Original Article

TANAFFOS

Effect of Self-Management Program on Health Status and Dyspnea in Patients with Chronic Obstructive Pulmonary Disease

Ali Hasanpour Dehkordi [1], Farshad Heidari-Beni [2], Iman Reiszadeh [3], Masih Hosseini [4], Fereydoun Khajeh Ali [5]

[1] Social Determinants of Health Research Center, School of Allied Medical Sciences, Shahrekord University of Medical sciences, Shahrekord, Iran, [2] Nursing Care Research Center (NCRC), School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran, [3] Kashani Hospital, Shahrekord University of Medical Sciences, Shahrekord, Iran, [4] Department of Anatomical Sciences and Histology, School of Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran, [5] Department of Internal Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran.

Background: Self-management is becoming increasingly important in patients with chronic obstructive pulmonary disease (COPD) as it is associated with improved clinical outcomes. The aim of this study was to determine the effect of a self-management program on health status and dyspnea severity in patients with COPD.

Materials and Methods: This semi-experimental study was done on patients with COPD who were hospitalized at Ayatollah Kashani and Hajar hospitals from July 2017 to November 2019 in Shahrekord, Iran. Sixty patients with COPD were selected and completed three questionnaires, including a demographic questionnaire, COPD Assessment Test (CAT), and Dyspnea Scale (mMRC). The researcher educated the self-management skills to the intervention group, and the control group received routine care only. Three months after the intervention, the questionnaires were completed again by the control and intervention groups. Data were analyzed using descriptive and analytical statistics by SPSS version 24.

Results: The results of this study showed that there was no significant difference in health status between the two groups before the intervention (p=0.827). Three months after the intervention, the health status score in the control and intervention groups were 20.93±5.00 and 18.00±5.18, respectively, which this difference was statistically significant (p=0.030). Also, at the beginning of the study, the difference in dyspnea score between the two groups was not statistically significant (p=0.593). However, three months after the intervention, the score of dyspnea in the control and intervention groups was 2.1±0.995 and 1.53±1.074, respectively, which this difference was significant (p= 0.038).

Conclusion: This study showed that self-management intervention could improve the health status and reduce the dyspnea of patients with COPD.

Key words: Self-management; Health status; Dyspnea; Chronic obstructive pulmonary disease

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a major public health problem and one of the most common chronic diseases. COPD caused 4.7 million deaths in 2020(1), and now it ranks third among the top ten causes of death worldwide(2). It is estimated that COPD prevalence is 12% worldwide, and the global COPD prevalence increased by 44% from 1990 to 2015 mainly because of

aging (3). The prevalence of COPD is 4.9% in Iran(4). COPD is a respiratory disease characterized by irreversible airflow limitation(5). It is a progressive, lifelong, and unpredictable disease. Although it is preventable and treatable, it is not fully curable(6). Therefore, when the disease progresses, progressive decline in the forced expiratory volume (FEV) occurs that results in the poor ability of the patient to perform physical activity and social function that is reflected in measuring clinical outcomes, such as dyspnea and health status(7). Dyspnea, production of sputum, and cough are the most common symptoms of COPD(8). The main symptom of COPD(9) and the most complaint of COPD patients is dyspnea. Therefore, dyspnea management is a key target in COPD treatment (10); however, medical treatment often does not completely relieve the patients, and patients with COPD must control their shortness of breath by themselves (11). Therefore, non-pharmacologic interventions, such as self-management, have an important role in the management of dyspnea (10).

These patients experience respiratory symptoms, physical disabilities, health problems, and several other problems(12). Moreover, to avoid dyspnea, COPD patients adopt a sedentary lifestyle that leads to skeletal muscle deconditioning, social isolation, and psychological distress(13) that finally leads to poor health status (14). These patients often have impaired health status (12), and the worst health scores are related to patients in stage IV. Health status is defined as "the effect of health on people's ability to perform daily activities"(15). Measurement of health status by a questionnaire can be used in clinical practice to improve communication, disease progression, response to treatment, screening of unknown disability, improving patient satisfaction, and examining the severity of the disease(16).

There is no definitive cure for COPD(17), and current treatments for COPD only delay the progression of the disease, and patients must deal with a disease that has a great impact on mental, physical, and social aspects of their lives for years(18). Therefore, instead of considering interventions focusing on specific problems related to disease, self-management interventions that provide a set of cognitive and behavioral skills to cope with different problems can be used(19).

Self-management intervention is a key element of COPD management(20), in which patients should be able to manage various dimensions of their lives, including adherence to prescribed medications, implementation of appropriate inhalation technique, early recognition and treatment of disease exacerbation periods, annual injection of influenza vaccine, performing daily activities of life despite the illness and airway clearance techniques (ACTs), doing exercise to maintain lung function, quitting smoking, and taking a healthy diet(21).

Self-management intervention improves the patients' health behaviors and self-care skills; thus, it improves the physical health and well-being of COPD patients(22).

Therefore, due to the low health status and high rate of dyspnea in patients with COPD and the role of self-management in the improvement of health-related outcomes, this study aimed to determine the effect of a self-management program on health status and dyspnea severity of patients with COPD.

MATERIALS AND METHODS

This is a semi-experimental study. Participants consisted of patients with COPD who were hospitalized at the internal wards of Ayatollah Kashani and Hajar hospitals from July 2017 to November 2019 in Shahrekord, Iran. The sample size was calculated based on previous studies (60 patients, 30 patients in control, and 30 patients in the intervention groups). After obtaining written permission from the Research Deputy of Shahrekord University of Medical Sciences, the researcher went to the study settings and, after introducing himself, explained the aims of the research and obtained written consent, and selected eligible COPD patients for the study.

The inclusion criteria for the study included the age of between 40 and 75 years old, confirmation of the disease by a lung specialist physician, being able to understand,

speak, and read Persian, having physical ability to interview or complete the questionnaire, non-participation in previous COPD self-management programs, having no mental disease based on of the patient's profile, having no active cancer and severe neurological problems based on the patient's records, having no hearing impairments, and no problems interfere with communication. The exclusion criteria included patient's death, any signs, symptoms, or diagnosis of asthma, bronchiectasis, pulmonary tuberculosis, pneumoconiosis, and acute congestive heart failure during the study, being absent in one session of the program, and unwillingness to continue.

In order to prevent bias in the study, patients hospitalized at Ayatollah Kashani hospital were considered the intervention group, and patients hospitalized at Hajar hospital were considered the control group. The researcher completed the questionnaires by interviewing the patients. The demographic questionnaire consisted of items such as age, gender, educational level, marital status, employment status, place of residence, and information about the disease, including the history of the disease, the frequency of hospitalization, and the history of the drugs used. The COPD assessment test (CAT) is a universal tool for assessing the effect of COPD on health status. This tool has eight questions that are scored on a 5-point scale. The total score of CAT ranges from 0 to 40, and higher scores show a more severe impact of COPD on the patient's life. The difference between stable and exacerbation patients is five points. The reliability of CAT has already been confirmed in several European countries, such as Spain, Belgium, France, Britain, Netherlands, and Germany. Cronbach's alpha of 0.88 has been reported for this tool and is highly correlated with other questionnaires assessing the health status of patients with COPD (23). The Dyspnea Scale, a modified scale of the Medical Research Council (mMRC), is another tool that was used to assess the disability associated with dyspnea. It is scored on a 4-point scale. A patient with a grade of 0 has no disability, and grade 4 reflects almost complete incapacity. All questions are related to daily activity, and the score can be calculated in a few seconds. This questionnaire was also completed by the researcher. The reliability of mMRC was determined to be 98% by the inter-rater reliability method. Its validity was confirmed through criterion validity, which was correlated with other criteria of lung function measurements and direct measurement of disability.

The researcher taught self-management skills to the intervention group, and the control group received only routine care and education. In addition, a story was told to the participants to neutralize the psychological effects of speaking with patients. Teaching in the intervention group was face-to-face. Learning tools, such as the displaying images and various forms of pills and inhaled drugs, were used as well. The educational content consisted of five main topics according to the study by Effing et al. that included smoking cessation advice and support, self-recognition, and treatment of exacerbations, exercise, and increased physical activities, nutritional advice, and dyspnea management (24). The educational content was derived from the Australian guidelines for the diagnosis and management of COPD, and before application, it was confirmed by the faculty members of the Medical-Surgical Nursing department of the School of Nursing and Midwifery of Shahrekord University of Medical Sciences. The number of educational sessions was four sessions, once a week in consecutive weeks. At the end of the education, an educational booklet was provided to the patients in the intervention group, and for the control group, the booklet was given to them at the end of the study. After discharge, to ensure not to be forgotten and to follow the given education, the intervention group members were contacted twice a week in the first week, once in the second week, and then repeated every two weeks until three months after discharge. Three months after the intervention, the questionnaires were completed again by the intervention and control groups to determine the effect of the intervention.

Ethics

The procedures were in accordance with the ethical standards of the responsible committee on human

experimentation (institutional or regional) and with the Helsinki Declaration of 1975 as revised in 1983. This article is based on a research project approved by Shahrekord University of Medical Sciences with the Ethics committee review board clearance number of "IR.SKUMS.REC.1396.55".

Statistics

Descriptive (numerical indexes, graphs, and tables) and analytical statistics (t-test and paired t-test) were used to analyze the data using SPSS version 24. A P-value of less than 0.05 was considered significant.

RESULTS

In this study, the Chi-square test showed that the participants did not have any significant statistical differences regarding demographic characteristics, including gender, financial status, marital status, the severity of disease, employment, and educational status, BMI, and smoking habit (Table 1).

As shown in Table 2, at the beginning of the study, the score of health status in the control and intervention groups was 20.77±4.95 and 21.07±5.61, respectively. This difference between the two groups was not statistically significant (p= 0.827). Three months after the intervention, the health status score in the control group increased as much as 0.16 and reached 20.93±5.00, while at intervention group, the health status score decreased as much as 3.1 and reached 18.00±5.18. This difference between groups was statistically significant (p= 0.03). The score of dyspnea in the control and intervention groups was 1.97±0.999 and 2.1±0.923, respectively, at the beginning of the study, and this difference between groups was not statistically significant (p= 0.593). However, three months after the intervention, the score of dyspnea in the control and intervention groups reached 2.1±0.995 and 1.53±1.074, respectively. This difference between groups was statistically significant (p= 0.038).

Table 1. Demographic Characteristics of patients in control and intervention groups

Variable	Group	Intervention No.	Intervention %	Control No.	Control %	p-value
Gender	Male	20	66.7	22	73.3	0.573
	Female	10	33.3	8	26.7	
Income	Inadequate	9	30	5	16.7	
	Somewhat adequate	15	50	20	66.7	0.378
	Adequate	6	20	5	16.7	
Marital status	Single	5	16.7	7	23.3	0.519
	Married	25	83.3	23	76.7	
Severity of disease	Stage 1	6	20	8	26.7	
	Stage 2	12	40	13	43.3	0.893
	Stage 3	9	30	7	23.3	
	Stage 4	3	10	2	6.7	
Employment status	Unemployed	9	30	8	26.7	
	Housewife	4	13.3	3	10	0.877
	Employed	7	23.3	10	33.3	
	Retired	10	33.3	9	30	
Education Level	School	22	73.3	16	53.4	
	Diploma	5	16.7	11	36.7	0.647
	University	3	10	3	10	
BMI	Underweight	2	6.7	4	13.3	
	Normal	15	50	12	40	0.624
	Overweigh t	9	30	12	40	
	Obese	4	13.3	2	6.7	
Smoking habit	Yes	24	80	22	73.3	0.542
	No	6	20	9	26.7	

Table 2. The mean score of health status and dyspnea before and after the intervention in intervention and control groups

Variable	Phase	Groups		p-value within groups
		Intervention Mean±SD	Control Mean±SD	
Health status	Before	21.07±5.61	20.77±4.95	0.827
	After	18.00±5.18	20.93±5.00	0.03
	p-value within groups	<0.001	0.134	-
	Changes	-3.1±02.05	0.16±02.59	<0.001
Dyspnea	Before	2.1±0.923	1.97±0.999	0.593
	After	1.53±1.074	2.1±0.995	0.038
	p-value within groups	<0.001	0.161	-
	Changes	-0.57±0.568	0.133±0.30	<0.001

DISCUSSION

The aim of the study was to examine the effect of a self-management program on health status and dyspnea severity among patients with COPD. The results of this study showed that self-management interventions could improve the health status and reduce the dyspnea of patients with COPD.

Shakur evaluated the effect of a self-management program on the health status of patients with COPD and showed that these interventions improved the health status of patients in the intervention group compared to the control one (25). Rees examined a self-management program for patients with COPD and showed that this program improved this group of patients (26). Similarly, Bourbeau showed that COPD patients with impaired health status benefited from self-management interventions (27). Wood-Baker et al. showed that the health status was better in the intervention group that received self-management interventions compared to the other group (28). Howard et al. investigated the effectiveness of a group cognitive-behavioral breathlessness intervention on health status in elderly patients with COPD and indicated that the intervention improved the health status of patients (29). According to Franek's study, self-management support could improve the health status of patients (30). Bentsen et al. evaluated the effect of self-management interventions on COPD, and their results showed the positive effect of self-management interventions on the health status of patients with COPD

(31). These results are consistent with the present study and show that self-management interventions can improve the health status of COPD patients.

However, there are also some studies in contrast with the present study, in which self-management interventions did not improve the health status of patients with COPD. For instance, in a study by Tabak et al., to investigate the effect of a telehealth program for self-management on COPD exacerbations, the results showed that the telehealth program for self-management had no effect on improving the health status of these patients (32).

Talboom-Kamp et al. investigated the effect of a self-management web platform on health status in COPD management in primary care, and no effect on the health status of the participants was found (33). The results of Russo et al. also showed that self-management education programs for COPD did not significantly affect the health status of COPD patients (34).

Although patient education was the main and common part of the present study with mentioned studies, it is shown that increasing COPD knowledge can lead to improvement in self-management skills or behavior, and health literacy or disease knowledge are not readily translated into self-management behaviors (35). Disler et al. showed that various factors, including physical factors, such as dyspnea, functional impairment, and energy conservation techniques, physiological factors, such as illness perception, anxiety, depression, hope, self-efficacy, and sense of control, social factors, such as social isolation,

loss of social role, social support, socioeconomic status, health literacy, individual perception of life, spirituality, religion, and related factors to the health system, such as communication with healthcare personnel and access to resources, may impede effective COPD self-management (36). Perhaps in addition to the differences of participants, the difference in the mentioned factors is the most important reason for the discrepancy of results. Also, the variations in self-management programs and differences in the content, delivery type, and duration of the programs may cause differences in the results.

Nguyen et al. showed that self-management programs after one year did not affect the dyspnea of patients with COPD (37) that is in contrast with the present study, which may be due to the differences in the characteristics of the study samples, the level of health literacy, the educational content, and the degree of follow-up of the educations. The results of most other studies are consistent with the results of e the current study. For instance, a study by Apps et al. was conducted to investigate the impact of a new self-management program on patients with COPD. The results of this study showed that self-management of COPD improved the dyspnea of affected patients (38). Another study by Nguyen et al. was conducted to investigate three types of self-management interventions on dyspnea in patients with COPD. The results showed that those who participated in all 24 education sessions of the self-management program had a better improvement in their dyspnea compared to other groups (37). Zwerink et al. also showed that self-management interventions could reduce the dyspnea of patients with COPD (39). These results are consistent with the present study and show that self-management interventions can improve the dyspnea of COPD patients.

Limitations

One of the limitations of this study was the difficulty in accessing patients after three months to determine the effect of the self-management programs, which sought to overcome the problem by getting the patients' phone numbers and full addresses.

CONCLUSION

The results of this study showed that self-management interventions could improve the health status and reduce the dyspnea of patients with COPD. Therefore, the nurses of the treatment team must teach self-management skills to these patients and their families to enhance their ability to manage themselves and participate actively in their care and treatment process to improve outcomes. Additionally, inhibiting factors of self-management in these patients, including hopelessness, feelings of helplessness, physical and mental fatigue, feeling emptiness, and the lack of knowledge and awareness, should be identified, and critical thinking and problem-solving methods should be considered and overcome in cooperation with family members, friends, and patient's trusted individuals, and the medical team to help these patients.

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