Original Article

The effect of using Orem's model of self-care on recovery of patients
with heart failure

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Abstract

BACKGROUND: Using care models provide a common method between teachers, students and nurses, which brings together education, services and research. Orem's model of self-care has been widely studied and is globally applied in the modern nursing. This study is aimed to determine efficiency of Orem's model of self-care in the recovery of patients with heart failure.

METHODS: This is a semi-experimental study and a clinical trial. Study population included all patients with heart failure (class I and II) who referred to medical centers of hospitals administered by Tehran University of Medical Sciences. Patients were randomly divided into two groups and both groups were monitored for 6 months. Data were collected using self-care questionnaire and were analyzed using chi-square and t-test.

RESULTS: The findings showed a significant difference between self-care abilities of patients in experiment group after the intervention compared with controls ($p < 0.001$). Also, the recovery of patients, what they were doing to remove symptoms and their compliance with treatment regimen and the fluids balance of intervention group was better than controls ($p < 0.001$).

CONCLUSION: Treatment of patients with heart failure needs long term control and the patient is the only one who can gradually improve their heart condition. To achieve this situation, the results of this study showed that applying Orem's model of self-care is very effective for patients with heart failure. It resulted in higher scores of self-care, less referral, less hospitalizations and better liquid and electrolyte balance.

KEY WORDS: Self-care, Orem's model, nursing, heart failure.

Using care models provide a common method between teachers, students and nurses, which bring together education, services and research.[1] Care models also provide nurses an approach to systematically organize various data of patients they face everyday.[2] Therefore, using these models, make care services purposive, systematic and innovative and helps more control on the outcomes of nursing cares.

Orem's model of self-care has been widely studied and is globally applied in the modern nursing.[3] Nursing system from Orem's view is a system that helps patients by resolving their needs to nurses' help. In this view, nursing is necessary just when the care patients need is beyond their capacity and ability, in which case nurses respond by educating, guiding, supporting and providing relative or complete care the patients need.[4] This model focuses on the phys-

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Research Article of Isfahan University of Medical Sciences, No: 81238

ical abilities and patients, families, relatives and nurses operate together in this model.[5]

Heart diseases are among the main health problems in all countries including Iran. The increase of population, especially elderly population increase the prevalence of these diseases so that in the US about 400,000 new cases of heart failure are diagnosed every year and about one million patients are annually hospitalized because of heart failure.[6] As age increases, the cases of heart failure increases too, so that 1% of people over 50 years of age and 10% of people over 80 years of age in the US are suffering from this disease.[6] The severe effects and symptoms of this disease effects various dimensions of life. Following special diet, medical regimen, limitation of using salt, liquids, etc oblige patients with heart failure to change their lifestyle. These patients face many physical and psychological problems such as dyspnea, edema, limitation in activities, etc.[7]

Using planned education and support, which are the main components of Orem's model can be very effective for correcting patients' lifestyle and their adjustment with the disease conditions. These patients should be able to control their disease and follow up their treatments. Therefore, they should be familiar with the causes, symptoms, complications and treatments of their disease and considering the chronic nature of disease, they should be effectively and appropriately take care of themselves.[8]

Dietary, combating fatigue caused by disease, weight control, controlling absorbed liquid and its disposal, how to take medicines, effects and complications of medicine and quitting smoking and alcohol are among self-care issues that should be taught to these patients. In this regard, Orem's model of self-care seems to be very effective.[7]

Considering the importance of self-care for patients with heart failure and considering specific characteristics of Orem's model of self-care and its easy application compared to other models, its expandability and inclusiveness, familiarity of all members of medical team with the language of this model, nurses' time saving

by applying this model and in order to provide an applicable model of care in nursing education, it felt necessary to conduct this study in Iranian society with its special cultural and social characteristics; especially since these patients' lack of knowledge about self-care leads to their frequent hospitalization, which impose great costs on the Iranian health care system. As Artinian et al (2002) believes, one of the ways to prevent frequent hospitalization of the patients with heart failure is to improve their ability of self-care, which should be taught and followed by nurses.[6] Therefore, considering all above mentioned and also considering the fact that there has not been any effective application of Orem's model of self-care for patients with heart failure in Iran, and considering the prevalence of cardiovascular diseases in Iran and the necessity of developing plans to reduce the costs of this disease, this study was conducted aiming to determine efficiency of Orem's model of self-care in the recovery of patients with heart failure.

Methods
This is a semi-experimental study and a clinical trial. Study population included all patients with heart failure (class I and II) who referred to medical centers and hospitals administered by Tehran University of Medical Sciences. The patients were introduced to research team based on their medical files and physicians' approval. The entry criteria included being conscious, passing at least 3 months from their diagnosis, having no heart surgery history in past 6 months, living in Tehran and being literate. Excluding criterion included having irrelevant chronic diseases which interfere with symptoms of heart failure such as COPD. The study environment included heart and internal clinics and wards of hospitals administered by Tehran University of Medical Sciences.

Considering entry criteria and after receiving written consent from patients, the patients were randomly divided into two groups of experiment and control and both groups were monitored for 6 months. In the control group, nursing care was as usual and in the experiment

group, patients were under Orem's model of health care and the principles and conditions of self-care which were the fundamentals of this model were provided based on the conditions through face to face education, written materials, using signs and symbols as well as other educational techniques to the patients or their families individually or in groups. Educations were provided in two sections. The first section included general information that patients with heart failure should know and the second section was provided after a primary need assessments. Along with these educations, supportive acts included emphasis on what the patients paid less attention to, encouragement of patients and relatives to do specific things and providing helpful information.

In the control group, all routine services and informal educations (unplanned) by nurses and physicians were provided as usual and the questionnaires were completed by research team at the same time for both groups. Questionnaire, which was the instrument for data collection in this study, was completed at the time patients and their families entered the study and during the study. If the patients did not have any more referral to the heart clinics, the questionnaire was completed at their houses. It is obvious that periodical completion of questionnaire was necessary for evaluation of study conduction.

The sample size was estimated 100 patients based on similar studies. Data collection instrument was a standard questionnaire of self-care with biographic data and data related to clinical referrals or re-hospitalization and various dimensions of self-care. It was an standard instrument and was used in many researches both in Iran and other countries.[1,3,9] However, validity and reliability of the instruments were reassessed and approved. The content validity of self-care questionnaire was assessed and corrected after the primary translation by professors and its reliability was approved by re-test (r = 0.73).

Descriptive statistics were used to determine central-tendency indices and deviation of study variables. Data were analyzed using chi-square

(comparison of qualitative variables) and t-test (comparison of quantitative variables) to find relationship between variables.

Results
Results of the study showed that mean age of patients was 56.78 (5.07) years for the intervention group and 58.33 (3.73) years for the controls. Majority of patients in both intervention and control groups were male, 54% and 48% respectively. Also, educational level of most patients in both groups was primary school. In intervention group 74% of patients and in control group 80% of them were in level II of the heart failure disease. The mean duration of disease was 17.1 (9.31) years for intervention group and 15.72 (6.33) years for the controls.

Most patients in both groups (61% in intervention group and 60% in control group) were under care of their family members.

Also, both groups were tested statistically and were similar in medication types, history of latest hospitalization, sodium amount and BUN of the last test before the study.

Investigating for the objective of this study, which was to determine efficiency of Orem's model of self-care in the recovery of patients with heart failure, as table 1 shows, 67% of intervention group had high ability of self-care and 33% had average ability of self-care. In the control group, 40% had little ability for self-care and 60% had average ability. Statistical test of chi-square found significant difference between the two groups (p < 0.001).

Comparing mean scores and standard deviation of the two groups of CHF patients' self-care during the study showed that mean score of self-care was 65.69 (6.33) for the intervention group and 32.75 (6.42) for the control group. T test showed a significant difference between the two groups (p < 0.001) (Table 2).

Before the intervention, 52% of intervention group had average efforts and 48% had high efforts. In the control group, 53% had average efforts and 47% had high efforts and both groups were similar. However during the study (Table 3), 100% of patients in the intervention group had high efforts, while 53% of controls

had average and 48% had high efforts to control the disease symptoms. Statistical test of chi-square showed significant difference between the two groups (p < 0.001).

Regarding compliance with medical regimen in the two groups of CHF patients before and after intervention, the results showed that they became significantly different during the study (Table 4). The compliance with medical regimen was average for 58% of patients in the intervention group and high for 42% of them, while in the control group 46% were low and 54% were average. Chi square test showed a significant difference between the two groups considering their compliance with medical regimen (p < 0.001). Also, mean scores of compliance with medical regimen was 57.16 (13.49) for the intervention group and 38 (8.36) for the control group. T-test showed a significant difference between the two groups during the study (p < 0.001).

Findings of this study regarding mean frequency of referral showed that it was 0.67 for the intervention group and 0.8 for the control group. It means that patients in the intervention group had less referral compared to the controls (p < 0.001). Also, the results showed that during the study, none of patients in the intervention group were re-hospitalized, while 20% of controls were re-hospitalized (p < 0.001).

Regarding liquid balance, the results showed that 94% of the intervention group had high balance during the study while it was low for 52% of controls. Chi square test showed a significant difference between the two groups (p < 0.001). The mean scores of the liquid balance were 75.11 for the intervention and 31.44 for the controls and t test showed a significant difference between the two (p < 0.001). It means that patients in the intervention group had better liquid control compared to the controls.

Table 1. Comparing the self care ability in heart failure patients after intervention in both groups

Group Self care ability	Intervention		Control		Test results
	n	%	n	%	
Low	0	0	40	40	$\chi^2 = 114.8$
Average	33	33	60	60	df = 2
High	67	67	0	0	p < 0.001
Total	100	100	100	100	(sig)

Table 2. Comparison of mean and SD of self care score after intervention in both groups

Self care ability Group	n	Mean	SD	ESD
Intervention	100	65.69	6.23	0.62
Control	100	32.75	6.42	0.64

T = 36.8   df = 198   p < 0.001 (sig)

Table 3. Comparing the rate of trying to reduce symptoms in heart failure patients in both groups

Group Rate of trying to reduce symptoms	Intervention		Control		Test results
	n	%	n	%	
Average	0	0	53	53	
High	100	100	47	47	
Total	100	100	100	100	

Table 4. Comparing the condition of following treatment regimen after intervention in both groups

Group	Intervention		Control		Test results
Following treatment regimen condition	**n**	**%**	**n**	**%**	
Low	0	0	46	46	$\chi^2 = 88.2$
Average	58	58	54	54	df = 2
High	42	42	0	0	p < 0.001
Total	100	100	100	100	(sig)

Discussion

In the current study, the number of correct answers to questions on the knowledge of hospital infections was less than other studies. In a similar study on 216 nurses most of them know the importance of inappropriate performing and the increasing danger of hospital infections and believed that there should be a suitable protocol to disinfect the existed equipments and then use them.[6] In another study also, an educational program was recommended for health personnel to control infections.[5] While more than 150 years ago it was showed that washing hands before contacting with patients with infective diseases decreased mortality rate to a great extent.[7] While controlling infections in the environment around infants can decrease hospital infections.[8] In current study, the rate of correct answers to the methods of sterilizing consumable materials, equipments and surfaces was in agreement with a previous study.[9] It is found that following a standard health program is weak in controlling infections.[10] Considering the above points, a good plan is recommended to increase knowledge of nurses on methods of preventing hospital infections based on the infection control standards and an appropriate supervision on usage standards.

The Authors declare that have no conflict of interest in this study and ethical committee approved the study.

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