

QUALITY OF LIFE IN PATIENTS WITH COPD

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Abstract: Chronic obstructive pulmonary disease is a serious public health issue that significantly lowers patients' quality of life. The fourth most common cause of death globally is COPD. It is a more common cause of death for men and affects them more frequently than women. In individuals over 40, the prevalence of COPD is significant, ranging from 5 to 10%. Smokers have a higher death rate and are more likely than non-smokers to develop COPD. The most prevalent lung condition in adults is chronic bronchitis. For men over 60, the incidence rates vary from 20 to 60%. Women have also been impacted more often in recent years. Risk factors for the development of COPD can be divided into those related to: personal factors (genetic predisposition, airway hyperreactivity, abnormalities in lung growth and development, older age) and environmental factors (smoking, occupational exposure to dust and chemicals, indoor and outdoor air pollution, infections, and socioeconomic status). The disease is characterized by progressive airflow limitation and chronic respiratory symptoms that affect physical, emotional, and social functioning. The diagnosis is made on the basis of the anamnesis, clinical manifestations, physical findings, spirometry, determination of oxygen and carbon dioxide in arterial blood, acid-base status of arterial blood, microbiological analysis of sputum, chest radiography and electrocardiogram. COPD is a progressive and incurable disease, and the goal of treatment is to prevent disease progression and exacerbations, and to improve quality of life. The aim of this research is to examine the impact of COPD on quality of life, with a particular focus on differences between gender and the relationship between age and the degree of impairment. The general research hypothesis assumes that COPD has a significant impact on quality of life, with expected gender differences and a correlation between age and the level of quality of life impairment. The study was designed as a cross-sectional research and conducted on a sample of 30 patients diagnosed with COPD, including 15 males and 15 females of different ages. The impact of COPD symptoms on quality of life was assessed using the COPD Assessment Test (CAT) questionnaire, with scores ranging from 0 to 40, where higher values indicate a greater negative impact of the disease. Data were analyzed using descriptive statistics, independent samples t-test, and Pearson correlation coefficient. The results showed that male patients ($M = 19.20$; $SD = 3.509$) had significantly higher CAT scores compared to female patients ($M = 15.20$; $SD = 6.549$), indicating a greater impairment in quality of life ($t(28) = 2.085$; $p < 0.05$). Furthermore, a statistically significant positive correlation was found between age and CAT score ($r = 0.364$; $p = 0.048$), suggesting that quality of life worsens with increasing age. The findings confirm that COPD significantly affects quality of life and that demographic factors such as gender and age play an important role in the degree of impairment. Older patients and male patients appear to be more affected, highlighting the need for targeted and individualized approaches in disease management. The study emphasizes the importance of early diagnosis, continuous monitoring, and comprehensive treatment strategies aimed at improving quality of life in patients with COPD.

Keywords: COPD, symptoms, quality of life, gender, age

1. INTRODUCTION

Definition and classification of COPD

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) defines COPD as a condition that limits airflow and cannot be completely reversed. An inadequate inflammatory response of the lungs to harmful particles or gases is linked to the airflow restriction, which is typically progressive limitation of airflow. Spirometry measurements serve as the foundation for COPD severity classification and diagnosis (GOLD, 2025). COPD is classified into four stages based on the values of forced expiratory volume in the first second (FEV₁), forced vital capacity (FVC), and their ratio (FEV₁/FVC%):

Stage 0: At risk: Lung function is still normal, although there is a persistent cough and sputum production.

Stage I: Mild COPD: Usually characterized by a persistent cough and sputum production, as well as mild airflow limitation ($FEV_1/FVC < 70\%$ but $FEV_1 \geq 80\%$ expected). People should be aware that their lung function is compromised at this point.

Stage II: Moderate COPD; worsening airflow restriction ($50 < FEV_1 \leq 50\%$ expected); symptoms frequently worsen with exertion-induced shortness of breath.

Stage III: Severe COPD, characterized by growing obstruction ($30\% < \text{or} = \text{FEV1} < 50\%$ expected value), increasing dyspnea, and recurrent exacerbations that impact the patient's health.

Stage IV: Extremely severe COPD with significant airflow restriction ($30\% < \text{or} = \text{FEV1} < 50\%$ plus chronic respiratory failure). The patient's quality of life significantly declines at this point, and exacerbations may be fatal (Stanojevic et al., 2024).

2. EPIDEMIOLOGY AND ETIOLOGY

Globally, chronic obstructive pulmonary disease ranks as the fourth most common cause of mortality. It is a more common cause of death in men and affects men more frequently than women. In adults over 40, the prevalence of COPD is significant, ranging from 5 to 10%. Smokers have a greater death rate and are more likely to develop COPD than non-smokers. The most prevalent lung condition among people is chronic bronchitis. For men over 60, incidence rates vary from 20 to 60%. Women have also been impacted more often in recent years (Wang et al., 2025).

Risk factors for COPD can be divided into those related to:

- a) personal factors (genetic predisposition, airway hyperreactivity, abnormalities in lung growth and development, older age),
- b) environmental factors (smoking, occupational exposure to dust and chemicals, indoor and outdoor air pollution, infections, and socioeconomic status) .

Tobacco smoking is the main risk factor for the development of COPD. In smokers, early damage to the peripheral airways occurs, but COPD does not develop in everyone. Another important factor is air pollution and occupational exposure (miners, cement workers, paper mills, and blast furnace workers are at risk). Viral and bacterial respiratory infections also play a role in its development. Poor socioeconomic conditions are a serious cause of the disease. They include poor housing conditions, living in polluted parts of the city, exposure to passive smoking, poor nutrition, and frequent infections in childhood. It is genetically caused by alpha 1-antitrypsin deficiency (Yang et al., 2022).

3. CLINICAL MANIFESTATIONS

Patients with COPD have two main symptoms: dyspnea and cough. They are also accompanied by wheezing in the chest and chronic coughing. Anamnestic data indicate repeated infections, especially in the winter period, long-term smoking, exposure to chemicals, smoke and a positive family history. Cough is occasional at the beginning of the disease and later as the disease progresses it becomes more frequent and leads to expectoration. Expectoration is almost imperceptible at first because it occurs only in the morning. The sputum is mucous, and as the disease worsens it becomes purulent. Dyspnea is progressive and increases with physical exertion or respiratory tract infection. Patients initially consider their symptoms to be normal due to smoking and consult a doctor when cough and dyspnea worsen and affect the quality of daily life, or during exacerbation of the disease (Niu et al., 2020).

Exacerbation or worsening of the disease is a condition in which the symptoms of the disease worsen and become more pronounced than before. COPD exacerbation can be caused by several factors, the most common causes being respiratory tract infections. As the disease worsens, fever occurs, chest tightness occurs, breathing is difficult at rest or during exertion, wheezing occurs, weight loss occurs, and coughing occurs more frequently with an increase in the amount of sputum, which most often becomes purulent (yellow or green). Physical examination may reveal that the patient is dyspneic, has a barrel-shaped chest, uses accessory respiratory muscles, cyanosis may be found, and auscultation of the lungs reveals prolonged expiration (Viniol & Vogelmeier, 2018).

4. DIAGNOSIS

The diagnosis is made on the basis of the anamnesis, clinical manifestations, physical findings, spirometry, determination of oxygen and carbon dioxide in arterial blood, acid-base status of arterial blood, microbiological analysis of sputum, chest radiography and electrocardiogram. From the anamnesis data we learn about persistent productive cough during the day and night. Dyspnea initially occurs only during exertion and as the disease worsens it also occurs during rest. The physical findings in the initial stage are normal. As the disease progresses or worsens, wheezing occurs. In the advanced stage, the appearance of the chest takes on a barrelshaped shape and the patient uses auxiliary respiratory muscles (Cagle et al., 2023). Pulmonary function tests are very important in diagnosing COPD. Spirometry is used to demonstrate reduced airflow and make the diagnosis. A straightforward test called spirometry assesses a patient's forced vital capacity (FVC) and forced expiratory volume in one second (FEV1). The FEV1/FVC ratio is computed. Using the proper normal values based on height, age, and gender, spirometry results are reported as a percentage of expected values. FEV1 and FEV1/FVC usually decline in COPD patients. (Hughes, 2017).

Microbiological analysis of sputum is indicated in infections for the purpose of determining antibiotics. An arterial blood gas test measures the level of oxygen in the blood taken from an artery. The test can help determine how advanced the disease is and whether the patient needs oxygen therapy. On radiological examination, emphysema appears as hyperinflation (overinflation) and has an enlarged heart wall. In chronic bronchitis, the heart is enlarged and vascular lines in the basal parts of the lungs are increased. An electrocardiogram shows signs of microvoltage, hypotrophy of the right heart (Peerzada, 2020).

5. TREATMENT

COPD is a progressive and incurable disease, and the goal of treatment is to prevent disease progression and exacerbations, and to improve quality of life. The disease must first be diagnosed and monitored. Smoking is the biggest cause of chronic obstructive pulmonary disease, and smoking cessation is an important part of treatment. It largely stops further damage to lung function. Therefore, it is very important to educate the patient well at the very beginning of care and warn about the harmful effects of smoking. Psychosocial and drug methods are used in the process of quitting smoking. People should avoid exposure to air pollutants, reduce occupational exposure to dust and chemicals, and get vaccinated against influenza (Yang et al., 2022).

Pharmacotherapy improves quality of life, lessens symptoms, and decreases the frequency of exacerbations. BETA 2 antagonists, such as salbutamol, aminophylline, anticholinergics, methylxanthines, and corticosteroids, are utilized as bronchodilators in stable COPD. Inhalation is the most effective way to take bronchodilators, which are used either permanently or as needed. It is not advised to take corticosteroids for an extended period of time unless the patient has a history of exacerbations and spirometry has demonstrated a positive outcome. When the illness is more serious, oxygen therapy is used. (Cagle et al., 2023).

Acute exacerbations, which are typically brought on by infection, disrupt the disease's stable course and necessitate appropriate antibiotic therapy. Exacerbations are classified as mild (treated with bronchodilators alone), moderate (treated with bronchodilators, antibiotics, and oral corticosteroids), and severe (the patient needs to be admitted to the hospital). Hospital treatment indications include worsening of symptoms (dyspnea at rest), the appearance of cyanosis and edema, heart failure, and arrhythmias. Mild exacerbations are treated with bronchodilators alone; moderate exacerbations are treated with bronchodilators, antibiotics, and oral corticosteroids; and severe exacerbations necessitate hospitalization. Worsening symptoms (dyspnea at rest), the emergence of cyanosis and edema, heart failure, and arrhythmias are indications for hospital care.

(Cagle et al., 2023).

6. QUALITY OF LIFE IN PATIENTS WITH COPD

COPD significantly impairs patients' quality of life, encompassing multiple aspects of daily functioning, including physical activity, emotional state, and social roles. Most studies show a moderate to severe reduction in health-related quality of life in patients with COPD. The results of studies indicate a significantly impaired quality of life in patients with COPD, with the values of assessment scales compared to the healthy population showing lower results in these patients, especially in terms of physical functioning and vitality. In addition, studies show that the disease has a wide impact on daily life, encompassing emotional status, social activities and functional ability, with depression, reduced mobility and sleep disorders often present (Assaf et al., 2022; Fayaz et al., 2025). The most pronounced impairment is in the physical domain, where patients experience dyspnea, decreased exercise tolerance, and limited ability to perform daily activities. Symptoms such as cough, sputum production and shortness of breath represent a significant burden for patients. The psychological aspect is also significantly affected, with frequent occurrence of anxiety, depression and negative emotions, while social life is limited due to reduced interaction and dependence on care from others (Roberts et al., 2024).

The quality of life in patients with COPD is influenced by multiple factors. More severe stages of the disease, reduced lung function, pronounced dyspnea, frequent exacerbations and longer duration of the disease are associated with a worse quality of life. In addition, frequent hospitalizations and exacerbations of the disease significantly worsen the quality of life over time. The presence of comorbidities, such as cardiovascular disease, hypertension, diabetes, obesity, as well as depression and anxiety, also contribute to its reduction (Roberts et al., 2024).

Functional capacity and physical activity levels are strongly associated with quality of life, with reduced physical activity, muscle weakness and sleep disturbances being associated with worse outcomes. Sociodemographic factors, such as older age, lower education, unemployment and lower socioeconomic status, also have a negative impact, while smoking further worsens quality of life (Yang et al., 2022).

Quality of life also has prognostic significance. Deterioration of the results within one year is associated with an increased risk of hospitalizations and mortality, with each deterioration bringing a significant increase in risk. Long-

term studies show that the same factors, especially physical activity and hospitalizations, continue to influence quality of life over a period of several years (Fayaz et al., 2025).

From the perspective of intervention, studies indicate that there are modifying factors through which quality of life can be improved, such as increasing physical activity, quitting smoking, better management of comorbidities and psychological state, improving sleep and regular therapy (Assaf et al., 2022).

Hence patients with COPD have a significantly reduced quality of life, especially in the domains of physical functioning, breathing and emotional well-being. This parameter is not only an indicator of symptoms, but also an important predictor of the further course of the disease, including the risk of hospitalization and mortality, which makes it a key element in the modern approach to the treatment and care of these patients (Roberts et al., 2024).

7. RESEARCH METHODOLOGY

The main **research problem** is to determine the impact of COPD symptoms severity on the everyday quality of life of patients.

The **aim of the research** is to examine the differences in the quality of life between the sexes, as well as the correlation between age and the degree of impairment of the quality of life.

General research hypothesis: There is a significant impact of Chronic Obstructive Pulmonary Disease on the quality of life of patients, with expected gender differences, as well as a relationship between age and the degree of impairment in quality of life.

Hypothesis 1: There are statistically significant differences in quality of life between male and female patients with COPD.

Hypothesis 2: There is a statistically significant correlation between age and quality of life in patients with COPD.

The research has a cross-sectional design. It was conducted on a sample of 30 patients with COPD (15 males and 15 females), of different ages.

The COPD Assessment Test (CAT) questionnaire (0–40) was used to assess the impact of COPD symptoms on quality of life, with higher values indicating a greater negative impact of the disease.

The data were processed with SPSS software for statistical analysis, using descriptive statistics, and t-tests for examining the statistical significance of differences in arithmetic means and Pearson correlation coefficient were used to examine differences and correlations.

8. RESULTS

Table 1 contains the descriptive statistical results for the impact of severity of COPD symptoms on quality of life in patients according to gender.

Table 1. Descriptive statistics for impact of COPD on life quality in patients

Group Statistics					
Gender		N	Mean	Std. Deviation	Std. Error Mean
CAT	Male	15	19,20	3,509	,906
	Female	15	15,20	6,549	1,691

Source: Author's own analysis in SPSS

Table 2. Differences in quality of life in patients with COPD depending on gender

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CA T	Equal variances assumed	6,256	,019	2,085	28	,046	4,000	1,918	,070	7,930

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									Lower	Upper
CA T	Equal variances assumed	6,256	,019	2,085	28	,046	4,000	1,918	,070	7,930
	Equal variances not assumed			2,085	21,428	,049	4,000	1,918	,015	7,985

Source: Author's own analysis in SPSS

Table 2 shows the t-test result for the statistical significance of the difference in arithmetic means for patients depending on their gender. The t-test result shows that there is a statistically significant difference between male (M = 19,20; SD = 3.509) and female patients with COPD (M = 15,20; SD = 6.549) in terms of impact of disease on everyday life quality (t (28) = 2.085; p<0.05).

Table 3 contains the result of Pearson coefficient for relationship between age and quality of life in patients with COPD. The obtained result shows that there is a statistically significant positive correlation between age and CAT score, i.e., the impact on quality of life in patients with COPD (r = 0.364; p = 0.048), indicating that increasing age worsens the quality of life in patients with COPD.

Table 3. Correlation between age and impact of COPD symptoms on everyday life quality of patients

Correlations		Age	CAT
Age	Pearson Correlation	1	,364*
	Sig. (2-tailed)		,048
	N	30	30

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Author's own analysis in SPSS

9. DISCUSSION

In particular, the results showed a statistically significant difference between male and female patients, with male patients reporting higher CAT scores, indicating a greater negative impact of the disease on quality of life. These findings suggest that men with COPD in this sample experience more severe limitations in daily activities and symptom burden than women. The obtained results confirm that COPD has a significant impact on patients' quality of life, supporting the general research hypothesis. The results show that the degree of impairment in daily functioning and well-being is significantly influenced by both gender and age. In particular, the findings revealed a statistically significant difference between male and female patients, with male patients having higher CAT scores, suggesting a more detrimental effect of the illness on quality of life. These results imply that compared to women, men with COPD in this population have more severe limits in their everyday activities and symptom load. As also suggested by earlier studies, this could be connected to variations in the severity of the illness, lifestyle characteristics, or health-seeking behavior. Additionally, the study showed a statistically significant positive link between age and CAT score, suggesting that patients who are older typically have lower quality of life. This result is in line with previous research that indicates increased symptom severity and functional limits in COPD patients are caused by the aging process, comorbidities, and decreased physiological reserves.

10. CONCLUSION

The study demonstrated that patients' quality of life is significantly impacted by COPD. There are gender disparities in how the disease is experienced, as evidenced by the higher degree of impairment reported by male patients

compared to female patients. Furthermore, a strong positive link between age and CAT score was found, indicating a decline in quality of life as people age. These results emphasize the significance of taking age and gender into account when diagnosing and treating COPD, as well as the necessity of focused therapies meant to enhance quality of life, particularly for older patients and those with more severe symptoms.

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