



# Effects of Health Education Program and Improving Self-care among Vietnamese Adult Patients with Chronic Heart Failure in Nam Dinh Province Vietnam

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## **Authors' contributions**

*This work was carried out in collaboration between both authors. Author NHH designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author PTHN managed the literature searches. Both authors read and approved the final manuscript.*

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## **ABSTRACT**

This study aimed to improve the knowledge and practice of self-care among Vietnamese adult patients with chronic heart failure in Nam Dinh province Vietnam. The one group pre-test and post-test educational intervention was conducted among 90 patients with chronic heart failure in Nam Dinh General Hospital. The education programme based on the guidelines for self-care of heart failure by Vietnam National Heart Association 2015 and by American Heart Association 2014. The evaluation knowledge and practice before and after based on the Atlanta Heart Failure Knowledge Test and the Self-care of Heart Failure Index. By the scale of 22 points for self-care knowledge, the mean score of participated patients before the intervention was  $10.41 \pm 3.54$ , then went up to  $19.38 \pm 2.16$  points right after completing the intervention and retained at  $17.92 \pm 2.52$  points at the time of one month later (p values of 0.001). By the scale of 100 points for each field of self-care practice, the mean scores of participated patients before the intervention were limited in three fields of practice with  $41.52 \pm 20.51$  points for self-care maintenance,  $35.56 \pm 15.21$  points for self-care management, and  $50.45 \pm 16.11$  for self-care self-confidence, then positive changes in comparison

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with these three fields before the intervention were seen after completing the intervention one month, including  $53.90 \pm 20.03$  points,  $52.96 \pm 15.08$  points, and  $59.31 \pm 14.68$ , respectively (p values of 0.001). The study revealed a reality of limited self-care knowledge and practice among Vietnamese adult patients with chronic heart failure before the intervention and showed the initial positive results in improving both knowledge and practice of patients with chronic heart failure through the patient education which helping them to do self-caring their condition and needs to be implemented regularly.

*Keywords: Self-care; chronic heart failure; patient; education.*

## 1. INTRODUCTION

Heart failure is one of the leading causes of hospitalization, with high morbidity and mortality in many countries [1]. Statistically, about 26 million people worldwide suffer from heart failure [2]. In the United States, the number of people with chronic heart failure (CHF) has increased from 5.7 million (2009-2012) to 6.5 million (2011-2014) [3]. Heart failure has become a burden not only for patients and their families but for the whole society while the medical cost for heart failure accounts for a small amount in the budget for health. Developed countries spend one to two percent of health care costs for examination and treatment of CHF meanwhile the estimated cost for heart failure in 2010 amounted to 39.2 billion dollars in the United States [4]. Heart failure has been, and will be, a health problem for all of humanity with a re-hospitalization rate of about 25 percent after 30 days of discharge [5,6] and a death rate within five years after diagnosed is about 50% [3].

CHF is poor prognosis and deterioration, and not always preventable. However, nearly 50% of hospital readmissions and deaths from heart failure are preventable [7]. In fact, more than half of CHF cases are re-hospitalized as a result of worsen symptoms and a direct result of poor self-care [8]. Poor self-care such as poor adherence to medication, failure in following a salt-restricted diet and fluid restriction, delaying in self-monitoring of daily weight and results in exacerbated condition, increased re-admission rates and risk of death in patients with CHF [9,10]. In fact, many people with CHF have poor self-care behaviors [10].

Self-care in patients with CHF can be defined as activities that help patients maintain their physical condition and monitor signs of illness (self-care maintenance), identify and take appropriate measures to deal with the symptoms of heart failure, and evaluate the effectiveness of the intervention (self-care management) [11]. The European Heart Association emphasizes the

importance of self-care as part of successful treatment and enhances self-care for patients by providing education programs that can reduce aggravation of symptoms of the disease, improve health, reduce the risk of re-admission and improve the quality of life [12,13]. Building of self-care strengthen is one of the main goals of educational interventions for people with CHF [14].

This study is based within Vietnam, a country located in the center of the Southeast Asian Region. Although Vietnam (in land and resources) is a small country, Vietnam's population reaches over 96.2 million, ranking 15th in the world according to the report of 2019 Census. There has not been an official survey nationwide, it is estimated that between 320,000 and 1.6 million people suffer from heart failure based on the world's prevalence [15], and the incidence of heart failure may continue to increase due to population growth and aging [4].

Transforming from providing care to self-care has been a promising strategy for managing chronic conditions [16-18]. However, this is still a new approach in managing chronic conditions in Vietnamese context, especially in CHF. This study aimed to improve the knowledge and practice of self-care for Vietnamese adult patients with CHF, therefore Nam Dinh province was chosen as it has features that are representative of Vietnamese health structure and system as well as features of geography, demography of Red River Delta region in northern Vietnam, a smallest area but highest population and population density of all regions of Vietnam. And it is anticipated that the findings from this study will be transferable to other provinces of the area.

## 2. OBJECTIVES

The study was conducted to describe the current knowledge and practice of self-care among Vietnamese adult patients with CHF and to

evaluate changes after the education program for those.

### 3. METHODS

Intervention studies with before and after comparison, One-Group Pretest-Posttest Design due to seeing as suitable for the evaluation changes or differences in knowledge and practice of patients focused on self-care their condition after received the health education [19,20]. We Randomly select 90 patients diagnosed as chronic heart failure, are currently inpatient treatment at the Department of Cardiology, General Hospital of Nam Dinh province with selection criteria as patients who are being treated from day 2 onwards. go, have the capacity to give interviews and voluntarily participate in the research. Exclude patients who are on active treatment, who have not fully participated in health education interventions and have participated in a program with similar content.

The content for patient education regarding self-care in CHF was developed based on the recommendation of Vietnam National Heart Association (VNHA) 2015 [21] and the Self-Care Guide for the heart failure patient of American Heart Association (AHA) 2014 [22].

Selected eligible patients are assessed the real situation of self-care knowledge and practice (1-T1-time assessment) using prepared questionnaires. The interview lasted about 20 minutes, including: contacting the patient, explaining the purpose, order of participation in the study and directly interviewing the patient.

In the afternoon of the same day, patients who were assessed before the intervention in the morning will be invited to the Administrative Division of the Department of Cardiology and Cardiology for direct consultation on knowledge and practice of self-care for chronic heart failure (Usually 3 - 5 people / session). The intervention includes hand-outs for patients, illustrations, leaflets. After GDSK is finished, will ask NB if there are any questions or not to answer. Time to intervene and answer questions of patients is about 40 minutes. Re-evaluate knowledge of self-care of research subjects right after the intervention (2nd-T2 assessment) using the same content assessment of knowledge as pre-intervention assessment (T1). Interview time is about 10 minutes. After the interview, if the patient has incorrect knowledge about self-care,

the investigator will supplement and remind him. Appointment of NB at the assessment time after 1 month.

Re-assess knowledge and self-care practice of research subjects after 1 month of intervention (3rd - T3 assessment) using the same questionnaire for the 1st time. After interviewing, if the patient still has knowledge and incorrect practice on self-care, the investigator will supplement and remind the patient.

At the time of T3, in 90 study subjects, 52 study subjects came to re-examination according to appointment, while 38 subjects did not come to re-examination. We went home to interview 38 study subjects who did not come to visit again, distributed in the following places: Y Yen district has 5 people, Xuan Truong district has 1 person, Giao Thuy district has 2 people, Vu district The village has 7 people, Truc Ninh district has 3 people, Nghia Hung district has 1 person, Nam Truc district has 10 people, My Loc district has 2 people, the city area has 7 people.

Beside questions for demographic data, the study instrument based on the Atlanta Heart Failure Knowledge Test (A-HFKT) questionnaire to measure self-care knowledge [23] and the Self-Care of Heart Failure Index (SCHFI) questionnaire [24] to measure self-care practice. Data from the questionnaire included demographic, knowledge and practice indicators of self-care areas mentioned above were analysed using SPSS for windows software, descriptive analysis were used to analyze the data sets and much of the data were nominal and ordinal and therefore only non-parametric tests for significant difference could be used.

All questionnaires were securely stored by the researcher in a locked cabinet at Nam Dinh University of Nursing. Individual patients were identified by only numbers and no health service or university personnel had access to either the list of numbers, or the raw data, and the raw data will be stored for five years and then destroyed. Beside these ethical items, at the time of measurement after one month when patients returned by appointment, any of items in self-care contents which patients showed inappropriately were reinforced.

### 4. RESULTS

There were 90 patients with CHF met the criteria of recruitment and fully participated to the project

during the 1st quarter of 2018. During this period, there were days on which the number of selected patients for the study was up to 3 per day, and of course, days on which no patient was selected. All participants had been at least twice of hospitalization for CHF at the beginning of this study. The mean age  $\pm$  SD of the participated patients was  $65.59 \pm 10.77$  years, ranged from 34 to 86 years. The number of patients aged 60 and older, were women, and living in the countryside accounted for 81.1%, 51.1%, and 56.7%, respectively.

All the education sessions went well for 90 participated patients and it took an average of 45 minutes for an education session without interrupting or interfering with the course of medical treatment and every participants felt easy and comfortable. To get an overview of the result of the program the mean values of overall scores from the measurements before and after the patient education were calculated and any association (using t-test and p value < 0.05) between these values were considered as presented in the following.

The reality of patients' self-care knowledge and practice in CHF at the beginning and changes after the educational intervention of this study through the mean values of overall scores from

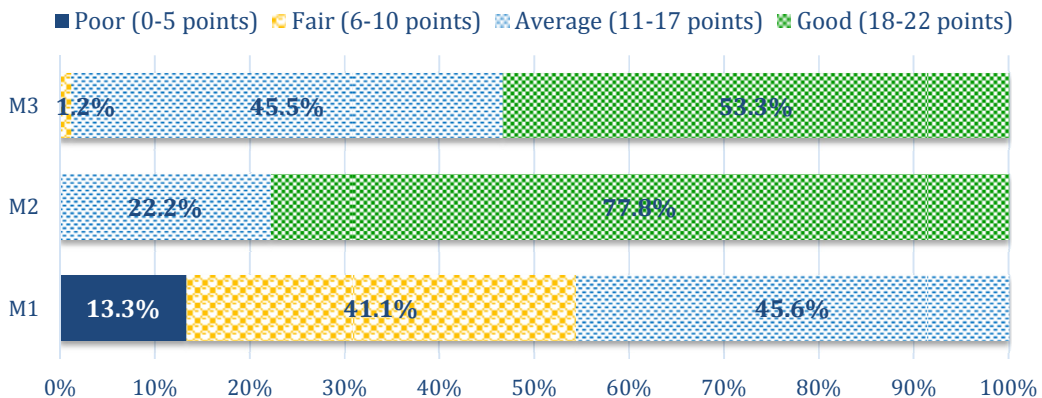
the measurements were calculated and any association (using t-test and p-value < 0.05) between these values were considered as presented in Table 1 and Table 2. In addition, the levels of self-care knowledge based on band scores of self-care knowledge were presented in Fig. 1 and the changes in self-care practice based on the percentages of 90 participated patients of the study sample who followed the guided activities of self-care practice before and after the study intervention were presented in Table 3, Fig. 2 and Fig. 3.

The mean score of knowledge before the intervention was  $10.41 \pm 3.54$  points (less than 50% of the total 22 points of the knowledge scale). It elevated significantly to  $19.38 \pm 2.16$  points right after the study intervention and was still high after one month at  $17.92 \pm 2.52$  points compared with this before the intervention (p values less than 0.001).

At the beginning of the study (M1), there was 13.3% of patients at the poor level (0-5 points) and no one was at the good level (18-22 points) in CHF self-care knowledge. Right after the study intervention (M2) and one month later (M3), the percentage of patients with good level increased to 77.8% and remained at 53.3%, and no body fell into the poor level.

**Table 1. General result by overall score of Self-care knowledge**

Measurement	Score of Self-care knowledge			P value (t-test)
	Min	Max	Mean $\pm$ SD	
M1	3	17	10.41 $\pm$ 3.54	
M2	13	22	19.38 $\pm$ 2.16	p(2;1) < 0.001
M3	11	22	17.92 $\pm$ 2.52	p(3;1) < 0.001



**Fig. 1. Result based on band score of Self-care knowledge**

**Table 2. General result by score of self-care practice fields**

Fields of Practice	Measurement	Score of Self-care practice			P value (t-test)
		Min	Max	Mean ± SD	
Self-care maintenance	M1	10	86	41.52 ± 20.51	p(3;1) < 0.001
	M3	13	89	53.90 ± 20.03	
Self-care management	M1	05	75	35.56 ± 15.21	p(3;1) < 0.001
	M3	20	80	52.96 ± 15.08	
Self-care self-confidence	M1	11	88	50.45 ± 16.11	p(3;1) < 0.001
	M3	22	94	63.35 ± 16.06	

**Table 3. Result in patients' self-care maintenance**

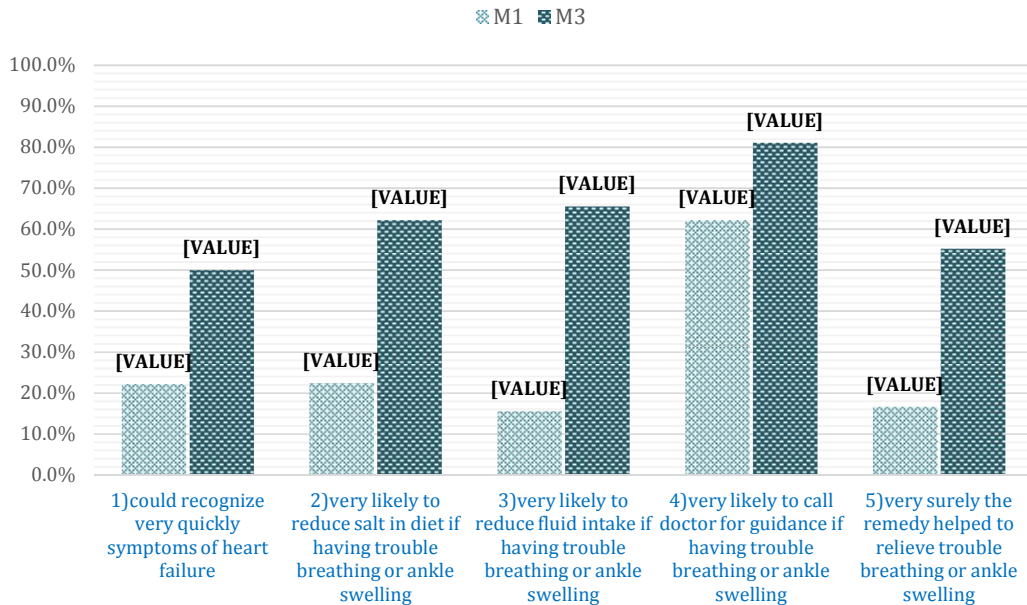
Frequencies of doing self-care maintenance		Percentage of patients			
		Never or rarely	Sometimes	Frequently	Always or daily
1. Measure body weigh	M1	56.7	33.3	7.8	2.2
	M3	20.0	61.1	11.1	7.8
2. Check ankles for swelling	M1	54.4	23.4	7.8	14.4
	M3	20.0	37.7	23.4	18.9
3. Try to avoid getting sick (e.g., flu shot, avoid ill people)	M1	52.2	32.2	10.0	5.6
	M3	18.9	52.2	17.8	11.1
4. Do some physical activity	M1	6.7	37.7	36.7	18.9
	M3	2.2	16.7	62.2	18.9
5. Keep doctor or nurse appointment	M1	23.4	27.7	32.2	16.7
	M3	0.0	43.3	40.0	16.7
6. Eat a low salt diet	M1	28.9	37.7	23.4	10.0
	M3	8.9	33.3	35.6	22.2
7. Exercise for 30 minutes	M1	11.1	28.9	41.1	18.9
	M3	0.0	18.9	62.2	18.9
8. Forget to take one of your medicines	M1	15.6	57.8	26.6	0.0
	M3	42.2	38.9	18.9	0.0
9. Ask for low salt items when eating out or visiting others	M1	47.8	34.4	8.9	8.9
	M3	26.7	45.5	10.0	17.8
10. Use a system to help you remember your medicines	M1	38.9	34.4	20.0	6.7
	M3	20.0	40.0	26.7	13.3

The mean scores of practice separately calculated by fields of Self-care maintenance, Self-care management and Self-care self-confidence (100 points scale for each field) before the intervention were 41.52 ± 20.51 points, 35.56 ± 15.21 points and 50.45 ± 16.11 points, respectively. One month after the completing of the study educational intervention, the scores of three fields all increased significantly to 53.90 ± 20.03 points, 52.96 ± 15.08 points and 63.35 ± 16.06 points in comparison with those before the intervention, (all p values less than 0.001).

Table 3 illustrated a trend of self-care maintenance in which the percentages of patients who followed more frequently beneficial activities for their CHF included activities numbered from 1

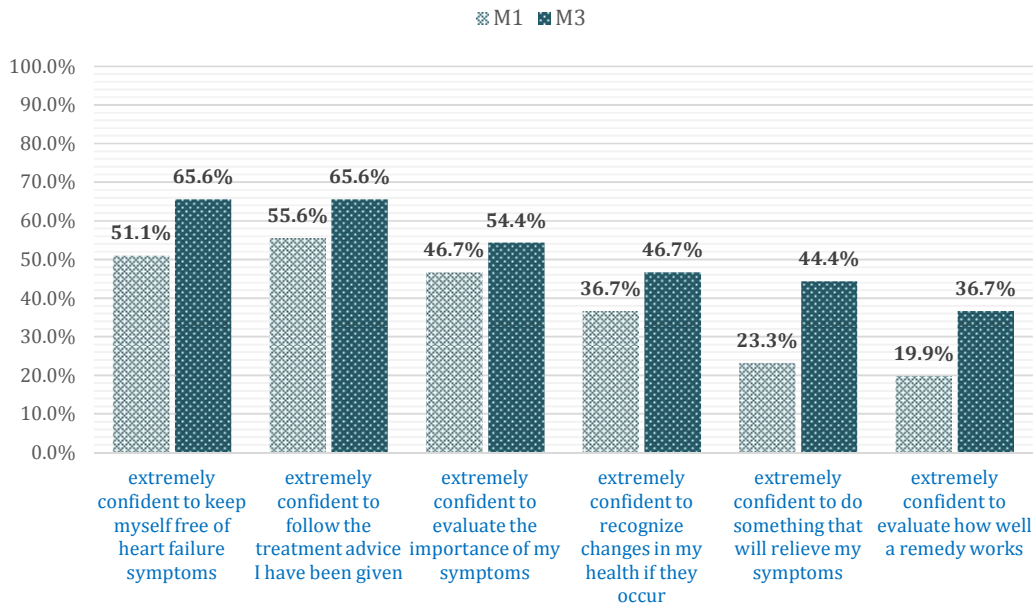
to 7 as well as 9 and 10 increased and by contrast, the percentage of patients who often forgot to take medicines decreased after one month compared with those before the intervention.

For self-care management, levels of how quickly participants recognized trouble breathing or ankle swelling if they had in the past month, how certainly participants reduce salt in diet, reduce fluid intake, call doctor for guidance if they having trouble breathing or ankle swelling, and how surely the remedy they tried helped when they had trouble breathing or ankle swelling were listed, and the highest level of patients' practice of self-care management were presented in Fig. 2.



**Fig. 2. Result in patients' self-care management**

As we see in above figure, there are 22.2% people participating this study recognize the symptoms very fast. 22/4% people likely to reduce salt in diet, 15.6% participants likely to reduce fluid intake and there are 16.7% people were very surely the remedy helped to relieve their symptoms and 52.2% people were very surely the remedy helped to relieve their symptoms



**Fig. 3. Result in patients' self-care self-confidence**

As we see in above figure, there are 51.1% people extremely confident to keep themselves free, 36.7% people confident to recognize change, and 19.9% patients who were extremely confident to do helpful activities (evaluate how well services for their heart failure increased in all items after one month in comparison with those before the intervention)

In this study, all 90 patients answered they had trouble breathing or ankle swelling in the month before participated to the study and there were 20 participants (22.2%) could recognize very quickly the symptoms. In the next month after participating the study, discharged from hospital, there were 38 patients said they had trouble breathing or ankle swelling, and 19 of these participants (50.0%) could recognize very quickly the symptoms. The percentages of participants who committed they very likely to do activities numbered 2), 3), and 4) after one month were higher than those before the intervention. For the helpfulness of the remedy, before entering to the study, there were 30 patients answered they tried the remedy and only 5 of them (16.7%) were very surely the remedy helped to relieve their symptoms. After one month, of the 38 participants, who had trouble breathing or ankle swelling and tried the remedy during the month after the study intervention, 21 participants (52.2%) were very surely the remedy helped to relieve their symptoms.

Self-care self-confidence, levels of confidence included 'not confident', 'somewhat confident', 'very confident' and 'extremely confident' were counted and the highest levels of self-confidence were presented in Fig. 3.

Fig. 3 showed the percentages of patients who were extremely confident to do helpful activities for their heart failure increased in all items after one month in comparison with those before the intervention.

## 5. DISCUSSION

Although this study was not epidemiological, the age profile (included mean  $\pm$  SD: 65.59  $\pm$  10.77 years and aged of 60 and older: 81.1%) of patients in our study is similar to this feature in a study at Hue Central Hospital in 2017 [25], reflecting in somewhat, heart failure is one of conditions with prevalence and incidence increasing by aging worldwide [4], and the trend in aging of the population in which older people facing chronic medical conditions as well as trends in the need of health care management for older people.

Katz [10] and Komajda et al. [14] stated Heart failure has recently undergone major changes: while heart failure with reduced ejection fraction or HFrEF is declining due to effective revascularization of patients with acute coronary syndromes, the prevalence and incidence of heart

failure with preserved ejection fraction or HFpEF, mainly characterized by diastolic dysfunction, is increasing due to ageing Western societies.

At the beginning of the study, the participated patients had a certain level of knowledge about CHF self-care with the mean score of 10.41  $\pm$  3.54 points and this makes sense because the patients could learn from several sources during their illness and from usual care by their doctors or nurses during previous hospitalizations for CHF. But this level of knowledge was limited (less than 50% of the 22 points scale), the same situation also was seen in an educational intervention study in Japan published in 2016 [26], the Japanese self-care knowledge of heart failure before the educational program was also low with 10.6  $\pm$  3.2 points in the interventional group before the intervention. This may be because the previous instructions were incomplete or the method was not suitable. In Vietnam, the current situation of overcrowding, the increasing number of patients coming for medical examination and treatment is one of the challenges for health workers in health education for patients. Therefore, it is necessary to develop an appropriate and effective health education program to help people with heart failure take care of themselves.

As mentioned above, more than half of CHF cases are re-hospitalized as a result of serious illness and a direct result of poor self-care [8] and self-care is part of treatment success [13]. The figures on the current status of self-care knowledge among patients in this study and in the Japanese research once again confirmed the need of health education for CHF patients. In this study, immediately after the educational intervention, there was a sharp increase in knowledge score (19.38  $\pm$  2.16 points) and remained at a high score (17.92  $\pm$  2.52 points) after completing the intervention one month (Table 1). By the classification of knowledge in Fig. 1, there was a positive change in the number of patients on levels of knowledge from the poor (0-5 points) and the fair (6-10 points) before the intervention to the average (11-17 points) and the good (18-22 points) after the educational intervention.

Accompanying with the self-care knowledge, it can be seen in Table 2 positive changes with the increased mean scores after completing the educational intervention in comparison with those at the beginning of study in all three fields of CHF self-care practices including Self-care

maintenance, Self-care management, and Self-care self-confidence. It would be unreasonable to compare this study with studies which were not similar to the research method, but there was similar early changes in improving CHF self-care practice after the educational intervention in a research conducted in Iran published in 2013 [27] as well as the research mentioned in Japan [26]. In our study, statistically the scores of practice after the intervention increased significantly however, on the scale of 100 points for each practice field, differences in these scores were relatively modest. Evidently, changing behaviors are always hard and takes times, in addition the duration for assessment of changes in practice in our study was just one month after the end of the intervention. This result in CHF self-care practice revealed the necessity for reinforced education in the next monthly appointments of patients. The results of increased numbers of patients were frequently to do self-care maintenance in Table 3, very likely to do self-care management in Fig. 2, and more confident to do self-care activities in Fig. 3 after the educational intervention in this study showed practical benefits rather than statistical significance. These initial results in this study also contributed to demonstrate the effect of the educational intervention on self-care practice for CHF patients as seen in the studies mentioned in Japan [26] and in Iran [27].

This study also had certain limitations included the small sample size, the short duration of evaluation and the dependence on the patients' remember for evaluating of self-care practice.

## 6. CONCLUSION

The result of this study indicated that self-care knowledge and practice of the participated patients were limited and there were initial improvements after the educational intervention. The findings of this study showed that the necessity of regular education for patients with heart failure.

## CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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