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The effect of nursing continuous care on Self-Management in Patients with Myocardial Infarction

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Abstract

Aims: Self-management is considered an important factor for change of behavior and health care to reduce disability in patients with myocardial infarction (MI). Continuous care model (CCM) is a plan that improves knowledge, practice, and attitude of patients toward health care. This study aimed to investigate the effect of CCM on self-management in patients with MI.

Instrument & Methods: This study was a controlled trial conducted on patients with MI, admitted to cardiac care units in one of the eastern cities of Iran. 82 eligible patients were selected and randomly assigned into two groups of CCM and control. In the intervention group, 4 to 6 educational sessions (1 to 2 hours) with a follow up period were conducted. The mean score of self-management was assessed in both groups at the beginning of the study, after training and after follow-up of the model.

Findings: Mean score of self-management significantly decreased in both intervention and control groups immediately after the implementation of CCM and follow up of the study ($P < 0.001$). Considering that in the questionnaire, the lower score indicates a better situation, there was a significant difference between the two groups at different times regarding self-management score. After the study, the self-management score in the follow-up care group was significantly lower than that of the control group.

Conclusion: Implementation of CCM is recommended to improve self-management skills in patients with MI, and further studies are needed in other chronic patients.

Keywords
Self-Management [https://www.ncbi.nlm.nih.gov/mesh/?term=Self-Management];
Continuous Care Model [Note Found];
Nursing [https://www.ncbi.nlm.nih.gov/mesh/68009729];
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Introduction

Cardiovascular disease (CVD) is still the leading cause of mortality in Europe and the world. Studies have estimated that the disease is the most common cause of mortality, and 29.6% of all mortalities worldwide. The disease is still the cause of more than 4 million mortalities a year and nearly half of all mortalities in Europe. In the latest statistics in Europe, out of every ten deaths, three cases occur in under-65-year-old people with CVD [1]. Among cardiovascular diseases, acute MI has increased over the past decade and it is responsible for nearly 46% of all mortalities in Iran, which is one of the most important health disturbing factors [2, 3] as well as one of the most common causes of hospital admissions. The disease usually leads to disability, loss of working ability and daily activities of individuals and imposes heavy costs on the person, family and community due to reduced productivity [4, 5]. In the treatment of patients with MI, cardiac rehabilitation is a complex intervention and the best way of secondary prevention which includes management in health and cardiovascular risk education, medical evaluation, physical activity, and stress education, and counselling [6]. One of the methods of health care is self-management. Patient with self-management improve the level of health, prevent and control the disease. Self-management refers to a set of individual abilities to create positive behaviour or to increase the skill for the control of symptoms, treatment, physical, psychological, and social complications and the treatment of chronic disorders, such as cardiovascular disease [7]. Therefore, it seems that self-management is the best method for behavioural changes, reduction of readmissions and complications and improvement of outcomes [8] and treatment adherence [9] in patients with cardiovascular conditions. Studies have shown a positive role for self-management in chronic patients. Self-management in patients with chronic obstructive pulmonary disease improved quality of life, reduced all-cause hospital admissions, and improved dyspnoea [10]. Self-management in patients with diabetes mellitus has increased the participation, improved quality of life, reduced hospital admissions, readmissions and costs [11], and controlled cardiovascular risk factors in reducing blood pressure [12]. In general, people with heart attacks are at high risk of severe symptoms such as chest pain, dyspnoea, and vomiting, as well as psychological symptoms such as stress, depression, and anxiety. Therefore, there is a need to develop nursing interventions to help these people manage the physical and mental symptoms themselves [13]. Patient training is an important part of the rehabilitation program for patients with cardiovascular disease that targets self-management behaviour to reduce risk factors and cardiovascular events [14, 15]. Unfortunately, so far, no standardized or evaluated educational program for the rehabilitation of patients with cardiovascular disease is available for daily use [16, 17]. Also, theory-based methods [18] and the use of nursing models are the most important educational tools to improve health behaviours in patients. CCM is one of the localized models designed by Ahmadi *et al.,* to address the needs of patients with chronic coronary artery disease. The purpose of this model is to plan and increase patient insight to achieve proper functioning and control the disease and its side-effects through continuous care [19]. In fact, continuous care is based on continuous engagement and acceptance. This model focuses on the influential, balanced role of the nurse, the patient and the patient's family [20]. The positive impact of implementing a CCM on improving the quality of life of patients with heart failure [21], patients with haemodialysis [22] and sleep quality of haemodialysis patients [23] has been identified. Also, the implementation of this model was effective on the self-efficacy and control of complications [24], and reducing risk factors and improving lifestyle in patients with MI [25] Therefore, this study aimed to determine the effect of CCM on self-management in patients with MI.

Instrument and Methods

This study was a clinical trial. The research setting was cardiac care unit in Ali Ibn Abitaleb Hospital in Rafsanjan, the city in the southwest of Iran.

The study included 82 patients with MI who were selected through convenience sampling and were assigned to intervention (n = 41) and control (n = 41) groups using minimization method (according to sex and level of education). The sample size was determined based on similar studies (mean and standard deviation). Eligible individuals were divided into two groups according to sex and education level and using the table of numbers. The inclusion criteria included: not having a specific mental illness, reading and writing literacy, and diagnosis of MI. Exclusion criteria included diseases such as unstable angina, congestive heart failure and, the ones did not attend training sessions (more than one session). Two people were excluded from the study because of death (one sample from the intervention group) and refuse to complete the questionnaires (one sample from the control group) (Figure1).

Two questionnaires were used to collect the data. The first questionnaire consisted of two parts of the demographic information (age, sex, occupation, marital status, educational level, income, and insurance) and the profile of the disease (referral time, the main complaint of the patient at the time of

arrival and other diseases). The second questionnaire was a self- management questionnaire, which was used by Battersby *et al.* in 2003 to evaluate the self-management of chronic patients (26). The questionnaire consists of 11 items with a 9-point Likert scale. (Very bad = 8 and very good = 0). A higher score indicates lower self-management. At first, the questionnaire was translated by two professional English translators familiar with the medical sciences in Farsi, and then the translated questionnaire was translated back into English by two other professional translators, and the content was compared with the main questionnaire. The questionnaire was provided to 10 faculty members of Rafsanjan Nursing and Midwifery Faculty to determine the validity, and content validity index was 0.92. The questionnaire was then provided by 20 patients with MI to determine the reliability and the Cronbach's alpha coefficient was 0.86.

After explaining the study goals, written consent forms, demographic information, and self-management questionnaires were completed for eligible samples. The participant was divided into intervention and control groups by a nurse other than the researcher .In the control group, routine care was provided. In the intervention group, the CCM (localized Iranian care model) was applied. In this model, four stages of orientation, sensitization, control, and evaluation were used.

Stage1: At the orientation stage, participants and researchers expressed their expectations from the course in a 25 to 30-minute session and emphasized the continuity of care relationship until the end of the course.

Stage 2: At the sensitization stage, actions such as an explanation of illness and its complications, assessment of the educational and skill needs of the patient and the need for self-management are done. Patients in the intervention group received self-management counseling along with a family member in 4-6 group training sessions. The training was conducted in the intervention group for two days a week. Patients were divided into three groups of 10 and one group of 11, at different times based on the ability to participate in the classes. Educational content included the nature, symptoms, risk factors, diagnosis, and complications of MI, the importance of using medications, the importance of doctor's visits, the habits that improve the health and the role of the patient in tracking the disease and the importance of continuing self-management behaviours. Educational sessions were conducted in question and answer form (at the beginning of the session) and then they were presented by the researcher with the help of slides and lectures. At the end of the training sessions, after delivery of the handbook, the clients were asked to read the materials at home. After the training sessions, at the end of the first month, the questionnaires were completed, and the researcher's contact number was provided to the patients. Telephone follow up for patients with MI was performed at this stage. During the first three weeks of the whole period of the model, the stages of awareness and sensitization were implemented.

Stage 3: In the control phase, interconnection is maintained, and the researcher evaluated how to apply the training during the three phases of the calls (15, 30 and 45 days after the end of the intervention) or at the time of the patient's referral to the department. The researcher conducted a phone call for an average of 15 minutes. During the control phase, the researcher monitored the patient's behaviours for two months, reviewed the care process and how the client performed the work, with the counselling suitable for the care needs.

Stage 4: The evaluation stage is the final stage of the model, which is measured by completing the care process questionnaire, successes and failures. The third turn questionnaires were completed in the intervention group after follow-up phase (actually 3 months after the start of the study). In the control group simultaneously with the intervention group, the demographic and self-management questionnaires were completed before intervention, after training and after follow-up by two trained nurses.

SPSS version 18 was used to analyze data. Descriptive statistics (frequency, percent, and standard deviation) was used to describe the demographic and background characteristics of both groups. T independent, χ^2, and Fisher exact tests were used to compare two groups regarding background and confounding variables at the beginning of the study. Repeated measurements ANOVA were used to determine the mean score of self-management in three intervals between and within two groups. Statistical significance was set at a P value less than 0.05.

After the study procedure was clearly explained then Informed consent was obtained from all participants. The researcher began the sampling by obtaining the code of the ethics from the Ethics Committee of Kerman University of Medical Sciences (IR.Kmu.REC.1395.893).

Findings

The mean age in the intervention and control groups was 56.95 ± 10.26 and 59.9 ± 11.78, respectively. There was no significant difference between the two groups regarding age (P = 0.23, t = -1.2). There was no significant difference between the two groups of CCM and routine care regarding gender, marital status, education level, income level and type of insurance. Regarding occupation, there were significant differences between intervention and control groups (Table 1).

There was no significant difference between the two CCM and routine care groups regarding clinical data, except for family history of MI and hospitalization history (Table 2).

The results showed that self-management score had a significant reduction in both intervention and control group immediately after training and after follow-up, compared with before the study (P < 0.001). Also, there was a significant difference between the two intervention and control groups at different times regarding self-management score. Although at the beginning of the study the self-management score in the CCM group was more than that of the control group, after the study, the self-management score in the CCM group significantly decreased more than that of the control group. In the other words, by passing time self-management improved in the CCM group more than that of the control group (P < 0.001; Table 3; Figure 2).

Table 1) Background information of research units in two groups of CCM and routine care (N=82)

Variable	Control N (%)	CCM N (%)	χ^2 test	P value
Gender				
Male	31 (75.6)	31 (75.6)	0.00	1
Female	10 (24.4)	10 (24.4)		
Marital status				
Single	2 (4.9)	1 (2.4)	0.46	0.99
Married	32 (78)	33 (80.5)		
Widowed/Divorced	7 (17.1)	7 (17.1)		
Education level				
Illiterate	9 (22)	9 (22)	0.00	1
Primary education	20 (48.8)	20 (48.8)		
Diploma	8 (19.4)	8 (19.4)		
Higher education	4 (9.8)	4 (9.8)		
Occupational status				
Self-employed	14 (34.1)	11 (26.8)	8.73	0.03
Employee	6 (14.6)	1 (2.5)		
Retired	4 (9.8)	13 (31.7)		
Unemployed	17 (41.5)	16 (39)		
Income level (IRR)				
< 5,000,000	2 (4.9)	2 (4.9)	0.89	0.83
5,000,000 and 10 million	8 (19.5)	6 (14.6)		
10 to 20 million	15 (36.6)	19 (46.4)		
> 20 million	16 (39)	14 (34.1)		
Type of insurance				
Social Security Insurance	18 (43.9)	19 (46.3)	0.36	0.84
Social Security Insurance	21 (51.2)	21 (51.3)		
Other cases	2 (4.9)	1 (2.4)		

The two variables, the hospitalization history and the family history of MI, which could affect the outcome of the study, were separately entered into the model. It was determined that when the hospitalization variable was entered the model, there is a significant difference between the two groups of intervention and control in self-management scores at different times. However, when the family history of MI was introduced into the model, there was not a significant difference between the two intervention and control groups at different times regarding self-management score (P = 0.06; F = 3.68).

Table 2) Clinical information in two CCM and routine care groups (N=82)

Variable	Control N (%)	CCM N (%)	test	P value
Diabetes Mellitus				
Yes	9 (22)	11 (26.8)	0.26	0.61
No	32 (78)	30 (73.2)		
Coronary artery disease				
Yes	4 (9.8)	0	4.2*	0.12
No	37 (90.2)	41 (100)		
Hypertension				
Yes	11 (26.8)	14 (34.1)	0.52	0.47
No	30 (73.2)	27 (65.9)		
Hyperlipidaemia				
Yes	11 (26.8)	6 (14.6)	1.86	0.17
No	30 (73.2)	35 (85.4)		
Other diseases[1]				
Yes	7 (17.1)	9 (22)	0.31	0.58
No	34 (82.9)	32 (78)		
Family history of MI				
Yes	8 (19.5)	1 (2.4)	6.12	0.03
No	33 (80.5)	40 (97.6)		
History of Angioplasty				
Yes	1 (2.4)	4 (9.8)	1.92*	0.36
No	40 (97.6)	37 (90.2)		
Smoking				
Yes	15 (36.6)	18 (43.9)	0.46	0.5
No	26 (63.4)	23 (56.1)		
Chest pain				
Yes	36 (87.8)	37 (90.2)	0.13	0.72
No	5 (12.2)	4 (9.8)		
Opium addict				
Yes	10 (24.4)	7 (17.1)	0.67	0.41
No	31 (75.6)	34 (82.9)		
Methadone User				
Yes	0	1 (2.4)	0.01*	0.99
No	41 (100)	40 (97.6)		
Hospitalization history				
Yes	21 (51.2)	4 (9.8)	16.63	0.001
No	20 (48.8)	37 (90.2)		

*Fisher's exact test, in other cases, Chi-square test

[1]Other disease: Kidney failure, respiratory diseases, Congenital heart disease

Table 3) Comparison of self-management mean scores between two CCM and routine care groups at different times

Time	Control	CCM	F	P.
Before Intervention	55.93±11.21	61.56±10.48	18.72	<0.001
After training	44.88±9.81	31.73±6.76		
After follow-up	46.78±10.48	32.34±8.79		
F	27.65	218.52	-	
P value	<0.001	<0.001		

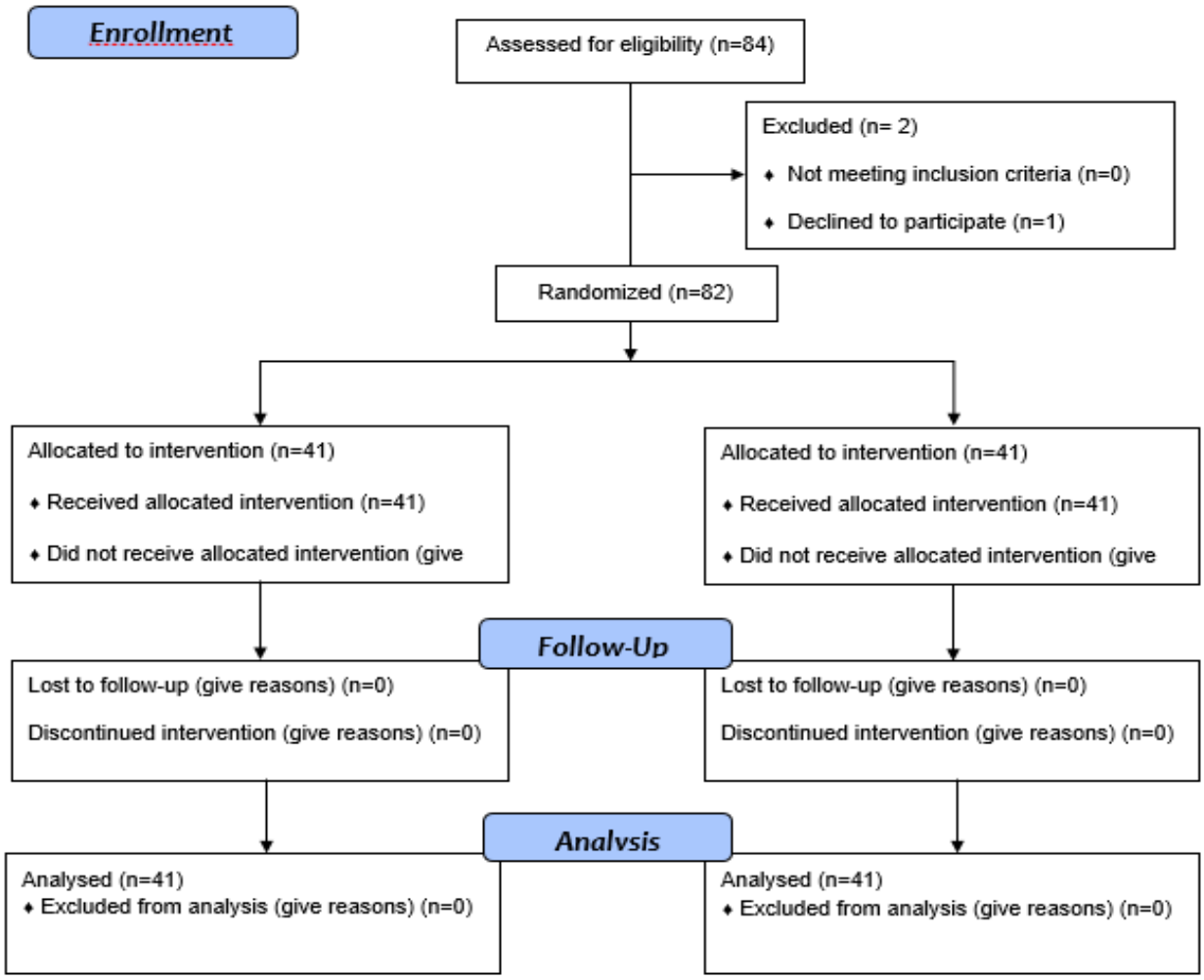

Figure 1) The flow diagram of the study

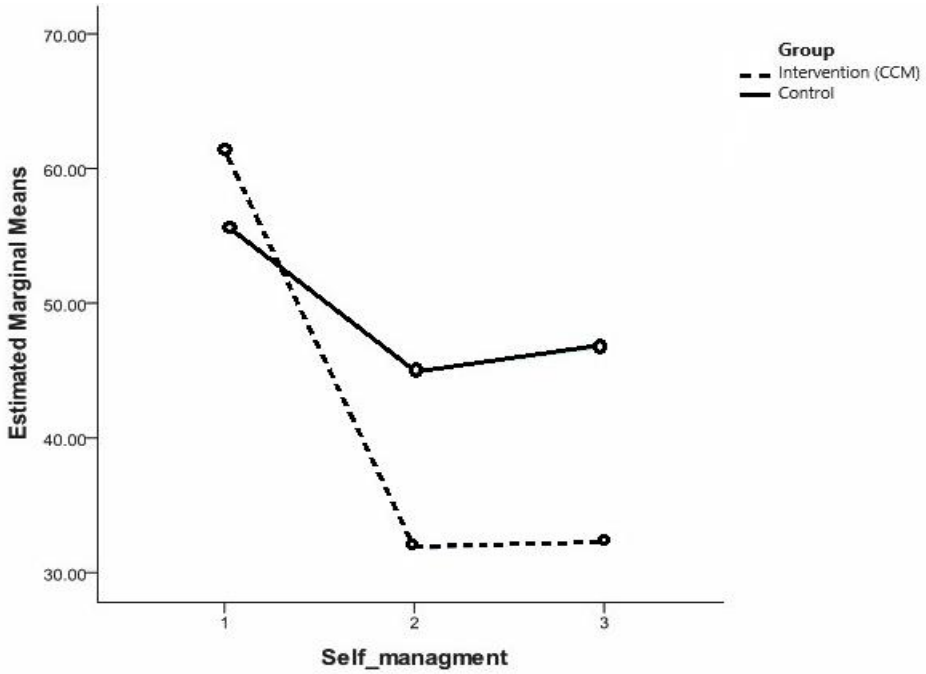

Figure 2) The comparison of self-management score between the CCM group and the control group at different times

Discussion

MI requires cardiac rehab after being discharged because of its chronic nature. This study aimed to investigate the effect of CCM on the self-management of patients with MI. The results confirm that the implementation of the CCM improved self-management of patients with MI. The results of this study are consistent with the study by Akbari *et al.* which illustrates the effect of CCM on self-management of MI patients in overall self-management dimensions. In Akbari study, after the intervention, there was a significant improvement in all dimensions of self-management in the intervention group. However, only the average fatigue changes and the use of health care between the intervention and control groups were significant [27]. In the study of Meng *et al.,* The effect of the training program on self-management behaviours was confirmed in patients with coronary artery disease, and this program increased the disease [28] compared with the usual care after one year. In the Meng study, the effect of training between the groups after 12 months shows a significant difference and it did not make a significant difference before 12 months, indicating the need for long-term education in the field of health. Also, in the Meng study, patients with coronary artery disease were studied that were more specific than those in the present study and a range of cardiac patients.

The study of Aliasgharpour *et al.* showed that training of patients with epilepsy after one month had a significant difference in self-management scores in intervention and control groups and the educational program had a positive effect on self-management behaviors in patients with epilepsy [29]. Regarding the increased self-management in the Meng study and in the short term in the Aliasgharpour study, it seems that the type of disease, the effect of the disease on patients and the individual and social consequences have an important role in increasing self-management of patients.

With regard to community structure and new technology in the field of health, the use of new, innovative methods and tools that make patient easier access to education can increase the level of self-management of patients. Because in the CCM, telephone follows up is carried out, the results of this study are comparable with the results of comparative studies. In a study conducted by Harkness *et al.,* CABG patients who received nursing care by telephone had better recovery conditions than those receiving routine care [30]. Research by Yan *et al.* showed that telephone follow-up was effective in improving the health behaviors and self-management of patients with MI [31]. Taherian *et al.,* also showed that telephone education at home improved health behaviors in patients with MI [32]. Billington *et al.*, in an intervention, assessed nursing telephone training on self-management of patients with chronic obstructive pulmonary disease. The results of this study included the improvement of self-management after the intervention [33].

In some studies, the lack of interventions and training on self-management of cardiac and non-cardiac patients has been mentioned which is incompatible with the present study. The study of Akbari *et al.,* which examined the implementation of CCM on self-management in patients with MI, does not support the self-management dimensions of the current study. In the Akbari study after the intervention, the mean changes in the dimensions of self-management are as follows: General health, health problems, Dyspnoea, pain, physical activity, belief in physical activity, daily activities and communication with doctors did not differ significantly between the two groups [27]. One of the reasons for the non-consistency of the Akbari study with the current study is the different type of questionnaire. Another reason is the age distribution of the two groups, which had a significant difference in the Akbari study.

In the study by Dilorio *et al.,* which was performed on nurses with 5 sessions and 4 phone follow-ups, there was no significant change in self-management scores after the intervention [34]. The small sample size (n = 22) is one of the most important reasons for the inability to identify the difference between the intervention and control groups. In Lorig *et al.,* in an 18-month study on diabetic patients, it was shown that following the self-management program, the use of email did not improve the results of the program [35]. This suggests that the type and duration of follow up in patients are a very important topic. In the CCM, follow-up is in the form of a telephone call that has positive effects on the improvement of disease and patient's condition in the present study. But the effect of tracking patients by an e-mail is fewer than the effect of calls made by phone. On the other hand, people may have difficulty in accessing to email and the Internet or due to the culture of society and the growth of technology in different countries, patients and public may not access email and internet Lorig *et al.* studied a research on diabetic patients in the American Indian community and the Alaskan Natives, in which people might have had difficulties in Internet access [35].

The main limitation of this study was significant difference between two groups regarding the family history of MI. Only one sample of CCM group and 8 samples of control group had the family history of MI. The low samples of this characteristic in two groups may influenced on the analysis. However, we checked many variables in this study and tried to control all influencing variables. Further study is needed to compare CCM between who had and had not the

family history of MI in an accurate sample size.

Conclusion

The results of this study indicate that the implementation of the CCM has improved self-management in patients with MI. Given that patients may face multiple barriers to the implementation and management of their illness after discharging, the need for a comprehensive support system by the government and cooperation and support from families is necessary. In this regard, factors such as the interaction of patients with the medical staff, the establishment of a post-discharge care network, follow-up to complete the training process, the provision of complementary services, and the encouragement and continuous advice of nurses and medical staff to the patient and family members are among the most important factors in improving the health of chronic patients. Therefore, considering the progression of follow-up care in patient management, it is suggested that this model be used to increase the ability and recovery in other chronic patients.

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Ethical Permissions: Ethical approval was obtained from the Ethics Committee from Kerman University of Medical Sciences (IR.Kmu.REC.1395.893). All participants received written and oral information from the researcher and gave their informed consent by means of their signature before inclusion in the study.

Conflicts of Interests: The authors declare that they have no conflict of interest.

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