



## Relationship between anxiety, depression, symptom level, and quality of life in individuals with COPD

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### Abstract

Chronic obstructive pulmonary disease (COPD) is a progressive obstructive pulmonary disease. COPD is a major cause of workforce loss and may affect 7-12% of the adult population. The current study aimed to investigate the relationship between anxiety, depression, symptom level, and quality of life in patients with COPD who were in a stable period. The present study included 125 patients with COPD (66.1±9.011 years) in a stable period. Data were obtained using the St. George Respiratory Questionnaire (SGRQ), Hospital Anxiety and Depression Scale (HAD), and COPD Assessment Test (CAT). There was a significant positive correlation between HAD-anxiety, HAD-depression, HAD-total, CAT, SGRQ-symptom level, and SGRQ-total scores in each pairwise relationship ( $p<0.05$ ). The present study showed a positive relationship between anxiety, depression, symptom level, and quality of life in patients with COPD who were in a stable period. COPD patients with lower quality of life had higher levels of anxiety, depression, and symptoms. Furthermore, COPD patients with higher symptom levels had higher levels of anxiety and depression. Therefore, multidisciplinary approaches such as breathing exercises and relaxation techniques are remarkable to reduce symptoms and increase the quality of life in patients with COPD.

**Keywords:** COPD, anxiety, depression, quality of life

### 1. Introduction

Chronic obstructive pulmonary disease (COPD) is a progressive obstructive pulmonary disease characterized by persistent airflow limitation and associated with an increased chronic inflammatory response of the airways and lungs to noxious gases and particles. Although COPD is the fourth most common cause of death in the world, it is an important preventable and treatable health problem. Globally, the burden of COPD is expected to increase with greater exposure to COPD risk factors and the increasing elderly population (1).

Because dyspnea occurs due to airway obstruction in COPD, daily activity levels are restricted, and functional status gradually worsens (2). COPD is a major cause of workforce loss and may affect 7-12% of the adult population (3). In the study of Peña et al. (4), it has been reported that the prevalence of COPD was 9.1% in the adult population aged 40-69 years in Spain. When evaluated in terms of the community health care system, it is stated that COPD has an important place in both primary health care services and hospital admissions. Considering the aging of the population and the ever-increasing prevalence of the disease, the socioeconomic impact of COPD is gradually increasing (5).

In addition to being a chronic disease, COPD is a condition that can lead to a series of psychological, emotional, social, and psychosexual problems and conflicts for the patient (6). COPD severely affects emotional, social, and behavioral functions,

self-care, mobility, enjoying hobbies, sleep, and rest functions. When dyspnea is acute and severe, it causes emotional stress. In some cases, it reaches the level of fear of death (7).

In the study of Gore et al. (8), it has been shown that patients with severe COPD had worse activities of daily living and physical, social, and emotional functions than patients with inoperable non-small-cell lung carcinoma. Furthermore, while depression and anxiety were detected in 90% of COPD cases, the rate was found to be 52% in the group with malignancy. It has been reported that patients with COPD have less knowledge about their diseases, receive less social support, and have a shorter life than patients with cancer (8).

COPD may lead to psychological disorders by affecting brain functions and occur psychological symptoms depending on the perception of the disease and its impact on the patient's life areas (9, 10). It has been reported that psychological disorders, especially depression and anxiety, are common in COPD patients compared to the general population (10, 11). It is stated that anxiety seen in COPD patients is 55%. Anxiety negatively affects the quality of life and functional independence of COPD patients (9, 12). It also causes an increase in physical findings such as breathlessness, dryness in the mouth, and palpitations seen in COPD patients (10). In the study of Van Ede et al. (11), it has been shown that hypoxemia in COPD accompanies depression by causing changes in

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neurophysiological functions. In the treatment, it is recommended to apply psychotherapeutic approaches in addition to giving medication for symptoms. The prevalence of depression in patients with COPD has been the issue of many studies. The rates obtained in these studies are in the range of 6-42% (10). Depression can rarely be realized or treated since depressive symptoms are often regarded as the manifestation of the disease in patients diagnosed with COPD.

Because COPD is a chronic disease and causes problems such as dyspnea, it is very important to evaluate parameters that affect the daily activities of the patient, such as anxiety, depression, symptom level, and quality of life, as well as respiratory functions and performances in patients with COPD. The current study aimed to investigate the relationship between anxiety, depression, symptom level, and quality of life in patients with COPD.

## 2. Materials and methods

### 2.1. Study population

125 patients with a diagnosis of COPD who applied to the chest diseases polyclinic were included in the present study. Inclusion criteria were being diagnosed with COPD according to the GOLD (Global Initiative for Obstructive Lung Disease) 2017 criteria, being in a stable period, and not having a mental problem that prevented them from completing the questionnaires used in the current study. Exclusion criteria were being uneducated, being in the attack period, and having cognitive problems.

### 2.2. Study design

The present study was planned as cross-sectional. An information form was created to query the demographic information and other data of the patients. Name, surname, gender, job, age, height, weight, marital status, education status, duration of disease, pain, history of disease and surgery, devices used, medications, accompanying diseases, social assurance, habits, allergies, curriculum vitae, family history, vital signs, years of smoking, and how many packs of cigarettes a day were questioned in this form. After the patients were evaluated with this form, the evaluation questionnaires described below were applied to each patient separately.

Necessary permissions were obtained from Non-Interventional Research Ethics Committee (2016/79) to carry out the study. The current study followed the principles of the Declaration of Helsinki. Detailed information about the study was given to volunteers participating in the study, and informed consent forms were signed by all patients.

### 2.3. Measurements

#### 2.3.1. St. George respiratory questionnaire

Developed by Jones et al. (13), the St. George Respiratory Questionnaire (SGRQ) consists of 50-item. It is a questionnaire used to evaluate the quality of life in patients with airway obstruction. SGRQ is a specific test used for respiratory diseases. The number of answer options per question ranges from two to five. Scores are calculated separately in three areas

as symptoms (8 items), activity (16 items), and psychosocial impact (26 items), and the total score is obtained by summing these scores. The symptoms section involves shortness of breath, cough, sputum, wheezing, and attacks. In the activity section, physical activities that are affected or restricted due to shortness of breath are asked. The psychosocial impact section includes the panic state of the patient due to respiratory disease and the psychosocial impact of the disease on the patient. A score between 0 and 100 is taken. While a high score indicates poor health, a low score represents good health. It has a high repeatability and sensitivity level. The validity and reliability of SGRQ was conducted by Polatli et al. (14). It is especially used in asthma and COPD (15).

#### 2.3.2. Hospital anxiety and depression scale

The Hospital Anxiety and Depression Scale (HAD) was developed to determine the risk of anxiety and depression in individuals applying to primary health care services and to measure the level of anxiety and change in severity. HAD, which is a self-assessment scale, consists of 14 questions. While seven of the questions investigate anxiety levels, the other seven evaluate depression levels. Turkish validity and reliability study was performed by Aydemir (16).

#### 2.3.3. COPD assessment test

The COPD Assessment Test (CAT) is recommended in the GOLD guideline for scoring COPD symptoms and grading the severity of COPD (17). CAT provides to measure the symptom level of patient with COPD and to obtain information about the patient's quality of life (18). In CAT, which consists of 8 items, each item is scored between 0 and 5, so a maximum of 40 points can be obtained from this test. A high score indicates worsening of symptoms and increased severity of COPD. Turkish validity and reliability study of the CAT was conducted by Yorgancioglu et al. (17).

### 2.4. Statistical analyses

Shapiro-Wilk's test was used to determine whether variables were normally distributed. Descriptive analyzes of the obtained data were stated as mean ( $\bar{x}$ ), standard deviation (SD), frequency (n), and percentage (%). Since variables were normally distributed, relationships between measurements were investigated using Pearson correlation analysis. Statistical significance level was taken as  $p \leq 0.05$  and analyzes were made using PASW (SPSS 18.0) statistical analysis program.

## 3. Results

Demographic characteristics of 125 patients with COPD participated in the current study were given in Table 1. The mean age of all patients was  $66.1 \pm 9.011$  years, the mean height was  $1.69 \pm 0.065$  m, the mean weight was  $77.29 \pm 16,087$  kg, and the mean body mass index was  $27.135.49$  kg/m<sup>2</sup>.

### 3.1. Correlation between variables

Pairwise relationship between HAD-anxiety, HAD-depression, HAD-total, CAT, SGRQ-symptom level, and SGRQ-total scores were analyzed using Pearson correlation

analysis. The correlation coefficients and the statistical significance level of these coefficients were shown in Table 2. According to these findings, there was a positive and significant correlation between HAD-anxiety, HAD-depression, HAD-total, CAT, SGRQ-symptom level, and SGRQ-total scores. In addition, all scores positively correlated with each other at the  $p=0.001$  significance level.

**Table 1.** Demographic characteristics of patients with COPD

	Patients with COPD (n=125)
<b>Characteristics</b>	<b>X±SD / n; %</b>
Age (year)	66.10±9.011
Male/female	115; 92% / 10; 8%
Weight (kg)	77.29±16.087
Height (m)	1.69±0.065
Body mass index (kg/m <sup>2</sup> )	27.13±5.49
<b>Marital status</b>	
Married	111; 88.8%
Single	14; 11.2%
<b>Job</b>	
Public officer	4; 3.2%
Artisan or self-employment	9; 7.2%
Worker or servant	7; 5.6%
Retired	93; 74.4%
Others	12; 9.6%
<b>Social assurance</b>	
Yes	121; 96.8%
No	4; 3.2%
<b>Working status</b>	
Working	16; 12.8%
Retired	109; 87.2%
<b>Individuals living together</b>	
Alone	6; 4.8%
Spouse/child	116; 92.8%
Mother/father	2; 1.6%
Others	1; 0.8%

kg: kilogram, m: meter, x±SD: mean±standard deviation, n: frequency, %: percentage

**Table 2.** The relationship between variables in patients with COPD

		HAD-anxiety	HAD-depression	HAD-total	CAT	SGRQ- symptom level	SGRQ-total
HAD-anxiety	r	-	<b>0.841</b>	<b>0.959</b>	<b>0.521</b>	<b>0.615</b>	<b>0.613</b>
	p		<b>p&lt;0.001*</b>	<b>p&lt;0.001*</b>	<b>p&lt;0.001*</b>	<b>p&lt;0.001*</b>	<b>p&lt;0.001*</b>
HAD-depression	r	-	-	<b>0.960</b>	<b>0.493</b>	<b>0.661</b>	<b>0.639</b>
	p			<b>p&lt;0.001*</b>	<b>p&lt;0.001*</b>	<b>p&lt;0.001*</b>	<b>p&lt;0.001*</b>
HAD-total	r	-	-	-	<b>0.529</b>	<b>0.666</b>	<b>0.653</b>
	p				<b>p&lt;0.001*</b>	<b>p&lt;0.001*</b>	<b>p&lt;0.001*</b>
CAT	r	-	-	-	-	<b>0.764</b>	<b>0.827</b>
	p					<b>p&lt;0.001*</b>	<b>p&lt;0.001*</b>
SGRQ-symptom level	r	-	-	-	-	-	<b>0.963</b>
	p						<b>p&lt;0.001*</b>
SGRQ-total	r	-	-	-	-	-	-
	p						-

r: Pearson correlation coefficient, COPD: Chronic obstructive pulmonary disease, HAD: Hospital Anxiety and Depression Scale, CAT: COPD Assessment Test, SGRQ: St George's Respiratory Questionnaire. \* $p<0,05$ . Pearson correlation coefficient was used because all values were normally distributed.

In the present study, 92% of patients with COPD were men and the mean age was 66.10 years. In the study of Balcells et al. (24), which had a similar population to patients in our study, 93% of the patients with COPD were men and the mean age was 68 years. We think that since variables such as age range

#### 4. Discussion

In the present study, a significant positive correlation was found between anxiety, depression, symptom level, and quality of life in patients with COPD who were in a stable period. In other words, it was concluded that COPD patients with decreased quality of life had higher levels of anxiety, depression, and symptoms. In addition, our study showed that COPD patients with higher symptom levels had higher levels of anxiety and depression.

Anxiety and depression negatively affect individuals' self-care and lifestyles. At the same time, it directly affects the health status of patients, the frequency of hospitalization, and symptom control. Therefore, detection of anxiety and depression is vital (19,20). It has been reported that depression is associated with exacerbations of COPD, hospitalizations, and mortality (21). Studies in the literature have shown that the depression rate in patients with COPD varies between 11% and 40%. However, it has been stated that depression is difficult to diagnose because its symptoms can be confused with the symptoms of COPD. For this reason, the patient's history and physical examination were expressed to be important (22,23). In the literature, it has been reported that depression and anxiety disorders are more common in patients with COPD compared to the general population and patients with other chronic diseases (10,11). Quality of life and functional independence are negatively affected in COPD patients with higher levels of anxiety (9,12). In the current study, COPD patients with decreased quality of life were showed to have higher levels of anxiety and depression. In parallel with our results, in the study of Balcells et al. (24) conducted on patients with mild and moderate COPD, it has been reported that COPD patients with decreased quality of life had higher levels of anxiety and depression.

and gender in the study of Balcells et al. (24) are similar to our variables, the results of this study may be parallel to ours. Consistent with our study, the study of Burgel et al. (25) conducted on COPD patients with a mean age of 65 (male patient rate = 77%) stated that quality of life decreased in COPD patients with higher levels of anxiety or depression.

In line with our study, the study of Ekici et al. (26) carried out on patients with COPD in a stable period reported that there was a significant correlation between the lower quality of life and higher levels of anxiety and depression. Furthermore, as a result of the study, a significant relationship was found between quality of life and anxiety, while there was no relationship between quality of life and depression (26). In the study of Ekici et al. (26), men comprised 98.4% of patients with COPD, and 70.9% of participants had bronchiectasis. However, it has been stated that the presence of bronchiectasis did not affect the quality of life and psychological disorders.

Anxiety and depression complaints are common in patients with COPD. Depression is observed to be two to four times more often than in healthy individuals (19,20). The study of Cully et al. (27) showed that higher levels of anxiety and depression were associated with lower quality of life in COPD patients. In the study of Giardino et al. (28), the relationship between anxiety and quality of life in clinically stable patients with moderate to severe emphysema was investigated. Although the mean age (66.7 years) of the participants in the study was similar to our study, the rate of male participants (62%) was lower than ours. Consistent with our finding, this study showed that a higher anxiety level was associated with decreased quality of life (28). When we searched for studies investigating the relationship of quality of life with anxiety and depression in COPD patients with similar age groups and different gender ratios in the literature, we saw that almost all of them support each other. The results of our study are also compatible with the literature.

As far as we know, there is one study showing a relationship between anxiety, depression, symptom level, and quality of life in patients with COPD. In our study, in addition to the quality of life, a positive correlation was found between higher symptom levels and higher levels of anxiety and depression. In the study of Cleland et al. (29), the relationship between gender, age, anxiety, depression, symptom level, and quality of life in patients with COPD was analyzed. As a result of the study, in which 51.8% of the participants were men, it was reported that higher age and higher symptom levels were associated with higher levels of anxiety and depression (29). In our study, symptom level was also found to be positively associated with levels of anxiety and depression. The rate of men in our study was much higher than in this study. The relationship of gender with levels of anxiety and depression was not analyzed in our study. However, in the study of Cleland et al. (29), it was shown that there was no relationship between gender and levels of anxiety and depression. As the symptom level increases in COPD patients, the levels of anxiety and depression worsen (29). Based on this information, it was concluded that anxiety and depression levels are more in COPD patients with higher symptom levels.

As a result of our research, a significant relationship was revealed between anxiety, depression, symptom level and

quality of life in COPD patients who were in the stable period. It was showed that the levels of symptom, anxiety and depression were more in COPD patients with poor quality of life. In addition, it was found that the levels of anxiety and depression were also higher in COPD patients with higher symptom levels. COPD is a disease with severe symptoms. Furthermore, anxiety and depression are more common in COPD. As with other chronic diseases, psychological health is also very important in COPD. For this reason, psychosocial approaches, as well as the appropriate medical treatments, gain importance. We would like to emphasize that multidisciplinary approaches are remarkable in reducing symptoms such as anxiety and depression and increasing the quality of life by using breathing exercises and relaxation techniques in patients with COPD.

#### Conflict of interest

None to declare.

#### Acknowledgments

None to declare.

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