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RESEARCH ARTICLE

Exploring the health literacy characteristics of patients with chronic obstructive pulmonary disease

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ABSTRACT

Exploring the health literacy characteristics of patients with chronic obstructive pulmonary disease

Introduction: Health literacy encompasses patients' abilities to access health-care, comprehend health information, and make decisions based on that knowledge. We aimed to examine the relationship between dyspnea levels, acute exacerbations, hospitalizations, disease severity and comorbidities of chronic obstructive pulmonary disease (COPD) patients according to their health literacy levels.

Materials and Methods: A total of 106 COPD patients were prospectively enrolled in our study. Demographic data, history, pulmonary function tests, COPD severity, comorbidities, health status, quality of life and the factors determining the course of the disease in the last year were collected. We also measured patients' health literacy using the Turkish version of the European Health Literacy scale.

Results: Our findings revealed that elderly COPD patients ($p= 0.04$) with advanced disease stages ($p< 0.001$), higher Charlson Comorbidity Index and Saint George Hospital Respiratory Questionnaire scores ($p< 0.001$), and low-income ($p= 0.02$) had lower levels of health literacy. Moreover, patients with lower health literacy experienced more frequent exacerbations ($p= 0.01$), more severe exacerbations ($p< 0.001$), and higher rates of hospitalization ($p< 0.001$). Logistic regression analysis unveiled that GOLD stages (OR: 11.62, 95% CI: 3.36-26.25), and recent severe exacerbations within the last year (OR: 14.24, 95% CI: 5.41-38.13) stood out as the most strongly associated risk factors for poor health literacy.

Conclusion: COPD patients with low health literacy have a higher risk of severe disease. Recognizing the concept of health literacy and identifying risk factors associated with low health literacy are crucial steps in enhancing education, care, and social support for COPD patients. It emphasizes the need for tailored interventions and support for COPD patients, especially those with lower health literacy.

Key words: Disease burden; COPD; comorbidity; health literacy

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Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ÖZ**Kronik obstrüktif akciğer hastalığı olan hastaların sağlık okuryazarlığı özelliklerinin araştırılması**

Giriş: Sağlık okuryazarlığı, hastaların sağlık hizmetlerine erişme, sağlık bilgilerini anlama ve bu bilgilere dayanarak karar verme becerilerini kapsar. Çalışmamızda, kronik obstrüktif akciğer hastalığı (KOAH) hastalarının sağlık okuryazarlığı düzeylerine göre dispne düzeyleri, akut alevlenmeleri, hastaneye yatışları, hastalık şiddeti ve komorbiditeleri arasındaki ilişkiyi incelemeyi amaçladık.

Materyal ve Metod: Çalışmamıza toplam 106 KOAH hastası prospektif olarak dahil edildi. Demografik veriler, öykü, solunum fonksiyon testleri, KOAH şiddeti, eşlik eden hastalıklar, sağlık durumu, yaşam kalitesi ve hastalığın son bir yıldaki seyri belirleyen faktörler toplandı. Ayrıca hastaların sağlık okuryazarlığı, Avrupa Sağlık Okuryazarlığı Ölçeği'nin Türkçe versiyonu kullanılarak ölçüldü.

Bulgular: Çalışmamız; ileri yaşta KOAH hastalarının ($p=0.04$), ileri hastalık evrelerinde olanların ($p<0.001$), daha yüksek CCI ve SGRQ skorlarına sahip olanların ($p<0.001$) ve düşük gelirli olanların ($p=0.02$) sağlık okuryazarlığı düzeylerinin daha düşük olduğunu ortaya koymuştur. Ayrıca sağlık okuryazarlığı düşük olan hastalar, daha sık alevlenme ($p=0.01$), daha şiddetli alevlenme ($p<0.001$) ve daha yüksek hastaneye yatış oranları ($p<0.001$) yaşamıştır. Lojistik regresyon analizi, GOLD evrelerinin (OR: 11.62, %95 GA: 3.36-26.25) ve son bir yıl içinde geçirilen şiddetli alevlenmelerin (OR: 14.24, %95 GA: 5.41-38.13) zayıf sağlık okuryazarlığı ile en güçlü şekilde ilişkili risk faktörleri olduğunu ortaya koymuştur.

Sonuç: Sağlık okuryazarlığı düşük olan KOAH hastalarında ağır hastalık riski daha yüksektir. Sağlık okuryazarlığı kavramının tanınması ve düşük sağlık okuryazarlığı ile ilişkili risk faktörlerinin belirlenmesi, KOAH hastaları için eğitim, bakım ve sosyal desteğin geliştirilmesinde önemli adımlardır. Bu durum, özellikle sağlık okuryazarlığı düşük olan KOAH hastaları için özel müdahalelere ve desteğe duyulan ihtiyacı vurgulamaktadır.

Anahtar kelimeler: Hastalık yükü; KOAH; komorbidite; sağlık okuryazarlığı

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a persistent, often progressive, heterogeneous lung disease characterized by chronic respiratory symptoms (dyspnea, cough, sputum) as a result of the damage in the airways (bronchitis, bronchiolitis) and/or alveoli (emphysema) (1). COPD is a leading cause of morbidity and mortality in the world due to its economic and social burden (2,3). Previous data have shown that lower socio-economical status is associated with an increased risk of COPD. Increased pollution exposure, unplanned population growth, malnutrition, or infections increase the risk of COPD (4-6). The results of the articles, which analyze the relationship between lower socioeconomic status and COPD, are controversial. The difference in the accessibility to health services may cause differences between the studies. Lower socio-economic status may delay diagnosis and can also affect the physical environment, including living areas, traffic exposure, outdoor air pollution, the quality of indoor air, and other factors. It is still not clear that emergency service admission, increased risk of hospitalization, and mortality in COPD directly reflect low socio-economic status (7-9). The results of the studies, which invest in non-smoker COPD patients, have shown that air pollution, occupational exposures, environmental tobacco exposure, infectious diseases, and low socio-economic status are the etiological causes of COPD (10).

Health literacy is a concept that defines the level of individuals' access to health information they need to make appropriate health decisions and their ability to understand and use information for their purposes. The incapability of health literacy may cause insufficient preventive healthcare service access and use, decreased health status, increased ratio of critical mistake, increased health expenditures and increased risk of morbidity and mortality (11).

It is known that health literacy is related to the health results of the most chronic diseases (12,13). Multidisciplinary education approaches in COPD increase knowledge of COPD, increase adherence to treatment, and positively affect mortality rates (14).

It is not suggested that only education in COPD patients be used to prevent acute exacerbation of COPD (15). However, the educational status of COPD patients affects their implementation of the action plan and their display of beneficial behaviors in their daily lives. Some studies have shown that patient education reduces exacerbations. It is very important to increase studies on the design of patient education programs and their effectiveness. Education of COPD patients can reduce hospital costs and healthcare utilization. Self-management interventions for patients with COPD have shown significant benefits in terms of respiratory-related hospital admissions (16-18).

Many scales can be used to evaluate health literacy. The Turkish Adaptation of the European Health

Literacy Scale (ASOY-TR) is a questionnaire that includes questions regarding disease prevention, health improvement, health-related decision making and practices (access, understanding, decision-making and application) (19).

This study examined the health literacy levels of COPD patients using the ASOY-TR questionnaire applied in our clinic. It aimed to evaluate the relationship between health literacy level and dyspnea level, acute exacerbation, hospital admission, hospitalization, disease severity, comorbidities, and health quality of COPD patients.

MATERIALS and METHODS

Patient Selection

Subjects who were followed up with COPD diagnosis at outpatient clinic of Chest Disease Department were included prospectively into the study from February 2021 to May 2023. Informed consent was obtained from participants in the study. Ethics approval was obtained on September 15, 2020 with decision number 17-402-20.

Inclusion criteria were as follows: Patients aged 40 and over, with a smoking history of 10 packs/year or more, conscious, volunteer to study, spirometric data compatible with COPD according to Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria, and followed up with the diagnosis of COPD (20). Pulmonary function tests included in the study were selected among patients whose pulmonary function tests were completely by the GOLD criteria, and patients whose pulmonary function tests were not compatible with obstruction due to additional reasons other than COPD were not included. Every patient who accepted the study and was compatible with the inclusion criteria was included, and no selection or randomization was performed.

Exclusion criteria were as follows: Patients under age of 40, whose level of consciousness was not suitable for the questionnaire, who did not volunteer for the study, and did not have spirometric data. The number of illiterate patients in the COPD population is high, and patients who could not read the questionnaire due to illiteracy could not be included in the study.

Data Collection

Demographic data (age, sex, occupation, income status), history [smoking history, comorbidities, long-

term oxygen therapy (LTOT), non-invasive mechanical ventilator (NIMV) use], pulmonary function test and GOLD classification, factors determining the course of the disease in the last year (exacerbation number, hospital admission number) were evaluated (20). COPD acute exacerbation was defined according to the GOLD guideline. The severity of exacerbation was determined, and when needed, patients were hospitalized. Those who needed treatment with only short-acting bronchodilators were evaluated as mild, patients treated with short-acting bronchodilators and oral corticosteroids \pm antibiotics as moderate, those who needed hospitalization or needed emergency service or developed acute respiratory failure as severe exacerbation (21).

The comorbidities of the subjects were questioned, and the Charlson Comorbidity Index (CCI) score was determined. Dyspnea levels were determined by the Modified Medical Research Council Questionnaire (mMRC), symptom severity by the COPD Assessment Questionnaire (CAT), and quality of life by the Saint George Hospital Respiratory Questionnaire (SGRQ). The health literacy level of COPD cases was evaluated using the ASOY-TR. This questionnaire has 47 questions and the score ranges from 0 to 50. Health literacy level is evaluated in four categories. 0-25 points: insufficient health literacy, 25-33: problematic-limited health literacy 33-42: adequate health literacy, 42-50: excellent health literacy (19). It was planned to examine the patients in four groups according to their health literacy levels, but there were no patients with excellent health literacy, so they were examined in three groups.

Statistical Analysis

SPSS version 20.0 for Windows (SPSS Inc., Chicago, IL, USA) was used for all statistical analyses. The descriptive statistics for continuous variables were expressed as mean \pm standard deviation, and categorical variables were expressed as frequency (percentage), and median (min-max). Independent group comparisons were performed using ANOVA or Kruskal-Wallis tests, depending on the normality of data distribution. Chi-square test and Fisher's exact test were used for categorical variables. Logistic regression analysis was employed to identify the most significant risk factors associated with poor health literacy. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 106 patients diagnosed with COPD were included in our study. It was observed that 73.6% of the patients included in our study were male, and 26.4% were female. Mean age of the patients was 67.3 ± 8.5 years. Minimum patient age was 44 and maximum was 85. We observed that 7.5% of the patients were between the ages of 45-54, 28.3% were 55-64, 38.7% were 65-74, and 22.6% were 75 years old and older. In total, 75.5% of the patients had comorbidities, and 72.6% of the patients had a history of hospitalization in the past year due to COPD. The percentage of ex-smoker patients was 53.8%, and current smokers were 46.2%. Biomass exposure was present in 67.9% of the patients. LTOT use was observed in 60 (56.6%) patients and NIMV use was observed in 19 (17.9%) patients.

In total, 18.1% of the patients were GOLD A, 10.5% GOLD B, 3.8% GOLD C, 67.6% GOLD D group (Table 1). According to the spirometric evaluation, 12.3% of the patients were GOLD stage 1, 51.9% GOLD stage 2, 19.8% GOLD stage 3, and 16% GOLD stage 4.

The patients' health literacy levels are classified as 41.5% insufficient, 38.7% problematic-limited, and 19.8% adequate. Excellent health literacy was not seen. Table 2 compares the health literacy levels of subjects with symptom severity and clinical and functional status.

There was no statistically significant relationship between sex and health literacy levels ($p= 0.51$). Age was found to be associated with health literacy level. The level of health literacy in the group with a history of hospitalization in the past year was significantly lower than those without a history of hospitalization ($p< 0.001$). The level of health literacy in the group with stable disease clinic was significantly higher than in the patient group with exacerbation ($p= 0.001$).

The level of health literacy was found to be lower in the patient group with a lower income level ($p= 0.02$). There was no statistical relationship between patients' smoking status or biomass exposure and health literacy levels ($p= 0.16$, $p= 0.06$ respectively). The number of exacerbations in the last year was associated with a decrease in health literacy level ($p= 0.01$). As the severity of exacerbation increased, the

Table 1. Demographics, pulmonary functions and clinical characteristics of the COPD subjects

n= 106	
Age, years	67.2 ± 8.5
Age groups	
45-54	8 (7.5)
55-64	30 (28.5)
65-74	41 (38.7)
>75	24 (22.6)
Sex	
Male	78 (73.6)
Female	22 (26.4)
Smoking history, pack-year	
Active	49 (46.2)
Former	57 (53.8)
BMI, kg/m ²	28.9 ± 6.7
Comorbidities	80 (75.5)
FEV ₁ , %	55.6 ± 22.4
FVC,%	72.1 ± 19
FEV ₁ /FVC	58.3 ± 11.7
CAT score	19.6 ± 10.7
SGRQ	
Total score	56.2 ± 26.6
Impact score	47.2 ± 29.5
Symptom score	55.9 ± 25.5
Activity score	71.52 ± 29
CCI	1.9 ± 1.2
LTOT	60 (56.6)
NIMV	19 (17.9)
GOLD A	19 (18.1)
GOLD B	11 (10.5)
GOLD C	4 (3.8)
GOLD D	71 (67.6)

Results were given as n(%) and mean ± SD.
 BMI: Body mass index, FEV₁: Forced expiratory volume in 1 second, FVC: Forced vital capacity, CAT: COPD assessment questionnaire; SGRQ: Saint George Hospital respiratory questionnaire, CCI: Charlson Comorbidity index, LTOT: Long-term oxygen therapy, NIMV: Non-invasive mechanical ventilator, GOLD: Global initiative for chronic obstructive lung disease.

level of health literacy decreased ($p< 0.001$). Health literacy was found to be insufficient in those with frequent severe exacerbations ($p< 0.001$). There was no statistical relationship between patients' NIMV use and health literacy levels ($p= 0.06$).

It was observed that as the mMRC score decreased, the level of health literacy increased ($p < 0.001$). The patient's health literacy level in the GOLD D group was significantly lower ($p < 0.001$).

There was a significant difference with forced expiratory volume in 1 second (FEV_1), forced vital capacity,

CAT score, SGRQ scores and CCI score between the insufficient health literacy, problematic-limited health literacy, and adequate health literacy groups ($p = 0.01$, $p < 0.001$, $p < 0.001$, $p < 0.001$, $p = 0.006$, respectively) (Table 2).

Table 2. Comparison of health literacy level of COPD subjects with symptom severity, clinical and functional status of patients

	Insufficient Health Literacy n= 44	Limited Health Literacy n= 41	Adequate Health Literacy n= 21	p
Sex				0.51
Male	30 (68.2)	31 (75.6)	17 (81)	
Female	14 (31.8)	10 (24.4)	4 (19)	
Age groups				0.05
45-54	4 (9)	2 (4.8)	2 (9.5)	
55-64	8 (18.1)	13 (31.7)	9 (42.8)	
65-74	15 (34)	18 (43.9)	8 (38)	
>75	17 (38.6)	6 (14.6)	1 (4.7)	
Hospitalization				<0.001
Yes	38 (86.3)	31 (75.6)	13 (61.9)	
No	6 (13.6)	10 (24.3)	8 (38)	
Clinic				0.001
Exacerbation	36 (81.8)	30 (73.1)	8 (38)	
Stable	8 (18.1)	11 (26.8)	13 (61.9)	
No of exacerbations (last year)				0.01
0	5 (11.3)	8 (19.5)	12 (57.1)	
1	12 (27.2)	18 (43.9)	6 (28.5)	
≥2	17 (38.6)	15 (36.5)	3 (14.2)	
Severity of exacerbation				<0.001
Mild	2 (4.5)	3 (7.3)	0	
Moderate	0	5 (12.1)	1 (4.7)	
Severe	37 (84)	25 (60.9)	8 (38)	
GOLD				<0.001
A	1 (2.2)	6 (14.6)	12 (57.1)	
B	5 (11.3)	6 (14.6)	0	
C	2 (4.5)	1 (2.4)	1 (4.7)	
D	36 (81.8)	27 (65.8)	8 (38)	
mMRC				<0.001
0	0	1 (2.4)	3 (14.2)	
1	5 (11.3)	7 (17)	10 (47.6)	
≥2	39 (88.6)	33 (80.4)	8 (38)	
CAT score	24.45 ± 8.46	19.63 ± 9.11	9.81 ± 11.56	<0.001
FEV_1 , % pred	52.2 ± 21.4	51.2 ± 21	68.4 ± 22.4	0.01
FVC, % pred	71.6 ± 19.1	68.1 ± 17.3	79.5 ± 20.4	<0.001
FEV_1 /FVC	55.6 ± 14.4	56.9 ± 13.1	65.1 ± 4.9	0.05

Table 2. Comparison of health literacy level of COPD subjects with symptom severity, clinical and functional status of patients (continue)

	Insufficient Health Literacy n= 44	Limited Health Literacy n= 41	Adequate Health Literacy n= 21	p
CCI	2.34 ± 1.58	1.85 ± 1.06	1.29 ± 0.46	0.006
SGRQ				<0.001
Total score	66.8 ± 19.5	57.3 ± 23.9	31.8 ± 29.7	
Impact score	57.8 ± 25	47.2 ± 27.8	25.2 ± 30.7	
Symptom score	65.9 ± 20.7	57.1 ± 22.5	32.7 ± 26.3	
Activity score	83.5 ± 17.8	73.4 ± 25.3	42.6 ± 35.4	
LTOT	31 (70.4)	23 (56)	6 (28.5)	0.006
NIMV	12 (27.2)	6 (14.6)	1 (4.7)	0.06
Income, per month				0.02
<150 Euro	11 (25)	8 (19.5)	2 (9.5)	
150-500 Euro	32 (72.7)	31 (75.6)	14 (66.6)	
>500 Euro	1 (2.2)	2 (4.8)	5 (23.8)	

Results were given as n(%) or mean ± SD.

GOLD: Global initiative for chronic obstructive lung disease, mMRC: Modified medical research council questionnaire, CAT: COPD assessment questionnaire, FEV₁: Forced expiratory volume in 1 second, FVC: Forced vital capacity, CCI: Charlson comorbidity index, SGRQ: Saint George Hospital respiratory questionnaire, LTOT: Long-term oxygen therapy, NIMV: Non-invasive mechanical ventilator.

Table 3. Risk factors for low health literacy found by logistic regression analysis

	OR	95%CI	p
FEV ₁	0.81	0.34 - 1.18	NS
GOLD stages	11.62	3.36 - 26.25	<0.001
Severe exacerbations within the past year	14.24	5.41 - 38.13	<0.001
CCI	0.93	0.56 - 2.14	NS

OR: Odds ratio, CI: Confidence interval, FEV₁: Forced expiratory volume in 1 second, GOLD: Global initiative for chronic obstructive lung disease, CCI: Charlson comorbidity index.

A statistically significant correlation was found between the income level and hospitalization (p= 0.006). The logistic regression analysis model (Hosmer and Lemeshow test significance is 0.865) was created with the variables FEV₁, GOLD stages, severe exacerbation and CCI in the past year, and GOLD stages and severe exacerbation were found to be independent risk factors for poor health literacy (Table 3). Multinomial logistic regression analysis was performed to evaluate the impact of health literacy on GOLD stages and the number of exacerbations within the past year in COPD patients. The results demonstrated that health literacy was identified as a significant independent variable associated with both GOLD stages (OR: 0.59, 95% CI: 0.38-0.91, p= 0.03) and the number of severe exacerbations in the previous year (OR: 0.83, 95% CI: 0.54-1.14, p= 0.01).

DISCUSSION

COPD is a leading cause of morbidity and mortality in the world due to its economic and social burden (2,3). Social inequality and socioeconomic inadequacies are responsible for the etiology of COPD. However, a notable observation from our study is the scarcity of research dedicated to exploring this critical aspect.

Health literacy is a concept that defines the level of individuals' access to health information they need to make appropriate health decisions and their ability to understand and use information for their purposes. The incapability of health literacy may cause insufficient preventive healthcare service access and use, compromise health status, elevate the risk of critical errors, increase health expenditures and amplify the morbidity and mortality risk associated with COPD (11).

Establishing the concept of health literacy and identifying risk factors associated with low health literacy are pivotal steps toward improving education, enhancing healthcare delivery, and fostering social support systems, all of which are instrumental in preventing disease progression.

Self-management interventions can improve the health outcomes in people with chronic diseases. Numerous patient characteristics are also linked to the development of self-management behaviors. Low health literacy leads to poorer self management behaviors and increases the cost of health care. However, the mechanisms behind this relationship remain unclear. It was found that COPD patients with low health literacy were more dependent and they had increased emergency service and hospital admission ratios. Also, it has been shown that, these patients have higher all cause mortality ratios in the following year (22). Additionally, independent of socio-economic status, low health literacy is correlated with increased risk of COPD severity, poor quality of life and increased number of emergency service admissions (23).

Every COPD patient must be assessed individually. Personalized education can provide long-term functionality and appropriate health behaviour. Self-management intervention includes motivating, involving, and supporting patients to adapt their health behaviors positively and develop their skills for better illness management. Adequate education improves the health situation and decreases hospitalization and emergency service applications (21). A study has shown that patients with low or limited health literacy have a lower compliance rate and poor inhaler technique (24).

In a study from Iran that evaluated the health literacy level of COPD patients, a significant relationship has been found between the patient's age and their health literacy, similar to our study. The increase in disease severity and comorbidities with age may cause this result (25).

We observed a significant relationship between the severity of comorbidity, determined by CCI score, and the level of health literacy. In the study of Mueller et al., it was found that those with low health literacy were more likely to have diabetes, hypertension, congestive heart failure, and/or depression (26). Another study found mostly low health literacy in the COPD with multiple comorbidity group. Also, this

was associated with socio-economic factors and poor perception of illness (27). This result suggests that low socio-economic conditions increase the risk and severity of comorbidity, which is associated with low health literacy.

The average BMI value was 28.9. Similar to Puente et al.' study, it shows that the patients are overweight (22). Unhealthy nutrition, sedentary lifestyle and exercise restriction, which also plays an important role in the etiology and prognosis of COPD, maybe the cause of overweightness.

The level of health literacy was found to be significantly lower in COPD patients who had a history of hospitalization, were admitted to the hospital with an exacerbation, had a high number of exacerbations, had severe exacerbations, had a higher GOLD group, and had a low-income level in our study. The patient's health literacy level in the GOLD D group was significantly lower. Similarly to the study of Azkan Türe et al., a low level of health literacy was associated with increased severity of COPD, and the risk of severe COPD was found to be significantly higher in patients with low income than in patients with good income, and a significant relationship was found between income level and health literacy (28). In another study, poor health literacy was associated with higher rates of COPD-related emergency service application and hospitalization (23). The results of our study were found to be compatible with the literature. Insufficient knowledge about the disease, inadequate education and social problems can cause difficulty in disease control. Lack of information and limitations in accessing health services can lead to delays in the diagnosis of the disease and an increase in the severity of the disease.

No significant relationship was found between smoking status and the level of health literacy. The reason is that non-smokers were excluded from our study. However, smoking may indeed be a factor associated with health literacy, as evidenced by a study with elderly patients (29). In another study, which examined adolescents and young adults, a significant relationship was found between smoking and low health literacy level (30). In our study, the patients who did not have respiratory failure and did not use LTOT had a higher level of health literacy. The LTOT-using group can reflect that the group which has a severe COPD level had a lower health literacy. That may reflect the importance of COPD severity, as with the previous literature data (23,28).

In our study, a significant relationship was found between symptom severity, evaluated by mMRC and CAT scale, airway obstruction assessed by maximal expiratory flow rates, and health literacy of COPD patients. In addition, the low health literacy group had comorbidities and lower life quality. Insufficient health literacy is correlated with the level of comorbidities, which suggests that poor comorbidity control may be due to increased systemic inflammation and disease severity in COPD. Dyspnea, frequent exacerbations, and hospitalizations, which are associated with health literacy, also impair the quality of life of the cases and place them in an increasingly vicious circle.

In Puente et al.'s study, CCI was high, and spirometric values showed moderate obstruction and higher mMRC and CAT scores. Although the respiratory functions of the patients were not different, a significant difference was observed between the mMRC, CAT and EQ-5 data (22). The results can be evaluated as similar to those of our study.

Another important result in our study is that although we included a very heterogeneous patient group, no patients with excellent health literacy were observed. In a study from our country, 207 type 2 diabetes mellitus patients were evaluated with ASOY-TR and eight patients with excellent health literacy levels were found (31). When the literature data were examined, excellent health literacy was rarely found, as with the other studies, which used other health literacy scales and included other patient groups. However, in our study, the fact that no patients were in the group with excellent health literacy is one of the most important findings, which shows us that COPD should be treated specially.

The limitations of our study are that fewer patients could be included in the study compared to the process, and the main reason for this is the pandemic period. The number of pulmonary function tests performed during the pandemic decreased, and patient recruitment was more careful due to hygiene measures. In addition, the number of illiterate patients in the COPD population is high, and patients who could not read the questionnaire due to illiteracy could not be included in the study. However, the sample size in the power analysis result and the number of patients included in the study were compatible and sufficient. Statistically, sufficient results were obtained from the study.

CONCLUSION

In conclusion, COPD is a chronic, systemic, inflammatory disease, and it requires long-term treatment; the course of the disease is affected by environmental factors such as smoking, exacerbations accelerate disease progression, and early hospital admission during exacerbations is important, vaccination has a great effect on the severity and number of exacerbation, and it is important to apply the methods properly and regularly to prevent and treat the disease. Due to these facts, health literacy is important in COPD follow-up. Low socioeconomic status, poor quality of life, and increased health expenditures may be associated with low health literacy. Our study found a statistically significant correlation between the income level and hospitalization. Severe exacerbations in the past year, GOLD stages, FEV₁ and CCI were independent risk factors for poor health literacy. Severe exacerbations in the past year and GOLD stages stood out as the most strongly associated risk factors for poor health literacy. Establishing the concept of health literacy and identifying the risk factors that may cause low health literacy, is important to increase education, care, and social support. These may prevent the disease state of patients.

Ethical Committee Approval: This study was approved by This study has been approved by the Ankara University Faculty of Medicine Human Research Ethics Committee (Decision no: İ7-402-20, Date: 09.07.2020).

Peer-review: Externally peer-reviewed.

CONFLICT of INTEREST

The authors declare that they have no conflict of interest.

AUTHORSHIP CONTRIBUTIONS

Concept/Design: FA, MÖ, ÖY, AGK

Analysis/Interpretation: ÖVY, DE, FA

Data acquisition: ÖVY, MÖ, DE, AGK

Writing: ÖVY, FA

Clinical Revision: FA, ÖY, MÖ, AGK

Final Approval: All of authors

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