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Effect of education based on collaborative care model on the self-efficacy of patients with heart failure

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Abstract

Background: Empowering patients with heart failure plays a crucial role in managing and preventing the disease. Enhancing patients' self-efficacy through education based on the collaborative care model can significantly impact their empowerment skills, lifestyle, and disease management.

Objectives: This study aimed to evaluate the effectiveness of educational interventions based on the collaborative care model in improving the self-efficacy of heart failure patients.

Methods: This randomized clinical trial involved 60 Iranian patients with heart failure. We used convenience sampling to select the participants, who were then randomly divided into two groups: intervention and control. Data collection was conducted using the Cardiac Self-Efficacy Scale (Sullivan questionnaire). The intervention group received education based on the Collaborative Care Model, while the control group received routine education for 3 months. Both groups completed the questionnaire before and after the intervention in the intervention group.

Results: Both groups were matched in terms of demographic variables. Prior to the intervention, the intervention and control groups did not exhibit significant differences in their average self-efficacy scores (22.8±1.9 vs. 23.6±2.4) (P=0.056). However, following the intervention, the mean self-efficacy score in the intervention group was significantly higher compared to the control group (39.4±2.1 vs. 24.2±4.6) (P<0.001).

Conclusion: The findings suggest that implementing a collaborative care model in education may enhance self-efficacy in patients with heart failure. In other words, appropriate interventions can effectively improve the self-efficacy of these patients.

Keywords: Education, Collaborative care model, Self-efficacy, Heart failure.

Introduction

Improvements in the healthcare system, control of communicable diseases, urbanization, industrialization of societies, aging, and population growth have led to an increase in the incidence of cardiovascular diseases.[1] According to the American Heart Association, approximately 7.3% of total deaths resulting from cardiovascular diseases are attributed to heart failure.[2] It is projected that the prevalence of this disease will rise by 25% globally by 2030.[3]

In Europe, approximately 6.5 million people suffer from heart failure, and over one million people in our country, Iran, are affected by this condition.[4,5]

Controlling risk factors and modifying the lifestyle of patients with heart failure may enhance their self-care abilities.[6] People with heart failure need to increase their self-care and empowerment skills so that they can effectively control the signs and symptoms of the disease and prevent disease-induced complications.[7] Paryad et al., consider the promotion of self-efficacy as a way to increase

self-care empowerment.[6]

Self-efficacy is defined as an individual's belief in their own ability to organize and execute the necessary steps to achieve a desired outcome. Therefore, self-efficacy serves as a cognitive mechanism that influences behavior related to participating in different activities.[8] Personal self-efficacy, or one's confidence in their own abilities, impacts one's lifestyle by reflecting their comprehension of their skill level and potential for success.[9]

Evidence suggests that low self-efficacy is associated with poor self-care behaviors, anxiety, depression, and re-hospitalization.[10] Exacerbation of heart failure symptoms and physical limitations significantly reduce quality of life, and the presence of mood disorders in patients with heart failure further compromises their well-being.[11] Enhancing self-efficacy and promoting subsequent self-care behaviors in patients with heart failure can enhance quality of life, shorten hospitalization durations, prevent complications or delay them, and foster more active patient involvement in the treatment process.[12]

Thus, enhancing self-efficacy can lead to self-management improvement and modification of health behaviors; therefore, self-efficacy assessment and promotion can increase patients' motivation to take care of themselves, which is an essential aspect of a comprehensive heart failure care program.[13] Individuals with heart failure frequently lack adequate knowledge regarding treatment regimens, diagnosis, and management of symptoms, making patient education crucial for optimal outcomes.[14] The overall goal of providing a training program for patients with heart failure is to modify their behavior. For this purpose, the patient must feel confident that they have the capacity to take on new tasks (i.e., self-efficacy).[15] The objective of patient training is to foster desired behavioral modifications within them through the provision of relevant knowledge.[16]

The training program provides patient and family learning opportunities in the areas of disease, treatment, adaptation mechanisms, and enhancement of self-care and empowerment skills.[17] Using a theoretical framework and a model is one way to provide training.[18] Nursing models enable all personnel to utilize a singular approach to care for patients and conduct care evaluations in the same manner.[19] The Collaborative Care Model, established by Mohammadi et al., is a novel approach to high blood pressure control.[20] This model consists of two components: care and collaboration, which form its central core: collaborative care.[21] This model is actually a systematic and logical process for facilitating effective, interactive, and dynamic communication between clients and healthcare providers to better understand their needs, problems, and expectations in the treatment process and to encourage and involve them in taking responsibility and helping to improve, maintain, and promote their health.[20] In general, heart failure symptoms change from day to day, and the daily management of the disease and its symptoms, which are likely to be impacted by self-efficacy, is the most difficult issue when compared to the symptoms of other cardiac diseases.[22]

Objectives

The current study aimed to evaluate the impact of an educational intervention based on the collaborative care model on the self-efficacy of patients with heart failure.

Methods

Study design

A randomized controlled trial was conducted using two groups and a pre- and post-intervention design. The study was conducted at the clinic of Imam Khomeini Hospital in Saqqez, Kurdistan province, Iran, in 2019.

Participants

The study included 60 patients with heart failure who were referred to the clinic of Imam Khomeini Hospital in Saqqez. The inclusion criteria were as follows: willingness to participate in the study, diagnosis of heart failure based on a cardiologist's opinion (left ventricular ejection fraction <45%), age between 18 and 65 years, ability to communicate verbally or nonverbally, and lack of participation in any heart failure training programs at the same time as the study. Exclusion criteria were unwillingness to continue the study, death due to the disease, failure to attend training sessions for more than one session, and exacerbation of the disease. The study

participants were selected based on the inclusion criteria using convenience sampling. They were then randomly assigned to either the control or intervention group (30 in each) using a random number table.

Measurement

Data were collected using two questionnaires: a demographic information questionnaire (including information on age, gender, marital status, job status, and place of residence) and Sullivan's Cardiac Self-Efficacy Questionnaire. Sullivan's Cardiac Self-Efficacy Questionnaire consists of 16 questions and is scored using a 5-point Likert scale (complete agreement (4) and not certain (0)). The total score ranges from zero to 64, with higher scores indicating higher self-efficacy. The validity and reliability of this questionnaire have been established in previous studies.[23,24] In this study, its reliability was found to be 0.93.

Intervention

At baseline, both groups completed questionnaires. For illiterate participants, the researcher read and explained the questions aloud before they filled out their questionnaires. Next, the intervention was implemented in the intervention group using a collaborative care model.

This model consists of four stages, specifically motivation, preparation, involvement, and evaluation, all of which have a continuous and dynamic nature.[25] The collaborative care model was implemented in the form of collaborative educational sessions and collaborative follow-up sessions over a period of three months. Collaborative educational sessions involve two stages, including motivation and preparation, and are composed of three sessions with a ten-day interval between each session. Collaborative follow-up sessions also consist of two stages, involving involvement and evaluation, and are conducted through four sessions with a two-week interval between each session [Table 1]. Following the implementation of the intervention among the treatment group (while the control group did not receive any intervention), questionnaires were administered to both groups.

Ethical considerations

The objectives of the study were clearly explained to patients, and informed written consent was obtained from each participant. Patients were assured that their personal information would be kept confidential and that they had the right to withdraw from the study at any time. To uphold ethical principles, the collaborative care model was thoroughly explained to the control group during a one-hour session, and an educational booklet was provided to each participant to increase their understanding in this regard. The Ethics Committee of Kurdistan University of Medical Sciences approved the current study (registration number IR.MUK.REC.1398.228).

Statistical analysis

The data were analyzed by SPSS software (version 21). The Kolmogorov-Smirnov showed normal distribution of data. To compare means before and after the intervention in each group, paired sample t-test was used. Independent t-test was run to compare means between the two groups. In addition, chi-square test was used to compare the frequency of the qualitative variables in two groups. $P<0.05$ was considered statistically significant.

Table-1. The content of the collaborative care model sessions

Title of sessions	Sessions	Objective	Content	Instrument	Duration
Motivation	First	Stimulating clients through assessment and cognition by taking a history, preparing a list of problems, exchanging views on philosophies of participation, awareness of psychological problems, and thoughtful discussions between a clinical psychologist and nurse.	Presenting care problems, current health conditions, and future risks in order to involve the client in the process of self-care and reviewing the anatomy of the heart in simple language, causes of heart failure, exacerbating and mitigating factors, and the importance of health-promoting behaviors.	Lectures, educational videos, and photos	100 minutes

Preparation	Second	Informing clients of the importance of performing their duties correctly according to the scheduled educational participatory visits.	Getting acquainted with a healthy diet, including consuming adequate amounts of vegetables and fruits, exercising regularly, practicing effective stress management techniques, and implementing pain prevention strategies.	Lecture, photo, educational video, pamphlet, group discussion, and feedback from the nurse	60 minutes
Preparation	Third	Continuation of Educational Participatory Visits Offering New Tasks Alongside Consolidating Previous Ones	The role of drugs in controlling symptoms, the significance of timely drug administration, and learning how to accurately calculate heart rate.	Group discussion and feedback	60 minutes
involvement	First to fourth	Continuation of care program, follow-up visits, and client participation	Correcting programs, ensuring client adherence to treatment, and solving clients' problems to provide solutions and share experiences.	Group discussion and feedback	60 minutes
Evaluation	Each session	Assessing the learning rate of educational goals	Asking educational goals	Question and answer	During sessions, when needed
	Final	Completing the scale or questionnaire	-	Self-efficacy scale	60 minutes

Results

The mean age of patients was 56.3±12.2 years old in the intervention group and 11.2±54.3 years old in the control group (P=0.75). Most patients in both groups (73.3% in the intervention group and 80% in the control group) were married. The majority of patients in both groups (40% in the intervention group and 43.3% in the control group) were illiterate. There were no statistically significant differences in demographic variables between the two groups [Table 2]. The mean self-efficacy score before the intervention was 22.8±1.9 in the intervention group and 23.6±2.4 in the control group, indicating no significant difference between the two groups (P=0.56). However, the mean self-efficacy score in the intervention group (39.4±2.1) was higher than that in the control group (24.2±4.6) after the intervention (P<0.001) [Table 3]. According to t-test results, there was no significant difference in self-efficacy scores in the control group before and after the intervention (P=0.82), but a significant increase in self-efficacy scores was observed in the intervention group after the intervention (P<0.01).

Discussion

The aim of this study was to investigate the effect of the collaborative care model on the self-efficacy of patients with heart failure. The findings showed that this model can enhance self-efficacy in these patients. Similarly, Aghamohammadi et al., found that a self-management training program improved self-efficacy in elderly patients with heart failure.[26] Patients with heart failure require complex self-management activities, including adherence to treatment, weight control, and self-directed diuretic titration, and those with higher self-efficacy have better self-management.[22] Bekelman et al. examined the effect of a collaborative care model on patients with heart failure's health status, depression, and disease symptoms. They found that the collaborative care model reduced the symptoms of depression and fatigue in patients with heart failure but did not affect the symptoms of pain, shortness of breath, or respiratory distress. In line with the current study, the previously mentioned study showed the efficacy of the collaborative care model in promoting psychological factors such as depression and self-efficacy in these patients.[27] Hua et al., investigated the effects of the collaborative care model on self-care ability and quality of life in patients with heart failure and found that the implementation of this model improved self-care ability, quality of life, and cardiac function in patients with heart failure.[28] Promoting self-efficacy in patients with heart failure leads to an improvement in their self-care abilities.[29]

Table-2. Distribution of demographic characteristics of the patients

Variables		Experimental		Control		P-value
		Number	Percentage	Number	Percentage	
Age	<45	6	20	7	23.3	0.750
	45-59	17	56.7	16	53.3	
	>59	7	23.3	7	23.4	
Gender	Male	16	53.3	15	50	0.491
	Female	14	46.7	15	50	
Education	Illiterate	12	40	13	43.3	0.440
	Guidance school	11	36.7	12	40	
	High school	7	23.3	5	16.7	
Job	Working	14	46.6	12	40	0.282
	Non-working	16	53.4	18	60	
Marital status	Married	22	73.3	24	80	0.366
	Single	8	26.7	6	20	
Residence	Urban	25	83.3	26	86.6	0.560
	Rural	2	16.7	4	13.4	

Table-3. Comparison of mean self-efficacy scores in two groups before and after the intervention

Group/time	**Pre-test, Mean±SD**	**Post-test, Mean±SD**	**P value** (within group)
Intervention	22.8±1.9	39.4±2.1	P<0.001
Control	23.6±2.4	24.2±4.6	P=0.822
P-value (between groups)	P=0.56	P<0.001	

A meta-analysis by Cui et al.,[30] revealed that interventions based on the collaborative care model significantly improve quality of life and psychological functioning in patients with heart failure, which aligns with the findings of this study. Borji and Mottaghi[31] examined the effect of the collaborative care model on social support and self-efficacy of the elderly, and their findings revealed that implementing this model enhanced the level of social support and self-efficacy in this population. Heidari Beni et al.,[14] studied the effect of peer education on the self-efficacy of patients with heart failure and found that peer education enhanced self-efficacy in these patients. Similarly, their study investigated the impact of an educational model on the self-efficacy of patients with heart failure using a similar sample size (60 patients with heart failure). Therefore, the use of educational models in health centers is recommended to promote the self-efficacy of patients with heart failure. Sanaie et al., examined the effect of collaborative care education on the self-efficacy of family caregivers of patients undergoing coronary artery bypass grafts. They indicated that the intervention significantly increased self-efficacy scores in the studied samples. Although the population in the present study differs from that in Sanaie et al.'s study, the effect of collaborative care education on self-efficacy was supported in both studies.[32]

In a meta-analysis, Ashford et al.,[33] found that educational interventions based on psychological techniques were most effective in improving patients' self-efficacy. This finding is supported by Jahanshahi et al.'s study on the effect of educational programs on self-efficacy in heart failure patients, which is in line with the current study.[1] The results of another study have demonstrated that self-care education leads to improved self-efficacy in patients with chronic obstructive pulmonary disease.[34] Although the type of disease differs from that studied in the current study, both studies examine the significance of self-efficacy in chronic diseases. The findings of previous studies involving other chronic patient populations suggest that training care models boosts self-efficacy, enhances functional activities, reduces readmission rates, and leads to optimal disease management.[35]

An essential objective of collaborative care education is to foster long-lasting behaviors, which are crucial to

patient well-being. Continuity of behavior is particularly valuable in managing chronic diseases. By educating individuals on proper disease management techniques tailored to their specific conditions, coordination with prescribed medications, and problem-solving skills, they can better handle novel challenges. Unfortunately, many chronic disease patients lack adequate knowledge regarding self-care, leading to unnecessary readmissions. By shifting some of the care responsibilities to the patient and their loved ones through targeted teaching and training, we can reduce hospital occupation rates while improving patient outcomes.[36,37]

In the collaborative care model, face-to-face and written training are utilized to increase awareness of the nature of the disease, proper diet, and physical activity, as well as exacerbating and mitigating factors in disease. The collaborative care model has empowered clients by making them an integral part of the treatment team. Through this approach, patients engage in dialogue with both doctors and nurses, gaining a deeper understanding of their condition and taking an active role in their treatment plan. This collaboration fosters mutual learning and cooperation among team members, ultimately leading to better health outcomes and enhanced self-efficacy.

Given that most of the study participants were illiterate, the researcher recited and explained the questions in simple language for them, which could have led to misinterpretation of the questions. Another limitation of this study was the potential impact of cultural and social factors on how individuals responded to the questionnaire, so it's important to exercise caution when drawing conclusions from these findings. Additionally, participants in this study may have been exposed to information about the intervention through various forms of public media, such as radio, television, and newspapers, which was outside of the researchers' control.

Conclusions

The findings of this study indicate that the educational collaborative care model was effective in improving the self-efficacy of patients with heart failure. Consequently, it appears that collaborative care education can be a valuable tool for improving self-efficacy, which in turn may enhance disease management. Moreover, educating nurses through a collaborative care model is crucial to boosting the self-efficacy of patients with heart failure.

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Competing interests

The authors declare that they have no competing interests.

Abbreviations

HPLPII: Health-Promoting Lifestyle Profile; LVEF: left Ventricular Ejection Fraction; QoL: Quality of Life; WHO: World Health Organization.

Authors' contributions

SM and RGG: study design, SM: data collection; NO and SM: final revision and grammar editing; RGG: statistical analysis. All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

This study proposal has been reviewed and approved by the ethics committee at Kurdistan University of Medical Sciences (IR.MUK.REC.1398.228). All patients included in the study provided written consent to participate.

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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