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Empowering heart failure patients: The role of education in self-management

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ABSTRACT

Background: Heart failure (HF) is a syndrome that occurs with symptoms and signs due to heart dysfunction and results in shortened life expectancy. It is one of the significant health problems affecting approximately 26 million people worldwide and more than 2 million people in our country.

Objective: This study was designed to investigate the effect of education on the quality of life (QoL) and chronic disease self-management of patients diagnosed with chronic HF.

Materials and method: The study was conducted between January 1, 2023, and April 1, 2023, using 60 patients diagnosed with CHF for at least one year and hospitalized at Tekirdag Namik Kemal University, Cardiology Department, Turkey. During the patients' hospitalization, their QoL was assessed using the Minnesota living with heart failure questionnaire (MLHFQ) and disease self-management with the chronic disease self-management scale (CDSMS). Patients received nurse-led living with heart failure education (LHFE) at discharge. Patients' QoL and self-management were re-evaluated using the same scales at their outpatient clinic visit one month later.

Results: The mean pre-education MLHFQ score was 64.20 ± 19.42, and the mean post-education MLHFQ score was 44.01 ± 17.65. Participants' mean CDSMS total score before training was 2.20 ± 0.40, and the mean total score after training was 3.13 ± 0.42. This training was highly effective in improving patients' self-management and QoL ($p < 0.05$).

Conclusion: Nurse-led LHFE is an important part of nursing care in terms of ensuring patients' self-management and improving their QoL.

Keywords: heart failure, patient education, quality of life, self-management

INTRODUCTION

Heart failure (HF) is a condition in which the heart's ability to pump blood effectively is impaired. This can result in circulatory failure, meaning the heart cannot meet the body's oxygen needs. Common symptoms of HF include swelling (edema), shortness of breath, and fatigue [1]. HF usually shows a chronic progressive nature; however, in rare cases, it may appear suddenly and progress acutely [2, 3]. In the last decade, it was reported that the global burden had increased to approximately 64 million cases [4], with a prevalence of 2% [5]. The findings of population-based studies suggest an elevated rate of 7% among the elderly population. The prevalence of the condition is found to be higher in males compared to females [6].

HF can result from various cardiac diseases, including coronary artery disease, arrhythmias, valvular heart disease, and congenital or genetic heart conditions. Additionally, it can be triggered by non-cardiac factors, including hypertension, diabetes mellitus, kidney failure, smoking, alcohol use, and side effects from certain medications [7-9]. It is essential to understand the causes of HF, which can be either preventable or non-preventable. To help prevent acute exacerbations of HF, patients need to be educated on the importance of following their treatment plans, recognizing symptoms early, and seeking hospital care before their condition worsens. Providing an education on self-management is also crucial in the treatment of HF. Studies have shown that patients often face challenges with inadequate self-care and disease management after being discharged. Self-management involves activities designed to address the disease, including those that promote healing, protection, and overall well-being [10, 11]. Since chronic HF requires long-term treatment, nonadherence to therapy often leads to increased symptoms, patient complaints, and hospitalizations. Therefore, patient follow-up and self-management are crucial [12, 13]. These follow-ups and treatments are most successful when accompanied by patient education and empowerment. Well-designed training programs are expected to enhance patients' self-management skills and, as a result, improve their quality of life (QoL) [14].

The development of HF is multifactorial. Consequently, the management of HF necessitates a multidisciplinary approach. Nurses, as integral members of the healthcare team, assume a

pivotal role in this management, thereby underscoring the significance of their involvement in the overall process [15]. Symptoms such as weakness, fatigue, edema, dyspnea, and exercise intolerance can be both physically and psychologically debilitating. Worsening symptoms can lead to poorer prognosis and negatively affect a patient's QoL, making it difficult to manage the disease. Proper patient education is essential, as it can reduce symptom severity by improving self-management behaviors, ultimately enhancing the QoL for patients. Many patients are not fully informed about HF, which can result in recurrent complications [16]. They may fail to recognize their symptoms, struggle to manage them effectively, or lack an understanding of how to live with HF in their daily lives. This includes being aware of dietary and exercise recommendations [15, 17]. To address this issue, it is essential for nurses to provide self-management education to patients in a care setting. Patients must develop a comprehensive understanding of the impact of HF on their daily lives and be equipped with effective strategies for managing the disease.

Although standard education equips patients with essential knowledge and strategies, individuals living with HF still face ongoing challenges in applying this knowledge to manage their condition effectively in daily life. It is essential for patients to have a thorough understanding of HF, including its symptoms, causes, and triggers, as this knowledge enables them to recognize, manage, and minimize complications effectively [18]. Self-management education is critical in enhancing patients' ability to cope with HF within the healthcare setting and promoting sustainable behavioral change [19, 20]. Educational programs that provide comprehensive information before hospital discharge are vital in ensuring patients understand the disease's impact on daily life and learn effective strategies for managing symptoms. Therefore, this study aimed to evaluate the effectiveness of a structured, nurse-led self-management education program for patients with chronic HF by examining its impact on QoL and self-care behaviors, thereby highlighting the critical role of tailored educational interventions in empowering patients and improving long-term disease management.

Objectives

This study aimed to evaluate the effectiveness of a nurse-led living with heart failure education (LHFE) program on self-care behaviors and QoL among patients with chronic HF. The specific objectives were:

1. To assess the impact of nurse-led self-management education on HF patients' QoL, as measured by the *Minnesota living with heart failure questionnaire (MLHFQ)*.
2. To examine changes in self-management behaviors among HF patients before and after the educational intervention, using the *chronic disease self-management scale (CDSMS)*.
3. To explore the relationship between educational level, social support, and self-management skills in patients with HF.

MATERIALS AND METHOD

Design of the Study

A quasi-experimental research design was utilized in this study, employing a single-group, pre-/post-test, prospective follow-up design. Since the study design was a nonrandomized/quasi-experimental study, transparent reporting of evaluations with nonrandomized designs has been used for the reporting [21, 22].

Inclusion Criteria

Participants were included in the study if they met the following conditions:

- Diagnosed with chronic HF for at least one year, ensuring that participants had experienced the condition long enough to benefit from self-management education.
- Aged 18 years or older to ensure that participants could provide informed consent and independently engage in self-care practices.
- Provided written informed consent after receiving detailed information about the study, its objectives, and potential benefits.
- Able to read and write, allowing them to comprehend the educational materials and self-report outcomes effectively.

Exclusion Criteria

Participants were excluded from the study if they met any of the following conditions:

- Individuals diagnosed with HF for less than one year were excluded to ensure that participants had enough experience managing their condition before receiving self-management education.
- Patients diagnosed with cognitive or psychiatric conditions such as dementia, Alzheimer's disease, or other severe mental health disorders were excluded, as these conditions could interfere with their ability to comprehend, retain, and apply the educational content.
- Patients with other life-threatening or unstable medical conditions that could significantly impact their participation and adherence to self-care education were also excluded.

Methods of Recruitment

Throughout the three-month study period, all patients admitted to the cardiology service of Tekirdag Namik Kemal University Hospital with a diagnosis of HF were screened by researchers to determine their eligibility based on the inclusion and exclusion criteria. Patients who met the criteria were continuously identified and assessed for participation. After the patients' acute condition were stabilized, the principal investigator (PI) visited them at their bedside to discuss the study. Patients were provided with detailed verbal and written informed consent, including an explanation of the study's purpose, procedures, potential benefits, and their rights as participants. They were explicitly informed that participation was entirely voluntary, and they had the right to decline or withdraw at any time without any consequences for their medical care. To ensure that the patients had the opportunity

to deliberate and ask questions, a sufficient time frame was allotted for consideration and inquiry. Those who consented to participate provided written informed consent prior to their discharge. The educational intervention was scheduled for the day of discharge, and the initial phase of data collection was completed before the patients were discharged.

Time and Location

The study was conducted at the cardiology service of Tekirdag Namik Kemal University Hospital over a three-month period, from January 1, 2023, to April 1, 2023. During this time, all newly admitted patients diagnosed with HF were screened for eligibility on an ongoing basis. The hospital admits an average of five HF patients per week, and recruitment was planned at a rate of one patient per day to ensure adequate time for education, data collection, and individualized follow-up. The educational intervention and pre-test assessments were conducted on the day of discharge in the patients' hospital rooms. Post-test assessments were conducted one month later during patients' routine outpatient follow-up visits at the same institution.

Sample Size

The G*Power program was employed to calculate the sample size for the study. The calculations were based on an effect size of 0.58. It measured the effects of self-management education on QoL for patients with HF, which is similar to the focus of the current research. Through the G*Power program, it was determined that a total sample size of 45 participants was required, utilizing an alpha level of 0.05, 95% power, and the specified effect size of 0.58. Although the study was designed to recruit 60 patients to account for an expected 20% dropout rate, the study was successfully completed with all 60 participants. A post hoc analysis was conducted afterward to calculate the true power, which was found to be 0.95.

Interventions

In the initial phase of the study, patients diagnosed with HF completed a socio-demographic questionnaire developed by the researcher, along with MLHFQ and CDSMS as a pre-test assessment. Following this, patients participated in a nurse-led LHFE session. The educational intervention lasted 20 minutes, during which essential information on self-management and disease-control strategies was provided. At the end of the session, patients were allowed to ask questions, which the PI addressed to ensure comprehension and clarify uncertainties. After the session, patients were discharged home. One month later, during their routine follow-up visit at the outpatient clinic, patients completed the post-test assessment, which included the MLHFQ and CDSMS, to evaluate changes in QoL and self-management behaviors following the educational intervention.

Data Collection Tools

Socio-demographic information form

The socio-demographic information form is a researcher-developed data collection tool based on relevant literature. It comprises 12 questions designed to gather demographic and health-related information from patients with chronic HF [23-26]. The first six questions are about socio-demographic information. The remaining six questions relate to the patient's perceived health.

Minnesota living with heart failure questionnaire

The MLHFQ was developed in [27] to measure the QoL in patients with HF. The scale was adapted into Turkish [28] and it consists of 21 items and 2 sub-dimensions. The physical functioning sub-dimension includes items 2, 3, 4, 5, 6, 7, 12, and 13. The emotional functioning sub-dimension consists of items 17, 18, 19, 20, and 21. The scale is prepared as a 5-point Likert scale where 0 is "not at all," and 5 is "very much." The total score on the scale ranges from 0-150. *A low score indicates a high QoL*. Cronbach's alpha reliability coefficient was calculated as 0.85 in [28] study. For this study, the reliability coefficient was 0.95 before training and 0.954 after training.

The Chronic Disease Self-Management Scale

This scale was developed by Ngai and colleagues in 2021 to assess the self-management of chronic diseases [29]. The scale consists of 23 items and four subscales. These subscales measure self-stigmatization, coping with stigmatization, healthcare effectiveness, and treatment compliance. The scale items are in a five-point Likert-type format with scores between 1-5. In 2021, it was adapted into Turkish [30]. *A high mean score indicates high self-management skills.* The study reported Cronbach's alpha reliability coefficient of 0.91. In this study, Cronbach's alpha was found to be 0.65 before training and 0.58 after the training.

Nurse-led Living with HF Education

The educational goals included recognizing and managing symptoms, reducing peripheral edema, increasing exercise tolerance, improving adherence to medical therapy, and preventing complications related to chronic HF. To achieve these goals, a comprehensive educational program was developed for patients. The content and structure of the training were developed according to the patient's needs and existing literature [24, 25, 31, 32]. The training covered topics such as 'what is HF and who can have it,' 'symptoms and signs,' 'managing HF,' 'dietary and lifestyle changes in HF,' and 'emergency.' To ensure the educational content's validity, reliability, and structure, expert input from three PhD experts in internal medicine, nursing, and surgical nursing was sought using a 5-point Likert-type rating form. The researcher then made necessary revisions based on the feedback received, and the training material was prepared and given to the patients in the form of a booklet during the training. The study was carried out in the patient's hospital room on the day of discharge. The pre-test was administered first, followed by the LHFE training. The education was conducted by the PI with an oral presentation. After each topic's explanation in the booklet, patients were encouraged to ask questions. Each training session lasted an average of 20-30 minutes, including time for patient questions, and the patient was allowed to go home at the end of the education session. The study was completed in a single session, and the patient was informed that they would be contacted again after 1 month for a routine check-up, during which the same questions would be asked again. All patients were informed at the beginning of the study that participation was entirely voluntary and no incentives would be given. Since the PI was the clinical nurse of the patients and the PI was the one who gave the education, blinding was not possible. However, a professional statistician was hired for the statistical analysis of the study and all data were sent anonymously to the statistician.

Table 1. Participants' socio-demographic information

Characteristics	n	%
Gender		
Female	30	50.0
Male	30	50.0
Educational status		
Elementary or middle school graduates	29	48.3
High school graduates	13	21.7
University and higher education graduates	18	30.0
Alcohol usage		
Yes	27	45.0
No	33	55.0
Smoking		
Yes	22	36.7
No	38	63.3
Hospitalization in the last year		
0-4 times	31	51.7
5-10 times	24	40.0
Over 11 times	5	8.3
Duration of the HF diagnosis		
1-3 years	12	20.0
4-7 years	23	38.3
8-11 years	25	41.7
ED admission in the last year		
0-4 times	30	50.0
5-10 times	21	35.0
Over 11 times	9	15.0
Comorbid chronic diseases		
Diabetes mellitus	28	32.2
Hypertension	38	43.7
Asthma	4	4.6
COPD	7	8.0
Other	10	11.5
Total	60	100

Data Analysis

Statistical analysis of the data obtained in the study was performed using the statistical package for social sciences 25.0 program. Descriptive statistical methods (number, percentage, mean, standard deviation) were used to evaluate the data. When comparing quantitative data, a t-test was used for normally distributed variables to analyze the difference between the two variables. The Mann-Whitney U test was used for variables that were not normally distributed between two variables. In the case of more than two variables, the ANOVA test was used in the case of normal distribution in the intergroup comparisons of parameters, and Tukey post-hoc tests were used to determine the groups causing the difference. The Kruskal-Wallis H test was used for more than two groups that did not show a normal distribution, and the Mann-Whitney U test was used to determine the group that caused the difference.

Ethical Considerations

Before beginning the study, Institutional Review Board approval was obtained from the Tekirdag Namik Kemal University Non-Interventional Clinical Research Ethics Committee (application number: 2022.226.12.04, date: 12/27/2022). Additionally, institutional permission was granted by the Tekirdag Namik Kemal University hospital administration to carry out the research. For the use of the MLHFQ and the CDSMS in this study, official permissions were received via email from the respective scale developers.

RESULTS

Demographic information regarding those participating is shown in **Table 1**.

Almost half of the participants had completed primary or secondary school (48.3%). Nearly half reported alcohol use (45%), while a slightly higher proportion were non-smokers (53.3%). In the past year, 50% visited the emergency department (ED) 1 to 4 times, and an equal percentage had been hospitalized due to HF (**Table 1**).

As shown in **Table 2**, participants' MLHFQ total scores significantly decreased from pre- to post-test ($t = 13.10$, $p < .05$, Cohen's $d = 1.69$), indicating a large effect size. This suggests that the education intervention had a substantial impact on patients' QoL. Additionally, there were statistically significant improvements in both the physical ($t = 12.47$, $p < .05$, $d = 1.61$) and emotional ($t = 9.60$, $p < .05$, $d = 1.24$) sub-dimension scores, each reflecting a large effect size. These results indicate that the program was highly effective in improving both physical and emotional aspects of QoL.

Table 3 presents statistically significant differences between pre- and post-test scores in the CDSM total score and all sub-dimensions. Significant improvements were observed in favor of the post-test for the CDSM total score ($t = -7.89$, $p < .05$, $d = -0.89$), Self-stigmatization ($t = -9.70$, $p < .05$, $d = -1.25$), Coping with stigmatization ($t = -5.04$, $p < .05$, $d = -0.65$), and treatment compliance ($t = -8.14$, $p < .05$, $d = -1.05$). These results indicate that the program was highly effective, with large effect sizes observed across all domains.

There was no significant difference between the views of the participants in the sub-dimensions of stigma ($p = .104$), coping ($p = .622$), and treatment adherence ($p = .270$) of the scale according to the variable of marital status. There was a significant difference in favor of single participants in the sub-dimension of health care ($t = -1.682$; $p < .05$; $d = -.584$). This result had a moderate effect size. There was no statistically significant difference in the self-stigmatization ($p = .941$) and treatment compliance ($p = .773$) sub-dimensions of the scale according to the educational status variable. A significant difference was found in the coping with stigmatization

Table 2. MLHFQ total score and sub-dimensions pre- and post-test comparison (n = 60)

	Mean	Standard deviation	t	p	Cohen's d
MLHFQ total score pre-test	64.20	19.42	13.10	**.00***	1.690
MLHFQ total score post-test	44.01	17.65			
Physical functioning sub-dimension pre-test	25.66	8.19	12.46	**.00****	1.610
Physical functioning sub-dimension post-test	17.33	7.31			
Emotional functioning pre-test	15.10	5.13	9.59	**.00****	1.240
Emotional functioning post-test	9.85	4.87			

Note. t: Independent sample t-test; Cohen's d: Effect size; ***p < 0.01**; & ****p < 0.05**

Table 3. CDSMS total score and sub-dimensions pre- and post-test comparison (n = 60)

	Mean	Standard deviation	t	p	Cohen's d
CDSM total score pre-test	2.20	0.40	- 7.89	**.00***	- 0.893
CDSM total score post-test	3.13	0.42			
Self-stigmatization pre-test	1.86	.65	- 9.70	**.00***	- 1.253
Self-stigmatization post-test	2.79	.76			
Coping with stigmatization pre-test	2.62	.80	- 5.04	**.00***	- 0.651
Coping with stigmatization post-test	3.32	.71			
Health care effectiveness pre-test	2.62	.82	- 7.20	**.00***	- 0.934
Health care effectiveness post-test	3.60	.87			
Treatment compliance pre-test	2.01	.76	- 8.14	**.00***	- 1.051
Treatment compliance post-test	3.05	.93			

Note. t: Independent samples t-test; Cohen's d: Effect size; & ***p < 0.01**

Table 4. Comparison between marital status and education level and CDSMS post-test

Sub-dimensions	**Status**	**n**	**Mean**	**Standard deviation**	**t**	**df**	**p**	**Cohen's d**
Self-stigmatization	Married	45	1.946	698	1.650	58	.104	
	Single	15	1.628	.437				
Coping with stigmatization	Married	45	3.346	.715	.495	58	.622	
	Single	15	3.240	.745				
Health care effectiveness	Married	45	3.933	.963	-1.682	58	**.019***	-.584
	Single	15	3.500	.416				
Treatment compliance	Married	45	2.080	.844	1.113	58	.270	
	Single	15	1.826	.413				
Education status		**n**		**Rank**	**x^2**	**df**	**p**	**ε^2**
Self-stigmatization	Elementary or middle school	29		31.28	.122	2	.941	
	High school	13		30.15				
	University and higher education	18		29.50				
Coping with stigmatization	Elementary or middle school	29		25.41	7.830	2	**.020***	.133
	High school	13		28.92				
	University and higher education	18		39.83				
Health care effectiveness	Elementary or middle school	29		22.66	11.514	2	**.003***	.195
	High school	13		38.38				
	University and higher education	18		37.44				
Treatment compliance	Elementary or middle school	29		32.05	.516	2	.773	
	High school	13		30.00				
	University and higher education	18		28.36				

Note. t: Independent sample t-test; df: Degrees of freedom; Cohen's d: Effect size; ε^2: Eta-squared; & ***p < 0.05**

dimension (x^2 = 7.830; p < .05; ε^2 = .133). This significant difference had a moderate effect size (**Table 4**).

DISCUSSION

HF represents a significant global health challenge, characterized by its widespread occurrence and associated complications, such as frequent hospitalizations and a decline in QoL. These consequences are often attributable to suboptimal self-management strategies [18]. To address this issue, a multifaceted approach is necessary, including the management of symptoms, the reduction of hospitalizations, patient education regarding their disease, and the facilitation of self-management strategies. A significant body of research indicates that patient education regarding HF plays a pivotal role in facilitating effective self-management among individuals living with this condition [20, 33-35].

The average MLHFQ total score for the patients in our study was 64.20 ± 19.42. In a cross-sectional dissertation study [36], the mean MLHFQ total score was 45.84 ± 20.09, and they stated that the patients needed empowerment education. In a meta-analysis conducted in [37], the mean MLHFQ total score was reported as 44.1. Based on these results, it was observed that the pre-education MLHFQ scores of the patients in our study were higher than those reported in the literature. In our study, the mean total score decreased to 44.01 ± 17.65, the mean physical functioning sub-dimension score decreased to 17.33 ± 7.31, and the mean emotional functioning sub-dimension score decreased to 9.85 ± 4.87 after the training, with all showing significant decreases in the post-test compared to the pre-test, which is a proof the effectiveness of our nurse-led LHFE program. The study in [38] demonstrated that educating patients with HF at the time of discharge improves self-care and QoL. It was emphasized that discharge education can greatly enhance self-care and QoL in HF patients [39]–which is supported by the American College of Cardiology/American Heart Association guidelines advocating for patient education at discharge [32]. Another study in [40] involved educating patients hospitalized with HF about their disease and treatment during their hospitalization, and those who had outpatient follow-up after discharge showed better personal knowledge and care. Similarly, in our study, it can be concluded that the education provided to the patients had a significant impact on their QoL.

Self-management education programs are educational programs that are designed to teach patients the skills necessary to implement disease-specific medical regimens, guide health behavior change, and control their disease [19, 41]. Research findings indicate that patients who receive self-management education experience an enhancement in QoL

[42]. A systematic review in [42] found that incorporating self-management strategies led to a decline in hospitalization rates and healthcare expenditures. These results underscore the significance of self-management education in enhancing patient outcomes and reducing the financial burden on healthcare systems [43]. Many studies have shown that the teaching of self-management skills to patients is associated with a reduction in HF symptoms and hospitalizations [44, 45].

In the present study, the primary objective of post-discharge education was to inform patients about their condition and enhance their self-management capabilities. Participants' self-management abilities were evaluated before and after the educational intervention using the CDSMS. The findings demonstrated statistically significant improvements in scores related to self-stigmatization, coping with stigmatization, healthcare effectiveness, and treatment adherence following the intervention. These results, supported by existing literature, highlight the effectiveness of nurse-led, tailored educational programs in promoting self-management among patients with HF [34, 39, 44, 45]. This underscores the importance of incorporating self-management education as a central component in the treatment and long-term care of HF. Further analysis of CDSM sub-dimension scores by educational level revealed that self-stigmatization and treatment compliance scores tended to increase with higher education levels, although these differences were not statistically significant. However, significant differences were observed in the coping with stigmatization sub-dimension, where participants with only primary education scored notably lower than those with university-level education. Similarly, in the healthcare effectiveness sub-dimension, individuals with primary education scored significantly lower than those with high school or university education. These findings emphasize the critical role of health literacy and the necessity of tailoring educational interventions to the individual's educational background. The authors in [29] examined the factors affecting treatment compliance of young patients with chronic diseases and showed that patients with a higher education level positively impacted disease management [46]. In the study in [47], a significant relationship was found between education level and self-care and management scores; patients with higher levels of education consistently showed better scores compared to those with lower educational attainment. However, it was observed that education level did not differ significantly in any sub-dimension [47]. These differences between studies are probably due to differences in education systems and self-management measurement techniques used in studies conducted in different countries. It was stated that social support is highly effective in helping to manage chronic conditions [48].

In our study, there was a significant difference in the healthcare effectiveness subscale, although the total score did not show that patients with HF had higher disease self-management. It was reported that patients with social support had higher adherence to treatment, similar to our results [49]. In addition, patients who were ill and had social support from their spouses had fewer hospitalizations for HF exacerbations, as reported in [50]. According to these data, in line with the literature, it appears that nurse-led LHFE is highly effective compared to CDSMS. This shows that self-management education should be the main goal in the treatment of HF.

Limitations

This study has several limitations. First, it utilized a single-group, quasi-experimental design without a control group, which limits the ability to establish a direct causal relationship between the intervention and the observed improvements in self-care behaviors and QoL. Future randomized controlled trials with a control group would strengthen the validity of these findings. Second, the follow-up period was limited to one month, which may not be sufficient to assess the long-term impact of the nurse-led educational intervention. Future research with extended follow-up periods would provide deeper insights into the sustained effects of self-management education on HF outcomes. Third, this study was conducted in a single university hospital, which may limit the generalizability of the findings to other healthcare settings or diverse patient populations. Future multi-center studies with larger and more heterogeneous samples would improve external validity. Fourth, the study sample was limited to patients who met specific inclusion criteria, including literacy requirements for self-reporting. This may have excluded individuals with lower health literacy or cognitive impairments, reducing the applicability of the findings to a broader HF population. Future studies should consider tailored educational approaches that accommodate individuals with varying levels of health literacy. Finally, blinding was not feasible in this study, as the PI also conducted the intervention, which may have introduced potential researcher bias. However, to minimize this risk, data analysis was performed by an independent statistician, ensuring an objective evaluation of the study outcomes.

CONCLUSION

Patients diagnosed with chronic HF can greatly benefit from structured education aimed at helping them develop behaviors that enable them to live with the disease and adopt a healthy lifestyle. This kind of planned education can significantly improve patients' ability to manage their condition, leading to an overall increase in their QoL. The aim of the study was to provide post-discharge education to patients in order to enhance their understanding of their diseases and improve self-management. The patients' ability to manage their conditions both pre and post training was evaluated using CDSMS. It is recommended that structured self-management training be integrated into standard care in outpatient facilities.

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Declaration of interest: No conflict of interest is declared by the authors.

Data sharing statement: Data supporting the findings and conclusions are available upon request from the corresponding author.

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