The Effect of a Health Education Based Program on the Orem's Self-Care Theory with Heart Failure Patient: An Experimental Study

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Abstract

Heart Failure (HF) is considered one of the most worldwide diseases with high readmission rate, cost, and morbidity and mortality rates. One of the best ways to prevent the negative consequences of this disease is by performing the healthy self-care behaviors. This study is aimed to describe the effect of self-care behaviors on re-hospitalization rate among patients with congestive heart failure in Jordan. Experimental, descriptive, and retrospective methods were used in this study. An experimental design was used to assess the effect of a health educational self-care behaviors based on Orem's Theory of self-care of patients with heart failure. Data were collected from 120 admitted patients with HF from King Abdullah University Hospital by using demographical/clinical data sheet and the Arabic version of The European Heart Failure Self-Care Behaviors Scale (EHFSCB scale). A total of 120 Heart Failure (HF) patients participated in the present study. The patients were distributed into two groups; a control group (n=60) and an experimental group (n=60). The results of the study showed that there were significant statistical differences at significance level ($\alpha \le 0.05$) between the mean scores of the control group and the experimental group in the post-assessment of the participants' self-care behaviors, which was referred to the significant positive effect of the educational intervention-based on Orem's self-care theory. These results highlighted the need for ongoing training for self-care behavior to both nurses and patients with HF. The implications of this study for practice, education, administration and research might lead to positive outcomes not only for patient and their families but also for all society.

Keywords: Heart Failure, Orem's Theory, Intervention, Education, Jordan.

Introduction

Heart failure (HF), a common disease in elderly population, is an age-related disease due to a series of changes in the body [6]. With the growth of the global population and the aging of the population, the incidence and prevalence of heart failure have increased significantly6. Therefore, heart failure has become the most common reason for hospitalization of the elderly, and the social burden of heart failure become increasingly heavy.[6,17]

It was found that the causes of admission and complications in most patients with heart failure can be avoided, but this depends on various factors[18].There is also increasing evidence that improving self-care in patients with heart failure is important to prevent heart failure related outcomes and improve health-related quality of life[25].

However, self-care is very important in the long-term care and disease control of chronic diseases such as heart failure[12]. Self-care is needed by everyone, when the patient's self-care ability is lower than self-care needs, nurses should give timely support[26]. Nurses need to consider various factors affecting the elderly with heart failure when providing support, and formulate effective self-care measures to improve self-care effect [29].

Self-care is crucial for patients with heart failure[12]. Nurses need to focus on how to promote patients' self-care skills[25]. Understanding factors related to self-care for patients with heart failure is essential for guiding both patients and nurses, the first step of which is to identify patient profile and take these characteristics of which as

the goal of health education to improve self-care[25]. It's necessary for nurses to provide evidence-based care and nurse-patient cooperation to help patients better implement self-care, and, most importantly, enable patients conduct daily self-care.[16]

Therefore, the patients must be able to face this disease and its consequences. Self-care behaviors are considered one of the main methods that decrease CHF complications and increase patient adaptation to this disease.

The Self-Care Deficit Theory of Nursing is based on three interrelated theories:
(1) the theory of self-care, (2) the self-care deficit theory, and (3) the theory of nursing systems, which all form a framework for nursing. In this study, the focus is on the Self-Care Deficit Theory which developed by Dorothea Orem as a result of working toward of improving the quality of nursing in public sector hospitals. The Self-Care Deficit Theory states that all people have the capacity to develop their intellectual and practical skills, along with the basic drivers of self-care and Orem believes that individuals can develop self-care habits or routines or practice. The Self-Care Theory has its main component requisites of self-care, which are universal, developmental.

In this study, health deviation requisite, which is presented in ill person or injured, who has specific forms of pathologic conditions or disorders, [26i] it is for the patients who have CHF. In order to meet these requisites, patients or "self-care agent" as defined by Orem; must have the power and ability to engage in a course of actions and

decide what to do, and how to perform care measures to meet self-care requisites[20]. Some of these actions and care measures were recommended. that must be followed by patients with CHF, such as eating less sodium (salt) each day, weighing every day at the same time, recording weight on a daily log, checking and recording blood pressure and pulse rate each day, balancing physical activity with rest, monitoring heart failure symptoms each day, taking all the medications that are prescribed by heart failure care team, quitting smoking, avoiding alcohol and trying to lower known stresses[28].

In Jordan, HF is considered a serious disease since a 99,000 patients were estimated to have HF and the mortality rate of HF is more than 8% out of 38% of the mortality rate of the total cardiovascular diseases which are considered the leading cause of death in Jordan Statistics 2003, It was found that some people in Jordan continue to lead sedentary lifestyle, unhealthy nutritional habits, low rates of screening practices, low physical activity levels and smoking.[24] In 2017, a survey was conducted among adult Jordanians 18 years or older found the prevalence of hypertension to be 26%, the impaired fasting glucose 24% (50% increase since 2015) and hypercholesterolemia 34%, overweight was 66%, thirty two percent of Jordanians are physically inactive, almost 29% of the Jordanians smoke cigarettes regularly (50% males, 6% females). The carbohydrate share of the dietary energy supply was decreasing and this decrease was accompanied by an increase in the share of energy supply from fat. It was found that only a small percentage of Jordanian adults participated in health-promoting behaviors3. Controlling these modifiable cardiac risk factors could be achieved through improving the healthy self-care behaviors among Jordanian cardiac patients. Therefore, Jordanian people need to pay more attention to health-prompting behaviors for either healthy people or cardiovascular patients in general and for patients with HF in specific.

Based on Orem Self-care Theory and the literature reviewed it was suggested that enhancing self-care behaviors among patients with CHF will improve their quality of life. This study will focus on assessment of patient self-care and its relation toward decreasing re-hospitalization rate in CHF patients, because few studies have been conducted on this topic in Jordan.

Methodology
Study design
Experimental, descriptive, and retrospective methods were used in this study. An experimental design was used to assess the effect of a health educational self-care behaviors based on Orem's Theory of self-care of patients with heart failure. This study is an experimental study, with one experimental group receiving Orem's self-care model and a control group receiving care as usual. The outcome measure was the effectiveness of Orem's model in improving self-care knowledge, attitudes, and practices among heart failure patients.

Setting and participants
The study population is comprised of patients diagnosed to have heart failure in King Abdullah Hospital. According to the King Abdullah Hospital report, 850 heart failure patients in 2019 attended the cardiology clinic, which are 18 years old and above seeking regular checkup. Only patients with stable condition were approached and introduced to the study. They were selected through the following inclusion and exclusion criteria:

Inclusion criteria: patients who are with heart failure diagnosis, above 18 years old and Jordanian National.

Exclusion criteria: patients who are mentally challenged, has a chronic disease other than HF, and/or not willing to participate.

Sampling
The researcher used the results of Mohammadpour (2015) and the following formula for calculating the sample size, $(n) = 1+2C (SD/d)2$. Accordingly, with a confidence level of 95% and a power of 80%, the sample size was determined to be 60 patients in each group. Was employed the simple random sampling technique (lottery method) to randomly assign the patients to either the control or the experimental groups.

Sample size $(n) = 1+2C (SD/d)2, (n) = 1+2*7.85 (25/15)2$, $(n) = 1+53.3$, $(n) = 54.3+6$ (considering 10% dropout), Sample size $(n) =60$ for each group. Total of 120 participants, $C = 7.85$ (at 95% CI and 80% power)

Instrumentation
Socio demographic characteristics were gathered through individual interviews and medical data was extracted from King Abdullah Hospital medical records. The demographic questionnaire consisted of questions including patients' age, gender, educational level, weight and family history of HF.

The European Heart Failure Self-Care Behaviors (EHFScB) Scale was used in the study. It consists of 12 items rated on a 5-point Likert Scale that range from 1= completely agree to 5 = completely disagree, the total score was calculated by summing the ratings for each item and can range from 12 to 60, where higher scores indicate poorer self-care behavior.

EHFSCB's original version scale consisted of 20 items8 and was reduced to 12 items 2 and her colleagues. Concurrent validity was confirmed, patients with HF education to patients without such education were compared, the European Heart Failure Self-care Behavior Scale explained the difference between these groups. Therefore, validity of the scale was confirmed. The internal consistency of the scale was tested using pooled data of 442 patients from two centers in Sweden, three in the Netherlands and one in Italy. Cronbach's Alpha was 0.81 9.

From 14 instrument identified in the literature, only two instruments were found to be reliable and valid tools to measure HF self-care behaviors; the EHFScB scale was one of these two instruments4.Therefore, The EHFScBS is a valid and reliable scale that measures self-reported self-care behaviors among patients with HF such as taking medication, daily weighing, fluid restriction, physical activity and monitoring of HF symptoms, also it has the ability to differentiate between patients' educational level.

The EHFScBS was translated into 14 languages and this study add one more language by translating it to Arabic language.

Permission from the author was obtained to use the instrument. Translation and back translation were conducted by two doctoral prepared nurses and two qualified nurses who were competent in both Arabic and English languages. The scale was modified for the current study, two columns were suggested to be added in the main instrument, the first column include a question whether the patients was taught about the behavior (yes/no question) and the second column include a question on if so, who taught patients on this behavior; participants selected from the following options; physician, nurse, relative and friend.

In order to understand the results of (EHFScB scale) and according to the literature, the items that related to the same behaviors were jointed together. For example, items 2,3,4,5 and 8 were the behaviors that related to symptoms monitoring activities. Item 7 and 12 were the behaviors that related to physical activity and items 6 and 9 were the behaviors related to diet and fluid restriction (Kato, 2009; Tsuyuki, 2001; Holzapfel, 2009) According to (Kinugawa, 2017) the cutting point score for EHFScBS was 24, this mean that if the total score of EHFScBS was 24 or less indicated good self-care behaviors and if the total score of EHFScBS was more than 24 indicated poor self-care behaviors. This cutting point was used to discuss the results of current study.

A pilot study was conducted to evaluate feasibility and test the reliability of the Arabic version of EHFScBS. The questionnaire was distributed to 13 patients with HF in KAUH using a structural interview. The finding of pilot study indicated that the Arabic version of EHFScBS was reliable with Cronbachs's alpha of 0.88, and the scale was found easy to be administered and practical to use.

Study Intervention

The Participants were randomized to the intervened groups received health education based on of Orem's self-care theory, intervention aimed at improving self-care behaviors. Health education included a 30-minutehealth care education session for in a comfortable place on the hospital facility. The Self-care to Success program used clinical practice guidelines and the implementation guide to direct the implementation process23.

Participants (n=120) were heart failure patients selected from three heart failure clinics managed by three outpatient nurses during regular clinic visits.

Data collection included written consent, democratic data, and completion of self-care of heart failure index. Face to face interviews were held with each of the participants by nurses to review the patient's checklist taking into account knowledge and current heart failure status of the patients.

Also, a pre-post interventional design was used to measure outcomes following heart failure self-care to success (HFS25) program in this self-care program for patient with heart failure

Heart failure's signs, symptoms and quality of life were explained to the participants and free photo copy was given to each participants. The health education session focused on information such as the definition and symptoms of heart failure, medications, strategies to prevent the worsening of HF symptoms, recommendations regarding dietary changes, exercise and smoking cessation.

We used Bryant & Himawan (2019) clinical practice guideline for program content (calendar and weight skills) and the situation-specific theory of heart failure self-care to direct the implementation process (implementation guided). This self-care program has been piloted in a house call and outpatient cardiology practice reporting a decrease in heart failure hospitalization and improved self-care behavior.

Ethical Consideration

The consideration in terms of ethical aspects is upheld for the participants of the study. For this study, the researcher follows the ethical guidelines developed by the National Institute of Health (NIH), which contains the following: Codes and regulations, respect for persons, beneficence and justice. In order to protect the right of the participants in the research study, after the proposal was reviewed and approved, it was presented to the private University Research Ethics Committee (REC) before the researcher will start the data gathering process. Moreover, the researcher will secure permission to conduct the study from the Director of the Hospital. Once approved, the researcher informed participants about the purpose and design of the study to establish rapport, gain their cooperation during the entire course of the data collection and gain their trust.

The participants were asked to share their personal experiences that may or may not cause them to feel uncomfortable, and if they want to terminate their participation in the study at any point during the interview, they are free to do so. If there are questions that they do not wish to answer, they may say so. The right to privacy was maintained throughout the study for all the participants. Participants was assured that all their data was kept confidential. To facilitate this, anonymity and confidentiality procedures were followed in this study, so the data will not be linked to participants. Furthermore, the data was maintained in a secure environment for storage. For the qualitative part, data collection was carried on by doing interviews with participants who agreed to participate in the study.

The participants were assured of the confidentiality of all the information they will share with the researcher. To maintain the anonymity of the participants, their names will not be indicated; instead, the researcher will utilize pseudonyms. Participants was informed that this is voluntary, and they were given the opportunity to ask questions or clarifications about the study. The content of informed consent included the study purposes, procedure, type of data, risks, and benefits of the study, confidentiality pledge 5. Respect for cultural, religious, and other forms of diversity among participants was maintained during the study.

Data Collection Procedure

Before conducting the study, approval from Institutional Review Board (IRB) committee at privet` University for the protection of human subjects and approval from governmental Hospital were granted.

Nursing directors and in-charge nurses at both hospitals were contacted and were informed about the purposes of the study and data collection procedure. Consent form was on the first page of each questionnaire, and included the name of the researcher, the purpose of this study. The consent form ensured that the participation in this study was voluntary, and that each participant has the right to withdraw from this study at any time without being punished and their care will not be affected. Additionally, the consent form ensured the anonymity procedure in data collection for this study. Patients were not asked to express or write their identifying data on the questionnaires, and the researcher told the participants that all information that was gathered was used only for the purpose of research.

Patients who met the inclusion criteria were asked to participate in this study. A registered nurse was assigned to help the researcher in data collection in King Abdullah university hospital (KAUH) after training on the data collection procedure. As mentioned before, participants were randomly assigned to an experimental group (n=60) and control group (n=60) recruited from CCU and medical ward patients and outpatient clinics patients. Participants were provided teaching using (H2S) model with permission from the author (Bryant & Himawan, 2019), and were asked to complete the calendar and record their weighs, HF symptoms, medication, physical activity, hospitalization rate and diet and fluid restriction measures. A questionnaire was applied as pretest and posttest and required 10-15 minutes to complete. Patients were asked to provide their addresses and regular follow-up visits at their homes were scheduled three times a month for one hour. The follow-up visits continued for three months. Data collection took place in the patient's room in the medical department, CCU and clinical patient unit in hospitals. Questionnaires were given to patients who can comprehend and able to read and write, the researcher read the items in case patients were unable to read or write. All returned questionnaires were checked for completion and were entered to computer for analysis.

Statistical analysis.
The statistical package for the social science SPSS version 16 was used to analyze the data. Descriptive statistics (mean, standard deviation, frequencies and percentages) were used to analyze all demographical characteristics of participants, describe self-care behaviors among patients with HF, identify the self-care behaviors that most taught to Jordanian patients with HF and persons who taught these behaviors.

Pearson correlation, t-test and ANOVA test were used to describe the relationship between sociodemographic and clinical variables with self-care behaviors. All tests were analyzed at a significant level of alpha <.05.

Results
A total of 120 Heart Failure (HF) patients participated in the present study. The patients were distributed into two groups; a control group (n=60) and an experimental group (n=60). The results presented in table (1) represent the demographic and clinical characteristics of the study sample. The mean age of the participants in the control group was 53.08 years, whereas the mean age of the participants in the experimental group was 51.53 years. Male participants constituted 55% (n=33) of the control group, whereas females were 45% (n=27). For the experimental groups, there was an equal representation of males and females (50% for each).

Distributing the study sample in both groups based on their marital status revealed that married patients were the most represented category in both groups, as they were 91.7% (n=55) in the control group and 95% (n=57) in the experimental group. In addition, the results indicated that HF patients living in the city were representing 73.3% (n=44) of the control group and 70% (n=42) of the experimental group.

The majority of the HF patients in both groups (control and experimental) were living with other people, as the results revealed that 95% (n=57) of the control group were living with others, while 88.3% (n=53) of the experimental group were living with others. About 70% (n=42) of the control group HF patients were holding secondary education. On the other hand, 66.7% (n=40) of the experimental group HF patients were holding the secondary education certificate. In addition, there was 30% (n=18) of the control group members had a bachelor degree or higher, whereas they constituted 26.7% (n=16) of the experimental group HF patients.

The results related the employment status of the study participants revealed that in the control group; 50% (n=30) had a job, 16.7% (n=10) had no job, and 33.3% (n=20) were retired. On the other hand, they constituted 65% (n=39), 11.7% (n=7), and 23.3% (n=14), respectively in the experimental group.

Moreover, the results showed that those who work in the governmental sector represented 35% (n=21) of the control group, whereas private sector employee were representing 15% (n=9). In the experimental group, those who had a governmental job represented 40% (n=24), whereas HF patients who were working in the private sector were representing 25% (n=15).

The majority of the study participants in both the control group and the experimental group (71.7%, n=43) were having a monthly income ranged between 300 and 500 JD. The least represented category was those who had less than 300 JD as a monthly income, as they constituted 5% (n=3) and 1.7% (n=1) in the control group and the experimental group, respectively.

Investigating the presence of other chronic diseases among the study participants in both groups revealed that 75% (n=45) of the control group members had no other chronic diseases, whereas 76.6% (n=46) of the experimental group members reported that they had no other chronic diseases.

Diabetes Miletus (DM) was present among 8.3% (n=5) of the control group HF patients, and 5% (n=3) of the experimental group HF patients. In addition, Hypertension (HTN) was present among 16.7% (n=10) of the control group HF patients and 18.3% (n=11) of the experimental group HF patients.

During the last six months, 38.3% (n=23) of the HF patients in the control group reported that they were admitted to the hospital one time, while 30% (n=18) were admitted twice, 16.7% (n=10) were admitted three times, 11.7% (n=7) were admitted four times, and 3.3% (n=2) were admitted more than five times. For the experimental group, about 40% (n=24) reported that they were admitted to the hospital one time during the last six months, while 33.3% (n=20) were admitted two times, 18.3% (n=11) were admitted three times, and 8.3% (n=5) were admitted four times.

Most of the participants in both, the control group and the experimental group, reported that they had health insurance. They represented 98.3% (n=59) of the control group and 90% (n=54). The governmental health insurance was the most prevalent among the insured patients in both groups, as 96.7% (n=58) of the control group HF patients and 86.7% (n=52) of the experimental group HF patients were insured from governmental side.

Smoker HF patients represented 56.7% (n=34) of the control group HF patients, whereas they constituted 61.7% (n=37) of the experimental group HF patients. With regard to the duration of the heart failure disease, about 66.7% (n=40) of the control group and the experimental group HF patients reported that they had HF for less than one year.

The majority of the participants in both groups reported that they had no weighting Scaleat home. Those who had no weight scalerepresented 81.7% (n=49) of the control group, and 80% (n=48) of the experimental group.

About 93.3% (n=56) of the HF patients in the control group reported that they have a close health center to their living area. In addition, 85% (n=51) of the experimental group reported that they had a close health center to their living area.

Sixty-six percent (n=40) of the study participants from the control group and the experimental group reported that there was no restriction in physical activity, and normal activity does not cause fatigue, shortness of breath, heart palpitations or chest pain. 26.7% (n=16) of the control group members and 28.3% (n=17) of the experimental group members reported that there was a marked restriction in physical activity and they were comfortable when resting, but the symptoms of heart failure resulted from minimal physical activity. Finally, 6.7% (n=4) of the HF patients in the control group and 5% (n=3) of the HF patients in the experimental group reported that their physical activity is severely restricted and symptoms of heart failure appear even at rest.

Table 1: Demographic and Clinical Characteristics of the Study Sample

	Control group (N=60)	Experimental group (N=60)
Age (M±SD)	53.08±8.468	51.53±8.081
Gender (%)		
1 Female	27 (45%)	30 (50%)
2 Male	33 (55%)	30 (50%)
Marital Status		
1 Single	1 (1.7%)	0 (0%)
2 Married	55 (91.7%)	57 (95%)
3 Divorced	0 (0%)	1 (1.7%)
4 Widowed	4 (6.7%)	2 (3.3%)
Living Place		
1 City	44 (73.3%)	42 (70%)
2 Village	16 (26.7%)	34 (28.3%)
With whom do you live		
1 Alone	3 (5%)	7 (11.7%)
2 With others	57 (95%)	53 (88.3%)

	Control group (N=60)	Experimental group (N=60)
Educational qualification		
1 Primary	0 (0%)	4 (6.7%)
2 Secondary	42 (70%)	40 (66.7%)
3 Bachelor or higher	18 (30%)	16 (26.7%)
Do you have a job?		
1 Yes	30 (50%)	39 (65%)
2 No	10 (16.7%)	7 (11.7%)
3 Retired	20 (33.3%)	14 (23.3%)
Nature of work		
1 Governmental	21 (35%)	24 (40%)
2 Private	9 (15%)	15 (25%)
3 NA	30 (50%)	21 (35%)
Monthly income		
1 Less than 300 JOD	3 (5%)	1 (1.7%)
2 300 – 500 JOD	43 (71.7%)	43 (71.7%)
3 More than 500 JOD	14 (23.3%)	16 (26.7%)
Any other chronic diseases		
1 Yes	15 (25%)	14 (23.3%)
2 No	45 (75%)	46 (76.6%)
Present chronic diseases		
1 DM	5 (8.3%)	3 (5%)
2 Hypertension	10 (16.7%)	11 (18.3%)
3 No chronic	45 (75%)	46 (76.7%)
No. of admission during the last 6 months		
1 One	23 (38.3%)	24 (40%)
2 Two	18 (30%)	20 (33.3%)
3 Three	10 (16.7%)	11 (18.3%)
4 Four	7 (11.7%)	5 (8.3%)
5 Five or more	2 (3.3%)	0 (0%)
Do you have a health insurance?		
1 Yes	59 (98.3%)	54 (90%)
2 No	1 (1.7%)	6 (10%)

	Control group (N=60)	Experimental group (N=60)
Type of insurance		
1 Governmental	58 (96.7%)	52 (86.7%)
2 Private	2 (3.3%)	8 (13.3%)
Smoking status		
1 Smoker	34 (56.7%)	37 (61.7%)
2 Non-smoker	26 (43.3%)	23 (38.3%)
Duration of heart failure		
1 Less than 1 year	40 (66.7%)	40 (66.7%)
2 1-3 years	16 (26.7%)	17 (28.3%)
3 More than 3 years	4 (6.7%)	3 (5%)
Having weight balance at home		
1 Yes	11 (18.3%)	12 (20%)
2 No	49 (81.7%)	48 (80%)
Presence of close healthcare center to living area		
1 Yes	56 (93.3%)	51 (85%)
2 No	4 (6.7%)	9 (15%)
Severity of heart failure symptoms		
1 Class One	40 (66.7%)	40 (66.7%)
2 Class Two	16 (26.7%)	17 (28.3%)
3 Class Three	4 (6.7%)	3 (5%)

Baseline self-care behaviors among heart failure patients (pre)

The results shown in table (2) represent the mean and standard deviation scores for the self-care behaviors of HF patients before implementing the educational interventional program based on Orem's theory. The results revealed that there were no statistically significant differences in the self-care behaviors at ($\leq$0.05) regarding group variable, except for taking the flu shot every year item.

Table (2) Means and Standard Deviations scores for the self-care behaviors in the Control and the Experimental Groups before Intervention

	Control		Experimental		t	P
	Mean	SD	Mean	SD		
I weigh myself every day	3.43	1.430	3.78	1.136	-1.484	.140
If I get SOB I take it easy	3.45	1.185	3.72	1.342	-1.154	.251

If SOB increases I contact my doctor or nurse	3.48	1.255	3.53	1.109	-2.004	.067
If leg/feet are more swollen, I contact doctor or nurse	3.50	1.384	3.67	1.203	-.704	.483
If I gain weight I contact doctor or nurse	3.53	1.396	3.93	1.177	-1.697	.092
I limit the amount of fluids	3.53	1.255	3.83	1.237	-1.319	.190
I take a rest during the day	3.48	1.295	3.85	1.191	-1.614	.109
If I experience fatigue I contact doctor or nurse	3.43	1.226	3.50	1.151	-2.072	.080
I eat a low salt diet	3.62	1.209	3.97	1.119	-1.646	.102
I take my medication as prescribed	3.82	1.308	3.70	1.078	.533	.595
I get a flu shot every year	3.50	1.157	3.90	1.217	-1.845	.048
I exercise regularly	3.38	1.329	3.43	1.097	-2.697	.078
Total	3.51	.408	3.58	.349	-4.769	.301

Assessment of Self-care Behaviors among Heart Failure Patients after implementing the educational program

The results shown in table (3) represent the mean and standard deviation scores for the self-care behaviors of HF patients after implementing the educational interventional program based on Orem's theory. The results revealed that there were statistically significant differences in the self-care behaviors at (α= 0.05) regarding group variable.

The results indicated that the experimental group HF patients were more adhered to weight themselves on a daily basis (M=2.38, SD=1.462, t=3.854, P=.000), taking it easy if they get SOB (M=2.43, SD=1.345, t=4.134, P=.000), contacting the doctor or a nurse if SOB increases (M=2.35, SD=1.338, t=6.112, P=.000), contacting the doctor or the nurse if the leg/feet get more swollen (M=2.42, SD=1.357, t=4.538, P=.000), contacting the doctor or the nurse if gaining weight (M=2.15, SD=1.300, t=4.719, P=.000), limiting the amounts of fluid (M=2.43, SD=1.280, t=5.308, P=.000), taking rest during the day (M=2.17, SD=1.368, t=5.315, P=.000), contacting the doctor or the nurse if getting fatigue (M=2.37, SD=1.262, t=5.593, P=.000), eating a low salt diet (M=2.40, SD=1.532, t=5.713, P=.000), taking medication as prescribed (M=2.07, SD=1.247, t=5.474, P=.000), getting a flu shot every year (M=2.15, SD=1.363, t=4.633, P=.000), and exercising regularly (M=2.45, SD=1.358, t=4.823, P=.000).

Table (3) Means and Standard Deviations scores for the self-care behaviors in the Control and the Experimental Groups after intervention

	Control		Experimental			
	Mean	SD	Mean	SD	t	P
I weigh myself every day	3.38	1.379	2.38	1.462	3.854	.000
If I get SOB I take it easy	3.50	1.479	2.43	1.345	4.134	.000
If SOB increases I contact my doctor or nurse	3.80	1.260	2.35	1.338	6.112	.000
If leg/feet are more swollen, I contact doctor or nurse	3.48	1.214	2.42	1.357	4.538	.000
If I gain weight I contact doctor or nurse	3.30	1.369	2.15	1.300	4.719	.000
I limit the amount of fluids	3.72	1.367	2.43	1.280	5.308	.000

I take a rest during the day	3.43	1.240	2.17	1.368	5.315	.000
If I experience fatigue I contact doctor or nurse	3.67	1.284	2.37	1.262	5.593	.000
I eat a low salt diet	3.75	1.002	2.40	1.532	5.713	.000
I take my medication as prescribed	3.37	1.353	2.07	1.247	5.474	.000
I get a flu shot every year	3.33	1.434	2.15	1.363	4.633	.000
I exercise regularly	3.60	1.251	2.45	1.358	4.823	.000
Total	3.53	.373	2.31	.415	16.849	.000

The effect of educational program on Self-care Behaviors among Heart Failure Patients

To find out the direction of the differences, the researcher performed independent samples t-test. the results shown in table (4) represent the independent samples t-test for the study groups. The results indicated that there were statistically significant differences at (α=0.05) in the self-care behaviors between the control group and the experimental group in favor of the experimental group.

Table (4) Independent Samples Test for the self-care behaviors among the control group and the experimental group

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig.	Mean	Std. Error	Lower	Upper
PRE	Equal		.311		118	.201	−.33	.069	−.468	−.193
	Equal					.117	−.33	.069	−.468	−.193
POST	Equal		.253		118	.000	1.21	.072	1.071	1.357
	Equal					.000	1.21	.072	1.071	1.357

Table 5 Tests of Between-Subjects Effects

	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
PRE		1	.093	.598	.441	.005
GROUP	35.582	1	35.582	227.717	.000	.661
Error	18.282	117	.156			
Corrected Total	62.581	119				

Discussion

The results of the present study revealed the effectiveness of the educational program based on Orem's self-care theory in improving the self-care behaviors of Jordanian HF patients. This was shown through the significant statistical differences in self-care behaviors between pre and post mean scores of the experimental group that received the educational intervention.

The results showed that there was an improvement in the experimental group participants' self-care behaviors, such as weighting themselves every day, taking it easy if they get shortness of breath and contacting the nurse or the physician if the shortness of breath increased. In addition, there was an improvement in contacting the doctor or the nurse if his/her leg/feet gets more swollen or if they gain weight. Moreover, the participants adhered more to limiting the amount of fluids, taking rest during the day, contacting the doctor if experiencing fatigue, eating low salt diet, taking medications as prescribed, taking flu shot and exercising regularly.

These results were attributed to the educational program based on Orem's theory, which is oneself is able to perform self-care activities, maintain their health and well-being with physical activities and self-care demands, which is the totality of self-care actions to be performed for some duration in order to meet self-care requisites by using valid methods and related sets of operations and actions. When patients' abilities are greater than their needs, there is a self-care deficit. If this deficit exists, the need for nursing intervention for the deficit.

Through using the educational program described earlier in chapter three, patients were encouraged to be independent to care for themselves as they are able to recover faster by performing their own self-care.

The results of the present study are consistent with the findings reported by Bryant & Himawan (2019), which indicated that using intervention educational program based on Orem's self-care behaviors of heart failure patients and reducing their re-hospitalization rates.

In addition, the results of the study are in line with the results reported by Bryant & Himawan (2019), whom have reported the effectiveness of an educational program based on Orem's self-care model on improving the quality of life and self-care behaviors of heart failure patients.

Moreover, the results of the present study are consistent with the results reported by Bryant & Himawan (2019), which revealed that using Orem's model of self-care is very effective in improving self-care behaviors of heart failure patients.

In summary, it could be reported that using an educational intervention based on Orem's self-care model is an effective method in improving the constancy and practice of heart failure patients to self-care activities. Providing heart failure patients with sufficient knowledge related to their medical condition and the required self-care activities, in addition to making them independent in performing self-care activities, would significantly improve their health outcomes.

Limitations of the study

Despite that the present study was a clinical trial with a comparison and an interventional group, which is considered the most powerful design to infer the casual relationship between many confounding variables.

It could affect our results emerged while conducting the study, that are beyond control due to their invisibility and unattainability.

The first limitation of this study was that 10% of the participants dropped (they were replaced by other consented patients) as they found that the educational program is boring and repetitive. Although the educational program has the advantage of being short, able to reach many participants individually, and at scheduled times, this approach of course, rarely allows for the sort of interaction and active communication that is more hands-on or practical.

Another primary limitation in the current study was the difficulty of detecting changes of health status for the study participants; for example, progression or deterioration of health status, as well as the addition of some medications or changing the recommendation diet is important to modify the content of the educational program to address their learning needs, so the failure in updating the participants' health-related events might prevent the educational content from approaching its goals.

Implications and recommendations of the study

In terms of practice: the findings of this study revealed the effectiveness of a training program based on Orem's self-care model in improving self-care behaviors among heart failure patients. So, it is recommended for the stakeholders and decision makers exploit training sessions based on Orem's self-care model to obtain better outcomes of the treatment. In addition, this training program can be used to follow up with heart failure patients in the transition or discharge period, which may improve the patient-provider relationship, as patients feel that there is someone attentive to health and needs.. This also highlights the importance of communication between patients and health care providers.

Accordingly, the major practical contribution of the current research study is providing much needed empirical data about the use of the training program based on Orem's self-care model in improving the practice of self-care behaviors among Jordanian HF patients through increasing their knowledge and awareness regarding the self-care activities that might reduce the complications of HF and efficiently promote the health status of HF patients.

A second major practical implication of the findings of this study stems from the reframing of the issue of how theory-based training programs might play a significant role in health promotion in general, and among HF patients in particular.

In terms of research: the effectiveness of training programs based on Orem's self-care model still needs more research to prove its effectiveness. So, more research is needed in this area with different populations, settings, and diseases. For further research, it is recommended to assess longitudinally the effectiveness of the training programs.

The current study might be extended in search of the effectiveness of training programs in improving the adherence to self-care activities among the patients suffering from other chronic diseases, such as Diabetes Miletus. In addition, the design of the present study might be modified to include more self-care behaviors and in-depth knowledge content that will significantly improve the patients' practice to self-care activities. The content of the educational program might be modified in the future in order to be directed towards the healthy people as well in order to provide them with adequate knowledge regarding the risk factors and facts about HF.

In terms of administration: it is important for the administrative authorities to foster the significance of patients and healthcare providers relationship and having patients as active participants rather than passive participants, and if possible train health care providers on communicating effectively with patients and use the theory-based training programs effectively for this purpose.

The findings of the present study provide a research-based evidence of how a theory-based intervention, specifically Orem's self-care theory, significantly improves the HF patients' practice to self-care activities. The adoption of the theory-based interventions might significantly reduce the costs, efforts and challenges encountered by the healthcare providers when dealing with patients with chronic diseases such as HF., due to reduction in rates of hospital admissions and length of stay.

In terms of teaching: courses about communication with patients, its importance and the possible ways that could improve patients-health care provider relationship.

The findings of the present study might provide curriculum developers in the educational institutions with an insight on the significance of integrating theory-based interventions in the health promotion and practice to self-care activities among patients suffering from chronic diseases. Adding theory-based health interventions as a core topic in the syllabus of medical students study plan will provide the healthcare workers with the opportunity to adopt these interventions in their practical life and consequently affect the quality of the provided healthcare services.

Conclusion

The theory-based health interventions were reported to significantly help patients ease the burden of taking care of a chronic disease. Training programs were found to be the best approach to delivering tailored knowledge content to those patients. The simplicity, ease of access and low cost were featuring characteristics of training programs based on health promotion models. In addition, theory-based health intervention is useful for people that have transportation issues, other difficulties, child care or work that interferes with them coming for medical care. The current study investigated the effectiveness of educational, motivational and training program on improving the practice of self-care behaviors among HF patients in Jordan.

The use of training program based on Orem's self-care model could be useful and a promising method to design interventions that aim to enhance adherence with recommended lifestyle behaviors and self-care activities, such as adherence to taking medications, diet, foot care and exercise. Despite the cost of the training programs, it would be cost effective compared to the cost of non-adherence. Moreover, implementing training programs based on Orem's self-care model is easy and an effective way to communicate with the patients, make interventions personalized and interactive and can reach to a large number of patients. However, further study is needed to replicate the study results.

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