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IDENTIFYING AND COMPARING NUTRITIONAL BEHAVIOR OF MYOCARDIAL INFARCTION PATIENTS BEFORE AND TWO MONTHS AFTER NUTRITIONAL COUNSELING IN EXPERIMENTAL AND CONTROL GROUPS

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Abstract

Background: Myocardial infarction is a start for many heart problems that can make a patient refer to treatment centers long after discharge the objective of this study was to investigate the effect of nutritional counseling on nutritional behavior.

Materials and Methods: 120 patients who were admitted to cardiac intensive care units of selected after stroke were selected and were randomly assigned into two groups. If the total MEDFICS score in each group is higher than or equal to 70, nutritional behavior will need to be modified, if it is less than 40, the diet will be TLC, and if it is between 40-70, it will be heart-healthy diet. Subjects whose score was above 70 were referred to nutrition counseling classes.

Results: After two months, the mean MEDFICS score in the experimental group (62.4 ± 07.6) was significantly lower than that of the control group (4.22 ± 3.65). The results of the independent t-test after the intervention showed a significant difference between the experimental and control groups (P <0.001). It showed an improvement in nutritional behavior in the experimental group after the intervention.

Conclusion: the research hypothesis that states the nutritional behavior of patients improves after implementation of the nutritional counseling program is accepted with a 95% confidence interval.

Key words: Myocardial Infarction, Nutritional Behavior, Nutritional Counseling

Introduction

Empowering an individual with coronary artery disease to adhere to a diet can prevent or delay the effects of this disease (Hosseinzadeh, 2010). Self-efficacy of nutritional behavior that is created as a result on an individual's confidence in his or her capabilities to adapt to the changes in nutritional behavior after a heart event plays a major role in enhancing the patients' empowerment skills to provide better self-care (Siavashi, 2012). The effect of cardiac rehabilitation on the hemodynamic status of patients after coronary artery bypass graft surgery. Self-efficacy of nutritional behavior is a health-promoting mechanism and its regulation can be effective in modifying the health behaviors of patients with cardiovascular disease and decrease the incidence of severe coronary artery disease and thus decrease the rate of hospitalizations (Mehdipour 2011). Nurses, as the key members of the health team, play a major role in managing the clinical conditions of cardiac patients. According to NANDA nursing diagnoses, patients with myocardial infarction are at risk of nutritional disorders due to reduced mobility and reduced consumption of fiber-containing substances.(Beyer, 2006) (Doolan,2004). Cardiac rehabilitation. It is due to a lack of consistency with their needs because of

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insufficient information on proper nutrition resulting from a lack of knowledge about the disease process and diet program (Wiley-Blackwell). If patients with coronary artery disease believe that their heart condition is due to poor nutritional habits in their lifestyle and correcting it may improve or delay heart disease and reduce the rate of hospitalizations, they will make more efforts to create lasting changes in their nutritional behavior (Hosseinzadeh, 2010). Angina pectoris is a clinical syndrome caused by cardiovascular atherosclerosis and is always associated with significant obstruction in one of the coronary arteries (Smeltzer et al; 2007). When the coronary artery diameter decreases, the smallest activity that increases the heart demand for oxygen, due to coronary artery inability to increase blood flow, causes ischemia of the heart muscle followed by angina pain (Shiedfar et al., 2004). Myocardial infarction provides the conditions for a number of heart problems that can make a patient refer to the health center long after discharge (Dadvand, 2009). Some improper behavioral habits such as inappropriate consumption of lipids, carbohydrates, salt, etc., and lack of inappropriate physical activity associated with alcohol, drugs, smoking, and lack of attention to mental and psychological stresses are factors that often cause coronary artery disease (Kuhestani, 2010). Previous studies have shown that the Iranian population is at higher risk for cardiovascular disease and especially for the risk factors of blood lipids due to their behavioral, nutritional and physical activity levels (Afzal Aghaei, 2010). With improving diagnostic and therapeutic methods in cardiovascular diseases, mortality as a result of myocardial infarction has decreased, but post-infarction survivors are at the risk of fatal or non-fatal coronary artery events. 6-12 weeks after the infarction is an important opportunity for the repair of damaged heart tissue, and the likelihood of recurrence of its symptoms is common at this time (Brilakis 2003)(Bakhal, 2005) . Therapeutic changes in lifestyle, including dietary changes, have been highlighted by the American Heart Association and the European Heart Association as an integral part of lipid-lowering interventions for risk reduction strategies (Vincent, 2013)(Gallagher Robyn, 2013).

-Kuhpayezadeh et al (2006) conducted a study entitled "Investigating the relationship between nutritional factors and acute myocardial infarction". The mentioned case-control study was conducted on 250 patients with acute myocardial infarction and 250 healthy subjects in the control group who did not have the mentioned disease and they were matched in terms of age and gender variables. The patients were those who referred to Intensive Care Units of Imam Khomeini teaching center in Tehran during 2003. Sampling was done by sequential non-probability sampling method and data were collected through interview. Statistical tests of T-test, chi-square and odds ratio were used in this study. The alpha level error in the tests was considered at 0.05. The mean age of them was 54.8 years. The most common type of oil used in two studied groups was herbal oils. Beer consumption was significantly higher in the experimental group than that in the control group. Also, the odds ratio of beer consumption was 1.1. Daily coffee consumption did not differ between the two groups, but daily tea consumption in the experimental group was higher than that in the control group. Daily consumption of fish, eggs, raw and cooked cereals, high-fat foods, vegetables and sugars did not differ significantly between the two groups. However, the consumption of dairy and fresh fruit was significantly higher in the control group. Thus, the need for a proper diet to prevent cardiovascular disease has been emphasized and by increasing public knowledge, we can encourage them to choose a proper diet.

Sharma et al conducted a study entitled "Nutritional knowledge promotes nutritional behaviors in all food groups except for fruits and vegetables" to investigate the relationship between nutritional knowledge and nutritional behavior in Mexico. A total of 1007 residents of Pasodel were randomly selected first through phone with the inclusion criterion of 18-60 years old. Finally, 963 participants were selected. A questionnaire including 83 items of nutritional knowledge, nutritional behavior, and knowledge of size of shares was provided to them. In the nutritional knowledge section, questions were asked about the minimum number of proposed share of meat, cereals, fruits, vegetables, dairy products and daily consumption of them. The results showed that less than one-third of the subjects had knowledge about the level of food shares and consumed less than half the recommended level. The mean consumption of cereals, fruits and vegetables, dairy, meat, and beans was 2.2, 2.5, 1.9, 1.5, and 3, respectively. Only 8.2% of the subjects consumed the recommended level of fruits and vegetables and there was no significant relationship between the level of knowledge and consumption of fruits and vegetables. The results showed the need for nutrition educational programs to promote

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nutritional behavior (pp. 361-367). The objective of this study was to investigate the nutritional behaviors in patients with myocardial infarction and the need for planning for training based on the results (Holmes,2005). It seems that the implementation of counseling programs to modify and control risk factors can decrease mortality and relapse related to it (Shills, 2006). The constant involvement of heart patients with their symptoms makes it a necessity to conduct extensive studies on effective strategies to reduce the complications of the disease (Shafipour 20011). Also, as no domestic and foreign study was found to address the concept of nutritional counseling by nurses and its role in modifying nutritional behaviors, the present study was designed in this regard to provide nutritional counseling program to patients with myocardial infarction and evaluate its effects on their nutritional behavior. We hope that modifying nutritional habits to reduce the incidence of heart attacks and reduce disabilities and medical costs.

Materials and Methods

The present study is a randomized clinical trial conducted to investigate the effect of nutritional counseling program on nutritional behavior in patients with myocardial infarction. The research environment was CCU and cardiac wards of Tehran University of Medical Sciences and the research subjects included patients with acute and persistent myocardial infarction who referred to hospitals affiliated to Tehran University of Medical Sciences during 2014 and admitted to CCU and cardiac wards. In the sampling process, the eligible individuals with their written consent who met the inclusion criteria were included in the study and randomly assigned to one of two control and experimental groups. The research inclusion criteria included the definitive diagnosis of myocardial infarction for the first time by a cardiologist, hospitalization in cardiac or intensive care units, stable hemodynamic status of the patient, lack of receiving nutritional counseling from another person). During the sampling, the first eligible individuals were entered into the study after that researcher provided complete explanations of the research objectives and obtained their informed consent. Sampling continued until the desired sample size was reached. The researcher measured the nutritional behavior of the subjects with research tools before and two months after nutritional

Specific diet	Experimental group (n=60)	Control group (n=60)

counseling. The researcher also provided the content of nutritional counseling. It included emphasizing the effectiveness of diet-related measurements (assessing food intake, etc.) in drawing the patients' attention and guiding them to improve cardiovascular disease, providing practical and specific information that patients and their families can use them to make diet changes and control these changes. The control group received routine care, which included explaining the patient's medicine prescription and recommendation to refer to a physician at the time announced for the next visit. Accordingly, nutritional behavior was evaluated and compared in 120 patients with myocardial infarction. The independent variable in this study was myocardial infarction and the dependent variable was nutritional behavior. The data collection method in this research was self-reporting and the data collection tool was a two-section questionnaire. The first section includes demographic information (age, gender, level of education, and type of myocardial infarction). The second section was related to the incidence of clinical symptoms and the death of patients. Content validity was used to assess its validity. Nutritional behavior is measured by the MEDFICTS diet scale. A MEDFICTS questionnaire is a self-reporting tool used for assessing food behavior. The collected data were analyzed through SPSS version 21 software.

Results

Among the studied subjects, 48 (80%) in the experimental group and 33 (55%) in the control group did not have any specific diet. One-sample K-S test revealed that the data follow a normal distribution and the result of the Chi-square test revealed a significant relationship between the duration of the disease and the studied groups (P-value = 0.05).

In table 1 Frequency distribution and statistical comparison of the subjects according to a specific diet in myocardial infarction patients in experimental and control groups

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Yes	12 (20.0 %)	27 (45.0 %)
No	48 (80.0 %)	33 (55.0 %)
P-value	0.05	
Odds ratio	0.136-.688	
Relative risk	306.0	

In table 2, Frequency distribution and statistical comparison of studied myocardial infarction patients in experimental and control groups based on the duration of disease

Duration of disease	Experimental group (n=60)	Control group (n=60)
No history of disease	27 (45.0 %)	24 (40.0 %)
1-5 years	14 (23.3 %)	17 (28.3 %)
5-10 years	13 (21.7 %)	13 (21.7 %)
10-15 years	3 (5.0 %)	6 (10.0 %)
15-20 years	3 (5.0 %)	0 (0 %)
P-value	0.373	

The table above shows that 14.3 (23.3%) of the subjects in the experimental group and 17(28.3%) of the subjects in the control group had a history of other diseases for 1-5 years. One-sample K-S test revealed that the data follow a normal distribution and the result of the Chi-square test showed no significant relationship between the duration of the disease and the study groups, so the groups were homogenized in terms of duration of disease (P-value = 0.373).

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In table 3, Mean and standard deviation of MEDFICS questionnaire scores in the study groups before and after intervention in myocardial infarction patients (2014)

MEDFICS questionnaire score	Experimental	Control	P-value
	Mean±SD	Mean±SD	
Before intervention	8.2 14±.43	2.5 18±.43	913.0
After intervention	62.07 4±.6	4.3 22±.65	<0.001

In the present study, MEDFICS questionnaire score was 43.2 ± 14.8 before the intervention and 6.07 ± 4.62 after intervention in the experimental group. MEDFICS questionnaire score was 43.5 ± 18.2 before the intervention and 65.3 ± 22.4 after intervention in the experimental group. The result of the t-test showed a significant difference between the mean scores of MEDFICS questionnaire before and after the intervention in the experimental and control groups. As seen, the mean score of the MEDFICS questionnaire decreased after the intervention.

In table 4, Frequency distribution and statistical comparison of the subjects according to MEDFICS questionnaire score after intervention in myocardial infarction patients in experimental and control groups (2014)

Nutrition score levels	Experimental group (n=60)	Control group (n=60)
step2	60 (100.0 %)	8 (13.3 %)
step1	0 (0.0 %)	28 (46.7 %)
High fat	0 (0.0 %)	24 (40.0 %)
P-value	<0.001	

Based on the data obtained from the MEDFICS questionnaire after the intervention in the experimental group, it was found that all subjects with a high-fat diet were in step 1 of diet and in the control group, 13.3% were in step 1 and 40% in the high-fat diet step. The results of the Chi-square test showed that there was a significant relationship between the MEDFICS questionnaire scores and the study groups after the intervention (P-value <0.001).

In table 5, Logistic regression analysis (Multivariate Analysis) in myocardial infarction patients in the experimental and control groups (2014)

Variables	Confidence interval	Confidence interval	P-value
Duration of disease	0.588	0.0-349.990	0.046
Using specific diet	0.101	0.0-028.366	<0.001
Cholesterol level	1.013	1.1-003.024	0.013

In this study, logistic regression analysis showed that among all the variables studied, economic status, duration of disease, use of specific diet in the last two months, and cholesterol level were factors that could independently affect two study groups. Cox & Snell R Square coefficient was obtained at 0.335.

Discussion

The highest percentage of subjects was female (61.7%) in the experimental group and male (53.3%) in the control group. The highest percentage of the marital status of the subjects was married in both experimental (75%) and control (73.3%) groups. Job status of the highest percentage of subjects in the study was housewives in the experimental group (38.3%) and retired in the control group (40%). Most of the subjects in the experimental group (55%) and the control group (58.3%) had no history of hospitalization in cardiac care units. Most of the subjects in the experimental group (51.7%) and the control group (60%) had no other disease history, but in terms of disease type, the majority of the subjects in the experimental group (26.7%) and control group (28.3%) had a history of HTN. The highest percentage of disease duration in the subjects of the experimental group (23.3%) and control group (28.3%) was 1-5 years.

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Tables 3, 4, and 5 were used to test the hypothesis. As seen in Table 3, the two groups had no significant difference in terms of nutritional behavior before intervention (P = 0.913). However, the educational intervention changed the nutritional behavior of the subjects of the experimental group compared to the subjects of the control group after the intervention, which was statistically significant (P <0.001) (Table 3). Thus, the first hypothesis study that states there is a difference between the nutritional behaviors of patients before and after the clinical trial is confirmed. The study conducted by Vincent et al (2013) under the title of "Diet intervention by a nurse to maintain the heart-healthy diet pattern of myocardial infarction patients" based on the Independent T-test showed that there was no significant difference between nutritional behaviors of experimental and control groups before intervention. However, in the experimental group, after eight weeks of nutritional intervention provided by nurse, significant changes in the diet of myocardial infarction patients were observed, so that consumption of saturated fat and high-salt foods and preservatives (P <0.001) decreased, and consumption of heart-healthy food increased. Their results were in line with those of the present study (P<0.001).

In a study conducted by Tabiei (2005) under the title of "The effect of workshop training on nursing knowledge and attitude of nursing staff of Birjand University of Medical Sciences Hospitals", results showed that the mean level of knowledge and attitude of nursing staff about milk and dairy consumption, balance and variability of diet, nutrition of hypertensive diabetes patients, and weight gain showed a significant difference before intervention, immediately after, and three weeks after intervention (P <0.001). The above-mentioned research showed that nutrition education and counseling enhanced the nurses' knowledge of nutritional issues such as milk and dairy consumption, balance and variability of diet, nutrition in hypertensive and diabetes patients, and weight gain after intervention, and given the effective role of nurses in patients' nutrition, providing the necessary training on modifying nutritional behavior and lifestyle will have a major role in choosing the right diet. The results of the present study, which showed changes in nutritional behavior of patients before and after a clinical trial, are consistent with the results of this study, but the population of this study was staff, while in our study, the population included myocardial infarction patients.

The study conducted by Koohpayezadeh et al (2006) under the title of "Investigating the relationship between nutritional factors and acute myocardial infarction" showed that the most common type of oil consumed in the two groups was herbal oils, but the daily intake of tea was higher in the experimental group compared to control group. The daily intake of fish, eggs, raw and cooked cereals, high-fat foods, vegetables, and sugars did not differ significantly between the two groups, but the control group consumed significantly more dairy and fresh fruit. The results of this study revealed an increased risk of myocardial infarction in those who consumed red meat, butter and coffee and a reduction in the risk of myocardial infarction those who consumed fish, carrots, fresh vegetables, and fruits compared to the control group. In this regard, these results are in line with those of the present study. Thus, the necessity of proper diet in preventing cardiovascular disease is emphasized and nutritional counseling program can be effective in choosing the proper diet for heart patients.

Conclusion

The research hypothesis that states the nutritional behavior of patients improves after implementation of the nutritional counseling program is accepted with a 95% confidence interval.

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Conflict of interest

The authors declare that there is no conflict of interest

Consent for publication

We obtained informed written consent from all participants

Availability of data and material

The data used to support the findings of this study are available from the corresponding author upon request

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Authors' contributions

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SE, SG, MZ and AK contributed in designing the study AK, MZ,SG and SE collected the data, and analyzed by AK, SE,SG and MZ. The final report and article were written by SE, AG, MZ and AK and the paper were read and approved by all the authors

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