ORIGINAL ARTICLE

The Effect of Evidence-based Education on Self-care Behaviors in Patients with Congestive Cardiac Failure: A Clinical Trial Study

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Abstract

Background and Objective: Heart failure is a chronic and disabling disease that continues to increase despite medical advances. One of the important and non-pharmacological strategies to improve clinical outcomes in these patients is to promote self-care behaviors using the latest scientific evidence. Therefore, the objective of this study is to determine the effect of evidence-based education on self-care behaviors in patients with congestive cardiac failure. **Materials and Methods:** This clinical trial was performed on 104 patients in the coronary care unit (CCU) and post-CCU ward of Imam Khomeini Hospital in Islamabad, Iran, in 2016. The qualified patients were randomly divided into two groups: Control and intervention groups. Initially, a pre-test was performed on both the groups. Patients in the control group receive routine education. Patients in the intervention group received three education sessions that were prepared based on the latest scientific evidence. After 2 weeks, the patients were followed-up with phone on observing self-care behaviors. After a month, the questionnaire was completed by control and intervention groups. **Results:** The mean (standard deviation [SD]) of scores in the first and second-order control groups were respectively equal to 41.44 (4.17) and 41.34 (4.3) and the mean (SD) in the intervention group before and after education were equal to 42.73 (4.37) and 30.86 (3.7). Paired *t*-test showed a significant difference between the intervention group before and after education (*P* value = 000). However, the group did not find any significant difference in the control group (*P* value = 0.364). A significant level of $P < 0.05$ was considered. **Conclusion:** Evidence-based education can be used as an effective educational method for improving self-care behaviors in patients with heart failure.

Key words: Evidence-based education, heart failure, self-care

INTRODUCTION

Cardiovascular disease is one of the most common causes of death and disability in the whole world.[1] One of the most common cardiovascular disorders is congestive cardiac failure which is a chronic and disabling disorder.[2] Clinically, congestive cardiac failure is a complicated syndrome in which the heart is unable due to a disorder in heart performance and heart is unable to fill and pump it put according to the needs of the body's tissues, which has physical and psychological symptoms such as dyspnea, weakness, fatigue, chest pain, edema, depression, and sleep disorders.[3]

Cardiovascular diseases are the first causes of death in Iran, which lead to much health, economic, and social costs.[4] Heart failure is one of the main problems in public health due to the cost of treatment, and this is associated with a decrease in quality of life, high rate of death, and frequent hospitalization.[5] With the process of aging, the prevalence

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of congestive cardiac failure increases; in the way that, 10–20% of people over 80 are suffering from heart failure. All cardiovascular diseases can lead to heart failure. New medical and surgical treatments have led to an increase in life expectancy of these patients.[6] Different studies have shown that 50% of patients with heart failure do not consider their treatment recommendations, and this problem leads to their rehospitalization and also heart failure cases, many of which can be prevented by interventions for nursing education.[7] A study by Shojafard *et al*. 2009 showed that education and interventions are necessary to improve the quality of self-care behaviors in patients with heart failure and these can have an effective role in improving self-care behaviors and ultimately their quality of life.[8] Self-care is defined as a process for maintaining health and management of the disease. It covers behaviors that reduce the symptoms of illness and improve the health of patients.[9] Self-care has paramount importance among patients with chronic illness; in addition to improving the quality of life of these patients and their families, self-care behavior can help these patients to be effective in their comfort and increased performance. Self-care is very effective in patients with congestive cardiac failure because many of the health care of these patients is beyond the control of the health team.[10] Self-care behavior education significantly increases patient satisfaction and also can help them to be independent in daily activities and reduces stress and ultimately reduces disability in these patients.[11] Some self-care behaviors for these patients who suffer from heart failure include daily weighing, contact with the their doctor in the event of swollen legs, low salt diet, fluid intake, regular exercise, early detection of symptoms in the case of worsening, and timely intake of medication. Studies have shown that at least 50% of the rehospitalizations in these patients can be prevented.[12] Continuous scientific progress, along with the constant change in patients' condition, requires that nurses diagnose the patients' problems by combining their clinical skills and professional knowledge on the basis of scientific evidence, also design and implement a plan of care for meeting their problems, or in other words, provide evidence-based health care.[13] According to Sackett, evidence-based care means the use of research results, along with expertise, clinical experience, and considering patients' values in providing health-care services. Evidence-based education means to combine professional knowledge with the best available empirical evidence on how to provide a education plan.[14] A study by Case *et al*. in 2010 showed that evidence-based nursing in managing patients with heart failure in the intervention group is more effective than usual care for adhering to restrict the diet, drug regimens, reducing re-hospitalization, reducing death, and improving the quality of life.[15] In recent years, evidence-based care is emphasized on by policymakers of the health system as a way to improve health-care standards and also to improve health-care quality.[16] Therefore, the aim of this study is to investigate the effect of evidence-based education on self-care behaviors in patients with heart failure.

MATERIALS AND METHODS

This research is a clinical trial with semi-empirical randomized blinded experiment method with the code of IRCT2017021432565N1. This study has been conducted in 104 hospitalized patients in coronary care unit (CCU) and post-CCU ward of Imam Khomeini Hospital in Eslamabad-e Gharb, which is affiliated to Kermanshah University of Medical Sciences, Iran, in 2016. Inclusion criteria included having written consent for participation in the study; diagnosis of heart failure by a cardiologist; passing 4 months after diagnosis; echocardiography file in a hospitalization file with an ejection fraction rate of <40%; being more than 40-year-old, and a class two or three heart disease (according to the New York Heart Association). Exclusion criteria included patient death during the study and patient dissatisfaction to continue the collaboration. The method of blinded experiment was in the way that none of the patients knew about their group. The second researcher collected the data without knowing which patients were in the intervention or control group. The sample size was calculated 52 people in each group based on the study by Kabirian *et al*.[17] (who reported the mean and standard deviation of self-care score in the control and intervention groups in girls with dysmenorrhea as 76.6 ± 12.1 and 79.9 ± 9.1) and with the 95% confidence and 80% of statistical power and also by considering the difference of 6 scores between the two groups. Therefore, 104 subjects were considered as the sample in this study. At first, the patients were selected based on the inclusion criterion, were selected based on Convenience judgmental Sampling method, and were randomly assigned to the intervention and control groups based on age, sex, education level, and severity of the disease. Two questionnaires were used for data collection; these questionnaires included a demographic features questionnaire and a European questionnaire for self-care behaviors in patients with heart failure; the questionnaires included 12 questions and were evaluated based on 5-point Likert scale (always, most often, sometimes, rarely, and never). The tool has been used in many studies to measure the self-care behaviors of heart failure patients. It has been also used by Shojaei *et al*. 2009. Its validity has been assessed by content validity method, and also the reliability of the tool has been reported equal to 68% by Cronbach's alpha method.[18]

It was also reported equal to 81% in the study by Jaarsma *et al*. 2003 using an internal matching method.[19] Before the education, both groups were subjected to pre-test by the second researcher. The method was that the control group received routine education, which included oral advice during discharge. However, the patients received three education sessions in the intervention group, and each session was 30 min. During all stages of education, one of the family members accompanied the patient. The first session was performed on the 1st day of hospitalization, and necessary educations were provided for the patient and his/her family; the second session was performed during the hospitalization; and at last, the third education session was performed at the

time of discharging [Table 1]. At the discharging moment, a phone number was taken from the patient and the patient was contacted every 2 weeks to answer the questions about her/his illness and self-care behaviors. In total, the patient was contacted for 3 times. At the time of discharge, a booklet was provided to the patient in the intervention group which was prepared based on the latest scientific literature. Patient education was performed by the main researcher between 10 and 12 am (the patients were already visited and checked at this time, and also they were not asleep). A post-test was conducted on patients after 2 months and patients or their families were provided with the way of follow-up based on evidence-based education, and the latest research findings about their self-care were sent to them or their family through E-mail and Telegram. After collecting and entering the data, SPSS software version 22 was used to analyze data. Using descriptive statistics, the results of abstracting and reporting the distribution of frequency report of demographic and field variables in two groups were used. Independent *t*-test was used to compare the score of self-care and it was also used after test in both groups; furthermore, it was to compare the mean score of two groups after the intervention. Considering the pre-test scores, covariance test was used in both groups. Ethical considerations in this study included the following: Obtaining an ethical code from the Kurdistan University of Medical Sciences' Ethics Committee: IR.MUK.REC.1396.38; presenting the official letter of approval and taking the permission of Management of Kermanshah Educational Hospitals; presenting the official letter to the supervisor of CCU departments in Imam Khomeini Hospital; explaining the purpose and nature of the research to all the units under the study; obtaining consent from the units under the research to participate in the research; ensuring the confidentiality of the information obtained and the no need to mention the names and family names in the questionnaire; and optionality for participating in the research for the units under the study.

Findings

In this study, 104 patients with heart failure were studied based on the inclusion criteria. During the study, one of the subjects was excluded from the control group. The findings of the study showed that there was no significant difference between two groups in terms of age, sex, marital status, educational level, place of residence, occupational status, class of disease, and illness ($P < 0.05$) [Table 2].

The mean age of the participants in the study was equal to 60.9. Most of the patients (55.8%) were male. Most of the patients (65.4%) were married. Most male patients (19.2%) had free jobs. Most female patients (28.8%) were housewives. Most of the patients (53.8%) were illiterate. Most of the samples (53.9%) were city residents. Most people (51.9%) were in Grade 3 of the disease. The most common illness in both groups was diabetes and high blood pressure. Paired t-test results showed that there was no significant difference in the

Table 1: Education content for patients

Subjects	Education content
Blood circulation physiology and respiratory system	Anatomy and cardiac physiology, the nature of heart failure
	Blood circulatory system and oxygen exchange in the body
Pathophysiology of heart failure	Causes of heart failure, how to reduce EF and the outcomes of EF decrease
Medicines	The name and signs of the medication, the regular intake of the medication, Being aware of the side effects of the medications and the consequences of not taking or misusing the medication
A specific diet for heart failure patients	Low salt intake (up to 2 g) per day and fluid intake restrictions
Signs and symptoms foe worsening of illness	Shortness of breath, ankle edema, fatigue, weight gain, nausea, appetite loss, daytime sleepiness, dizziness
The time of referring to a doctor or health center	The worsening of symptoms (weight gain, increased shortness of breath and ankle edema, and dizziness)
Changing lifestyle	Regular exercise
	Changing eating habits
	Leaving the cigarette
	Weight loss
	Relaxation and stress management techniques
Symptoms control	Daily weighing
	Control of ankle edema, blood pressure, heart rate, and fatigue
Travel and regular exercise	Avoid climbing at elevations of more than 2000 m, ½ h of daily gentle exercise; avoiding exercising in cold, warm, and wet weather; avoiding of air travel if they are in Grade IV of the disease

Table 2: Demographic characteristics of two groups

Variable	Sub-group	Intervention	Control	*P*
Gender	Male	29 (55%/8)	29 (55%/8)	0.127
	Female	23 (44%/2)	23 (44%/2)	
Marital status	Married	31 (59%/6)	34 (65%/4)	
	Single	1 (1%/9)	0	0.165
	Widow	18 (34%/6)	17 (32%/7)	
	Divorced	2 (2%/8)	1 (1%/9)	
Employment status	Employee	4 (7%/7)	3 (5%/8)	
	Retired	9 (17%/3)	8 (18%/4)	
	Farmer	11 (21%/2)	8 (15%/4)	0.57
	Free	12 (23%/1)	10 (19%/2)	
	Housewife	10 (19%/2)	15 (19%/2)	
	Unemployed	6 (11%/5)	8 (15%/8)	
Education	Illiterate	28 (53%/8)	28 (53%/8)	
	Under diploma	15 (28%/8)	15 (28%/8)	0.304
	Diploma	8 (15%/4)	8 (15%/4)	
	University	1 (1%/9)	1 (1%/9)	
Leaving place	City	29 (55%/8)	27 (51%/9)	0.348
	Village	23 (23%)	25 (48%/1)	
	Class 2	25 (48%/1)	25 (48%/1)	
	Class 3	27 (51%/9)	27 (51%/9)	
Other illnesses	Diabetes	14 (37%/8)	10 (27%/)	
	Blood pressure	12 (32%/4)	10 (27%)	
	Blood lipids	4 (10%/8)	4 (10%/8)	
	Smoking	8 (21%/6)	6 (2%)	
Group		Mean±SD		
Age				
Intervention		10.11±64.94		0.279
Control		7.98±64.86		

self-care behaviors score in the control group before and after the test ($P > 0.05$). Furthermore, the results of *t*-test showed that there was a significant difference between the self-care behaviors score in the intervention group before and after the test ($P < 0.05$) [Table 3].

The results of covariance analysis showed that there is a significant difference between self-care behaviors in intervention and control groups before and after the intervention [Figure 1].

DISCUSSION

The results of this study showed that the implementation of evidence-based education improved self-care behaviors in patients with heart failure. However, in the review of literature, no study was found regarding the effect of evidence-based education impact of self-care behaviors in patients with heart failure; but several studies with similar and different outcomes have been conducted regarding the effects of different educational interventions on self-care behaviors in heart failure patients. The results of various studies have shown that education patients with heart failure can improve self-care behaviors in these patients. Shahriari *et al*. (2013) investigated the effect of family support on improving self-care behaviors; they found that family support education improves self-care behaviors in these patients, which is in line with the present study.[1] Moradi *et al*. investigated the effect of a follow-up care model on self- management of patients with heart failure and found that continuous care education could improve self-care behaviors in patients with heart failure, which is consistent with the results of the present study. The difference between this and the present study is the type of education.[20] Baker *et al*. in a study, examined the effect of the education on the self-management of primary dysmenorrhea in girls and found that this educational method improves self-care behaviors that are in line with this study.[2]

Table 3: Comparison of the mean score of self-care behaviors in the control and intervention groups before and after the test

Group	Mean±SD		T-statistics	*P*-value
	Before	After		
Intervention	42.73±0.61	34.31±0.45	21.35	0.000
Control	41.84±0.66	41.33±0.67	0.99	0.324

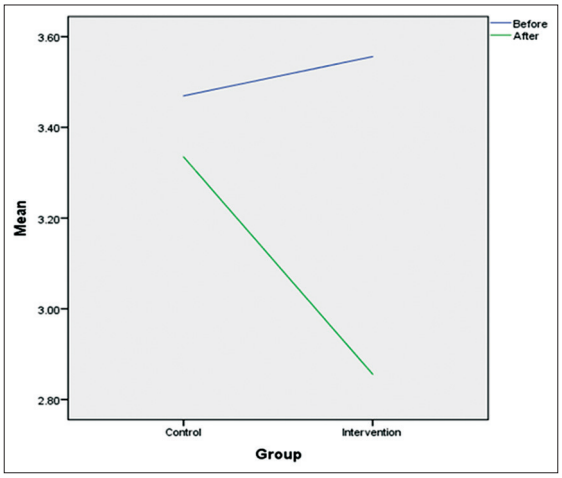

Figure 1: Comparison of the self-care score before and after the test in the control and experiment group

In a study, Shaw *et al*. investigated the impact of participatory care strategy, such as using of follow-up care model by telephone, which led to improvement in self-care in patients with heart failure. They found that there was a significant difference in self-care score before and after intervention in the intervention group. However, no significant difference was found in the control group, which is consistent with the present study.[21] In a study, Opusunju examined the effect of evidence-based education on knowledge and quality of knowledge and management of patients with mental disorders in relation with fatness. They found that these educations have led to an increase in awareness, a positive change in perception of fatness, and management knowledge in this patient.[22] Ross *et al*. also studied the effect of evidence-based education on decreasing pneumonia caused by ventilator and found that the increase in care for mouth based on scientific evidences in patients under mechanical ventilation can lead to a decrease in pneumonia caused by ventilator.[23] Rasul *et al.* also reviewed the effect of evidence-based education on nurses' knowledge of pain management after elective surgery and the satisfaction of patients. The results of this study showed that this education can increase nurses' knowledge about pain management and increase the time between injections of painkiller and also satisfaction of patients. The results of this study are in line with the present study. In a study, Seyed Rasouli evaluated the effect of applying principles of evidence-based nursing care on the incontinence of elderly women; he found that evidence-based care is effective for incontinence in the elderly people and there was a significant difference in the amount of urinary leakage, leakage times, and quality of life in the intervention group before and after the intervention.[24]

CONCLUSION

The results of this study showed that evidence-based education with better learning leads to improvement of self-care behaviors in patients with heart failure. Education interventions of self-care behaviors lead to increase in life expectancy, improvement of quality of life, and prevention of the disease progression, and also it reduces hospitalization rate. Regarding the fact that a set of factors are contributing to lack of self-care behaviors in heart failure patients, an organized education method should be used, and this necessitates the use of evidence-based education.

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