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Original Article

Self-Management Training in Chronic Obstructive Lung Disease Improves the Quality of Life

Betül Özdel Öztürk[1], Aylin Özgen Alpaydın[2], Sevgi Özalevli[3], Nurcan Güler[2], Can Cimilli[4]

[1]Clinic of Pulmonary Diseases, İzzet Baysal State Hospital, Bolu, Turkey
[2]Department of Pulmonary Diseases, Dokuz Eylül University School of Medicine, İzmir, Turkey
[3]Department of Pulmonary Rehabilitation, Dokuz Eylül University, Izmir, Turkey
[4]Department of Psychiatry, Dokuz Eylül University School of Medicine, İzmir, Turkey

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Abstract

OBJECTIVES: Management of chronic obstructive pulmonary disease (COPD) includes interventions such as improving skills in coping with the disease. We aimed to examine the effect of self-management training on the quality of life and functional parameters in patients with moderate to severe COPD.

MATERIALS AND METHODS: Sixty-one consecutive patients with COPD were recruited in the study prospectively. The patients were randomized into two groups: self-management training (n=31) and standard care (n=30). Each patient was evaluated by spirometry, COPD assessment test (CAT), St George's respiratory questionnaire (SGRQ), hospital anxiety and depression scale (HADS), modified British Medical Research Council (mMRC) dyspnea scale, and short form-36 (SF-36). A team of physiotherapists, psychologists, pulmonary disease specialists, and dietitians provided self-management training and biweekly counseling via phone. At the end of three months, both the groups were re-evaluated using the same assessment parameters.

RESULTS: We found no significant difference between the baseline demographic characteristics of the self-management training and standard care groups. We observed a reduction in CAT ($p<0.001$), SGRQ impact ($p=0.013$), activity subscales ($p<0.001$) and the total scores ($p=0.020$), and HADS anxiety ($p=0.012$) and depression ($p=0.014$) scores in the self-management training group after the education session. A significant increase in SF-36 physical function score was also observed ($p=0.008$). No significant improvement in the functional parameters was observed in either group; however, the change in FEV1 was more pronounced in the self-management training group than in the control group ($p=0.017$). The hospital readmissions and 1-year survival rates were similar for both the groups after receiving education ($p>0.05$).

CONCLUSION: Our results suggest that the self-management training of the patients with COPD improves the quality of life and reduces the symptoms of depression and anxiety. Therefore, at the least, self-management training should be done as the first step of pulmonary rehabilitation in patients with COPD who cannot access pulmonary rehabilitation facilities.

KEYWORDS: Self-management, chronic obstructive pulmonary disease, quality of life

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INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a common, irreversible, avoidable, and curable disease. It is characterized by persistent respiratory symptoms and airflow limitations [1]. After the COPD diagnosis, the patients and their caregivers should be informed about the disease as it is essential for the patients to be actively involved in the disease management. The education plan for COPD should be individualized according to disease severity and maintained upon the needs during the disease progression within a structured program [2]. The education programs in COPD are the unchanging and priority part of the pulmonary rehabilitation (PR) programs. Some researchers believe that classical education provides information to the patients but does not increase self-sufficiency. More recently, the focus has been on the concept of self-management through education [3].

Self-management is characterized by determining and dealing with the symptoms, treatment, physical and psychosocial outcomes, and lifestyle changes that are inherent to living with a chronic condition [4]. Self-management in COPD includes the ability to control the disease optimally and cope with the disease to understand the changes in the severity of the disease, the adaptation to the inhalation techniques and devices, and the behavioral changes [5]. Self-management interventions for COPD are constructed in an individualized manner and are often multifaceted, with targets toward motivating, engaging, and supporting the patients to positively adjust their health behavior(s) and improve skills to better self-manage their disease [6]. Studies reporting the effects of self-management in COPD have shown that disease-specific self-management programs

Address for Correspondence: Betül Özdel Öztürk, Clinic of Pulmonary Diseases, İzzet Baysal State Hospital, Bolu, Turkey
E-mail: betulozdel84@gmail.com

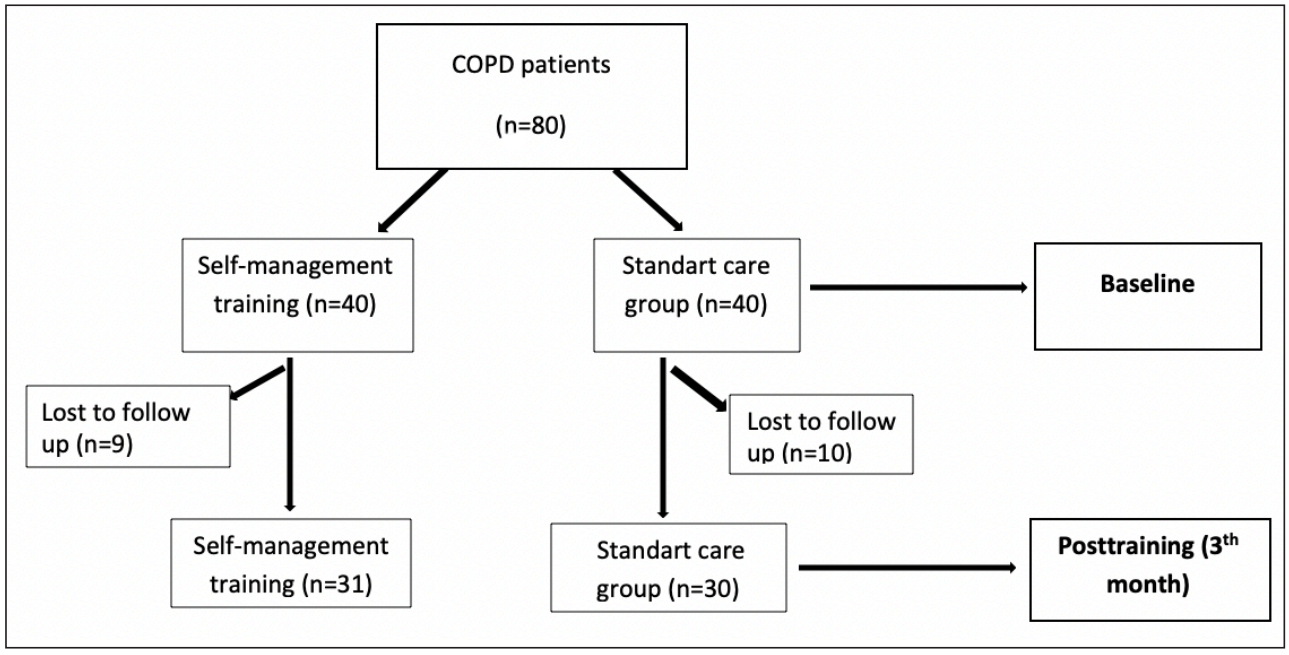

Figure 1. Study flow chart

can help develop skills such as appropriate use of medicines and respiratory techniques [7-9].

In this study, we aimed to examine the effect of structured self-management training on the health, quality of life, and functional parameters in patients with moderate to severe COPD.

MATERIALS AND METHODS

Study Design

This study was conducted as a prospective, case-control study. Eighty patients aged 45-75 years with moderate and/or severe COPD who were referred to our pulmonary diseases' outpatient clinic between September 2015 and January 2016, were screened. The patients included in the study comprised those who were followed up at the outpatient clinic and who came for routine control. By using the random number table, 40 patients each were assigned to the self-management training (case) and standard care (control) groups. However, 9 from the case and 10 from the control groups did not participate in the post-training evaluation; therefore, 31 case and 30 control patients were included in the study (Figure 1). COPD diagnosis was made upon post bronchodilator forced expiratory volume in the first second (FEV_1)/forced vital capacity (FVC) <70% in patients with complaints of dyspnea, chronic cough or sputum. Moderate and/or severe COPD was determined by GOLD spirometric staging. The exclusion criteria were psychiatric, neurological, muscular, and decompensated chronic diseases (congestive heart failure, chronic renal insufficiency, and diabetes mellitus), mild COPD, respiratory diseases other than COPD, acute exacerbation of COPD, and exacerbation of COPD in the last 1 month.

MAIN POINTS

- Current guidelines highlight individualized self-management training as an important part of COPD treatment.
- In the present study we showed that self-management training in COPD decreases CAT, SGRQ impact, activity sub scores and total scores, and HADS anxiety and depression scores.
- Since it is essential to prevent disease progression; COPD patients and their caregivers should be informed about the disease and should be actively involved in the management of process.
- A structured self-management education provided by a multidisciplinary team of experts improved the health-related quality of life and depression and anxiety symptoms in moderate and severe COPD patients.

The ethical approval for the study was obtained from Ethics Committee of Dokuz Eylül University School of Medicine (Date: 19.06.2014; Number: 2014 /22-23).

Verbal and written consents of the participants were obtained prior to study entry. A chest physician interviewed all included patients, and pulmonary function test, short form-36 (SF-36), St George's respiratory questionnaire (SGRQ), and modified British Medical Research Council (mMRC) dyspnea scale were performed.

The self-management-training group was assessed by a specified education team, which consisted of chest disease specialist, physiotherapist, dietitian, and psychologist. The self-management-training group was informed about the physical activity and chest physiotherapy by a single structured education session in the form of presenting and practicing workshop consisting of five or less patients. The group was also informed by the psychologist to cope with chronic illness through evaluation of the leisure time and directing the necessary events to the Mental Health Support. The self-management-training group was consulted by phone calls every two weeks by a chest disease specialist. She used motivational sentences to engage the patients in both the training

and control evaluations and created a new action plan for the patient according to the patients' answers. The phone calls included taking information about whether the patients used their medications, applied diets appropriately, and received psychological information. The contents of the structured education program are given in Table 1.

Outcome measures

All assessments were applied to self-management training and standard care groups before and after three months.

Spirometry: Spirometry: Spirometric measurements were performed by the same technician using the same device (Jeager Lab Manager V452İ) in accordance with the American Thoracic Society (ATS) criteria [10] between 08.30 and 10.30 a.m. The FEV1, FVC, and FEV1/FVC (Tiffeneau index) were measured.

Table 1. The contents of the structured education program

Chest disease specialist	Normal lung function and COPD pathophysiology
	Proper use of medicines
	Inhaler device training
	Oxygen therapy
	Smoking cessation attempt
	Prevention of attacks and early treatment
	Indications for referral to health facilities
Physiotherapist	Maintaining the benefits of exercise and physical activity
	Respiratory maneuvers
	Placement of a motion pattern in the thoraco-abdominal region
	Diaphragmatic respiration
	Slow and deep breathing
	Respiratory control
	Respiratory training to reduce the dynamic hyperinflation of the rib cage
	Lip breathing
	Relaxation exercises
	Bronchial hygiene techniques
	Effective coughing
	Huffing
	Postural drainage
	Energy saving and daily work simplification techniques
	Strengthening and endurance exercises to increase exercise capacity
Psychologist	Psychological assessment
	To cope with chronic illness
	Evaluation of leisure time
	Directing the necessary events to the Mental Health Support Unit
Dietitian	Nutritional training in COPD

Modified Medical Research Council (mMRC) Scale: The mMRC is a self-rating scale to measure the degree of breathlessness upon daily activities from 0 to 4 [11].

COPD Assessment Test (CAT): CAT has been used as a simple measurement to assess the health status impairment in COPD. CAT comprises of eight items. Each item has a 6-point scale (0-5 points). 0 points indicate excellent health status and 40 points indicate worst health status [12]. This scale is easily applied and has been used to assess disease severity in many countries. Yorgancioglu et al. [13] (2012) conducted the reliability and validity study of the Turkish version.

St George's Respiratory Questionnaire (SGRQ): The SGRQ is a self-reported scale. It has three domains with respiratory-specific questionnaire (symptom, activity, and impact) and a total score. The symptom subscale consists of respiratory symptoms, such as breathlessness, coughing, and wheezing. The activity subscale evaluates the physical activities. The impact subscale consists of the effects of respiratory disease on various factors, including employment, social interactions, emotional well-being, and feeling of being in control. Each subscale score and the total score range from 0 to 100, and higher scores demonstrate greater impairment [14]. The reliability and validity study of the Turkish version was conducted by Polatli et al. [15] in 2013.

Short Form-36 (SF-36): The SF-36 is a general health condition tool that includes 36 items. It has eight domains and can be mentally and physically divided into two psychometrically derived summary components. The domain and summary component scores range from 0 to 100, and lower scores demonstrate worse health status [16]. The Turkish translation, validity, and reliability of SF-36 was performed by Koçyiğit et al. [17] (1999).

The Hospital Anxiety and Depression Scale (HADS): The HADS is a self-report screening scale including 14 items. It was originally developed to show the potential presence of anxiety and depression states in the setting of a medical outpatient clinic [18]. Out of 14, 7 items include the anxiety questions, and the other 7 items measure the symptoms of depression with a score ranging from 0 to 21. The minimal important difference value for HADS in patients with COPD is around 1.5, corresponding to a change from baseline of around 20% [19]. Aydemir et al. [20] (1997) translated the Turkish version and studied its validity and reliability.

Statistical Analysis

The statistical analysis was performed using the Statistical Package for Social Sciences version 22.0 (IBM SPSS Corp.; Armonk, NY, USA) for Windows program. The data is expressed as mean ± standard deviation or median (min-max), wherever necessary. The characteristics of the groups were compared using Student's t test or chi square test according to the data characteristics. The effect of structured education program was evaluated by paired t test. A p value <0.05 was considered statistically significant.

RESULTS

Sixty-one patients diagnosed with moderate/severe COPD according to GOLD 2014 were included in the study and divided into two groups, self-management training (n=31) and standard care (n=30). The mean age of the patients in the self-management training and the standard care groups was 64.55±8.21 and 60.93±8.59, respectively (p=0.908). Two patients in the self-management training group and 5 patients in the standard care group were females (p=0.199). There was no difference between the two groups in terms of baseline mMRC, CAT, HADS, and SGRQ total scores, and the spirometric values (p>0.05) (Table 2). When SF-36 sub scores were compared, the physical and role function sub scores were higher in the self-management training group (p=0.020). However, there were no significant differences between the two groups in other SF-36 subscales (p>0.05).

All patients underwent a second evaluation using the same tests 3 months after the basal measurements after a structured education program. There was a statistically significant decrease in CAT, SGRQ impact, activity sub scores and total

Table 2. Sociodemographic data and clinical parameters of the self-management training and standard care groups

	Self-management training (n=31)	Standard care (n=30)	p value
Age	64.55±8.21	60.93±8.59	0.908
Female/Male (n)	2/29	5/25	0.199
mMRC score	2.06±0.81	1.80±081	0.207
CAT score	17.35±7.83	18.27±7.94	0.650
BMI (kg/m^2)	26.28±3.91	27.30±4.26	0.333
FEV1 (lt)	1.43±0.55	1.54±0.47	0.411
FVC (lt)	2.52±0.73	2.55±0.78	0.862
FEV1/FVC (%)	55.57±9.45	60.90±7.77	0.020*
SGRQ total score	49.72±20.54	54.38±21.21	0.500

*The data are given as mean ± standard deviation unless otherwise specified.
mMRC: Modified British Medical Research Council; CAT: COPD assessment test; BMI: body mass index; SGRQ: St George's respiratory questionnaire; FVC: forced vital capacity; FEV1: forced expiratory volume in the first second

Table 3. Pre/post-training clinical and functional parameters of the self-management training group

Self-management training group (n=31)	Pre-training	Post-training	p value
mMRC	2.06±0.81	1.74±0.58	0.056
CAT	17.35±7.83	15.84±6.66	0.000*
FEV1 (lt)	1.43±0.55	1.82±0.83	0.313
FVC (lt)	2.52±0.73	2.65±0.70	0.429
FEV1/FVC (%)	55.57±9.45	57.50±0.71	0.490
SGRQ impact score	45.61±21.19	42.26±16.85	0.013*
SGRQ symptom score	59.24±21.86	56.18±20.38	0.055
SGRQ activity score	52.05±24.88	46.18±20.61	0.001*
SGRQ total score	49.72±20.54	45.70±16.71	0.020*
HADS anxiety score	8.06±3.68	7.48±3.24	0.012*
HADS depression score	8.23±4.08	7.77±3.96	0.014*
SF-36 physical function	19.97±5.06	20.71±5.11	0.008*
SF-36 physical role function	6.26±1.79	6.45±1.79	0.110
SF-36 bodily pain	8.35±2.56	8.47±2.09	0.687
SF-36 general health	14.30±4.06	14.92±3.46	0.255
SF-36 social role functioning	7.48±2.08	7.61±1.84	0.608
SF-36 vitality	12.26±3.22	12.23±3.31	0.055
SF-36 emotional role functioning	4.77±1.34	4.94±1.34	0.202
SF-36 mental health	17.16±3.33	16.97±3.10	0.653

* The data are given as mean ± standard deviation unless otherwise specified.
mMRC: Modified British Medical Research Council; CAT: COPD assessment test; BMI: body mass index; SGRQ: St George's respiratory questionnaire; FVC: forced vital capacity; FEV1: forced expiratory volume in the first second; SF-36: short form-36, HADS: hospital anxiety depression scale

scores, and HADS anxiety and depression scores in the self-management training group (p<0.001, p=0.013, p=0.001, p=0.020, p=0.012, p=0.014, respectively) (Table 3). However, in the standard care group, a statistically significant increase in CAT (p=0.001), SGRQ impact (p=0.004), and symptom (p=0.004), subscales, and total scores (p=0.002) were observed (Table 4).

When the self-management training and standard care groups were compared for the change of quality of life and functional parameters, significant differences were observed in mMRC, CAT, SGRQ impact, symptom and activity sub scores, and total scores, and SF-36 physical function and vitality (p=0.002, p<0.001, p<0.001, p=0.004, p=0.001, p<0.001, p=0.001). This time, the increase in FEV_1 was significant in the self-management-training group when compared with that in the standard care group (p=0.017) (Table 5).

There was no exacerbation of COPD with hospitalization in both the groups during the 3 months between the first and second application of assessments. Within one year after the structured education program, 11 patients (35.5 %) in the self-management training and 11 patients (36.7 %) in the standard care group were admitted to the hospital because of exacerbation of COPD (p=0.802). When the medical records of the study population were reviewed for 1-year all-cause mortality after the intervention, there were 3 (9.7 %) deaths in the self-management group and 5 (16.7 %) deaths in the standard care group. There were no differences between the two groups in terms of mortality ratio for 1 year (p=0.419)

DISCUSSION

In this study, we aimed to examine the effect of structured self-management education, which is a major component of PR, on the quality of life and functional parameters in patients with severe and very severe COPD. We observed significant improvement in the quality of life, which is a major outcome parameter for COPD interventions, in patients who underwent self-management training.

At the basal evaluation, there was no significant difference between the self-management training and standard care groups in terms of age and sex, with a male predominance in both the groups. The basal dyspnea and health-related quality of life scores were similar, except a higher FEV_1/FVC ratio in the standard care group. Eighty patients were screened; however, there were 19 (24 %) dropouts due to not participating in the post-training assessment. In a review of similarly designed studies, it was found that the proportion of patients lost to follow-up was 0-30% [21].

The mMRC scale and/or CAT are the recommended tests for COPD symptom scoring. In our study, we used both scales for determining the effect of education on symptoms. We observed statistically significant decrease in the CAT scores in the self-management training group, whereas this effect was not observed in the mMRC. However, the change in mMRC and CAT scores were significant in the self-management training group, compared with that in the standard care group. These findings indicated that a structured education program was

Table 4. Pre/post-training clinical and functional parameters of the standard care group

Standard care group (n=31)	Pre-training	Post-training	p value
mMRC	1.80±0.81	2.00±2.74	0.056
CAT	18.27±7.94	19.10±7.95	0.000*
FEV1 (lt)	1.54±0.47	1.50±0.71	0.313
FVC (lt)	2.55±0.78	2.51±0.81	0.429
FEV1/FVC (%)	60.90±7.77	60.42±7.61	0.490
SGRQ impact score	51.42±21.32	54.55±20.02	0.004*
SGRQ symptom score	29.30±21.70	61.38±21.38	0.004*
SGRQ activity score	56.29±23.83	57.52±21.71	0.470
SGRQ total score	54.38±21.21	56.91±19.29	0.020*
HADS anxiety score	8.60±3.17	8.47±2.78	0.555
HADS depression score	7.90±4.32	7.80±4.19	0.620
SF-36 physical function	20.13±5.05	19.80±4.82	0.057
SF-36 physical role function	5.20±1.65	5.23±1.68	0.662
SF-36 bodily pain	8.15±2.33	8.18±2.08	0.808
SF-36 general health	12.70±2.97	12.16±2.70	0.084
SF-36 social role functioning	7.37±2.09	7.30±1.90	0.423
SF-36 vitality	12.37±3.24	12.10±2.83	0.223
SF-36 emotional role functioning	4.63±1.30	4.60±1.28	0.326
SF-36 mental health	17.97±3.50	18.00±3.17	0.845

* The data are given as mean ± standard deviation unless otherwise specified.
mMRC: Modified British Medical Research Council; CAT: COPD assessment test; BMI: body mass index; SGRQ: St George's respiratory questionnaire; FVC: forced vital capacity; FEV1: forced expiratory volume in the first second; SF-36: Short form-36; HADS: hospital anxiety depression scale

Table 5. Comparison of self-management training and standard care groups in terms of symptom and functional parameters differences between pre- and post-training

	Self-management training group	Standard care group	P
mMRC	-0.32±0.70	020±0.55	0.002*
CAT	-1.52±1.90	0.83±1.15	<0.001*
FEV1 (lt)	0.39±0.94	-0.04±0.22	0.017*
SGRQ impact score	-3.35±7.07	3.13±5.42	0.000*
SGRQ symptom score	-3.07±8.54	4.08±7.05	0.004*
SGRQ activity score	-5.87±9.11	1.23±9.17	0.001*
SGRQ total score	-4.03±6.03	2.52±5.59	<0.001*
HADS anxiety score	-.058±1.20	-0.13±1.22	0.156
HADS depression score	-0.45±0.99	-0.10±1.09	0.194
SF-36 physical function	074±1.45	-0.33±0.92	0.001*
SF-36 physical role function	0.19±0.65	0.03±0.41	0.257
SF-36 bodily pain	0.13±1.72	0.03±0.74	0.786
SF-36 general health	0.61±2.64	-0.54±1.65	0.064
SF-36 social role functioning	0.13±1.38	-0.06±0.45	0.460
SF-36 vitality	0.98±2.70	-0.26±1.17	0.025*
SF-36 emotional role functioning	0.16±0.69	-0.03±018	0.137
SF-36 mental health	-0.19±2.37	0.03±0.93	0.623

mMRC: Modified British Medical Research Council; CAT: COPD assessment test; SGRQ: St George's respiratory questionnaire; FEV1: forced expiratory volume in the first second; SF-36: Short Form-36; HADS: hospital anxiety depression scale

helpful in patients with COPD to cope with their symptoms. The studies that had aimed at promoting self-management skills demonstrated decreased mMRC scores in the training group after the education sessions [22, 23].

The studies that focused on evaluating the effect of education on pulmonary functions reported inconsistent findings as increase or decrease in FEV_1 levels [24-26]. In our study, the intervention group did not show any improvement after the structured education program, which indicated that the self-management training had no effect on the pulmonary functional parameters. Even then, the change in FEV_1 was significant in the self-management training group, compared with that in the standard care group.

Anxiety and depression are the comorbidities that may develop in the clinical course of COPD. In our study, HADS evaluation demonstrated significant decrease in anxiety and depression in the self-management training group after availing the structured education program. Similarly, Lamers et al. [27] investigated the effect of education consisting of cognitive behavioral therapy and self-management, provided by experienced nurses, psychiatrists, and psychologists, on the patients with COPD and depression and found improvement in anxiety and symptoms of depression after the education.

In the present study, the most impressive finding was the improvement in impact, activity, and symptom subscales and total score of SGRQ in the self-management training group after the structured education program. This improvement in the quality of life in the patients with COPD has been reported in similar studies [3, 28, 29]. A statistically significant increase in the SGRQ total scores observed in the standard care group was thought to be related to the inclusion phase of the study when COPD exacerbations were most frequent [30]. Considering the relevant literature, it is concluded that self-management programs for patients with COPD may point to important clues about additional benefits to standard treatment.

When a general quality of life index, SF-36, was evaluated, there was a significant increase in only the physical function subscale within 8 subscales in the SF-36 questionnaire in the self-management training group. There are studies that have reported no significant differences between the case and control groups in terms of general health-related quality of life after the training program [24, 31-33].

In our study, we also found no significant differences between the two groups in terms of mortality and hospital readmission rates after one year. Our finding is similar to those reported in the literature. Johnson-Warrington et al. (2016) investigated the effects of self-management program on readmission and mortality rates for COPD and compared them with the standard care. They found no significant differences in the readmission rates and mortality between the groups after 3 months [34]. In a recent meta-analysis, the effectiveness of disease-specific self-management education on health outcomes in COPD was evaluated. It was found that there was no significant reduction in the mortality rate in the patients with COPD with self-management education [35]. Our results and findings in literature may be related to only one-time self-management education and assessment after one year.

Our study has a number of limitations. First, the small sample size reduces the power to detect the differences between

the case and control groups. Second, although insignificant, there were some dropouts during the study period. Third, self-management training was performed face-to-face only once because of regional conditions and human features. Fourth, we exclusively used self-reported measurements to assess the patients' psychiatric symptoms, quality of life, and severity of dyspnea. Fifth, the results might have been affected in winter when COPD exacerbations are most common in the control group. Furthermore, COPD exacerbation without hospitalization in both the groups were not evaluated during the 3-months period between the first and second application of assessments. Despite these limitations, this study suggests that a structured self-management education program for patients with COPD may be helpful especially for improving the symptoms of depression and anxiety and severity of dyspnea.

In conclusion, when we evaluated the results of our study, a structured self-management education program run by a multidisciplinary team of experts improved the health-related quality of life and the symptoms of depression and anxiety in patients with moderate and severe COPD. Because it is essential to prevent disease progression, patients with COPD and their caregivers should be informed about the disease and should be actively involved in the disease management process. This can be achieved by education, a simple and cost-free intervention that offers advantages in the care of patients with COPD.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of Dokuz Eylül University School of Medicine (Date: 19.06.2014; Number: 2014 /22-23).

Informed Consent: Verbal and written informed consent was obtained from the patients who participated in this study.

Peer-review: Externally peer-reviewed.

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REFERENCES

1. Vogelmeier CF, Criner GJ, Martinez FJ, et al. Global strategy for the diagnosis, management and prevention of chronic obstructive lung disease 2017 report: GOLD Executive Summary. Am J Respir Crit Care Med 2017;195:557-82. [CrossRef]
2. Stoilkova A, Janssen DJ, Wouters EF. Educational programmes in COPD management interventions: A systematic review. Respir Med 2013;107:1637-50. [CrossRef]
3. Cornelison SD, Pascual RM. Pulmonary rehabilitation in the management of Chronic Lung Disease. Med Clin North Am 2019;103:577-584. [CrossRef]
4. Grady PA, Gough LL. Self-management: A comprehensive approach to management of chronic conditions. Am J Public Health 2014;104:25-31. [CrossRef]
5. Jolly K, Majothi S, Sitch AJ, et al. Self-management of health care behaviors for COPD: a systematic review and meta-analysis. Int J Chron Obstruct Pulmon Dis 2016;11:305-26. [CrossRef]
6. Effing TW, Vercoulen JH, Bourbeau J, et al. Definition of a COPD self-management intervention: International Expert Group consensus. Eur Respir J 2016;48:46-54. [CrossRef]
7. Barrecheguren M, Bourbeau J. Self-management strategies in chronic obstructive pulmonary disease: A first step toward personalized medicine. Curr Opin Pulm Med 2018;24:191-8. [CrossRef]
8. Murphy LA, Harrington P, Taylor SJ, et al. Clinical-effectiveness of self-management interventions in chronic obstructive pulmonary disease: An overview of reviews. Chron Respir Dis 2017;14:276-88. [CrossRef]
9. Korpershoek YJ, Bruins Slot JC, Effing TW, et al. Self-management behaviors to reduce exacerbation impact in COPD patients: a Delphi study. Int J Chron Obstruct Pulmon Dis 2017;12:2735-46. [CrossRef]
10. Ulubay G, Dilektaşlı AG, Börekçi Ş, et al. Turkish Thoracic Society Consensus Report: Interpretation of Spirometry. Turk Thorac J 2019;20:69-89. [CrossRef]
11. Perez T, Burgel PR, Paillasseur JL, et al. Modified Medical Research Council scale vs Baseline Dyspnea Index to evaluate dyspnea in chronic obstructive pulmonary disease. Int J Chron Obstruct Pulmon Dis 2015;10:1663-72. [CrossRef]
12. Jones PW, Harding G, Berry P, et al. Development and first validation of the COPD Assessment Test. Eur Respir J 2009;34:648-54. [CrossRef]
13. Yorgancıoğlu A, Polatlı M, Aydemir Ö, et al. Reliability and validity of Turkish version of COPD assessment test. Tuberk Toraks 2012;60:314-20. [CrossRef]
14. Kim V, Zhao H, Regan E, et al. The St. George's Respiratory Questionnaire definition of chronic bronchitis may be a better predictor of COPD exacerbations compared with the classic definition. Chest 2019;156:685-95. [CrossRef]
15. Polatlı M , Yorgancıoğlu A, Aydemir Ö, et al. Validity and reliability of Turkish version of St. George's respiratory questionnaire. Tuberk Toraks 2013;61:81-7. [CrossRef]
16. Akinci B, Aslan GK, Kiyan E. Sleep quality and quality of life in patients with moderate to very severe chronic obstructive pulmonary disease. Clin Respir J 2018;12:1739-46. [CrossRef]
17. Koçyiğit H, Aydemir Ö, Ölmez N, et al. Reliability and validity of the Turkish version of short form-36 (SF-36). İlaç ve Tedavi Dergisi 1999;12:102-6. (Turkish)
18. Nowak C, Sievi NA, Clarenbach CF, et al. Accuracy of the Hospital Anxiety and Depression Scale for identifying depression in chronic obstructive pulmonary disease patients. Pulm Med 2014; doi: 10.1155/2014/973858. Epub 2014 Dec 4. [CrossRef]
19. Puhan MA, Frey M, Büchi S, et al. The minimal important difference of the hospital anxiety and depression scale in patients with chronic obstructive pulmonary disease. Health Qual Life Outcomes 2008;6:46. doi: 10.1186/1477-7525-6-46. [CrossRef]
20. Aydemir Ö, Güvenir T, Küey L, et al. Validity and Reliability of Turkish Version of Hospital Anxiety and Depression Scale. Türk Psikiyatri Derg 1997;8:280-7.
21. Zwerink M, Brusse-Keizer M, van der Valk PD, et al. Self management for patients with chronic obstructive pulmonary disease. Cochrane Database Syst Rev 2014;doi: 10.1002/14651858.CD002990.pub3. [CrossRef]
22. Van Wetering CR, Hoogendoorn M, Mol SJM, et al. Short- and long-term efficacy of a community-based COPD management programme in less advanced COPD: A randomised controlled trial. Thorax 2010;65:7-13. [CrossRef]
23. Norweg A, Collins EG. Evidence for cognitive-behavioral strategies improving dyspnea and related distress in COPD. Int J Chron Obstruct Pulmon Dis 2013;8:439-551. [CrossRef]

24. Rea H, McAuley S, Stewart A, et al. A chronic disease management programme can reduce days in hospital for patients with chronic obstructive pulmonary disease. Intern Med J 2004;34:608-14. [CrossRef]
25. Khdour MR, Kidney JC, Smyth BM, et al. Clinical pharmacy-led disease and medicine management programme for patients with COPD. Br J Clin Pharmacol 2009;68:588-99. [CrossRef]
26. Moullec G, Ninot G. An integrated programme after pulmonary rehabilitation in patients with chronic obstructive pulmonary disease: effect on emotional and functional dimensions of quality of life. Clin Rehabil 2010;24:122-36. [CrossRef]
27. Lamers F, Jonkers CC, Bosma H, et al. Improving quality of life in depressed COPD patients: effectiveness of a minimal psychological intervention. COPD 2010;7:315-22. [CrossRef]
28. Chuang C, Levine SH, Rich J. Enhancing cost-effective care with a patient-centric chronic obstructive pulmonary disease program. Popul Health Manag 2011;14:133-6. [CrossRef]
29. Koff PB, Jones RH, Cashman JM, et al. Proactive integrated care improves quality of life in patients with COPD. Eur Respir J 2009;33:1031-8. [CrossRef]
30. Marquis K, Debigare R, Lacasse Y, et al. Midthigh muscle cross-sectional area is a better predictor of mortality than body mass index in patients with chronic obstructive pulmonary disease. Am J Respir Crit Care Med 2002;166:809-13. [CrossRef]
31. Ninot G, Moullec G, Picot MC, et al. Cost-saving effect of supervised exercise associated to COPD self-management education program. Respir Med 2011;105:377-85. [CrossRef]
32. Nguyen HQ, Gill DP, Wolpin S, et al. Pilot study of a cell phone-based exercise persistence intervention post-rehabilitation for COPD Int J Chron Obstruct Pulmon Dis 2009;4:301-13. [CrossRef]
33. Johnson-Warrington V, Rees K, Gelder C, et al. Can a supported self-management program for COPD upon hospital discharge reduce readmissions? A randomized controlled trial. COPD Int J Chron Obstruct Pulmon Dis 2016;11:1161-9. [CrossRef]
34. Wang T, Tan JY, Xiao LD, et al. Effectiveness of disease-specific self-management education on health outcomes in patients with chronic obstructive pulmonary disease: An updated systematic review and meta-analysis. Patient Educ Couns 2017;100:1432-46. [CrossRef]