

DOI: <https://dx.doi.org/10.18203/2319-2003.ijbcp20262870>

Original Research Article

Psychological distress and quality of life in patients with chronic obstructive pulmonary disease: a cross-sectional study

Pushpendra Kumar^{1*}, Arif Husain¹, Rishabh Gupta¹, Kalpana Upadhyay¹,
Ashwani Kumar¹, Rahul Gupta²

¹Department of Pharmaceutical Sciences, Jaipur National University, Jaipur, Rajasthan, India

²Department of Respiratory Medicine, JNUIMSRC, Jaipur, Rajasthan, India

Received: 12 July 2026

Accepted: 12 August 2026

*Correspondence:

Dr. Pushpendra Kumar,

Email: mpushpendra413@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: COPD has been associated with decreased QOL as well as various psychological disorders like anxiety, depression and stress. The study conducted was to measure psychological distress among COPD patients and the relation of it with QOL.

Methods: A cross-sectional study done on 74 COPD patients who had their consultation in a tertiary care hospital at Jaipur, Rajasthan, India. The QOL among COPD patients was evaluated applying CAT. Depression, anxiety and stress levels were assessed using the DASS-21 questionnaire. The relationship between QOL and psychological distress parameters was assessed using Spearman's correlation test, Kruskal–Wallis test and multiple linear regression analysis.

Results: The mean CAT score was 29.19 ± 9.53 which implied poor QOL among COPD patients. Moderate depression was found in 40.5% of COPD patients while extremely severe anxiety was found in 77% of the patients. Poor QOL showed significant correlation with depression ($p=0.394$, $p<0.001$), anxiety ($p=0.548$, $p<0.001$) and stress ($p=0.443$, $p<0.001$). Increased disease duration was strongly correlated with elevated psychological distress scores. In multiple regression analysis, anxiety was found to be the only independent predictor of poor QOL ($B=0.618$, $p<0.001$).

Conclusions: There is significant impairment in the QOL as well as a heavy psychological burden in terms of anxiety among COPD patients. Psychometric evaluation should be included as a key aspect of COPD management.

Keywords: Anxiety, CAT, Chronic obstructive pulmonary disease, Depression, DASS-21, Quality of life, Stress

INTRODUCTION

COPD is a progressive disorder of the airways that results in continuous reduction in lung function over time. This is a preventable and irreversible pulmonary disease.¹ It manifests as an obstruction of the airways with an abnormal ventilatory function that does not permit adequate gas exchange and obstructs breathing and Patients limit their activities of daily living.² Genetically determined alpha-1 antitrypsin deficiency is associated with the development of COPD.^{2,3} COPD mostly occurs in older people over 40 year of age all over the world. It means that someone who is 50 or older than 50 years may

not have COPD but there is 24% risk of developing COPD within 20 to 30 years.^{4,5} The risk of developing COPD is 3-5 times higher in smoker compared to non-smoker.^{6,7} COPD is the foremost cause of fatality and impairment worldwide, ranking 3rd among global reasons of death.⁸ Those who smoke account for about 50% of cases around the world and 10% to 12% of them have never smoked. In the world COPD is the third leading cause of death.^{9,10} Worldwide organizations have reported an estimated 65 million people globally have moderate to severe COPD, a chronic disease characterized by impaired respiration.^{11,12} The analysis has shown that 20%–40% of patients will experience depression and COPD together and in 30%–

50% of patients, COPD and anxiety disorders co-exist. Anxiety and depression are frequent mental health problems in people with COPD that can seriously affect their quality of life.^{13,14} People with COPD have several risk factors including long term smoking, being more seriously at risk for anxiety, depression and stress and also struggling with daily activities and social life.¹⁵ The problem of mental disorders has been highly prevalent among the elderly, in particular those with COPD, including major depressive disorders, dysthymic disorders and anxiety disorders.^{16,17} These mood difficulties can greatly impair daily life and life quality overall.^{18,19} With depressive disorders, the person experiences emptiness and irritability, which gives way to fear and anxiety when associated with an anxiety disorder, such as phobias and generalized anxiety disorder (GAD).^{20,21} Research shows that people who suffer from depression, anxiety and stress have an increased risk of hospitalization and elevated mortality.²²

Ranked as the 3rd primary cause of mortality in the world, it causes 3.5 million deaths in 2021 (~5% overall deaths).²³ Almost all of COPD deaths in LMICs occur in persons 20% and in China this number would be 1354,000 (almost 50%). While there are a total of 2748,000 cases annually in the whole world.^{24,25} In India the tobacco smoking rate among males ranges from 13.3% to 59.5% while among females the tobacco smoking rate ranges from 02% to 22%. In India almost 70% of people smoke bidi instead of cigarettes which contains raw tobacco (0.15-0.25 g) in which raw tobacco is loosely packed in leaves of *Tendu Diospyros melanoxylon*.^{26,27}

The smoke of bidi is 5 times more tar than the smoke of cigarette like bidi is much more potent than cigarette, but the important thing is that in India more than 70% people smoke bidi instead of cigarettes which contains raw tobacco (0.15–0.25g).^{28,29} In most of the house's biofuel is used for domestic cooking and heating, which has been identified as a greater risk factor for COPD than cigarette smoking.³⁰ A gradual increase in the global prevalence of COPD was observed, from 365 million cases in 2019 to 390 million in 2023, showing a continuous rise in worldwide disease burden. Global mortality also displayed a gradual upward trend, with deaths increasing from 3.20 million in 2019 to 3.23 million in 2023 despite minor yearly fluctuations.^{31,32}

In India, COPD prevalence rose consistently from 55 million cases in 2019 to 60.5 million in 2023, driven by factors such as air pollution, smoking and biomass exposure. COPD-related deaths in India also increased slightly from 0.95 million to 0.97 million during the same period.^{33,34} In Rajasthan, prevalence climbed from 4.2 million cases in 2019 to 4.6 million in 2023, indicating a rising regional health burden. Deaths due to COPD in Rajasthan increased from 72,000 to 75,000 between 2019 and 2023. Overall, all datasets show progressive increases in both prevalence and mortality, highlighting the urgent need for stronger prevention, early diagnosis and effective

COPD management strategies at global, national and state levels.^{35,36}

METHODS

Study design

This cross-sectional observational study was conducted over six months at the Department of Respiratory Medicine, Jaipur National University Institute for Medical Sciences and Research Centre, Jaipur, Rajasthan, India.

A total of 74 patients diagnosed with COPD according to GOLD guidelines were enrolled in the study. Participants who were ≥ 18 years of age and voluntarily provided written informed consent, not having severe cognitive problems, psychiatric disorders, critical illness and did not have incomplete questionnaires were included in the study. QOL was assessed using the CAT, depression, anxiety and stress using DASS-21. DASS scores were multiplied with 2 before being categorized into mild, moderate and severe levels according to the established guidelines.

Convenience sampling was employed and all eligible patients attending the study center during the study period were included. Quantitative data were reported in means $\pm$ SDs and qualitative data as frequency distribution. IBM SPSS Statistics software version 27.0 was used for statistical analysis.

Non-parametric statistical tests including Spearman's correlation test and Kruskal–Wallis test were used for data analysis. Multiple linear regression analysis was performed to identify independent predictors of impaired quality of life. Statistical significance was defined at $p < 0.05$. The study protocol was approved by Institutional Ethics Committee (IEC No. 2025/11).

RESULTS

Sociodemographic characteristics

Table 1 shows the sociodemographic characteristics of the study participants. A total of 74 patients with COPD were involved in this research. The average age of the participants was 61 ± 9.89 years. Regarding age distribution, the highest number included patients aged 51 to 60 years (37.8%) followed by patients aged 61 to 70 years (28.4%). Furthermore, 60.8% of the participants were male and 70.3% belonged to rural areas. These findings indicate that COPD was more common among older males living in rural regions.

Clinical characteristics

Table 2 presents the clinical characteristics of the participants. The mean duration of COPD was 4.55 ± 5.46 years and 28.4% of patients had disease duration greater than five years. Most participants (59.5%) were ex-smokers, while 25.7% were current smokers and 14.9%

had never smoked. The mean duration of smoking was 11.01 ± 13.03 years.

Quality of life (CAT) scores

Table 3 shows the quality-of-life impact scores. Assessment using the CAT showed that quality of life is severely affected. More than half of the patients (52.7%) were found to be severely impacted in terms of QOL, while 25.7% were moderately affected and just 4.1% were mildly affected. The mean CAT score was 29.19 ± 9.53 , indicating moderate to severe impairment of quality of life.

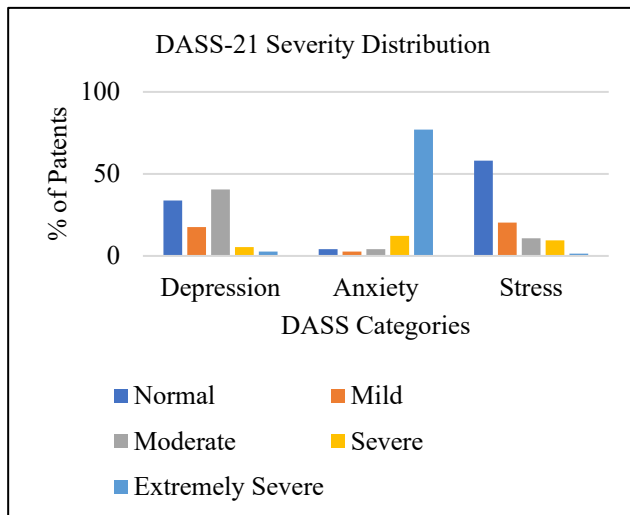


Figure 1: Severity distribution of depression, anxiety and stress among COPD patients based on DASS-21 scores.

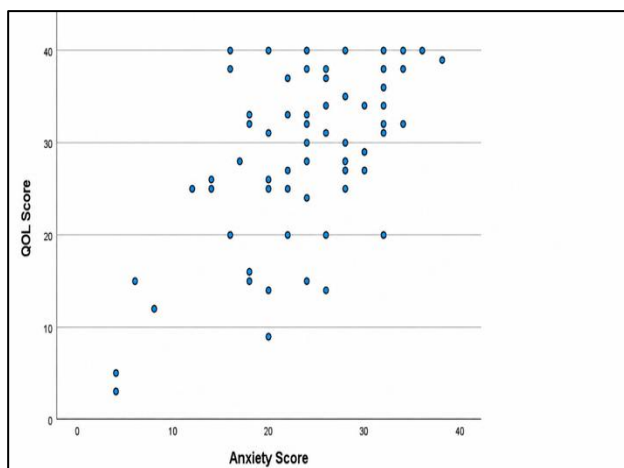


Figure 2: Relationship between anxiety score and quality of life score among COPD patients.

Psychological parameters (DASS-21)

Table 4 demonstrates the distribution of depression, anxiety and stress severity levels. Regarding depression, it has been observed that 40.5% of the patients suffer from

moderate depression, whereas 5.4% patients suffered from severe depression and 2.7% from extremely severe depression. In terms of anxiety, it was observed that 77% of the patients were experiencing extremely severe levels of anxiety and 12.2% of the patients had severe anxiety levels. As far as stress is concerned, it was observed that 58.1% of the patients experienced normal stress levels, whereas 9.5% and 1.4% suffered from severe and extremely severe stress levels respectively.

Correlation between QOL score and psychological parameters

Table 5 presents the Spearman correlation analysis showed significant association between the impairment of QOL values and all the psychological factors. Apart from this, the correlations were found the strongest between anxiety and low levels of QOL ($\rho=0.548$, $p<0.001$). Additionally, the connection between QOL and certain psychological factors including stress ($\rho=0.443$, $p<0.001$) and depression ($\rho=0.394$, $p<0.001$) has been established. Consequently, a negative psychological condition led to the low level of QOL among COPD patients (Table 5).

Association between COPD duration and psychological parameters

Table 6 shows that patients with COPD duration >5 years had significantly higher depression, anxiety and stress scores. As it can be seen from the Kruskal-Wallis's test results, the following psychological factors have a significant association with the duration of the disease.

The mean scores for depression (16.62 ± 7.17), anxiety (27.10 ± 6.29) and stress (19.29 ± 8.82) among those patients suffering from COPD in five or more years were statistically significant as compared to all other patients. It is necessary to point out that the values for increased stress are statistically higher than the ones for anxiety ($H=13.292$, $p=0.004$) and depression ($H=10.753$, $p=0.013$).

Multiple linear regression analysis

Table 7 presents the multiple linear regression analysis, conducted to find independent predictors of impaired QOL, multicollinearity was checked by means of variance inflation factor (VIF) and all results were acceptable. The regression analysis resulted in significant statistical findings for the whole model ($F=9.839$, $p<0.001$); the model explained 42% of the total variation of impaired QOL ($R^2=0.420$; Adjusted $R^2=0.377$).

From all examined variables, anxiety score became a statistically significant independent predictor of impaired QOL ($\beta=0.618$, $p<0.001$). Depressive symptoms score, stress score, duration of smoking and age failed to be independent predictors. Acceptable variance inflation factor (VIF) results for all predictors were observed.

Table 1: Sociodemographic characteristics of COPD patients.

Variables	N	%
Age group (in years)		
41–50	11	14.9
51–60	28	37.8
61–70	21	28.4
>70	14	18.9
Mean±SD	61±9.89 years	
Gender		
Male	45	60.8
Female	29	39.2
Residence		
Rural	52	70.3
Urban	22	29.7

Table 2: Clinical characteristics of COPD patients.

Variables	N	%
Duration of COPD		
<6 months	24	32.4
6–12 months	7	9.5
1–5 years	22	29.7
>5 years	21	28.4
Mean±SD	4.55±5.46 years	
Smoking status		
Non-smoker	11	14.9
Ex-smoker	44	59.5
Current smoker	19	25.7
Duration of smoking		
Non-smoker	11	14.9
≤10 years	38	51.4
>10 years	25	33.8
Mean±SD	11.01±13.03 years	

Table 3: Quality of life impact scores (CAT) among COPD patients.

QOL impacts	N	%
Low	3	4.1
Medium	13	17.6
High	19	25.7
Very High	39	52.7
Mean CAT Score±SD	29.19±9.53	

Table 4: Psychological parameters (DASS-21) among COPD patients.

Severity	Depression N (%)	Anxiety N (%)	Stress N (%)
Normal	25 (33.8)	3 (4.1)	43 (58.1)
Mild	13 (17.6)	2 (2.7)	15 (20.3)
Moderate	30 (40.5)	3 (4.1)	8 (10.8)
Severe	4 (5.4)	9 (12.2)	7 (9.5)
Extremely severe	2 (2.7)	57 (77.0)	1 (1.4)
Mean±SD	12.61±6.52	24.01±7.73	13.91±8.24

Table 5: Spearman correlation between impaired QOL score and psychological parameters.

Variables	Correlation coefficient (ρ)	P value
Depression score	0.394**	<0.001
Anxiety score	0.548**	<0.001
Stress score	0.443**	<0.001

** Significant Correlation at p <0.001 (two-tailed).

Table 6: Association between COPD duration and psychological parameters (Kruskal–Wallis Test).

COPD durations	Depression Mean±SD	Anxiety Mean±SD	Stress Mean±SD
<6 months (n=24)	10.33±4.71	20.33±7.86	10.17±6.04
6–12 months (n=7)	13.71±6.87	27.71±5.09	15.43±8.30
1–5 years (n=22)	10.91±5.98	23.91±8.08	12.36±7.37
>5 years (n=21)	16.62±7.17	27.10±6.29	19.29±8.82
Kruskal–Wallis H	10.753	11.083	13.292
P value	0.013	0.011	0.004

Table 7: Multiple linear regression analysis for predictors of impaired QOL among COPD patients.

Predictor variables	B Coefficient	Standardized β	P value	VIF
Depression score	-0.213	-0.146	0.394	3.380
Anxiety score	0.762	0.618	<0.001*	1.946
Stress score	0.208	0.180	0.286	3.269
Duration of smoking	-0.011	-0.015	0.869	1.006
Age	-0.026	-0.027	0.774	1.011

*-Statistically significant at $p < 0.05$.

DISCUSSION

The mean participant age was 61 ± 9.89 years with those aged 51–60 years forming the majority group. Male predominance occurred in this sample (60.8%) like that found by Jain et al among COPD patients where male smokers were found to develop the disease.³⁷ Such a demographic pattern is expected given the higher occupational and tobacco exposure in male individuals. Tobacco smoking is the most important modifiable risk factor for COPD. According to the present study, 59.5% were past smokers and 25.7% were current smokers. This distribution agrees with the GOLD 2026 Report which states that cigarette smoking is the number one preventable cause of COPD.³⁸

The QOL assessment showed a high level of impairment in the studied sample, since 52.7% patients experienced a substantial impact of COPD on their daily life as reflected in the CAT questionnaire. The average CAT score was 29.19 ± 9.53 points suggesting moderate to severe impact of COPD on various aspects of patients' lives. These findings are consistent with the study conducted by Rahi et al indicating that COPD patients with psychological disorders have impaired QOL.³⁹ A relatively higher prevalence of psychological illnesses was noted in the current study population. Anxiety was the most common psychological disorder identified, as more than 77% of the patients had been categorized as extremely severe based on DASS-21 scores.

Depression and stress were also common. The extremely high prevalence of severe anxiety among COPD patients as found in this study could be due to persistent breathlessness, fear of disease progression, frequent hospital admissions, decreased physical activity, financial problems, health risks linked with smoking habits and social dysfunction. Additionally, the presence of

predominantly rural patients in this study could have also contributed to higher levels of psychological distress due to lack of health care facilities and poor disease knowledge. These results agree with previous studies, which found high rates of anxiety and depression among COPD patients and their negative impact on management.^{39,40}

The results of the Spearman correlation revealed strong positive correlations between decreased quality of life and all three psychological measures, with the correlation being highest for anxiety ($\rho = 0.548$, $p < 0.001$). These results corroborate the conclusions of Tang et al, who showed that anxiety and depression adversely affect disease perception, increase breathlessness and worsen quality of life.⁴⁰

Another important finding of this study was that the increased duration of COPD was significantly connected with higher psychological distress levels. The individuals who had a history of COPD longer than five years obtained the highest scores in each of the three DASS-21 scales. This is most probably because of cumulative psychological consequences related to functional disability, exacerbations, deconditioning, social isolation and increased dependence, which were also mentioned in the literature.⁴¹ Multiple linear regression analysis was done for identification of the independent predictors of QOL impairment.

To assess multicollinearity, variance inflation factor (VIF) was calculated and all the values obtained were within normal limits ($\beta = 0.618$, $p < 0.001$). As follows from the results obtained, anxiety plays a much bigger role in affecting QOL among patients with COPD than either depression or stress. It can be explained by the fact that anxiety is exacerbated by fear, panic in case of exacerbation, intolerance of physical activity and ambiguity regarding prognosis, etc. Such results have been also confirmed by Wu et al.⁴² Undoubtedly, the GOLD

2026 report recognizes the crucial role of diagnosis and management of psychological disorders among COPD patients because of depression and anxiety on QOL.³⁸ Integrated approaches include rehabilitation, pharmacological and non-pharmacological management of mental disorders, smoking cessation and multidisciplinary-based therapy.

Overall, the present results support previous research in this area showing that mental disorders play a significant role in determining the health condition of COPD patients. Specifically, anxiety disorders should be noted for systematic diagnosis and treatment.

CONCLUSION

COPD patients suffer great reduction in QOL due to high levels of psychological distress. Anxiety was highly prevalent among patients with COPD. Patients having COPD for longer durations showed higher psychological distress levels. This implies that there is a need for psychological screening among COPD patients. A multidisciplinary management approach including psychological assessment and counselling may improve overall patient outcomes.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- Lima CD, Oliveira RC, Oliveira SA, Silva MA, Lima AD, Andrade MS, et al. Quality of life, anxiety and depression in patients with chronic obstructive pulmonary disease. *Rev Bras Enferm.* 2020;73(6):20190515.
- Gendron LM, Nyberg A, Saey D, Maltais F, Lacasse Y. Active mind-body movement therapies as an adjunct to or in comparison with pulmonary rehabilitation for people with chronic obstructive pulmonary disease. *Cochrane Database Syst Rev.* 2018;10:12290.
- Zhang J, Lin XF, Bai CX. Comparison of clinical features between non-smokers with COPD and smokers with COPD: a retrospective observational study. *Int J Chron Obstruct Pulmon Dis.* 2014;9:57–63.
- Bozkurt N, Bozkurt AI, Dirol H. Anxiety/depression scores and affecting factors in COPD patients. *Eurasian J Pulmonol.* 2017;19(2):77–82.
- Xiao T, Qiu H, Chen Y, Zhou X, Wu K, Ruan X, et al. Prevalence of anxiety and depression symptoms and their associated factors in mild COPD patients from community settings, Shanghai, China: a cross-sectional study. *BMC Psychiatry.* 2018;18(1):1–10.
- Prasad B. Chronic obstructive pulmonary disease (COPD). *Int J Pharm Res Technol.* 2020;10(1):1–6.
- Bai JW, Chen XX, Liu S, Yu L, Xu JF. Smoking cessation affects the natural history of COPD. *Int J Chron Obstruct Pulmon Dis.* 2017;12:3323–8.
- Wedzicha JA, Singh R, Mackay AJ. Acute COPD exacerbations. *Clin Chest Med.* 2014;35(1):157–63.
- Chennoufi A, Moussa C, Rouis H, Maalej S. Poor sleep quality in chronic obstructive pulmonary disease. *Rev Mal Respir.* 2019;36(9):1006–12.
- Cavallès A, Brinchault-Rabin G, Dixmier A, Goupil F, Gut-Gobert C, Marchand-Adam S, et al. Comorbidities of COPD. *Eur Respir Rev.* 2013;22(130):454–75.
- Akhtar PM, Yardi S, Tayade BO, Pathak M, Saraf B. Mental health, sleep and quality of life in patients with chronic obstructive pulmonary disease: A correlational study. *Int J Res Med Sci.* 2018;6(6):2036–41.
- Okutan O, Tas D, Demirel E, Kartaloglu Z. Evaluation of quality of life with the COPD Assessment Test in chronic obstructive pulmonary disease and the effect of dyspnea on quality of life. *Yonsei Med J.* 2013;54(5):1214–9.
- Balcells E, Gea J, Ferrer J, Serra I, Orozco-Levi M, de Batlle J, et al. Factors affecting the relationship between psychological status and quality of life in COPD patients. *Health Qual Life Outcomes.* 2010;8:108.
- Cully JA, Graham DP, Stanley MA, Ferguson CJ, Sharafkhan A, Soucek J, et al. Quality of life in patients with chronic obstructive pulmonary disease and comorbid anxiety or depression. *Psychosomatics.* 2006;47(4):312–9.
- Uchmanowicz I, Jankowska-Polanska B, Motowidlo U, Uchmanowicz B, Chabowski M. Assessment of illness acceptance by patients with COPD and the prevalence of depression and anxiety in COPD. *Int J Chron Obstruct Pulmon Dis.* 2016;11:963–70.
- Portero de la Cruz S, Cebrino Cruz J. Common mental disorders, functional limitation and diet quality trends and related factors among COPD patients in Spain, 2006–2017: evidence from Spanish national health surveys. *Int J Environ Res Public Health.* 2021;18(7):3689.
- Lopez-Campos JL, Fernandez-Villar A, Calero-Acuña C, Represas-Represas C, Lopez Ramírez C. Evaluation of the COPD Assessment Test and GOLD patient types: a cross-sectional analysis. *Int J Chron Obstruct Pulmon Dis.* 2015;10:975–84.
- Hynninen MJ, Pallesen S, Nordhus IH. Factors affecting health status in COPD patients with comorbid anxiety or depression. *Int J Chron Obstruct Pulmon Dis.* 2007;2(3):323–8.
- Wrzeciono A, Czech O, Buchta K, Zabłotni S, Gos E, Thuczykont Ł, et al. Assessment of stress, depressive and anxiety symptoms in patients with COPD during in-hospital pulmonary rehabilitation: an observational cohort study. *Medicina.* 2021;57(3):201.
- Bogart M, Stanford RH, Laliberté F, Germain G, Wu JW, Duh MS. Medication adherence and persistence

- in COPD patients receiving triple therapy. *Int J Chron Obstruct Pulmon Dis.* 2019;14:343–52.
21. Sulaiman I, Seheult J, MacHale E, D'Arcy S, Boland F, McCrory K, et al. Irregular and ineffective: a quantitative observational study of the time and technique of inhaler use. *J Allergy Clin Immunol Pract.* 2016;4(5):900–9.
 22. Davis JR, Wu B, Kern DM, Tunceli O, Fox KM, Horton J, et al. Impact of nonadherence to inhaled corticosteroid/LABA therapy on COPD exacerbation rates and healthcare costs. *Am Health Drug Benefits.* 2017;10(2):92–102.
 23. van Boven JFM, Lavorini F, Dekhuijzen PNR, Blasi F, Price DB, Viegi G. Urging Europe to put non-adherence to inhaled respiratory medication higher on the policy agenda: a report from the First European Congress on Adherence to Therapy. *Eur Respir J.* 2017;49(5):1700076.
 24. Arnold E, Bruton A, Donovan-Hall M, Fenwick A, Dibb B, Walker E. Ambulatory oxygen: why do COPD patients not use their portable systems as prescribed. A qualitative study. *BMC Pulm Med.* 2011;11:9.
 25. Mäkelä MJ, Backer V, Hedegaard M, Larsson K. Adherence to inhaled therapies, health outcomes and costs in patients with asthma and COPD. *Respir Med.* 2013;107(10):1481–90.
 26. Vrijens B, De Geest S, Hughes DA, Przemyslaw K, Demonceau J, Ruppar T, et al. A new taxonomy for describing and defining adherence to medications. *Br J Clin Pharmacol.* 2012;73(5):691–705.
 27. Forey BA, Thornton AJ, Lee PN. Systematic review with meta-analysis of the epidemiological evidence relating smoking to COPD, chronic bronchitis and emphysema. *BMC Pulm Med.* 2011;11:36.
 28. Kim V, Criner GJ. Chronic bronchitis and chronic obstructive pulmonary disease. *Am J Respir Crit Care Med.* 2013;187(3):228–37.
 29. Voelkel NF, Gomez-Arroyo J, Mizuno S. COPD/emphysema: the vascular story. *Pulm Circ.* 2011;1(3):320–6.
 30. Derenne JP, Fleury B, Pariente R. Acute respiratory failure of chronic obstructive pulmonary disease. *Am Rev Respir Dis.* 1988;138(4):1006–33.
 31. Wang Z, Lin J, Liang L, Huang F, Yao X, Peng K, et al. Global, regional and national burden of chronic obstructive pulmonary disease and its attributable risk factors from 1990 to 2021: an analysis for the global burden of disease study 2021. *Respir Res.* 2025;26(1):2.
 32. Safiri S, Carson-Chahhoud K, Noori M, Nejadghaderi SA, Sullman MJ, Heris JA, et al. Burden of chronic obstructive pulmonary disease and its attributable risk factors in 204 countries and territories, 1990–2019: results from the global burden of disease study 2019. *BMJ.* 2022;378:69869.
 33. Momtazmanesh S, Moghaddam SS, Ghamari SH, Rad EM, Rezaei N, Shobeiri P, et al. Global burden of chronic respiratory diseases and risk factors, 1990–2019: an update from the Global Burden of Disease Study 2019. *EClinicalMedicine.* 2023;59:101936.
 34. Zou J, Sun T, Song X, Liu YM, Lei F, Chen MM, et al. Distributions and trends of the global burden of COPD attributable to risk factors by SDI, age and sex from 1990 to 2019: a systematic analysis of GBD 2019 data. *Respir Res.* 2022;23(1):90.
 35. Adeloye D, Song P, Zhu Y, Campbell H, Sheikh A, Rudan I. Global, regional and national prevalence of and risk factors for, chronic obstructive pulmonary disease (COPD) in 2019: a systematic review and modelling analysis. *Lancet Respir Med.* 2022;10(5):447–58.
 36. Al Wachami N, Guennouni M, Iderdar Y, Boumendil K, Arraji M, Mourajid Y, et al. Estimating the global prevalence of chronic obstructive pulmonary disease (COPD): a systematic review and meta-analysis. *BMC Public Health.* 2024;24(1):297.
 37. Jain A, Lolak S, Shukla A. Study of predictors of quality of life and its association with anxiety and depression in chronic obstructive pulmonary disease in industrial workers. *J Family Med Prim Care.* 2020;9(12):6244–9.
 38. Global Initiative for Chronic Obstructive Lung Disease. Global Strategy for Prevention, Diagnosis and Management of Chronic Obstructive Pulmonary Disease: 2026 Report. GOLD. 2026.
 39. Rahi MS, Jindal V, Reyes SP, Gunasekaran K, Gupta R, Jaiyesimi I. The impact of anxiety and depression in chronic obstructive pulmonary disease. *Adv Respir Med.* 2023;91(2):123–34.
 40. Tang T, Jiang J, Chen Q. Development and validation of a risk prediction model for anxiety or depression among patients with chronic obstructive pulmonary disease. *Ann Med.* 2022;54(1):1882–90.
 41. Siraj RA, Siddiqui MS, Alshahrani MS. COPD and comorbid mental health: addressing anxiety and depression in chronic respiratory disease. *Medicina.* 2025;61(8):1426.
 42. Wu K, Zhang Y, Li X. Associations of anxiety and depression with prognosis in patients with chronic obstructive pulmonary disease: a systematic review. *Expert Rev Respir Med.* 2025;19(1):1–14.

Cite this article as: Kumar P, Husain A, Gupta R, Upadhyay K, Kumar A, Gupta R. Psychological distress and quality of life in patients with chronic obstructive pulmonary disease: a cross-sectional study. *Int J Basic Clin Pharmacol* 2026;15:981-7.