ORIGINAL ARTICLE

Effectiveness of Family-oriented Education on Self-care behaviors of Patients with Acute Myocardial Infarction: A Randomized Clinical Trial

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ABSTRACT

Background: Proper self-care practices play a crucial role in the well being and longevity of patients with cardiovascular disease. To effectively engage in self-care, it is imperative for patients to receive adequate education and training on the self-care process. This study was conducted to determine the effect of family-oriented education (FOE) on the self-care behaviors of patients with acute myocardial infarction (AMI).

Methods: In this randomized clinical trial study, 70 patients hospitalized in two hospitals in Shiraz during November 2021-April 2022 participated after the first AMI. Patients were randomly assigned into control (N=35) and intervention groups (N=35) based on random allocation. In the intervention group, an educational program was conducted for patients and active family members during three sessions of 45 to 60 minutes. The control group received routine care. Demographic information form and Self-Care Agency scale was completed by the patients before the educational intervention, one month, and two months after the educational intervention. Data analysis was done through SPSS 22 using Chi-square test, independent t-test, Fisher's exact, and Friedman test. $P<0.05$ was considered as the statistical significance level.

Results: There was no significant difference in self-care behaviors between the two groups before the intervention ($P=0.71$). The mean score of self-care behaviors in patients one month ($P<0.001$) and two months ($P<0.001$) after FOE in the intervention group showed a statistically significant difference with the control group. Also, the mean score of self-care behaviors two months after the education in the intervention group was significantly higher than before and one month after the intervention ($P<0.001$).

Conclusion: Given the positive effect of FOE on self-care behaviors of patients with AMI, it is recommended that educational interventions related to the treatment plan of these patients with the participation of families should be conducted.

Trial Registration Number: IRCT20211116053078N1

Keywords: Family health, Myocardial infarction, Patient education, Self care

INTRODUCTION

Acute myocardial infarction (AMI) is the most common and severe complication of coronary artery disease.[1] More than seven million people experience AMI each year, and the 1-year mortality is in the range of 10%.[2] It is predicted that by 2030, this category of diseases will become the first cause of death and disability in the world and cause the death of more than 23.6 million people annually.[3]

Scientific and evidence-based long-term management of Ischemic heart disease is necessary to decrease the mortality and morbidity. Management of patients after AMI is an important factor which is associated with interventions such as optimal drug therapy, appropriate lifestyle changes, and cardiovascular risk factor control.[2]

Prevention of complications of myocardial infarction, which is a chronic disease, is done at the third level.[4] The focus in third-level prevention is on self-care.[5] Self-care means the self-ability to identify the illness symptoms, take care, control the physical and mental consequences of the chronic diseases, and change unhealthy lifestyles. Self-care reduces the severity of disease symptoms, reduces the recurrence of cardiac events, and increases the quality of life.[6] Self-care is one of the essential factors in the long-term management of chronic diseases. Effective self-care is associated to a better quality of life, lower mortality, and lower readmission compared to the poor self-care.[7]

Self-care among cardiovascular patients is generally poor.[8] The most important weakness is reducing self-care behaviors over time.[9] In a study, an increase in self-care score was observed after discharge compared to the beginning of discharge.[10] In an another study, the self-care score for patients increased and decreased 2 and 4 weeks after applying continuous care model, respectively.[11] Also, the results of a study revealed that 30 days after discharge, 84.1% of the patients had unfavorable self-care behaviors.[9]

The considerable decrease in care one month after training needs further investigation and is a challenge.[9, 12] Many reasons such as teaching the patient, effective teaching of the family, and improving educational techniques can be effective in the self-care of cardiovascular patients. Family-oriented care plays a prominent role in chronic patients.[13, 14] Family-oriented care provides a model of care that removes the focus of care from the patient alone and introduces the patient and family as the center of care. The goal of family-oriented care is to maintain the centrality of the family to provide unique care and participation of the family in this process for each patient.[3] A review of the literature has also shown the positive effect of family-oriented education (FOE) in improving the quality of life of some chronic patients such as heart failure,[15] and hemodialysis.[16] Among cardiovascular diseases, heart failure has been investigated in providing family-oriented care,[15] but no study was found in providing FOE in AMI patients' self-care.

Given the increase in AMI and its impact on the patients' functions and lifestyles and the reduction of self-care over time, providing education to maintain health-enhancing behaviors is of great importance.[2, 9, 10] Based on research findings, the level of self-care exhibited by patients with cardiovascular disease is typically subpar.[8] After the acute period of the disease, patients are discharged from the hospital and follow the treatment regimen at home. Therefore, the role of family in helping the patients cope with the conditions created is significant.[7] The need to improve self-care behaviors to reduce re-admission, prevent secondary complications, and increase the quality of life emphasizes the importance of education.[17] Lifestyle changes require time, support, and ongoing follow-up. Therefore, education and follow-up after discharge concentrating on the patients' families may have an efficacious role in improving the patients' self-care behaviors. Given that it is possible to provide FOE with positive effects, the necessity of this issue and lack of studies in the field of FOE on self-care behaviors of

patients after an AMI, the present study was conducted to determine the effect of FOE on self-care behaviors of patients after AMI.

MATERIALS AND METHODS

This single-blind randomized clinical trial was conducted during November 2021-April 2022 in Shiraz, Iran. The participants were the patients admitted in the Cardiac Critical Care Unit (CCU) of teaching hospitals (Faghihi and Al-Zahra) affiliated to Shiraz University of Medical Sciences with the diagnosis of AMI.

According to Zakipour et al.,[18] the sample size was calculated to be 32 patients per group based on a sub-item of self-care and the error 5% (α=0.05), power of 80% (β=0.20), μ_1=13.37, μ_2=11.37, σ_1=2.68, σ_2=3.06 and use of the formula for comparing the two means. Given a 10% probability of attrition, the final sample size of 70 people (35 people per group) was estimated by G*Power software (version: 3.1.9.4) by using the following formula:

$$n = \frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2 (S_1^2 + S_2^2)}{(\mu_1 - \mu_2)^2}$$

The inclusion criteria were age above 18 years, diagnosis and confirmation of heart infarction (based on enzyme tests Ckmb-troponin I, electrocardiogram (ECG) changes, and clinical symptoms by a cardiologist diagnosis), lack of living alone or in a nursing home, access to family member, ability to read and write, no known mental illness according to the person's self-reported, and willingness to participate in the study. Also, the inclusion criteria of the family members were active member of the family (the closest family member to the patient, according to the patient's statement, a family member who was the caregiver of the patient), age above 18 years, ability to read and write, no known mental illness according to the patient's statement, and willingness to participate in the study. Individuals who were not willing to participate during the study and had recurrent

AMI, and those with worsened physical condition during the study were excluded.

The patients were selected through convenience sampling among the patients with AMI hospitalized in the CCU of two selected hospitals in Shiraz who met the criteria for entering the study. Patients were randomly assigned into control (N=35) and intervention groups (N=35). By default, A was the Intervention group and B the control one. Then, among the random numbers from 1 to 70, based on the random table, the numbers were taken from the table and randomly divided into two groups. In this process, letters A and B were chosen as codes for assigning to groups based on coin tossing, and then the samples were assigned to the control and intervention groups. The instructions for admission, discharge, care provided, and diagnosis of patients admitted in all the CCU were the same.

Seventy-six patients were screened to enrol in this research. One patient did not meet the inclusion criteria (due to depression and taking psychiatric medications), and one because his family was not available. Four patients refused to participate in the study. Finally, 70 patients were randomly assigned in two groups of 35 subjects. In the intervention group, two patients were excluded due to being candidates for coronary artery bypass grafting and not willing to participate in the study, and two people in the control group were excluded from the study because of their unwillingness to continue participating in the study; finally, 33 subjects remained in each group until the end of the study (Figure 1). This is a single-blind study, and a person who was unaware of the allocation of the control and intervention groups analysed the data.

The data collection tools in this study included the demographic information form and self-care agency scale. The demographic form was prepared based on the sources and opinions of experts based on the patient's demographic characteristics (including age, gender, marital status, employment status, medical history, educational level, and smoking history).
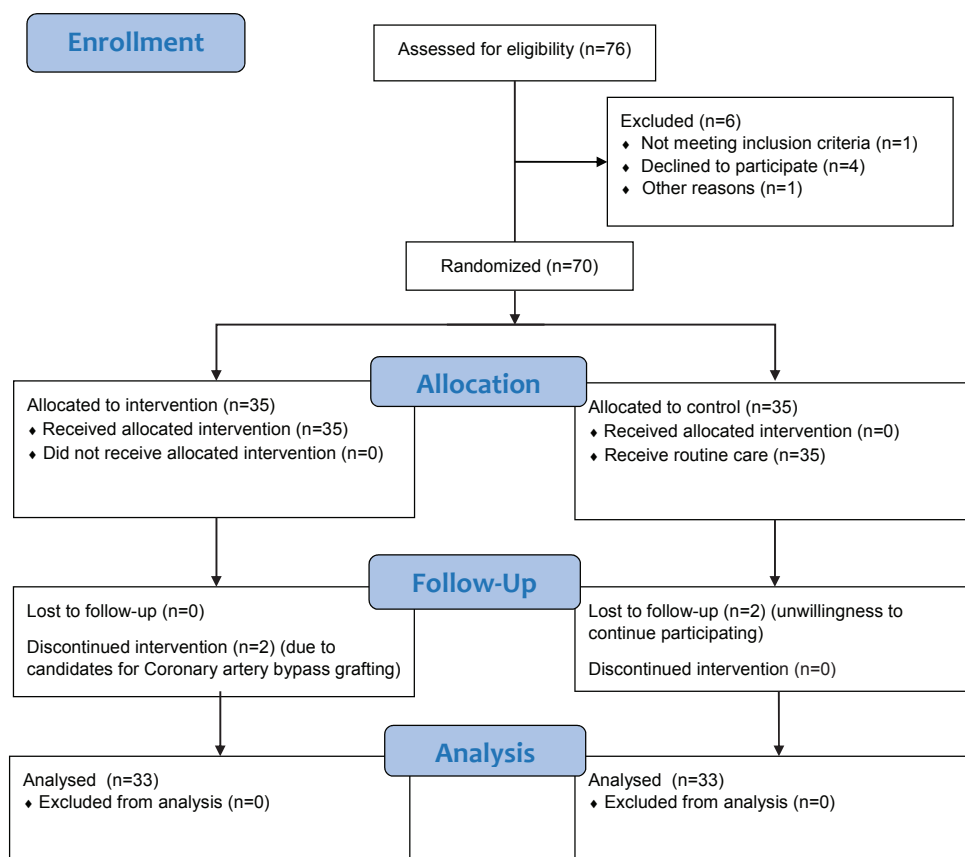
Figure 1: CONSORT flowchart of the study

The Exercise of Self-Care Agency (ESCA) scale was developed by Kearney and Fleischer (1979), and includes questions related to self-care behaviors and self-care ability, which contains 43 questions, and each question is rated from 0 to 4 based on a Likert scale. This questionnaire measures self-care ability and self-care behaviours in two separate parts. In this investigation, the self-care behavior part (21 items) of questionnaire was used. The highest score obtained in this tool indicates the highest degree of self-care. The content and construct validity of this scale have been confirmed by five nursing experts (80% inter rater agreement) and using Rotter's Internal-External Locus of Control of Reinforcement Scale (positive correlation), respectively. The reliability of this scale has been confirmed by the test –retest and split-half reliability of 0.77 and 0.81, respectively.[19]

In Iran, the content validity (by confirmation of 10 faculty members), face validity (by distribution of the scale among 30 patients) and reliability of this tool have been confirmed in the study of Hassani et al. (2010). The correlation between the results of the two stages is 86%, and the internal consistency of the questionnaire has also been confirmed using Cronbach's α of 0.92.[20] The Cronbach's α coefficient of the ESCA scale in this study was calculated 0.87.

First, the patients and their active family members were explained how to perform the intervention. The pre-test was performed by completing the demographic information form and the Agency (ESCA) scale. Questionnaires were distributed by the researcher and the research assistant, and the patients themselves completed them. Both groups received routine care, including vital signs control and ECG taking, drug prescription and drug education, diet as prescribed by the doctor, training on the amount and manner of activity, and discharge time training. There was no additional intervention in the control group. In the intervention group, three days after the myocardial infarction and when the patient's condition was stabilized, education

for patients and active family members was provided in the educational room in the ward. The training was performed in 3 sessions with groups of 4-6 patients and their family members depending on the conditions of the patients. In the first session, the cause of the disease, symptoms, care, need for follow-up treatment, and periodic visits in AMI were taught. In the second session, training was given regarding the drug program, drug side effects, the way to take drugs, and awareness of the related diet. In the third session, training was given regarding the type and amount of activity, smoking cessation, and exercise. The duration of each session was 45-60 minutes. The interval of the sessions was one day in between, and the teaching method was face-to-face and question and answer, using the training booklet. Based on the content of the education, a checklist was prepared for the patients to mark their daily care activities based on the contents of education. Then, every two weeks, the completion of this checklist was followed by phone by researchers through patients and family member. Finally, one and two months after the educational intervention, the questionnaires were distributed among the control and intervention groups of patients. Patients were asked to visit the hospital clinic by phone to complete the questionnaires. If the patient did not refer to the clinic, the meeting place was determined, and the questionnaire was completed by the patients. The validity of the educational content was confirmed based on the opinion of 5 expert professors (three nurses and two physicians) in the filed of care and treatment of heart diseases.

Data analysis started after the data were coded and entered into IBM SPSS ver. 22.0 (IBM Corp., Armonk, NY, USA). Normality of self-care behaviors was checked. The Friedman test was used to within group comparison of the variable due to its non-normal distribution. To compare the multi-categorical variables (age, education, and marriage) and two categorical variables (sex, occupation, past medical history, and smoking) of patients with a mean score of self-care, we used Fisher's exact test and Chi-square, respectively. The independent t-test was used to analyze the difference in the mean score of self-care behaviors in patients one and two months after FOE in the control and intervention groups. P value<0.05 was considered as statistically significant.

The present study was approved by the Ethics Committee of Shiraz University of Medical Sciences (Code: IR.SUMS.NURSING.REC.1400.023). All necessary approvals for performing the research were obtained from the relevant administrators. Furthermore, a session was held after the participants were selected to explain the study objectives and procedures. Written informed consent forms were also signed by all the participants. The right of voluntary participation and withdrawal from the study in any stage without any changes in the treatment process was preserved. All participants were assured of data confidentiality.

RESULTS

Demographic information of the patients is shown in Table 1. Based on the statistical analysis, there was no statistically significant difference between the demographic characteristics of the intervention and control groups (P>0.05) (Table 1).

The comparison of mean scores of self-care behaviors within the control group before training, one month, and two months after training had no significant difference (P=0.52). The mean score of self-care behaviors in patients one month after FOE showed a statistically significant difference between the control and intervention groups (P<0.001). Also, the mean score of self-care behaviors in patients two months after FOE was significantly different between the groups (P<0.001) (Table 2). Also, the results revealed that the mean score of self-care behaviors in the intervention group two months after the FOE was higher than before the training and one month after it (P<0.001).

Table 1: Comparison of demographic variables of patients with acute myocardial infarction in the intervention and control groups

Variable		Intervention group N (%)	Control group N (%)	P value
Age (year)	<40	1(3)	0 (0)	0.07*
	40-50	4 (12.1)	9 (27.3)	
	51-60	11 (33.3)	12 (36.4)	
	61-70	12 (36.4)	12 (36.4)	
	70>	5 (15.2)	0 (0)	
Sex	Male	26 (78.8)	26 (78.7)	0.99**
	Female	7 (21.2)	7 (21.2)	
Education level	Elementary	8 (24.2)	11 (33.3)	0.75*
	Intermediate	11 (33.3)	8 (24.2)	
	High school	9 (27.3)	9 (27.3)	
	Diploma	4 (12.1)	2 (6.1)	
	Bachelor'	1 (3)	2 (6.1)	
	Master	0 (0)	1 (3)	
Occupation	Employed	17 (51.5)	17 (51.5)	0.76**
	Unemployed	5 (15.2)	7 (21.2)	
	Retired	11 (33.3)	9 (27.3)	
Marital status	Married	25 (75.8)	20 (60.6)	0.06*
	Single	1 (3)	0 (0)	
	Widow	7 (21.2)	8 (24.2)	
	Divorced	0 (0)	5 (15.2)	
Past medical history	Yes	18 (54.5)	17 (51.5)	0.80**
	No	15 (45.5)	16 (48.5)	
Smoking	Yes	16 (48.5)	16 (48.5)	0.99**
	No	17 (51.5)	17 (51.5)	

*Fisher's exact test, **Chi-square

Table 2: Comparison of the mean score of self-care behaviors after family-oriented education between the intervention and control groups

Group	Before intervention	One month after intervention	Two months after intervention	P value*
Intervention	42.64±5.80	53.39±8.37	54.50±6.92	<0.001
Control	42.78±5.11	44.55±9.75	44.84±5.03	0.52
P value**	0.71	<0.001	<0.001	

*Friedman's Test, **Independent t-test

Discussion

The results of the present study showed that applying FOE improved the mean score of self-care behaviors of patients with AMI after the intervention. In this regard, the results of a study showed that a self-care training program in patients with permanent pacemakers had a significant effect on the quality of life after the training.[21] Also, some researchers investigated the effect of the FOE program on the quality of life of patients with a pacemaker. The study reported that the quality of life in patients with a pacemaker was relatively low and needed an appropriate intervention. By implementing the family-centered empowerment model, the participation of patients and their families in patient care increased. Finally, this participation improved the patients' quality of life.[22]

The results of a study which used a nurse-led education program in improving self-care management of heart failure showed that the self-care of the intervention group, after the implementation of the education, was significantly more than the control group; this is in the same line with the results of

the present study.[23] Therefore, training and follow-up after discharge had a significant effect on the acceptance and continuation of self-care behaviors. It was found that educating the patients' families improved self-care confidence in diet.[24] Of course, in this study, the target group was heart failure patients, who were very diverse. Also, self-care was investigated in self-care confidence for diet.[24] However, in the current study, the target group was AMI, and self-care was examined holistically.

The findings of other studies showed a decrease in the self-care scores of patients after 30 days.[9, 10] The decline of self-care over time was one of the important issues in these studies. It seems that on the first days of discharge and during the critical time of being in the hospital and providing care, the patient's fear and worry of repeating the incident caused an increase in adherence to self-care behaviors.[10] However in this study, the FOE model was used by reviewing previous studies.[3] In this model, the active and supportive presence of the family and follow-up and contact with patients and families had a positive effect on compliance with treatment and the correct implementation of self-care behaviors. Thus, with the passage of time, because the training was not interrupted, the durability of the training effects was still there.

In the present study, the persistence of the effects of education for up to two months was investigated. The result showed a significant difference between the intervention and control groups in self-care behaviors two months after FOE. The findings of a study showed that the levels of blood sugar and lipids of patients with myocardial infarction were significantly different in the family-oriented group than in the patient-oriented group, which is consistent with the results of the present study.[25] Education improved the laboratory indicators of patients with myocardial infarction, but the effect of education in the family-oriented group was significantly higher than the patient-oriented group.[25]

FOE by nurses can create the main effects on self-care in patients. Educating the families of chronic patients by nurses is suggested.[26] Of course, these trainings require the empowerment of nurses in the form of continuing professional education courses, so that by increasing the competence of nurses, the competence of patients' families can be improved.[27, 28] Increasing the competence of family members in the self-care needs of chronic patients is one of the most important factors for supporting the patients, strengthening their compatibility with their sitauations, and promoting their quality of life.[11]

In a study, it was reported that family support played an important role in the control of hypertension by encouraging the adoption of self-care activities.[29] Therefore, it was considered as a facilitating factor in treatment adherence. Another study reported that involving families in care had long-term effects on the patients' self-care, which was in line with the results of the present study.[30] Therefore, teaching self-care behaviors in a family-oriented way can have a significant and long-lasting effect on the patients' self-care. The present study also emphasizes the effectiveness of teaching family-oriented self-care behaviors to improve the patients' self-care. Also, the findings of this study revealed that family-oriented self-care education was a more effective method of care that over time not only doesn't stop but also continues. This method increases the power of self-care learning and can be used as a method to teach the patients' families.

Evidence shows that positive support from family and friends can improve the patient's behaviors for self-management.[31] For this reason, using more effective interventions, with empowerment of families instead of individuals, can be particularly useful in health promotion and disease prevention.[32] Also, the participation of family members can increase self-efficacy, knowledge, and self-care abilities in patients with a chronic disease.[29, 33] Educating families and their support for patients could reduce anxiety, depression, sleep problems, and distress; also, various

aspects of self-care and self-management in patients increased.[34] Critically ill patients are more exposed to mental disorders such as stress, depression, anxiety, and post-traumatic stress disorder due to invasive and modern technologies.[35-37] Family support can be very effective in reducing these problems.[34] Of course, this issue requires ethical and legal policies by health policymakers.[38, 39]

Use of FOE as an educational intervention for empowerment of patients with AMI was the most important strength of the present study. Since, the completion of the second and third stages of the questionnaire was done by calling the patients, the method could affect the patients' responses. Moreover, the level of concentration, attention, and mental condition of the patients at the time of answering the questionnaires could affect their answers, which were not under the control of the researchers.

Conclusion

The present study showed the beneficial effect of FOE on the total self-care scores of patients with AMI. It is recommended that educational interventions related to the treatment plan of these patients with the participation of families as a simple and accessible method should be conducted.

Acknowledgment

Conflict of Interest: None declared.

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