The Impact of a Hospital-Based Educational Program Based on the Health Belief Model on Self-Care Behaviors of Heart Failure Patients

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Abstract

Background: The empowerment of heart failure (HF) patients to improve self-care behaviors through appropriate training programs is necessary. Evidence has indicated a lack of theory-based trials in hospitals and healthcare centers, both of which represent important health promotion settings.

Objectives: This study aimed to examine the effect of a hospital-based educational program based on the constructs of the health belief model (HBM) on self-care behaviors of patients with HF.

Methods: This controlled quasi-experimental study consisted of 84 patients with HF (42 patients in an intervention group and 42 in a control group) who were admitted to two large, specialized, referral hospitals affiliated to Shiraz University of Medical Sciences, Shiraz, Iran from April to August 2015. The patients were selected using purposive sampling. Data on self-care according to the constructs of the HBM were collected using a European HF self-care behavior questionnaire and a researcher-made questionnaire.

Results: Before the intervention, the mean score for self-care behaviors was 30.69 ± 5.13 in the intervention group and 31.23 ± 5.48 in the control group. In the first and second post-tests of the intervention group, the mean scores for self-care behaviors were 39.47 ± 3.40 and 40.09 ± 2.91, respectively (P < 0.001). There was a significant increase in the determinants of self-care behaviors based on the HBM after the intervention. The results also pointed to a significant difference in the constructs of the HBM (knowledge, perceived susceptibility, severity, benefits, barriers, cues to action and self-efficacy) in the intervention group during different stages of measurement.

Conclusions: This study showed that implementation of the HBM-based educational intervention positively influenced the self-care behaviors of patients with HF. Thus, implementing long-term educational interventions, including continuous follow-ups, in inpatient treatment centers may result in improved and sustained self-care behaviors. We strongly suggest that novel trials of educational interventions that use other health behavior theories and training strategies are needed to expand training knowledge in hospitals.

Keywords: Hospital, Patient Education, Self-Care, Heart Failure

1. Background

Cardiovascular diseases are the most common chronic diseases and the main cause of death in most countries, including Iran (1, 2). Heart failure (HF), as one of the most common heart diseases, is a major public health concern throughout the world (3). Approximately 33 million people suffer from HF worldwide. This chronic heart disease affects nearly 4.7 million people in the U.S., which accounts for 1.5 - 2% of the U.S. population. Overall, about 550,000 individuals are diagnosed annually with HF (4).

Insufficient cross-training, a lack of awareness of patients and their families, incomplete adherence to medications and eating patterns, unhealthy lifestyles, absence of consistent treatment systems, and weak physician–patient and family–physician relationships can result in the readmission of HF patients and worsening of disease-related symptoms (4, 5).

Self-care is defined as a naturalistic decision-making process, which involves selecting behaviors that maintain physiological stability and responding to symptoms when they occur (6). The provision of self-care education on the need for regular physical exercise, adherence to a proper diet and medications, weight management, self-care of colds and flu, and the management of symptoms, such as ankle swelling and shortness of breath, can prevent the progress of HF (6-8). Effective interventions integrate strategies that motivate, empower, and encourage patients to make informed decisions and assume responsibility for self-care (9).

Generally, health behavior education aims at creating awareness, a positive attitude, and healthy behaviors in pa-

tients ([10](#)). To achieve these objectives and ensure the effectiveness of the training, after identification of a suitable environment, a needs assessment is done according to the patient's individual characteristics, symptoms, and previous information. Moreover, patients' cooperation and the utilization of behavioral change models provide a clear understanding of the effective factors in health behaviors. After planning and implementing the educational intervention, an evaluation, followed by a plan to eliminate observed defects, is of particular importance ([11](#)).

The identification and implementation of an effective educational self-care program can promote health and positively influence the patient's quality of life ([12](#), [13](#)). The aim of hospital-based health promotion and education, which is one of five major areas designated as a setting for health education, is preventive educational actions and health promotion, along with treatment measures ([14](#)). Trainees in hospitals have much room for improvement in their preventive behaviors and are more likely to practice these behaviors ([15](#)). During the critical time a patient spends in an intensive care unit, concern about the recurrence of heart events increases the patient's adherence to self-care behaviors. However, as the patient recovers, the rate of adherence will gradually diminish, which may result in symptom recurrence and readmission to the hospital ([16](#)).

The application of effective health education theories and strategies is necessary to increase awareness of and change attitudes toward self-care behaviors. The health belief model (HBM) was one of the first theories developed to explain health-related behaviors ([17](#)). This model is generally used to predict and analyze health-related behaviors in different levels of prevention. It has also ben used to assess mammography screening behaviors in cancer patients ([18](#)), promote self-care behaviors in HF patients ([19](#)), and prevent osteoporosis among female students ([20](#)).

A review of the literature indicated that existing studies on the education and training of patients with HF ([4](#), [5](#), [13](#), [21](#)) have addressed the importance of self-care behaviors ([6](#), [22](#)), need for effective training interventions ([7-9](#), [23](#)) and effective training environments ([14](#), [24](#), [25](#)), application of theories of behavior change ([17](#)), and use of the HBM to educate HF patients ([19](#), [20](#), [22](#)). However, there are no comprehensive studies of the impacts of hospital-based educational programs based on the HBM on HF patients' self-care behaviors. A review of the literature also showed no evidence of repetition of the hospital-based protocol.

2. Objectives

The present study aimed to examine the effect of a hospital-based educational program based on the HBM on

the self-care behaviors of HF patients.

3. Methods

3.1. Design

This controlled, quasi-experimental study involved HF patients who were admitted to specialized and referral hospitals affiliated to Shiraz University of Medical Sciences, Shiraz, Iran from the end of April to August 2015. This study was approved by the ethics committee of the university (No. IR.SUMS.REC.1394.17, 19 April 2015). The IRCT code and date are as follows: IRCT201506136261N11 4 November 2015.

3.2. Sampling and Data Collection

In the present study, of the 16 university hospitals in Shiraz, Namazi hospital and Shahid Faghihi hospitas were selected due to their similarity in being governmental, referral, educational, and specialized hospitals, having more than 400 beds, having more than 20 wards, and having cardio and CCU wards. To prevent information exchange between the patients, the cluster randomization unit was the hospital rather than individuals. Purposive sampling was used to select eligible patients for the study ([Figure 1](#)).

Following the protocols of previous studies, given a p value of 0.05, power (1 - β) of 80%, mean difference of 0.64, and standard deviation of 0.87 and 1.04, a 70-subject sample size was needed for the study (35 in each group). Considering a loss rate of 20%, the sample size was increased to 84, with 42 subjects assigned to an intervention group and 42 assigned to a control group. The sample size was estimated by [Equation 1](#) ([26](#)).

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

The following inclusion criteria were used to select patients for the study: having HF or a preserved ejection fraction equal to or less than 40; having the ability to read, write, and communicate with others; aged over 18 years; and having been diagnosed with the disease in the past six months. The exclusion criteria in the final analysis were unwillingness to cooperate in the study, failure to complete the questionnaires, leaving the study for personal reasons, and missing more than two training sessions or exams ([Figure 1](#)).

The data were collected before the intervention and two weeks and three months after the patient was discharged from the hospital. As the questionnaires were completed in small groups, and the patients were advised to ask the researcher about any ambiguities in the questionnaires, there were no missing values.
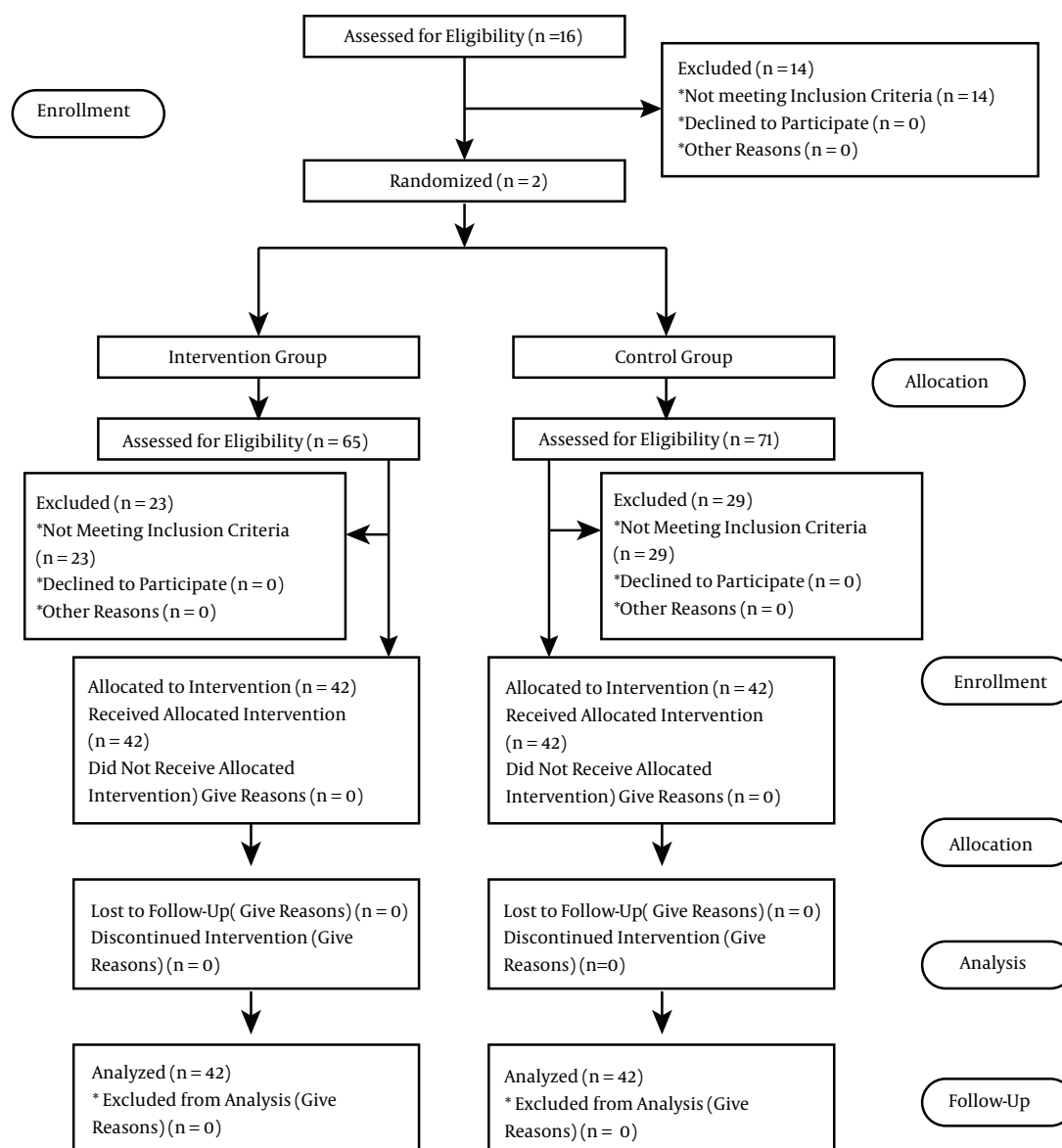
Figure 1. CONSORT Flow Diagram

3.3. Measurement Tools

The European self-care behavior HF questionnaire, developed by Jaarsma et al. (27) and translated into Persian by Siabani (25), was used to measure self-care changes among the patients with HF. This questionnaire includes 12 questions, four subscales on major aspects of self-care behaviors in HF patients, and six items on self-efficacy. The reliability of this questionnaire was confirmed earlier, with Shojaee et al., Momeni et al., and Ghanbari et al. reporting a Cronbach's alpha of 0.68, 0.71, and 0.83, respectively. In the present study, the Cronbach's alpha was 0.78.

Additionally, a researcher-made questionnaire was used to measure self-care changes according to the constructs of the HBM. In this questionnaire, the constructs of the HBM were assessed using a 5-point scale, with 1 denoting completely agree and 5 denoting completely disagree. The internal consistency of this questionnaire was confirmed by a Cronbach's alpha of 0.71. Its validity was approved by eight faculty members (CVI = 0.79, CVR = 0.77).

3.4. Intervention

The training intervention was conducted in four sessions. In the first session, which took place at the time of the patient's admission, the researcher greeted the patient at the patient's bedside and explained the objectives of the study. Then, written informed consent was obtained, face-to-face training was started, and the patient was provided with educational booklets for 20 minutes. In the second session, which took place at the time of the patient's discharge, the patient watched a 45-min educational video on self-care education and its importance. Two and six weeks later, the previous presentations were reviewed, and the researcher responded to the patient's questions in the clinic, with each session lasting 20 minutes.

3.5. Data Analysis

The study data were analyzed using SPSS statistical software, version 21. Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to describe the research data. The results of a Kolmogorov-Smirnov test revealed a normal distribution of the data. Therefore, an independent-samples t-test, a chi-square test, and a repeated measures ANOVA were used to examine the relationship between the variables. A value of $P < 0.05$ was considered statistically significant.

3.6. Ethical Considerations

This study was approved by the ethics committee of Shiraz University of Medical Sciences (No. IR.SUMS.REC.1394.17, date: 19 April 2015). Its IRCT code and date are as follows: IRCT201506136261N11 4 November 2015. Eligible patients were selected using purposive sampling. First, the study objectives were explained to the participants, and their written informed consent was obtained. The patients were assured about the confidentiality of their information. The patients then completed the questionnaires. Due to ethical considerations, the goals of the study were also explained to the control group.

4. Results

The response rate was 100% in this study. The mean age of the participants was 55.04 years, and 65.47% of the subjects were males. As regards education levels, 44.09% of the subjects were illiterate, and 33.33% had diplomas or academic degrees. Approximately 85.15% of the participants were readmitted to the hospital due to cardiovascular diseases. In the study group, 32.8% of the subjects had comorbid diseases, such as hypertension (16.4%), diabetes (14.1%), renal diseases (8.95%), and other chronic diseases (4.4%).

The results revealed no significant differences between the two groups regarding these variables.

As presented in Table 1, the results of the repeated measures ANOVA showed a significant difference between the intervention and control groups concerning the mean scores for knowledge and perceived susceptibility ($P < 0.001$). At the different measurement points, there was also a significant difference in the intervention group's mean scores for perceived severity, benefits, and barriers, cues to action and self-efficacy. In contrast, as shown in Table 1, no significant differences were observed in the control group in this regard ($P < 0.001$).

The mean score for self-care behaviors was 30.69 ± 5.13 in the intervention group and 31.23 ± 5.48 in the control group. In the first and second post-tests, the intervention group's mean scores for self-care behaviors were 39.47 ± 3.40 and 40.09 ± 2.91, respectively. The mean scores in the control group in the first and second post-tests were 32.28 ± 2.80 and 32.42 ± 2.86, respectively. The difference between the mean scores for self-care behaviors was statistically significant in the intervention group but not in the control group ($P < 0.001$), as shown in Figure 2.
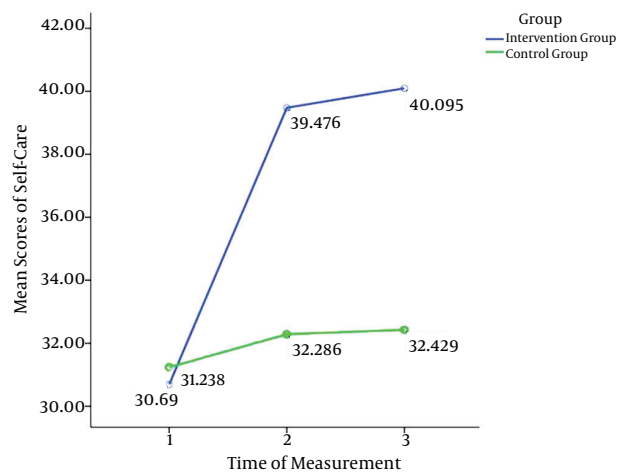

Figure 2. The Mean Scores for the Construct of Self-Care in the Intervention and Control Groups

5. Discussion

The finding of the present study revealed a significant difference in the knowledge of the intervention group. In the control group, there was also a slightly significant difference between pre- and post-test knowledge. These results are in accordance with those of earlier studies (8, 23, 28-30).

Table 1. The Mean Scores for the Constructs in the Health Belief Model (HBM) in the Intervention and Control Groups

Constructs	Group	Measurement					
		Pretest		Post-Test 1		Post-Test 2	
		Mean	SD	Mean	SD	Mean	SD
Knowledge	Intervention	35.07	5.49	46.47	2.71	47.11	2.15
	Control	35.59	5.79	36.78	2.71	36.78	2.71
Perceived susceptibility	Intervention	20.33	1.73	23.42	2.54	24.02	1.13
	Control	19.52	0.77	20.00	1.22	19.78	0.60
Perceived severity	Intervention	16.02	1.37	18.26	2.09	19.14	1.15
	Control	15.64	0.65	15.35	0.75	15.54	0.88
Perceived benefits	Intervention	19.97	1.71	23.14	2.44	23.90	1.26
	Control	19.42	0.85	19.28	0.80	19.33	0.81
Perceived barriers	Intervention	36.11	4.72	40.09	5.62	43.02	5.54
	Control	40.09	3.28	33.40	3.58	33.50	3.74
Cues to action	Intervention	23.85	2.89	29.14	2.73	29.14	2.73
	Control	23.14	1.21	24.71	1.38	24.71	1.38
Self-efficacy	Intervention	11.76	3.77	18.83	3.57	18.83	3.57
	Control	10.92	3.25	12.35	3.35	12.50	3.36

However, the current study results revealed no significant difference in the intervention group's perceived susceptibility. In contrast, there was a slightly significant difference in the perceived susceptibility of the control group between the pre- and post-test measurements. This finding is in agreement with the results of earlier studies (19, 31, 32). Our findings showed that the difference between the pretest and post-test mean scores for perceived severity was significant in the intervention group but not in the control group, in accordance with the results of previous research (19, 32, 33). Generally, a moderate or high perception of adverse effects of a health problem increases the rate of adherence to health behaviors (34).

The findings of the current study revealed a significant difference between the mean scores for perceived benefits in the intervention group, whereas no significant differences were observed in the control group in this respect. This finding is in accordance with the results of earlier studies (19, 29, 32, 35). The mean scores for perceived barriers were also significantly different in the intervention group but not in the control group (P > 0.001). Other researchers have reported similar findings (19, 29, 32, 35). Changes in the mean scores for self-efficacy were also significant in the intervention group but not in the control group (P > 0.001), as demonstrated in earlier studies (19, 29, 32, 35-38).

In the present study, the results revealed a significant

difference in the intervention group's mean scores for cues to action. However, no such difference was observed in the control group (P > 0.001). These findings are supported by those of previous studies (19, 36, 39, 40). Finally, the results demonstrated that the change in the mean score for self-care behaviors was statistically significant in the intervention group (P < 0.001) but not in the control group. These findings are in accordance with those of studies performed previously (8, 27, 41-43).

5.1. Strengths and Limitations

The strong point of this study was the training and follow up of the patients from the hospital to the clinic, as health care behaviors that are improved in the hospital can be enhanced further through follow-up. Moreover, the patients' survival in the study may indicate the usefulness of the educational and communication activities.

On the other hand, a weakness of this study was a slight change made to the training program of a small number of patients due to their specific conditions. In addition, the data were based on patients' self-reports, without follow-up procedures, such as monitoring their behaviors at home. Thus, the collected data might not reflect the participants' true characteristics in terms of literacy, knowledge, and other related factors. Nevertheless, we tried to measure the rate of adherence to self-care behaviors by effective communication, building confidence, and asking

clear and simple questions. Another possible limitation was that this study was carried out in Shiraz. Consequently, the results may not be generalizable to other populations in Iran. However, the hospitals in Shiraz are referral centers for patients from Fars province, as well as from other provinces in southern Iran.

5.2. Conclusions

The findings of this study showed that implementing a HBM-based educational intervention positively influenced the self-care behaviors of HF patients. Thus, implementing long-term educational interventions, together with continuous follow-ups in inpatient treatment centers, may result in improved and sustained self-care behaviors. We strongly suggest that novel trials of educational interventions are needed that use other health behavior theories and training strategies to expand training knowledge in hospitals.

Acknowledgments

Footnotes

Authors' Contribution: Mohammad Hossein Kaveh, Zakieh Khoramaki, and Javad Kojouri developed the study concept and design. Zakieh Khoramaki gathered the study data. Sareh Keshavarzi analyzed and interpreted the data. Zakieh Khoramaki drafted the manuscript. Mohammad Hossein Kaveh, as the senior advisor, revised the manuscript for important intellectual content.

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