	80.0	5	20.0	0	0.0	
Skilled	19	52.8	12	33.3	5	13.9	
Unskilled	9	75.0	2	16.7	1	8.3	
Free business	20	58.8	11	32.4	3	8.8	

Table (4): Relationship between personal data and reported practices of myocardial infarction studied patients at Heart Hospital at Assiut University Egypt (2017) (n=150).

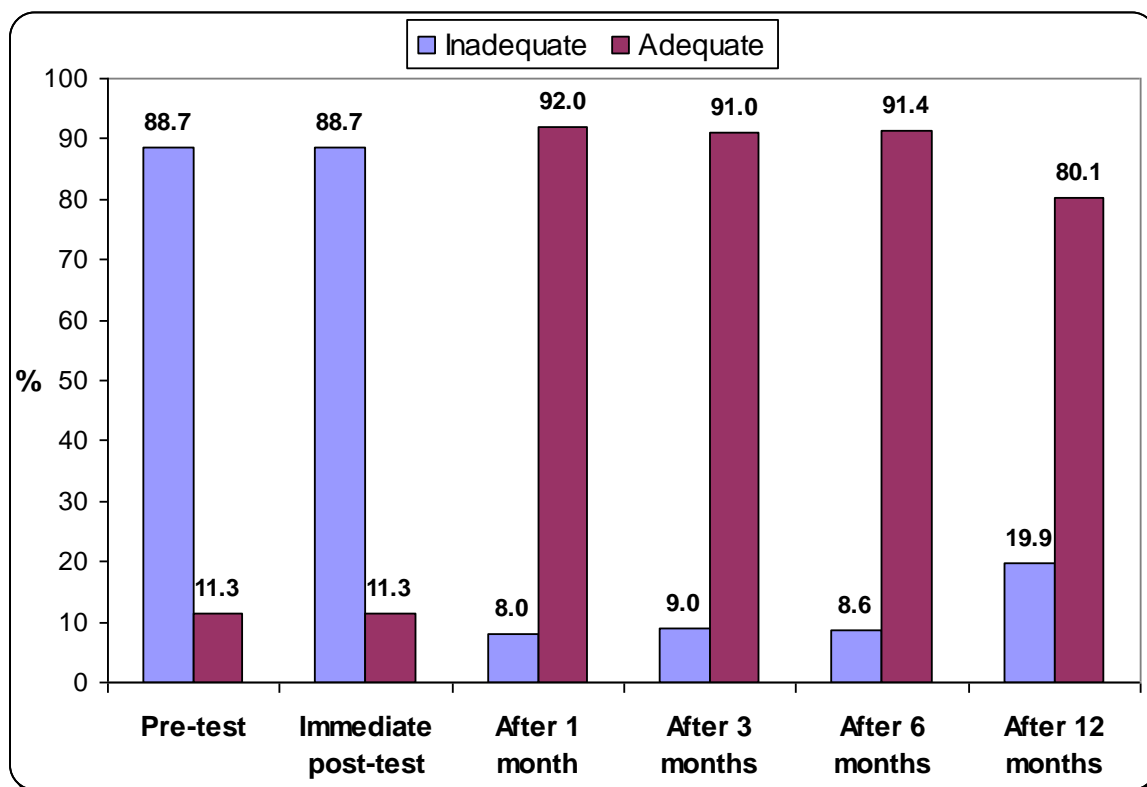
Item	Practices level				P-value
	Inadequate (n= 133)		Adequate (n= 17)		
	No.	%	No.	%	
Age:(years)					
< 50	57	87.7	8	12.3	0.742
≥ 50	76	89.4	9	10.6	
Sex:					
Male	106	91.4	10	8.6	0.067
Female	27	79.4	7	20.6	
Residence:					
Urban	69	92.0	6	8.0	0.198
Rural	64	85.3	11	14.7	
Marital status:					
Single	8	53.3	7	46.7	0.000*
Married	97	96.0	4	4.0	
Widow	28	82.4	6	17.6	
Level of education:					
High education	21	77.8	6	22.2	0.095
Secondary education	40	97.6	1	2.4	
Basic education	17	85.0	3	15.0	
Read and write	28	93.3	2	6.7	
Illiterate	27	84.4	5	15.6	
Occupation:					
Employee	30	100.0	0	0.0	0.117
Farmer	11	84.6	2	15.4	
Housewife	20	80.0	5	20.0	
Skilled	32	88.9	4	11.1	
Unskilled	12	100.0	0	0.0	
Free business	28	82.4	6	17.6	



P: between pre and immediate post test =0.00

P: between pre and all follow up tests =0.00

Figure (1): Total score of patients' knowledge regarding myocardial infarction and primary percutaneous coronary intervention in pre, post, and follow-up tests. (2017).



P: between pre and immediate post test =0.00

P: between pre and all follow up tests =0.00

Figure (2): Total score of patients' reported practice regarding myocardial infarction and primary percutaneous coronary intervention in pre, post, and follow-up tests. (2017).

Table (1): Illustrates the distribution of the studied myocardial infarction patients regarding their personal data, it was founded that , 43.3% their age younger than 50 years with mean \pm SD 49.86 ± 9.16 . Also 67.3% of them were married and 27.3% of them had secondary education.

Table (2): Shows the distribution of patients regarding their medical history. It was found that 83.3% of patients had risk factor of smoking. While 25.3% of them had risk factor of diabetes mellitus and 50.3% had family history of coronary artery disease before the age 55 years .Also it was clear that 96.7% of patients hadn't past complain.

Table (3): Explain the relationship between personal data and knowledge level. It was found that there is no statistical deference between score of knowledge and personal data in most items.

Table (4): Explain the relationship between personal data and reported practices. It was found that there is no statistical significant deference between levels of reported practices and personal data in most items.

Figure (1): Total score of patients' knowledge regarding myocardial infarction in pre, post, and follow-up tests. Regarding good score of knowledge It was found that 82.7% had good score in post test, 80.7 % after one month, 77.7% after six months and 74.3% after twelve months. With highly statistical significant difference between pre test and immediate post test, $P = 0.00$ as will as between pre test and follow up tests (after 1,3,6 and 12 moths) $P = 0.00$

Figure (2): Shows total score of patients' reported practice regarding myocardial infarction in pre, post, and follow-up tests. It was found that there is highly statistical significant difference between pre test and post test, the patients reported practice were improved after implementation of the educational program and slightly decreased in follow up tests.

III. Discussion

ST-segment elevation myocardial infarction (STEMI) is the term cardiologists use to describe a classic heart attack. It is one type of myocardial infarction in which a part of the heart muscle (myocardium) has died due to the obstruction of blood supply to the area (Maziar and Eric 2016).

If ST elevation myocardial infarction is present, the decision must be made quickly as to whether the patient should be treated with thrombolysis or with primary percutaneous coronary intervention. Primary percutaneous coronary intervention targets early intervention, achieving better outcomes for patients suffering

from ST elevation myocardial infarction .primary percutaneous coronary intervention is the most commonly performed revascularization method among cardiac patients **(Wijesinghe 2018)**.

It was observed in the present study that, more than two fifths of patient their age were younger than 50 years with mean \pm SD (49.86 \pm 9.16). This agree with **(Ahmed 2013)** who presented in her study about the impact of phase one cardiac rehabilitation on early complication of patients with St segment - elevation acute myocardial infarction in coronary care unit, Assiut University Hospital that the majority of both groups were in age group with mean and standard deviation of age (55.4 \pm 10.5 & 57.1 \pm 10.0).

As regarding the patient sex, the finding of the current study revealed that more than three quarter were male, while less than one quarter were female. This result agreed with **(Garza 2009)** who reported in his study ("improved Patient survival using a modified resuscitation protocol for out-of-hospital") in the emergency medical system in Kansas City, that three fifths of the samples acute myocardial infarction (AMI) were male and 40% were female. Also agree with **(Mehta 2016)** Who reported that after age 65 the increasing incidence of MI at females more than males, In the first scientific statement from the American Heart Association on acute myocardial infarction in women. The risk of having a myocardial infarction in women compared to the men of the same age is one quarter this could be explained through the estrogen hormone, This big difference is reduced after reaching the age of menopause, and at the age of 50 the chance of myocardial infarction becomes equal the Incidence in men and women equalized male's.

Regarding to the marital state, It was found that slightly more than two thirds of the studied patients were married as compared to widows, neither single patient. The study results also supported by **(Ahmed 2013)** who showed that the highest percentage of the studied patients was married. This may be due to the higher level of daily activities, life strain on married than single one and that pressure is one of the greatest aggravating features for coronary artery disease.

The current study results revealed that more than one tenth of patients had adequate level of reported practice. While the majority of them had inadequate level of reported practice related to myocardial infarction and primary percutaneous coronary intervention in pre test with highly statistical significant difference between pre test and follow up tests after educational program.

The current study shows that majority of patients were smoker, This result disagree with **Elkhader, 2016** how study the correlation of smoking and myocardial infarction among male patients above 40 years of age in Sudan Heart Center in Khartoum, he found that out of a total of 144 cases, less than two third of patients were smokers, While the current result gone in the same line with **(AbManap, 2018)** who study the effect of an education program on cardiovascular health index among patients with myocardial infarction on 58 respondents in Kuala Lumpur Hospital, Malaysia, he stated that health education helped to increase quitting smoking among patients with MI.

The current study results revealed that only less than one tenth of patients had good knowledge , more than half had poor knowledge and about one third had fair knowledge about myocardial infarction and primary percutaneous coronary intervention in pre test with highly statistical significant difference between pre test and immediate post test, the same finding exist between pre test and follow up tests after educational program. This result agree with **(Mohammed 2016)** who designed nursing educational protocol on health promotion for patients undergoing coronary artery stent using convenience sample of sixty adult male and female patients aged from (18-65 years old) who are scheduled for non emergency coronary artery stent. She said that Patient's knowledge regarding to coronary artery stent and procedure of PCI in catheterization lab at Assiut University Hospital in pre test are inadequate and the nursing staff member and medical did not offer them, this cause anxiety and distress from procedure.

The rational for knowledge improvement might be related to the provision of educational booklet and / or verbal instructional information. Also, the curiosity of the studied subjects as this is the first heart attack for them and many concerns are present. This result is in line with **(Abdelhameed 2013)**, who designed nursing intervention protocol on myocardial infarction patient's outcome at a selected university hospital in Egypt, reported that there were higher statistically significant difference between patient's knowledge score in pre and post exposure to the designed protocol.

Knowledge of acute myocardial infarction and primary percutaneous coronary intervention -symptoms remains to be substandard, especially knowledge of atypical-symptoms. Knowledge is essential to reduce delay-times, but it is not a panacea, since it is not sufficient alone to optimize pre hospital delay-times. **(Albarqouni 2016)**.

IV. Conclusion

Based on the results of the present study, it was concluded that patients with myocardial infarction (MI) whom underwent primary percutaneous coronary intervention (PPCI) both sexes males and females had poor knowledge and inadequate reported practice regarding their diseases, and discharge instruction, risk factor modification, or return to usual activities of daily living in pre test . The program was successful in correcting

the deficiency in patients' knowledge and reported practice. There was slightly decline through follow up testes but still better than pre test.

V. Recommendations

Based on results of the present study the following can be recommended:

1. Distribution of the health education booklet had been made, containing basic and important instructions for MI patients when leaving hospital.
2. Further research is needed to study the impact of health education programs on the patients with myocardial infarction disease underwent primary percutaneous intervention before discharge.
3. Health education for both patients and family members on discharge planning was essential.

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