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Investigating the Effect of Home Nursing Care on Lifestyle Modifications and Medication Compliance in Patients after Myocardial Infarction

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Quantitative Study

Abstract

Background: Nursing care leads to the continuation of healthcare and care services, reduces the risk of disease recurrence, and helps the patient to continue to lead a relatively normal life. The purpose of the present study was to determine the effect of home nursing cares on improving the lifestyle of patients after myocardial infarction (MI) in Farshchian Heart Hospital in Hamedan, Iran.

Methods: This research was a quasi-experimental study on 60 patients after MI. The participants were selected using convenience sampling method (30 individuals in the experimental group and 30 individuals in the control group). The experimental group received home nursing care for 3 months after hospital discharge. They were evaluated 6 months after intervention. However, the control group did not receive any interventions. Data were collected using the Lifestyle Questionnaire and analyzed using multivariate analysis of covariance (MANCOVA) in SPSS Software.

Results: The findings showed that patients with a history of MI who underwent home nursing care had significantly improved their lifestyle compared to the control group ($P < 0.01$).

Conclusion: It can be concluded that cooperation with the family and training patients with MI at home accompanied by drug therapy can effectively improve the lifestyle of these patients.

Keywords: Home nursing care, Lifestyle, Myocardial infarction

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Introduction

Due to the variations in people's lifestyle around the world, it seems that heart disease will surpass infectious diseases by 2020, and will be the chief cause of mortality and disability (Nishimura et al., 2014). Cardiovascular disease (CVD) is the most common cause of death throughout the world and in the United States (Dawber, Moore, & Mann, 2015). The World Health Organization (WHO) estimates that the number of deaths due to ischemic heart disease will increase from 1.7 million in 2002 to 11.1 million in 2020 (Dabek, Pyka,

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Piotrkowicz, Stachon, & Bonek-Wytrych, 2017), and it will be considered as the most important source of ill health, economic burden, and decreased production power by 2020 (Ye et al., 2016). According to the WHO, coronary, artery disease is considered as the prominent cause of death in Iran (World Health Organization, 2002). Ischemic heart disease is almost always chronic (Lie, Arnesen, Sandvik, Hamilton, & Bunch, 2010), and in addition to its effect on mortality rate, it affects the degree of disability, inability, and reduced productivity (Ye et al., 2016). There is a reverse relationship between physical activity and the risk of CHD and its resulting mortality (Runge, Patterson, Stouffer, & Netter, 2010). The adverse effects of immobilization include reduction of functional capacity, the risk of thrombosis formation, hemodynamic changes, and changes in the size and function of the heart (Mangiafico, Costello-Boerrigter, Andersen, Cataliotti, & Burnett, 2013). Immobilization is one of the modifiable factors of CHD (Runge et al., 2010). Lifestyle changing programs can help thwart and control heart disease (Todaro, 2010). Moreover, behavioral changes can improve the self-care process in patients, in particular those with heart diseases (Lie et al., 2010). The risk of death in individuals with high physical activity is 30% lower than that in individuals with very low physical activity (Runge et al., 2010). Lifestyle modification programs involve exercise, nutrition, stress management, psychiatric counseling, and social support programs (Todaro, 2010). We consider any kind of physical movement resulting from the contraction of skeletal muscles as physical activity such as exercise, gardening, dancing, and walking, which results in an increase in energy consumption from the base level (Runge et al., 2010). Exercise and activity intolerance is one of the clinical symptoms of CHD (Lie et al., 2010). In addition, patients are interested in returning to their previous daily physical activity levels (Adams, Cline, Reed, Masters, Ehlke, & Hartman, 2006). Cardiac rehabilitation can help the patient return to the previous level of activity, decrease risk factors, and lessen the incidence of heart attacks (Mangiafico et al., 2013). Similarly, cardiac rehabilitation improves the patient's performance (Lie et al., 2010), decreases mortality rate up to 20-25% in middle-aged people (Mangiafico et al., 2013), and improves the profile of risk factors for CHD (Kargarfard, Basati, Sadeghi, Rouzbehani, & Golabchi, 2011). The American Heart Association identifies the essential components of heart rehab as the following elements: controlling lipid levels, regulating blood pressure, quitting smoking, regulating body weight, controlling diabetes, and doing physical activity (Mangiafico et al., 2013). The diet has a major influence on the growth and development of cardiovascular diseases (CVDs). Having a low-fat diet, consuming unsaturated fats, vegetables, and fruits and cereals (Lie et al., 2010), and low-fat dairy products, and lowering the sodium intake are helpful in this regard (Wilson et al., 2009). In Iran, CVDs are also the principal causes of mortality (Ettehad et al., 2016). Moreover, during recent years, many researchers have focused on the family as the first and most important foundation of the social system. This system has special roles, culture, and structure that represent the physical, psychological, cultural, and social health of its members (Mega et al., 2015).

Treatment and control of a heart disease necessitate the use of appropriate therapeutic methods such pharmacotherapy, family therapy, community therapy, and rehabilitation. Therefore, providing a home care plan, in addition to reducing the length of hospitalization, leads to continuation of treatment and care services and reduction of the likelihood of disease recurrence, and the patient can continue to have a relatively normal life (Kitsiou, Pare, & Jaana, 2015). Home care programs have increased in response to an upsurge in the number of

heart patients in the community. One of the reasons for this rapid growth is the confirmed efficiency of home care among cardiac patients in dealing with the needs of these patients, which has been proven by the increasing efficiency and effectiveness of this method (Holden & Mickelson, 2013).

Nevertheless, it should be noted that the value of efficiency alone is not the basis for the provision of home care, but, in fact, the best reason for the provision of such care services is that this method is a humanitarian method whereby they can afford health care and support services (Chen, Tsai, Wu, Lin, & Lin, 2015).

Nursing is considered as maintaining, promoting, and optimizing health and capabilities, preventing diseases and harm, relieving suffering and pain during the diagnosis and treatment, and supporting individuals, families, communities, and humans through care. Care is a beneficial collaboration between the nurse and the patient, which is offered to the patient with the purpose of promoting awareness. The feeling of relief and comfort (Meleis, 2011), as a nursing principle and essence, has a superior status (McEwen & Wills, 2017), which leads to the high esteem, and sense of commitment and accountability of the nurse (Karaoz, 2005). The science of care consists of art and humanity. In fact, this science represents the experiences, phenomena, and process of care, and has biological, physical, psychological, cultural, social, and environmental dimensions that need to be studied in order to provide the patient with comprehensive care (Karaoz, 2005).

Nurses should understand their role in creating and expanding nursing care, provide nursing care based on qualitative documentation, and bring about a vibrant image of human experiences in the socio-cultural context of Iran. Valuable researches have been performed in relation to the process of nursing care; however, in Iran, no study has been conducted to explain the nursing care process. Consideration of and attention to the theoretical explanation of the nursing care process leads to the improvement of nursing care processes, especially regarding the cultural differences that exist with respect to nursing care in Iran. In addition, the production of professional knowledge, and promotion of patient health lead to greater satisfaction in patients and nurses.

Methods

This research was a semi-experimental study. The statistical population of this study consisted of all patients who had a history of it myocardial infarction (MI) and were hospitalized in Farshchian Heart Hospital in Hamedan, Iran. Through convenience sampling method, 60 patients were selected as the study participants after a heart attack (30 individuals in the experimental group and 30 others in the control group). Home nursing care was provided to the experimental group participants for 3 months after being discharged from the hospital. They were evaluated 6 months after the cessation of the intervention.

In the experimental group, patients with a history of MI after being discharged from the hospital were under nursing care for 3 months. Once in a week, the patient was examined by the nurse at home. The home nursing care program included patient assessment, provision of patient and family training programs, intervention in the environment including modification and improvement of the patient's living environment so that there is a treatment environment for the patient, and training on how to use drugs and monitor drug use. In order to evaluate the effect of home care for a longer period, the patients were also evaluated 3 months after the completion of home care (6 months after starting home care). In order to select the subjects in the control group, first, after homogenization in terms of demographic characteristics such as age, sex, education, occupation, and disease

duration, and they were evaluated 3 and 6 months after hospital discharge. In the control group, no special intervention was provided for the patients by nurses after discharge. The assessment criteria regarding the effect of home nursing care included the frequency of hospitalization, drug administration method, and the frequency of relapses. Furthermore, the control group was evaluated like the experimental group. The study inclusion criteria included ischemic disease or proven heart failure, age of less than 70 years, and low to moderate risk-taking, and an ejection fraction of more than 40-30%, and a ethical consent signature for participation in this research. The exclusion criteria were not being within the considered age range .

The cardiac rehabilitation course lasted for 8 weeks, 3 sessions a week, and each session lasted for 20-60 minutes. Each session included 5 minutes of warm-up, 10-30 minutes of the main exercise phase, and 5 minutes of cooling down exercises. The main phase of the exercise consisted of aerobic exercise and walking 3 times a week, and each time lasted 30 to 45 minutes. The exercise time and intensity were increased from the first to eighth week. Heart rate, blood pressure, and electrocardiogram (ECG) changes were controlled during exercise. The need for dietary change and modification was taught during the nutrition counseling before the beginning of this study. A psychiatrist provided the participants with advice regarding lifestyle and behavior modification, and smoking cessation before starting the study. Patients completed the demographic questionnaire and consent form before the beginning of the research.

Lifestyle Questionnaire: This questionnaire consists of 70 items and has been constructed and validated by Lali, Abedi, and Kajbaf in 2012 to evaluate 10 different dimensions of lifestyle (physical health, exercise and fitness, weight control and nutrition, prevention of diseases, psychological health, spiritual health, social health, avoidance of drugs and narcotics, prevention of accidents, and environmental health). The items are scored on a 6-point Likert scale ranging from *completely disagree* to *completely agree* (1-6, respectively). To obtain scores for each dimension, the total sum of the scores of the questions related to that dimension were calculated. In their research, Lali, Abedi, and Kajbaf confirmed the construct validity of the Lifestyle Questionnaire by using factor analysis as a multidimensional tool for assessing and measuring lifestyle. Cronbach's alpha coefficient for the whole instrument was 0.82 and for its subscales ranged from 0.64 to 0.91.

Data analysis was performed using multivariate analysis of covariance (MANCOVA) and in SPSS Software (version 22, IBM Corporation, Armonk, NY, USA).

Results

The results showed that the mean age (standard deviation) of the experimental group was 54.7 ± 6.1 and that of the control group was 52.5 ± 5.5. In terms of gender, 18 (60%) participants were women and 12 (40%) participants were men. In terms of education, the highest percentage (49.8%) had diploma and were unemployed. The duration of the disease in 50% of subjects under study was less than 1 year. Descriptive findings of lifestyle variables in the experimental and control groups are presented in table 1.

Levene's test was used to examine the assumption of equality of variances in the experimental and control groups for testing analysis of covariance (ANCOVA). The results of Levene's test show that, according to the significance level of this test ($P > 0.05$), the assumption for equality of variances is met.

MANCOVA was used to examine the differences between the two groups regarding lifestyle. The evaluation of the data feature showed that the statistical assumption of the variance-covariance matrices for lifestyle (Box's $M = 13.91$; $P > 0.05$) was established, and therefore,

Table 1. Descriptive findings of lifestyle variables in the experimental and control groups

Variables	Pretest		Posttest	
	Control group	Experimental group	Control group	Experimental group
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Physical health	29.73 ± 8.1	30.44 ± 8.2	31.65 ± 7.7	40.55 ± 4.66
Sport and fitness	22.36 ± 5.57	23.88 ± 6.31	23.46 ± 6.80	30.77 ± 4.96
Weight control	22.51 ± 4.86	23.11 ± 5.16	24.18 ± 5.62	29.70 ± 6.67
Prevention of disease	27.59 ± 5.23	28.40 ± 6.19	29.04 ± 6.28	37.90 ± 7.22
Psychological health	28.40 ± 8.53	27.27 ± 7.12	28.14 ± 8.72	35.50 ± 5.47
Spiritual health	24.63 ± 7.18	23.81 ± 6.95	24.97 ± 7.53	30.20 ± 8.97
Social health	27.76 ± 7.02	28.84 ± 7.02	27.78 ± 8.12	34.59 ± 7.75
Avoidance of drugs and narcotics	25.28 ± 5.97	26.18 ± 5.43	26.22 ± 6.16	33.91 ± 3.40
Prevention of accidents	33.72 ± 5.46	33.34 ± 5.68	34.40 ± 5.59	44.83 ± 4.02
Environmental health	25.69 ± 4.44	27.60 ± 4.71	26.87 ± 5.71	36.37 ± 6.87

Wilks' Lambda index was used to assess the significance of the multivariate effect. Wilks' Lambda index showed that the effect of the group on the linear combination of dependent variables was significant (partial $\eta^2 = 0.51$, $P < 0.001$, $F = 7.99$). In other words, there is a statistically significant difference between the experimental and control groups in at least one of the components of lifestyle.

The results presented in table 2 show a significant increase in the mean and standard deviation of different lifestyle domains in the experimental group compared to the control group; thus, it seems that home nursing care has led to the improvement of participants' lifestyles. The results presented in this table indicate that the mean scores of the participants in the experimental group were significantly increased compared to the control group in all of the lifestyle subscales including physical health, exercise and health, weight control, disease prevention, psychological health, spiritual wellbeing, social health, avoidance of drugs and narcotic, prevention of accidents, and environmental health. According to this table, the greatest difference in mean scores was, respectively, related to the subscales of physical health with an effect size of 0.52, weight control with an effect size of 0.5, prevention of diseases with an effect size of 49.9, exercise and well-being with an effect size of 0.48, spiritual health with an effect size of 0.44, psychological health with an effect size of 0.39, avoidance of drugs and narcotic with an effect size of 0.38, prevention of events with an effect size of 37.0, environmental health with an effect size of 0.35, and social health with an effect size of 0.34.

Table 2. The results of analysis of covariance of dependent variables scores in the experimental and control groups

Variables	SS	df	MS	F	P
Physical health	962.67	1	962.67	20.85	0.0001
Sport and fitness	82.10	1	82.10	5.00	0.0300
Weight control	2466.13	1	2466.13	47.97	0.0001
Disease prevention	168.03	1	168.03	7.26	0.0100
Psychological health	90.13	1	90.13	5.21	0.0100
Spiritual health	192.53	1	192.53	16.27	0.0001
Social health	2568.48	1	2568.48	48.11	0.0001
Avoidance of drugs	186.26	1	186.26	8.39	0.0100
Prevention of accidents	97.68	1	97.68	5.69	0.0100
Environmental health	204.53	1	204.53	16.98	36.37

SS: Sum of squares; df: Degree of freedom; MS: Mean of squares

Discussion

The present study results showed that home nursing care improved the lifestyle of in patients of Farshchian Hospital of Hamedan after MI. This finding is consistent with the results of the study by Farzadmehr, Fallahi Khoshknab, Hosseini, and Khankeh (2016) on the effect of nursing counseling on anxiety and satisfaction of the family members of patients in the cardiac care unit (CCU) for heart surgery. It is also in line with the results of the research by Farzadmehr, Fallahi Khoshknab, Hosseini, Khankeh, and NoorAbadi (2015) on the effect of nursing counseling on the satisfaction of family members of patients hospitalized in the special care unit for heart surgery.

In explanation of the findings of this research, it can be said that home nursing along with family training, emphasis on family therapy, and the assessment of patient's living conditions improves the patient's and his/her family's welfare and comfort, provides easy access to healthcare and counseling services, answers their questions, and increases their knowledge, and therefore, is better able to control the disease. Training programs for relatives of a patient during nursing care at home increase their awareness of heart disease as a disease, and make the way of dealing with it and their approach to this illness more optimistic. With more participation on the part of family members, the family's welfare and relief will increase. Moreover, lifestyle is the most important factor by which individuals regulate their life. It seems that changes in the lifestyle of heart patients have provided them with psychological and physical health. Nursing care at home leads to a regular, accurate, and scientific manner of continuation of the treatment, care, and rehabilitation of cardiac patients after hospital discharge, maintains the relationship between the healthcare team, family, and patient care, and maintains an easy access to and contact with healthcare and treatment services for heart patients (Farzadmehr et al., 2015). Various studies conducted in this regard also showed the efficiency and influence of nursing care at home.

In general, according to the results of the present study, it can be concluded that the expansion of nursing services at home for patients with heart disease is very effective because it reduces the length of hospitalization and risk of disease relapse, and renders the importance of the pharmacotherapy more comprehensible for the patients and their families. As a result, it prevents the cessation of and irregular medication intake. The use of this method in health planning can have valuable results. Nevertheless, presently, this service is not receiving much attention. Even in nursing training programs, despite the emphasis on a community-based nursing, the importance of nursing at homes is not well understood and students do not benefit from such educational programs. Regarding the results of this research and the existing statistics and figures in our country about the increase in the number of patients with MI, educational planning should be such that patients can be cared for at home and services can be provided easily to the different segments of the society (Varnfield et al., 2014). The growth of home nursing care results in easy access to care and provides follow-up, treatment, and rehabilitation services to heart patients. Nursing training in line with home care programs increases nurses' scientific and practical ability, and will be effective in the implementation of mental health programs in the community.

This research, like any other research, has some limitations. The first restriction of the present research was that the period of research implementation was limited to the posttest, and due to time constraints, a follow-up period was not considered. For this reason, it was not possible to examine and provide results after the posttest and the results' durability. Moreover, as the statistical population of this research was limited to patients who had a history of MI and were

hospitalized at Farshchian Heart Hospital, it is not logical to generalize the results to other patients. The next limitation was that other possible variables affecting the results were not controlled. Due to the limitations mentioned, it is suggested that, in subsequent studies, the follow-up phase be added to the study and the results be evaluated in intervals of several months after the end of the treatment. Furthermore, in future researches, through a review of literature, the potentially effective variables should be identified and, by timely evaluation of and attention to the impact of these variables, they should be controlled through one of the methods of research control or statistical analysis.

Conclusion

It can be concluded that cooperation with patients' families, the training of patients with MI, and administration of pharmacotherapy at home can improve patients' lifestyles.

Conflict of Interests

Authors have no conflict of interests.

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