Original Article

Efficacy of Self-Care Training Module on Knowledge Level of Patients with Myocardial Infarction

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ABSTRACT

Background: Myocardial infarction (MI) is a fatal disease characterized by the development of localized necrotic areas within the myocardium. Self-care in MI is an essential element in improving quality of life. **Aim:** To evaluate the effect of self-care training on knowledge in patients with myocardial infarction. **Method:** Design: A quasi-experimental research design was utilized. A purposive sample of 120 adult patients was recruited. Structured interview questionnaire was used to gather data, consisting of a demographic characteristics and health relevant data sheet and patients' knowledge assessment questionnaire. **Results:** There was a statistically significant difference between studied groups in relation to knowledge domains, as study groups show significant improvement in knowledge level ($p < 0.001$) compared to the control group in all domains **Conclusion:** Knowledge of the study group improved significantly after the self-care training module compared to the control. **Recommendation:** Continuous patient education through audio-visual materials and follow-up of patient outcomes.

Keywords: Knowledge, Myocardial Infarction, Self-Care Training

Introduction

Myocardial infarction (MI) occurs as a result of decreasing or stopping flow of blood to a portion of the heart that damage the heart muscle. The most common symptom, which can radiate to the jaw, shoulder, arm, neck, and back, is pain or discomfort in the chest. Often it continues for more than a few minutes and occurs in the center or left side of the chest. The discomfort can sometimes feel as heartburn. Additional symptoms could be fatigue, a cold sweat, nausea, shortness of breath, or feeling faint. Atypical symptoms are present in about 30% of individuals. Women tend to present with arm, neck, or fatigue more frequently than with chest pain. An irregular heartbeat, heart failure, cardiogenic shock or cardiac arrest may present as a result of MI **(Chalise et al., 2023).**

Nowadays, it is thought that an important aspect of managing chronic diseases in patients and their families is self-care. The ability of an individual to control chronic disease is known as self-care. This includes managing the physical and psychological effects of chronic illness, in addition to managing symptoms, diagnosing and treating illnesses, changing life style, and managing these effects. Self-care aims to enhance quality of life and lessen the negative impacts of chronic illnesses**. (Mostafa et al., 2023).**

Programs for cardiac rehabilitation with a variety of aspects that include patient education have decreased the risk of death and/or non-fatal cardiovascular illnesses and enhanced quality of life. Patient education that substantially correlates with knowledge about medications, cardiac symptoms, and lifestyle changes are significant to improve CHDs and other cardiovascular diseases (CVDs) risk factors **(Elzyen et al., 2023).**

Nurses, as one of the healthcare team members, are crucial in the management of patients with coronary heart diseases. Nursing interventions that appropriately conduct counseling and self-care for individuals suffering from coronary heart disease who are anticipated to have self-management abilities in preventing recurrences of emergencies can increase cardiovascular health status. The primary duty of nurses is to educate patients, which has a significant impact on their self-efficacy and helps them become more independent **(Jiang et al., 2020).**

Significance of the Study

The Middle East and North Africa (MENA) country with the largest population is Egypt, where

new studies have shown that Egypt has the highest rates of CAD mortality in the area **(Ralapanawa & Sivakanesan, 2021).** Sadly, 25% of patients with acute MI die, and most of those who survive have angina and a decrease in their quality of life. A number of cardiac risk factors, including uncontrolled cholesterol levels, diabetes, obesity, stress, smoking, and age, increase the incidence of MI. Thus, this disease has a significant financial impact on the country's health care systems **(Keshavaraz et al., 2020).**

The medical team members who are participating in the treatment plan help patients to develop their confidence in their ability to control their self-care. Among them are physicians, nurses, dietitians, and psychologists. The patient must receive appropriate guidance and education in order to increase their knowledge, strengthen their faith, and generally improve their well-being. The patient's life may be at danger due to unsatisfactory life expectations and insufficient understanding **(Nguyen & Stenvall, 2023).**Therefore, this study was conducted to design self-management protocol for MI patients for improving their knowledge about new life style.

Aim of the Study

This study aimed to evaluate the effect of self-care training module on myocardial infarction patients' knowledge level

Research Hypothesis

The following research hypothesis was developed in order to achieve the study's aim as the following:

H1: Myocardial infarction patients who participated in self-care training module will have a higher level of knowledge post module implementation than those in the control group.

Method

Research Design

A quasi-experimental design was utilized in this study.

The setting of Study

The study was performed in the inpatient unit of the cardiology department at the Specialized Medical Hospital of Mansoura University. The three units that make up the cardiovascular department are cardiac catheterization, inpatient, and intensive care units. There are three units in the cardiovascular department: the cardiac catheterization unit, the inpatient unit, and the intensive care unit. The cardiology unit is divided

into three rooms, each having twelve beds. The hospital serve delta region.

Sampling

This study included a purposive sample of 120 adult MI patients from the previously described setting.

Inclusion criteria

- Adult patients aged from 20 – 60 years, from both sexes.
- Newly diagnosed with MI.
- They agree to participate in the study.
- Not exposed to any teaching or learning experiences regarding coronary artery diseases.

Criteria for exclusion

- Unwillingness to continue to participate in research.
- Patients with mental disease.

Data Collection Tools

A structured interview questionnaire is employed to accomplish the objectives of the study. The researcher developed this tool after looking over relevant recent national and international literature **Ebraheim** and **Khorais (2016); Keshavaraz, Naderifar, Firouzkohi, Abdollahimohammad** and **Akbarizadeh, (2020); Murfin (2010)** to analyze patient medical parameter data and demographic information. It includes sixty-three questions: ten about the patient's demographics, twelve about the medical parameters, and forty-one about the patient's knowledge of myocardial infarction. The researcher collected this data from each patient separately and in accordance with the medical record. It consists of two parts that were designed in English and translated into Arabic.

Part I: Demographic characteristics and Health relevant data sheet: this part was concerned with the study sample's demographic characteristics, containing age, sex, education level, marital status, profession, place of residence, preferred phone number, and medical parameters data of the participants as the period of time with myocardial infarction, which myocardial infarction symptoms does the patient experience, the duration and number of prior hospitalizations within the last six months, family history, comorbidity, smoking, and exercise.

Part II: Patient knowledge assessment questionnaire: This part was concerned with assessing the patients' level of knowledge with MI. Forty-one questions contained multiple-choice

questions about disease definition, manifestations, diagnostic procedures, risk factors and management relating to diseases.

Scoring system: The knowledge assessment questionnaire for the patient was composed of closed-ended, multiple-choice questions. The researcher used a model key answer to score the answers, one point was given for each right response, and zeros were given for each wrong response. The sum of the points assigned to each of its responses was used to determine the final score. Every score was converted to a level as follows:

Score % = (the observed score / the maximum score) x 100. Then score % was transferred into categories:

- Low level = consider less than 50% of the total score.
- Moderate level = consider from 50 % to <75% of the total score.
- High level = considers ≥75% of the total score.

A pilot study carried out on 6 patients from each group, following an explanation of the nature, purpose, and testing the feasibility and applicability of the tools. The study sample did not include these patients.

Validity of the Tool

A jury of seven experts, (six expert professors from the faculty of nursing and one professor from the faculty of medicine, Mansoura University) tested the tool for appropriateness, relevance, correction and clearance through. Juries were from different academic categories (professors and assistant professors). They were asked about the tool format layout, consistency, and scoring system.

Tool Reliability

The Cronbach alpha test was used to assess reliability. Knowledge had a reliability score of 0.937.

Results

Table 1 shows the study groups' demographic distribution. This table revealed that seventy-one percent of the studied patients were males and most of them were married. Regarding the age, more than half of the study group (55.0%) was aged 40 > 50 whereas more than half of the control group (55.0%) was aged 50 - 60. As regard the education level, almost half of the studied groups were illiterate. Two-thirds of the studied patients were employed (68.3% and 65.0%)

Table 2 shows distribution of studied groups according to their health-relevant data. It was noticed that most of the studied patients complained of MI for less than a year and all of them experienced myocardial infarction symptoms. In the past six months, more than half of the studied groups were hospitalized one to two times due to MI. More than half of the control group (53.3%) had no family history of MI, compared to half of the study participants (50.0%).

Table 3 summarizes the overall knowledge score of patients who have had a myocardial infarction. Most of the study group (90%) in the pretest had low knowledge, 68.3% of them had high knowledge in the posttest, and about 70% of them had moderate knowledge in the follow-up test. Conversely, 90% of the control group had low knowledge in all tests. This table also indicates that the study group's knowledge of myocardial infarction increased significantly after implementation of self-care training program.

Additionally, there was no increase in the knowledge of the control group.

Table 4 illustrates the relationship between the overall MI knowledge score and the study groups' demographics. Following program implementation (both immediately and three months later), there was no statistically significant relation between the study groups' demographics and the total score of MI knowledge. The study groups' gender, level of education, and occupation items had a statistically significant correlation with their overall knowledge score (<0.001, <0.001, and 0.006) before the program was implemented. The relation between the study groups' demographics and the overall MI knowledge score. Prior to the program's implementation, there was a statistically significant association between the study groups' overall knowledge score and the questions related to gender, employment, and education level (<0.001, <0.001, and 0.006). However, there was no statistically significant correlation found between the study groups' overall MI knowledge score and their demographic characteristics either immediately after the program's implementation or three months later.

Table 1. Distribution of Studied Groups According to Their Demographic Characteristics (n=120).

	Study (n = 60)		Control (n = 60)		χ^2	p
	n	%	n	%		
Age (years)						
40 >50	33	55.0	27	45.0	1.200	0.273
50 - 60	27	45.0	33	55.0		
Gender						
Male	43	71.7	43	71.7	0.00	1.000
Female	17	28.3	17	28.3		
Level of education						
Illiterate	26	43.3	25	41.7	0.322	MCp= 0.981
Read & write	20	33.3	19	31.7		
Secondary	10	16.7	12	20.0		
University	4	6.7	4	6.7		
Occupation						
Working	41	68.3	39	65.0	0.150	0.699
Not working	19	31.7	21	35.0		
Marital status						
Married	49	81.7	52	86.7	0.659	MCp= 0.760
Divorced	6	10.0	4	6.7		
Widowed	5	8.3	4	6.7		

Table 2. Distribution of Studied Groups According to Their Health Relevant Data (n=120).

	Study (n = 60)		Control (n = 60)		χ^2	p
	n	%	n	%		
Duration of disease						
< 1 year	55	91.7	55	91.7	0.00	1.000
1-< 5 years	5	8.3	5	8.3		
Do you experience the disease's symptoms?						
Yes	**60**	**100.0**	**60**	**100.0**	–	–
Previous hospitalization due to myocardial infarction (MI) in past 6 months						
Non	28	46.7	27	45.0	0.034	0.855
1 – 2	**32**	**53.3**	**33**	**55.0**		
Duration of the previous hospitalization	**(n = 32)**		**(n = 33)**			
< One week	32	100.0	33	100.0	–	–
Family history of MI						
Yes	**30**	**50.0**	**28**	**46.7**	0.133	0.715
No	30	50.0	32	53.3		

Table 3. Comparison Between the Studied Groups According to Total Knowledge Regarding Myocardial Infarction (n = 120)

Patient knowledge regarding (MI)	Study(n=60)						Control(n=60)						Test of Sig.(p1)	Test of Sig.(p2)	Test of Sig.(p3)
	Before		After		Follow up		Before		After		Follow up				
	n	%	n	%	n	%	n	%	n	%	n	%			
Low(<50)	54	90.0	0	0.0	0	0.0	54	90.0	54	90.0	54	90.0	$\chi^2=$ 0.000 (1.000)	$\chi^2=$ 101.760* (<0.001*)	$\chi^2=$ 99.0* (<0.001*)
Moderate (50-<75)	6	10.0	19	31.7	42	70.0	6	10.0	6	10.0	6	10.0			
High(≥75)	0	0.0	41	68.3	18	30.0	0	0.0	0	0.0	0	0.0			
Total Score (0 – 43)															
Min.–Max.	2.0–26.0		26.0–40.0		24.0–37.0		2.0–26.0		2.0–26.0		2.0–26.0				
Mean ± SD.	8.68±6.30		33.70±3.22		31.08±2.98		8.73±6.43		8.83±6.39		8.70±6.43				
Median	8.0		34.0		31.0		8.0		8.0		7.50				
%Score													t= 0.043 (0.966)	t= 26.918* (<0.001*)	t= 24.465* (<0.001*)
Min.–Max.	4.65–60.47		60.47–93.02		55.81–86.05		4.65–60.47		4.65–60.47		4.65–60.47				
Mean ± SD.	20.19±14.66		78.37 ± 7.49		72.29 ± 6.92		20.31±14.94		20.54 ±14.86		20.23±14.96				
Median	18.60		79.07		72.09		18.60		18.60		17.44				

Table 4. Relation Between Total Knowledge Score and Demographic Characteristics in Studied Groups *(*n = 120*)*

Socio-demographic characteristics	% Score for Patient knowledge		
	Before	After	Follow up
	Mean ± SD.	Mean ± SD.	Mean ± SD.
Age (years)			
20 > 30	–	–	–
30 > 40	–	–	–
40 > 50	19.52 ± 10.24	78.08 ± 7.82	71.60 ± 6.97
50 - 60	21.02 ± 18.91	78.73 ± 7.20	73.13 ± 6.90
t (p)	0.369 (0.714)	0.328 (0.744)	0.848 (0.400)
Gender			
Male	23.31 ± 15.75	79.56 ± 7.52	72.90 ± 7.08
Female	12.31 ± 7.01	75.38 ± 6.73	70.73 ± 6.42
t (p)	3.736* (<0.001*)	1.996 (0.051)	1.101 (0.275)
Level of education			
Illiterate	16.99 ± 10.01	78.44 ± 5.90	72.36 ± 6.42
Read & write	14.65 ± 7.12	75.70 ± 8.75	71.40 ± 6.88
Secondary	28.84 ± 21.85	80.70 ± 7.76	72.79 ± 9.50
University	47.09 ± 11.45	85.47 ± 3.97	75.0 ± 3.49
F (p)	10.343* (<0.001*)	2.552 (0.065)	0.323 (0.809)
Occupation			
Working	22.97 ± 16.39	78.73 ± 8.31	72.72 ± 6.90
Not working	14.20 ± 7.23	77.60 ± 5.44	71.36 ± 7.06
t (p)	2.877* (0.006*)	0.627 (0.534)	0.704 (0.484)
Marital status			
Married	21.59 ± 14.62	78.55 ± 7.76	72.47 ± 7.06
Single	–	–	–
Divorced	19.38 ± 16.42	76.36 ± 8.50	70.54 ± 6.52
Widowed	7.44 ± 6.24	79.07 ± 2.85	72.56 ± 7.05
F (p)	2.211 (0.119)	0.246 (0.783)	0.206 (0.814)
Residence			
Rural	19.57 ± 16.32	78.56 ± 6.65	72.60 ± 7.16
Urban	21.54 ± 10.48	77.97 ± 9.25	71.60 ± 6.51

| | t (p) | 0.482 (0.632) | 0.282 (0.779) | 0.517 (0.607) |

Discussion

Myocardial infarction patients have poor skills for self-management and monitoring of symptoms and risk factors. These skills are actually required for the early detection and treatment of deteriorating disease symptoms, which reduces the risk of re-hospitalization. A health information session should be conducted to provide these skills to the patient when admitted to the hospital. The majority of patients have insufficient knowledge of self-care, self-care skills and self-care motivation. Effective health education helps patients' health-related behaviors as well as their financial burden. Patients with heart disease can lower their re-hospitalization rate and raise the percentage of clinic visits by receiving health education. This will reduce the financial burden on both people and governments **(Huriani, 2019).** In light of this, this study attempted to assess the impact of self-care training on myocardial infarction patients' knowledge.

The results of the current findings showed that the average age for both groups was between 40 to less than 60 years. These conclusions are supported by the fact this age group has a higher risk of myocardial infraction due to numerous changes in the structure and function of the cardiovascular system. A study by **Sobhy et al. (2022)** who found that half of the studied patients were aged ≥ 50 years furthered these conclusions.

According to the gender, the results of the current study found that males were the most of studied patients. This might be as a result of their frequent exposure to stress and responsibilities in life, as well as the fact that most of them smoke regularly. These results are in line with those of **El-Moselhy et al. (2018).** However, these were different from the study's findings **Elderiny et al. (2017)** which indicated that most of their study samples were females. In addition, it was noticed that most of studied patients were married and this is similar to the results of **Endalew et al. (2021).** This result may be due to married people having a higher risk of developing heart disease than single persons, which may be related to their ongoing stress and social duties.

Regarding occupation, the results of this study stated that most of the studied patients were working. This is due to the routine manner of work, which might lead to myocardial infarction by causing stress, irritability and anxiety, which is consistent with the outcome of **Hebeshy et al.**

(2022) who observed that nearly one third of studied patients were employment,

According to the results of the current study, the length of time with MI, most of the studied patients suffered from MI for less than one year. These findings were supported by the study of **Sobhy et al. (2022)** who concluded that for less than a year, slightly more than half of the patients in the study received treatment. In contrast, the study had provided by **Chow et al. (2019)** noticed that the majority of the studied patients were received treatment for more than two years. Increasingly, the result of **Elderiny et al. (2017)** which concluded that approximately 50% of the studied patients had suffered from MI for one to five years or less.

As regards to MI knowledge, the findings of the present study indicated that, during the pretest, most of the control and study groups had low levels of knowledge, with only the study group shown significant increase in knowledge post self-care training program. This result is agreed with **Mohamed et al. (2020)** who indicated that prior to the implementation of the educational guidelines, the majority of patients had unsatisfactory knowledge about MI; however, following the guidelines, there were improvements, and the education guidelines were the cause of the differences that are very statistically significant between baseline, immediate, and post-3-month levels of knowledge. The study's findings matched with those of **Erfan et al. (2022)** who demonstrated that the mean score of patient's knowledge increased more than pre-program after three months following program implementation.

Regarding the relation between total knowledge level and demographic characteristic, results of the present study clarified that, there was a significant correlation between MI patients' total knowledge score and demographic characteristics. In the same line of the present study results of **Mohamed et al. (2020)** who stated that there was a relation between the age of the patients and their level of knowledge. This may be explained by the fact that adults have greater life experience and understanding of the benefit of educational programs.

Conclusion

The study revealed a highly statistically significant effect of self-care training program on patients' knowledge level.

Recommendations

Based on the results, recommended to:

- Continuous patient education should be provided through audio-visual material including videos shared with patients.
- In addition, Patients' knowledge should be gradually and continuously evaluated.

Conflict of interest: Authors declared no conflicts of interest.

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