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ORIGINAL ARTICLE

Effectiveness of Pendleton's consultation model on the illness perception of heart failure patients

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ABSTRACT

Background and Aim: This study aimed to determine the effect of nursing consultation on the illness perception in heart failure patients.
Methods: In this experimental study, 100 heart failure patients were recruited through the convenience sampling method and were assigned to intervention and control groups by block randomization. In the first phase of the intervention, the researchers implemented Pendleton's consultation model. In the second phase, telephone follow-up was performed in four steps (1st, 2nd, 6th, and 12th weeks). The data were collected using a demographic information questionnaire and the illness perception questionnaire. Data were analyzed by SPSS 20 and using Chi-square, paired t, independent t, and covariance tests.
Results: There was no significant difference in demographic variables, and illness perception between the two groups before the intervention ($P > 0.05$).In the intervention group, the illness perception score increased from 31.33 ± 10.94 to 33.49 ± 10.25 after the intervention, which was not statistically significant ($P > 0.05$). Comparison between the two groups showed, in the intervention group the mean score of illness perception significantly improved after the intervention compared to the control group ($P = 0.003$).
Conclusion: The application of Pendleton's consultation model could improve the illness perception in heart failure patients.
Relevance for Patients: Considering that the cost of nursing consultations is not always low, it is suggested that nursing consultations be considered for patients with a higher number of sessions and telephone follow-ups for more efficacy if it is cost-effective.

1. Introduction

Heart failure is one of the most common cardiovascular disorders and is considered a chronic, progressive, and debilitating disorder [1]. It is the most common cause of hospitalization for patients over the age of 65. The heart failure rate of referrals to emergency departments and frequent hospitalizations is still high [2]. Heart failure is the most frequent reason for readmission within 30 days of discharge [3].

According to the latest reports, nearly six million people in the United States have heart failure. More than 550,000 new cases are diagnosed each year [2]. Heart failure affects 1–2% of the population or about 50 million people across Europe [4,5]. In Iran, the incidence of heart failure will increase to 3500 cases per 100,000 individuals in the future, and cardiovascular disorders such as heart failure are among the major causes of patient mortality and morbidity [6].

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Heart failure causes severe and progressive fatigue, intolerance to exercise, fluid retention, and dyspnea, which often result in reduced quality of life [7]. Research in neurocardiology has alluded to the presence of a "heart-brain" connection and the increased prevalence of anxiety, depressive, and stress symptoms among this patient population [8].

Seyam *et al.* [2013] concluded that it is necessary to provide appropriate consultation and special attention should also be paid to patients who have been hospitalized more often due to heart disease, as well as to those who have had a long history of heart disease. This ultimately prevents the recurrence of the disease and is useful in improving the quality of life and health [9].

Patient perception of the illness affects disease management and the psychological management of the patient. Being able to diagnose the cause of the disease helps patients to guide the disease control practical programs. The perception of the illness is the patients' organized cognitive reflection of their illness. According to the theory of Leventhal *et al.*, patients regulate their emotional behavior and response to the disease based on their perceptions of the nature, causes, consequences, control, and treatability of the disease [10]. Patient support aims at increasing the perception of individual control, which is one of the important components of illness perception. Patient support can be a primary care strategy in rebuilding health-facilitating programs, reducing fatigue, and improving quality of life. Therefore, having a complete understanding of the components of illness perception is useful and effective for guiding a person to a good quality of life [11].

Lucas *et al.* (2015) examined the effect of nurse consultation on heart disease, the beliefs, and the quality of life of heart failure patients. They found that being in touch with a nurse who specializes in heart failure patients, could improve patients' satisfaction with treatment decisions. However, it had less effect on a patient's beliefs compared to personal control and treatment control [4].

A study by Kadda *et al.* (2012) in Greece focused on the role of nursing education after a heart attack. The findings showed that nursing education regarding cardiac rehabilitation could improve health outcomes and reduce the risk of heart disease. A health education program organized by nurses for patients after a heart attack or surgery improves patients' knowledge of the disease and awareness of behavioral changes to prevent a new condition or hospital admission [12].

Lucas (2015) studied the effect of heart failure nurse consultations on patients' illness beliefs, mood, and quality of life over 6 months. The results showed that nursing consultation affected the belief in illness, satisfaction, and treatment decisions [4].

Given the increasing number of heart failure patients and its devastating effects on quality of life, it is recommended that nurses look for a new way to improve the quality of life of heart failure patients [1]. One of the nursing interventions is consultation [13]. Nurses play a key role in treatment because they are close to patients and their families throughout the disease process. Nurses need to meet the needs of patient care through training, consultation, support, supervision, and reinforcement. Nursing training in cardiac rehabilitation can improve health outcomes, and reduce the risk of heart disease. A health education program developed by nurses for patients improves patients' knowledge of the disease and awareness of behavioral changes to prevent a new event or hospital admission [12].

Results of previous studies showed that illness perception plays a predictive role in psychological and physical health conditions. Furthermore, these studies suggested that to understand the increase in adherence to therapy, the perception of the disease should be increased through education to patients. Thus, health-care providers should take interventions focused on changing illness perception to improve health outcomes in patients with heart failure [14-16]. As far as the authors are concerned, no study has focused on this issue in Iran. Therefore, the present study was conducted to determine the effect of nursing consultation on illness perception in heart failure patients.

2. Methods

2.1. Study design

The present study is an experimental study in which two groups of heart failure patients were assessed pre-and post-intervention.

2.2. Participants

In this study, 100 heart failure patients were selected by convenient sampling method and then divided into the intervention and control groups by block randomization method. In the block randomization method, the number of patients assigned to each group is almost equal. In this method, blocks were formed based on the variables considered in the present study. One-half of each block comprised intervention subjects and the other half includes the control group participants. The main goal of this method is to give a balance to the number of participants in each group.

The sample size was determined based on previous studies [17] and using the comparison formula of two averages and considering the following:

$$n = \frac{2(z_{1-\frac{\alpha}{2}} + z_{1-\beta})^z \sigma^2}{d^2}$$

d = 0.15, β = 0.80 α = 0.05

There were 50 patients in each group. Eventually, 100 participants entered the study. The study was able to detect at least a 15% of difference in the illness perception between the two groups, with a power of 80%. By performing power analysis using our data, the power value of 0.89 was obtained, which is very good and acceptable and even higher than 0.80 that we used to calculate the sample size.

2.3. Inclusion and exclusion criteria

The inclusion criteria were as follows: A minimum of 18 years and a maximum of 80 years, a history of chronic heart failure based on clinical signs, electrocardiography, and echocardiography, indicating an ejection fraction of <40% based on the patient's profile and with the approval of a cardiologist. The patients had to be in Classes 2 and 3 heart failure, according to the New York Heart Association's

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classification system and it had to be approved by two cardiovascular specialists. In addition, the patient had to be able to complete the questionnaire. The exclusion criteria included severe mental or cognitive impairment, pregnancy, and lactation. The patients who were fully aware of their care (medical staff, participation in related training courses) were removed from the experiment. The other exclusion criteria were participation in a similar research project, malignancy, experiencing severe psychological distress after entering the study, the reluctance to continue participating in the research project, and death during the study.

2.4. Intervention and data collection

Patients with chronic heart failure, whose disease has been proven and were under treatment by a cardiologist in the CCU and cardiac wards in the hospitals affiliated with the Kerman University of medical sciences, were divided into intervention and control groups. Initially, the purpose of the study was explained to the subjects. Written consent was obtained from those who were registered. The questionnaires (demographic information and illness perception) were completed by both groups.

We tried the intervention consistently applied among nurses and patients. Therefore, the first author administered the intervention to all patients. For the homogeneity of the sample, the patients were selected based on the inclusion criteria and were homogenized between the two groups.

For the intervention group, the intervention was performed in two phases. The first phase was based on Pendleton's consultation model and the second phase was by telephone follow-up. Pendleton's consultation was given face-to-face and individually, in two 15-min hospital sessions. Pendleton's consultation model was developed by Pendleton *et al.* in 1984. It is a patient-centered model based on seven tasks [18].

The information given to individuals in the form of the Pendleton model in this study is divided into five general areas. To provide all the steps, time and resource constraints were considered for the patients and the consulting nurses:

(1) To define the reason for the patient's attendance, including:
   a. The nature and history of the heart failure problem in the patient
   b. Their etiology
   c. Patients' ideas, concerns, and expectations about heart failure when hospitalized and when living with this disease at home
   d. The effects of the mental and physical problems, and the life quality in general
(2) To consider other problems of the patient:
   a. Other diseases and problems
   b. At-risk factors of the issues mentioned in section (a)
(3) With the patient, to choose an appropriate action for each problem.
(4) To achieve a shared understanding of the problems with the patient.
(5) To involve the patients in the management and encourage them to accept appropriate responsibility [13].

It should be noted that the first consultation session was given immediately after the patient's condition was stabilized and the symptoms improved. It was done in the ward and a quiet room such as the examination room, and it lasted for 15 min. The second session was held the next day for 15 min.

In the second phase, the second researcher also performed the telephone follow-up in four stages (1st week, 2nd week, 6th week, and 12th week). Phone follow-up is intended to further communicate with the patient in a supportive and motivational environment. The time was set at a maximum of 5 minutes. The required explanations and guidelines were given to the patient. The control group also received the ward routine care. After the intervention and at the end of the 12th week, both groups completed the illness perception questionnaire (IPQ). The patients were selected from different hospitals to prevent the contamination of the intervention and control groups. Two faculty members who are members of the research team and one non-faculty member of the research team determined the validity and the content of the consultations. The researchers advised everyone precisely according to the protocol, thus the conditions were the same for all patients.

2.5. Instruments

The demographic questionnaire and the IPQ were used for data collection.

The demographic questionnaire included questions about age, gender, employment status, disease class, economic and lifestyle level, and comorbidity.

The IPQ has nine subscales and designed by Brad Benet *et al.* (2006). Each subscale is a question that best summarizes the IPQ-R of the material on each subscale. Each rating scale is answered from 0 to 10. Each subscale measures a component of illness perception. Five subscales measure the cognitive response to disease, including (1) perception of consequences, (2) duration of illness, (3) personal control, (4) treatability, and (5) recognizing symptoms. There are two emotional responses: Concern about illness and emotions. One measures the ability to perceive and understand the disease. Open-ended questions are used. The score is given from 0 to 100. Zero indicates the lowest level of perception, and 100 indicates the highest level of perception [19,20]. Bagherian *et al.* (2008) prepared the Persian version of this questionnaire. Alpha Cronbach's Persian version was 0.84, and its correlation coefficient with the Persian version was 0.71 [20].

2.6. Data analysis

SPSS software version 20 was used to analyze the data. To assess homogeneity between the groups, an independent t-test and Chi-square test were used. To compare the pre- and post-intervention perception of the illness paired t-test was used. T-test was used to compare the mean score of illness perception between the two groups. To control the varying effect of the perception of the illness before the intervention, a covariance test was used to evaluate the changes after the intervention. The significance level was considered to be 0.05.

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Table 1. Demographic characteristics of patients with heart failure

Variable	Control group		Intervention group		Chi-square	*P*
	Frequency	Percentage	Frequency	Percentage		
Gender						
Female	25	55/6	23	51.1	0.179	0.673
Male	20	44.4	22	48.9		
Education						
Illiterate	14	31.1	20	44.4	4.772	0.311
Below diploma	16	35.6	18	40.0		
Diploma	7	15.6	4	8.9		
Associate degree	7	15.6	2	4.4		
Bachelors' degree	1	2.2	1	2.2		
Marital Status						
Single	3	6.7	8	17.8	2.589	0.108
Married	42	93.3	37	82.2		
Spouse's education						
Illiterate	17	39.5	19	48.7	3.682	0.451
Below diploma	19	44.2	16	41		
Diploma	5	11.6	3	7.7		
Associate degree	2	4.7	0	0.0		
Bachelors' degree	0	0.0	1	2.6		
Employment status						
Housewife/stay-at-home dad	17	37.8	19	42.2	5.318	0.256
Employee	4	8.9	0	0.0		
Student	11	24.4	13	28.9		
Business	13	28.9	12	26.7		
Retired	0	0.0	1	2.2		
Spouse's employment status						
Housewife/stay-at-home dad	1	45.2	19	55.9	1.504	0.681
Employee	1	2.4	0	0.0		
Student	0	0.0	0	0.0		
Business	12	28.6	8	23.5		
Retired	10	23.8	7	20.6		
Lifestyle						
With family	4	8.9	8	17.8	1.609	0.657
With spouse	31	68.9	27	60.0		
With children	6	13.3	6	13.3		
Alone	4	8.9	4	8.9		
Income						
Low	20	44.4	16	35.6	1.524	0.476
Average	24	53.3	26	57.8		
High	1	3.3	3	6.7		
Physical illness						
Yes	31	75.6	32	71.1	0.222	0.638
No	10	28.9	13	28.9		
Illness type						
Lower extremity swelling	10	43.5	2	14.3	5.89	0.117
Respiratory disease	8	34.8	6	42.9		
Diabetes	5	21.7	4	28.6		
Renal disease	0	0.0	2	14.3		

(*Contd...*)

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Table 1. (*Continued*)

Variable	Control group		Intervention group		Chi-square	*P*
	Frequency	Percentage	Frequency	Percentage		
Duration of heart disease						
<1 year	7	15.6	11	24.4	5.561	0.135
Between one and three years	11	24.4	10	22.2		
3–5 years	17	37.8	8	17.8		
More than 5 years	10	22.2	16	35.6		
Hospitalization history						
1–2	9	20.0	12	26.7	5.821	0.121
3–4	12	26.7	14	31.1		
5–6	17	42.2	9	20.0		
7 and more	5	11.1	10	22.2		
Tobacco use						
No	18	40.0	27	60.0	5.227	0.265
Opium	10	22.2	6	13.3		
Cigar	5	11.1	4	8.9		
Meth	0	0.0	1	2.2		
Opium and cigar	12	26.7	7	15.6		
Ejection fraction percentage						
10–20%	8	17.8	11	24.4	1.068	0.586
20–30%	21	46.7	22	48.9		
30–40%	16	35.6	12	26.7		
Heart failure Class						
Class 2	16	35.6	15	33.3	0.049	0.824
Class 3	29	46.4	30	66.7		

2.7. Ethical considerations

This study was approved by the Ethics Committee of Kerman University of Medical Sciences (IR.KMU.REC.1397.431, 29-1-2019). The purpose of the research was explained to the samples. The participants were not obliged to participate in the study. The letter of recommendation was obtained from the Faculty of Nursing and presented to the research environment authorities before collecting the data. Written consent was obtained from the study participants before they took part in the study. The consultation was given to the control group patients after completing the study upon their demand.

3. Results

3.1. Demographic characteristics

According to Table 1, most of the samples were in the following groups: Female (55.6%), below diploma (35.6%), and married (93.3%). There was no statistically significant difference between intervention and control groups in terms of demographic and clinical characteristics ($P > 0.05$).

The mean age of the control group was 59.96 and the mean age of the intervention group was 60.09. There was no statistically significant difference between the mean age of the two groups ($P > 0.05$).

3.2. Illness perception

According to the results of the t-test, there is no significant difference between mean scores of illness perception pre-intervention between the two groups ($P > 0.05$) (Table 2), whereas a post-intervention comparison showed a significant difference between the two groups ($P < 0.005$). To control the varying effect of the perception of the illness before the intervention, a covariance test was used to evaluate the changes after the intervention. As shown in Table 3, the mean score of illness perception after the intervention (by controlling the previous score) in the intervention group is 5.53 points higher than the control group, which is a statistically significant difference (Table 3).

Table 2. Comparing mean score for illness perception before intervention between two groups

Group	Mean±SD	Statistic	*P*-value
Control	4.98±28.22	1.73	0.087
Intervention	10.94±31.33		

Table 3. Comparing mean score for illness perception after intervention between two groups using analysis of covariance

Group	Mean±SD	Mean difference (95% confidence interval)	Statistic	*P*-value
Control	7.65±27.47	5.53 (1.69, 9.36)	8.23	0.005
Intervention	10.25±33.49			

According to the results of the paired *t*-test, there was no significant difference in the mean scores of illness perception in the control group before and after intervention ($P > 0.05$). In the

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Table 4. Pre- and post-intervention mean score for illness perception in patients with heart failure

Variable	Intervention	Control group				Intervention group			
		Mean	SD	Paired *t*-test	*P*	Mean	SD	Paired *t*-test	*P*
Illness perception	Pre-test	28.22	4.98	0.670	0.50	31.33	10.94	−-014	0.31
	Post-test	27.47	7.65			33.49	10.25		

intervention group, the mean score of illness perception increased from 31.33 before the intervention to 33.49 after the intervention, but this improvement was not statistically significant ($P > 0.05$) (Table 4).

4. Discussion

The results of this study indicated that Pendleton's consultation model improved the illness perception in patients with heart failure. These findings are consistent with previous studies.

Rakhshan (2013) conducted a study entitled the perception and experience of patients with pacemakers from the disease process: Based on Leventhal's model. They assessed 51 patients with a pacemaker over 10 weeks. Their findings suggest that patients with pacemakers expect less severity from their illness after the consultation-training intervention. They also consider their disease as a chronic, controllable, and treatable disease. They are more adaptable to the disease and more aware of the positive cognitive and emotional manifestations of their illness. This means that they have a more favorable interpretation of their disease and its conditions [21]. In another similar study, Tabarian *et al.* (2016) examined the effect of consultation and training on illness perception based on Leventhal's self-regulatory model. The results showed that after the intervention, the two groups had a statistically significant difference in the overall mean score of the illness perception. It was determined that the mean score of the illness perception and its components in the intervention group increased [22].

Petrie *et al.* (2012) in a clinical trial examined the effect of a text message program on adherence to the treatment regimen for young patients with asthma in New Zealand. The purpose of this program was to change the perception of the illness and the patient's beliefs about medication. The researchers reported that the text message program increased the rate of adherence to asthma prevention drugs and may be useful in other diseases where adherence to the treatment is important [23]. Jahandar *et al.* (2016) examined the effectiveness of cognitive-behavioral intervention on illness perception and quality of life of Type 2 diabetic patients. The results showed that relatively short-term cognitive-behavioral group intervention could lead to a significant increase in illness perception in Type 2 diabetic patients [24].

Perception of the illness affects how a patient controls the disease, and adapts to it. Health interventions through consultation and education based on the perception of the illness can help improve the health and recovery of the patient. Patients follow consultation to manage their illness when they have a clear understanding of their illness. A correct understanding of health can reduce mortality, complications, and disease outcomes.

Therefore, it is safe to say that although it is useful for patients to provide consultation to them during hospitalization, especially in chronic diseases, this does not merely suffice. It should also last after discharge. Furthermore, care managers in the primary clinical setting could create the conditions not only for a better control of the disease, but also for the prevention of adverse events in patients with chronic cardiovascular disease such as heart failure [25]. As a result, coordinating regular consultations based on the needs of patients at any time is vital in controlling and preventing heart failure. It may also raise the quality of life in these patients.

There was an average level of cooperation from some patients in completing the questionnaire. By explaining the objectives of the research and reassuring patients that the information was confidential, we were able to collect the data. Data are based on self-reports. This is a limitation. Given that the CCU ward of Shahid Bahonar Hospital was dissolved during the collection of research data, we were not able to collect the data of patients assigned to this hospital, thus patients from two other hospitals replaced them. This was another limitation of this study.

5. Conclusion

The findings of this investigation revealed that Pendleton's consultation model improved the illness perception in patients with heart failure. Thus, all medical staff should devote their clinical interventions and special measures to increasing the illness perception in these patients. They also need to consider training and consultation as the benchmark of their efforts. It is important to note that the effectiveness of the Pendleton model or any consultation model can vary depending on factors such as the context of care, health-care professional training, patient population, and individual preferences. Therefore, future studies with a focus on the aforementioned variables are required. Furthermore, it is also suggested that in future studies, the nursing consultation needs to be done with a higher number of sessions and telephone follow-ups for more efficacy, if it is cost-effective.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

Ethics Approval and Consent to Participate

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Consent for Publication

Not applicable.

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