

Comparison of the Effect of Two Educational Methods on the Frequency of Hospitalization and Clinical Symptoms of Patients after Acute Myocardial Infarction

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Abstract

Introduction: Patient training can be effective in preventing and controlling disease complications. Providing patient and family trainings is particularly important for improving compliance with a treatment diet.

Objective: The present study aimed at “determining the effect of two training methods (family-centered and patient-centered) on the frequency of hospitalization and clinical symptoms of patients after acute myocardial infarction”.

Materials and Methods: This clinical trial was performed in the Heart Care Unit of one of the hospitals in Arak, Iran between October and March 2014. Here, 60 patients who had experienced their first heart attack were randomly selected and divided into two groups: patient training and family training. Thereafter, for the intervention group, each patient was trained with an active member of the family through a computer in three fields of food, medicine, motion in three sessions of 30-45 min, and in the control group the same training content was given only to the patient (without the family). At the time of discharge, the checklist of patients' clinical symptoms and the number of re-admittance was given to patients to be marked if they occurred. Three months after the intervention, the incidence of clinical symptoms and re-admission in the two groups were compared and evaluated. Finally, data was analyzed using Chi-square and independent t-test.

Results: The two groups were significantly different in terms of demographic characteristics including age, gender, history of smoking and alcohol, occupation, familial history of cardiovascular disease, education, sport, and underlying diseases. The findings showed that the frequency of clinical symptoms including chest pain ($P = 0.0001$), Exertional dyspnea ($P = 0.004$), Orthopnea ($P = 0.033$), Paroxysmal Nocturnal Dyspnea ($P = 0.03$), Heart palpitations ($P = 0.015$) and the frequency of re-admittance ($P = 0.015$) were significantly lower in the family-based training group than patient-centered.

Conclusion: According to the results of this study, implementation of training programs with the presence of families plays an important role in following the plan, subsequently improving the treatment outcomes and reducing the cost of treatment for patients. Therefore, it is recommended that family-centered training interventions be conducted.

Keywords: Myocardial Infarction, Patient Education, Patient Readmission, Signs and Symptoms.

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Introduction

Cardiovascular disease is the leading cause of death in Iran and the world. It accounts for approximately 40% of all deaths in one year, of which about 50% is due to acute myocardial infarction [1]. Acute myocardial infarction (MI) is one of the most common diseases in today's societies, leading to rise in healthcare costs, pathogenicity, significant inability, and reduced productivity. In addition, complications such as cardiac arrhythmias, congestive heart failure, cardiogenic shock, and pulmonary embolism are other complications of myocardial infarction. Complications such as depression, anxiety, lack of participation in social activities and increased costs of treatment are also other complications [3].

Observation of the program [4], regular exercise program [5] and proper nutrition [6] play effective roles in preventing and controlling the complications of myocardial infarction [7]. One of the main axes of training is observation of treatment program [8] and considering that the main factors affecting the clinical outcomes of patients with myocardial infarction occur outside the system of medical care and in the home, it is therefore necessary that family members be responsible for the care and support of the patient at home [9]. Hence, interventions such as patient and family training contribute to improved compliance with a specific treatment diet [10].

Family training is one of the main concepts of nursing, as disease occurrence in one person can spread to all other members of the family [11]. Family participation facilitates care delivery through nurse, family and patient planning by focusing on all aspects of patient health [12]. Therefore, it has been suggested to create a positive attitude, reduce the anxiety and recovery of patients in all

medical and nursing care [13, 14]. There are several methods of training, such as traditional and modern. Today, traditional methods of training cannot respond appropriately to the rapid changes in information and meet the training needs of patients with chronic illness [15]. Thus, to facilitate communication between the patient and the nurse, modern methods such as computer-based education can be used to capture the patient's sense of sight and hearing simultaneously [16, 17]. The most important feature of this training method is that the learner can repeat the educational materials several times in accordance with his/her skill and ability to achieve a satisfactory level of learning [18]. The possibility of repeating the content, lack of time and place-specific training, individual training, suitability of the courses with the degree of audience development, and the possibility of matching the training with the patient's need are among the other benefits of this teaching method [19].

Studies in the field of training using computer in patients with heart disease [20], pregnant women [21], adolescents [22] and patients undergoing hemodialysis [23] have all reported positive outcomes such as increased awareness and compliance with the diet.

Considering the above, and based on the fact that few studies have examined the effect of family education along with patients on the clinical manifestations of myocardial infarction patients, this study aimed to compare the effect of two educational methods (family-centered and patient-centered) on the frequency of readmission and clinical symptoms of patients after acute myocardial infarction.

Materials and Methods

This clinical trial study was performed on patients with acute myocardial infarction,

referred to one of the hospitals in Arak, Iran, during the period from October to March 2014. After obtaining permission from the Arak Medical University's Ethics Committee, patients who met the inclusion criteria which includes age range of 30-70 years, having a heart attack for the first time and with the approval of a doctor, not being in critical condition during the study, absence of infection in the psychological crisis during the study, lack of long residence in the hospital due to complications of the disease, lack of speech, hearing, and blindness problems, access to the computer or the presence of a person close to the patient to help him/her with the use of computers and lack of computers education were chosen for the study.

It should be noted that none of the participants were excluded from the study. Patients who met the inclusion criteria were selected by available sampling method and then divided randomly into two, intervention and control groups by random assignment with the help of random numbers.

Sample size was determined based on the study of Zolfaghari et al. [24], considering following up of the program as 50% before and 80% after intervention, with a 20% drop, at a significant level of 0.05 and a test power of 80%; and assuming the difference of patient's full compliance to the diet to be at least 25% between the two groups, so that the difference is statistically significant. Accordingly, 30 patients were assigned to the patient-centered training group and another 30 to the family-oriented training group (patient education with active family members).

A total of 86 patients were studied, from which 60 met inclusion criteria and entered the study. Before the intervention,

a researcher-made questionnaire and checklist were completed using interviews and patient records. The questionnaire consisted of two parts: individual information and disease information. The checklist also included an examination of the clinical symptoms of patients (exertional dyspnea, Paroxysmal, palpitations, chest pain and frequency of re-admittance). It should be noted that all these terms were explained by simple examples and simple expressions for patients.

The validity of the tool was confirmed by 10 faculty members of Arak University of Medical Sciences. Due to the nature of the tool and the type of dependent variable, determination of reliability was not necessary.

Patients in the intervention group were trained with the active member of the family (a member of the family who was the main caregiver of the patient and spent the most time with the patient) via multimedia software (film, audio, image and animation) in three sessions of 30-45 minute about diet, medicine and sports by a researcher in the hospital's educational class with the coordination of the nursing office. At the end of each session, patient and family questions were answered in relation to the educational content or how to use the software for 10-15 min. At the end of the third session, the compact disc was given to patients to observe the home environment. Patient-centered group were trained alone (without attending) with multimedia software. It should be noted that training content was completely identical in both groups (Table 1). To better communicate and improve training effectiveness, training content was transmitted as short messages to patients' mobile phones in the patient-centered

Table 1: Content structure and activities of each session

The number of session	Educational content	Time of sessions/Minutes
First session	-Introduction and explanation of voluntarily nature of the research -Correct diet -Definition of diet and food groups -Importance of observation of the diet -Recommendations and limitations about food to the cardiovascular patients	30-45Minutes Through voice, image, animation
Second Session	-The importance of sports in controlling cardiovascular diseases -Introduction and method of sport activities in patients with cardiovascular diseases -Observing the essential points during sports	30-45Minutes Through voice, image, animation
Third session	-Importance of consumption of drugs -Side effects, consumption method, and cares essential when drugs are consumed -Providing training CDs at the end of third session	30-45Minutes Through voice, image, animation

Table 2: Comparison of two groups (family-centered and patient-centered education) in terms of underlying variables

Variable	Group	Patient centered N (%)	Family centered N (%)	Sig.*
Gender	Female	12 (48)	13 (52)	0.79
	Male	18 (51.4)	17 (48.6)	
Marital status	Married	10 (50)	21 (50)	0.03
	Single	20 (50)	9 (50)	
Smoking history	Yes	20 (51.3)	19 (48.7)	0.95
	No	10 (47.6)	11 (52.4)	
Alcohol consumption history	Yes	5 (45.5)	6 (54.4)	0.96
	No	25 (51)	24 (49)	
Employment	Worker	6 (54.5)	5 (45.5)	0.49
	Employee	4 (36.4)	7 (63.6)	
	Retired	17 (58.6)	12 (41.4)	
	Others	3 (33.3)	6 (66.7)	
Familial history of disease	Yes	18 (48.6)	19 (51.4)	0.79
	No	12 (52.2)	11 (47.8)	
Education level	Illiterate	4 (50)	4 (50)	0.56
	Under High School	18 (58.1)	13 (41.9)	
	High School	4 (36.4)	7 (63.6)	
	University	4 (40)	6 (60)	
Sports	No	3 (27.3)	8 (72.7)	0.95
	Yes	27 (55.1)	22 (44.9)	
Underlying Disease	Diabetes	3 (37.5)	5 (62.5)	0.97
	Chronic cardiovascular diseases	2 (50)	2 (50)	
	Brain attack	1 (100)	1 (50)	
	Chronic kidney deficiency	0 (0)	1 (100)	
	Thyroid disorders	1 (100)	0 (0)	
	Hypertension	4 (66.7)	2 (33.3)	
	Joint disorders	1 (100)	0 (0)	
	No one	2 (40)	3 (60)	
	Diabetes and hypertension	11 (50)	11 (50)	
More than one	5 (50)	5 (50)		

*Chi 2 test

group, and to the patient's cell phone and active member of the family in the family-centered group. Three months after the intervention, the patients of both groups referred to their physicians. Since the study samples were treated by one physician, checklists were collected by the researcher when the patient was referred to the clinic with the physician's correspondence. Patients were given the checklist to check the incidence of clinical symptoms and re-admission in order to mark the symptoms. Kolmogorov-Smirnov test was used to determine the distribution of quantitative variables in terms of compliance with normal distribution. Finally, the data were analyzed using SPSS V.16 software, by independent t-test and Chi-square test.

Results

In this study, all 60 patients with acute myocardial infarction participated (30 patients in each group). The age of the patients in the patient group was 60.52 ± 6.96 and 61.23 ± 8.78 years in the case group, which did not show a significant

difference between the two groups based on independent t-test ($P = 0.064$). Also, based on chi-square test, the two groups were the same in terms of gender, occupation, education level, underlying disease, history of tobacco use, alcohol, sport, and no significant difference was observed between them except in marital status variable. Of course, this variable was not associated with the frequency of re-admittance and clinical symptoms, as then it was not considered an interventionist (Table 2). The findings also showed that the incidence of clinical symptoms including chest pain ($P=0.0001$), exertional dyspnea ($P=0.004$), orthopnea ($P=0.033$), paroxysmal nocturnal dyspnea ($P=0.03$), heart palpitations ($P = 0.015$), and the frequency of re-admittance ($P=0.015$) was significantly lower in the family-based training group than the patient-centered training group. Comparison of the number of remittances and clinical symptoms of patients in the two groups was presented in Tables 3 and 4.

Table 3: Comparison of two groups (patient-centered and family-centered) in terms of the number of readmissions

Readmission	Family centered N (%)	Patient centered N (%)	Sig.*
Without admission	16 (53.3)	13 (43.3)	P=0.015
Once	12 (40)	10 (33.3)	
Twice	2 (6.7)	7 (23.3)	
Total	30 (100)	30 (100)	

*Independent T-test

Table 4: Comparison of two groups (patient-centered and family-centered education) in terms of frequency of clinical symptoms

Variable numbers

0

1

2

3

4

5

6

7

8

9

10

Sig*

	Chest pain		Exertional dyspnea		Orthopnea		Paroxysmal Nocturnal Dyspnea		Heart palpitations	
	Family Centered	Patient centered	Family centered	Patient centered	Family centered	Patient centered	Family centered	Patient centered	Family centered	Patient centered
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
0	6 (20)	2 (6.7)	8 (26.7)	1 (3.3)	17 (56.7)	6 (20.7)	19 (63.3)	12 (41.4)	7 (23.3)	1 (3.3)
1	9 (30)	2 (6.7)	11 (36.7)	4 (13.8)	10 (33.3)	10 (33.3)	10 (33.3)	12 (41.4)	9 (30)	2 (6.9)
2	5 (16.7)	2 (6.7)	6 (20)	7 (24.1)	2 (6.9)	8 (27.6)	1 (3.3)	3 (10.3)	6 (20.7)	3 (10.3)
3	5 (16.7)	4 (13.3)	3 (10)	4 (13.8)	0	1 (3.3)	0	2 (6.9)	5 (17.3)	7 (24.1)
4	2 (6.7)	9 (30)	1 (3.3)	5 (17.3)	1 (3.3)	3 (10.3)	0	0	1 (6.9)	3 (10.3)
5	0	3 (10)	0	3 (10.3)	0	1 (3.3)	0	0	0	1 (3.3)
6	2 (6.7)	5 (16.7)	0	2 (6.9)	0	0	0	0	1 (3.3)	1 (3.3)
7	1 (3.3)	2 (6.7)	0	2 (6.9)	0	0	0	0	1 (3.3)	1 (3.3)
8	1 (3.3)	1 (3.3)	1 (3.3)	1 (3.3)	0	0	0	0	0	6 (20.7)
9	0	1 (3.3)	0	0	0	0	0	0	0	3 (10.3)
10	0	1 (3.3)	0	0	0	0	0	0	0	1 (3.3)
Sig*	Df=57 T=3.797 P=0.0001		Df=57 T=3.801 P=0.004		Df=57 T=3.090 P=0.033		Df=57 T=2.214 P=0.03		Df=57 T=5.05 P<0.0001	

*Independent T-test

Discussion

The results of this study showed that education program (nutrition, drug and sports program) significantly improved the symptoms of the disease and decreased the number of patient admissions in the family-centered training group compared to the patient-centered training group. Several studies have suggested that the positive effect of training can be observed on chest pain reduction [25], better use of cardiac output and increased functional class [26], and a faster return of ECG to

normal [27]. Considering the fact that in addition to the patient, the family has also been trained, then the positive effect on the improvement of patients' outcomes can be observed. The results of this study are consistent with that of Zand et al. [28] who concluded that family-centered training was more effective in reducing patient-centered heart rate abnormalities. In addition, Zolfaghari et al. [24] concluded that family-centered training is more effective than patient-centered training in reducing hemodialysis complications.

However, the present study examined the effect of family-centered training in patients with acute myocardial infarction. Some other studies have also confirmed the effectiveness of family-centered learning [29-31]. In the present study, with the involvement of the active member of the family in training, the clinical symptoms of patients were better and the frequency of their recurrence was significantly lower than that of the patient-centered training group. In Chien et al.[32], it was also shown that person strained alongside the family and received post-surgery care education, had a higher level of knowledge and awareness than those who were trained alone.

In the present study, despite the similar content and training method in two groups of patients who participated in family meetings, they showed better treatment outcomes than those who were trained alone. Family training participation seems to be one of the measures that could provide a good basis for improving patients' clinical condition. As Aggarwal et al. [33] showed that, one of the most important factors in following the diet plan in cardiovascular patients after discharge is the active presence of the family and their support. Therefore, inclusion of families in the training of patients, especially chronic patients, such as cardiovascular patients who require a sense of tranquility and appropriate psychological conditions, can have a positive effect on improving patient compliance and consequently therapeutic outcomes. Based on the findings of this study, other studies appear to have had a positive impact on the implementation of programs that underpin the foundation of the family. Meanwhile, the study by Bahrami Nejad et al. [34] showed that both interventions had the same effect on diet modification and improved the physical activity of participants. This research justifies the difference between the findings of this study and that of Bahrami

Nejad on the ground that his study was performed on people without chronic disease. However, in the present study, patients with myocardial perfusion who need to follow a special treatment plan were treated; therefore, training methods carried out by the patients and their families can play an important role in following the program and adopting proper health behaviors in chronic patients. This is because in families with diseases and health problems, families are of particular importance and are a supportive sponsor of their own.

The limitations of this research includes; different mental and psychological differences in personal motivation, differences that influenced the patient's compliance with the plan, those that can be reduced through full explanation, the importance of inserting information and assuring participants that they were confidential, along with the creation of appropriate conditions. The probability of obtaining information at the time of the research from any other source (radio, television, relatives) other than the training of the researcher in both the control and intervention groups was beyond the control of the researcher. It seems that the provision of nursing education using modern training methods, with emphasis on active participation of the patient and family, improves the therapeutic outcomes of the patients. Considering that training is a major component of nursing care, and in the absence of adequate training patients do not understand the importance of proper conduct of the treatment program, leading to their suffering greatly due to complications and non-compliance with the therapeutic program, it is therefore recommended that family-centered training be provided by hospital staff, which can enhance initial conditions for the application of these care, especially in chronic diseases.

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Conflict of interest

No conflict of interest has been declared by the authors.

Author contributions

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE

(<http://www.icmje.org/recommendations/>):

-Substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;

-Drafting the article or revising it critically for important intellectual content.

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