

Depression and anxiety in COPD patients: Impact on health-related quality of life in a tertiary care setting

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Abstract

Objective: To determine the frequency of depression and anxiety in chronic obstructive pulmonary disease patients, and to determine the impact of anxiety and depression on health-related quality of life.

Method: The cross-sectional, analytical study was conducted at the outpatient department of the Indus Hospital, Karachi, from June 14 to December 14, 2022, and comprised patients with chronic obstructive pulmonary disease. All patients were evaluated for anxiety, depression and health-related quality of life using the Hospital Anxiety and Depression Scale and the St. George Respiratory Questionnaire. Data was analysed using SPSS 26.

Results: Of the 192 patients with mean age 61.44 ± 9.66 years, 139 (72.4%) were male. The frequency of anxiety and depression was 74 (38.5%) and 67 (34.9%), respectively. Multivariate models showed that COPD duration, physical inactivity and anxiety/depression were significant predictors of HR-QOL, but after adjusting for confounders, anxiety/depression remained strongly associated with Hr-QOL, with mean scores 22.9 points higher among patients with anxiety/depression compared to those without (95% CI: 18.29-27.5; $p < 0.001$).

Conclusion: Depression and anxiety significantly worsened health-related quality of life in chronic obstructive pulmonary disease patients.

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Introduction

Chronic obstructive pulmonary disease (COPD) is a common lung disease, and can be defined as chronic obstruction of lung airflow that interferes with normal breathing.¹ COPD is the fourth leading cause of death in the world.² Reported prevalence rates vary from 251 million to 328 million cases worldwide, and high smoking prevalence alongside ageing populations means that the rates are expected to continue to rise.² According to the World Health Organisation (WHO), the deaths from COPD will be increased by 30% every year and it will become the third common cause of death worldwide by 2030.² There is limited data on the prevalence of COPD in Pakistan, but a multinational epidemiological study published in 2012 reported a prevalence of 2.1% in individuals over the age of 40 years.³

COPD and depression are common heterogeneous conditions that are frequently associated, and both diseases generate an elevated global economic and social burden.⁴ Patients with chronic diseases in general, and those with COPD in particular, are likely to have coexisting

depression compared with healthy individuals.⁵ Depression and anxiety are associated with poorer health-related outcomes, especially when they form the comorbidity spectrum with long-term physical health conditions. These conditions are commonly comorbid in COPD to the extent that they should be considered in all patients.³ Because of the complexity of the link, the mechanism behind sadness and anxiety in COPD is still not fully understood. It is still unclear how depression and COPD are related biologically. It is interesting to note that these two conditions are regarded as heritable, and there has recently been discussion over whether the correlation between COPD and anxiety or depression might be explained by genetic factors.⁶

The most important risk factor for COPD is smoking.⁷ Smoking and depression have a bidirectional interaction. Depressed individuals are more likely to smoke, display higher risk to commence smoking, and find smoking cessation more difficult. Conversely, smokers are more likely to be depressed, which could be caused by the activation of nicotinic acetylcholine receptors, or direct inflammatory effects of smoking.⁸

The incidence of depression was 16.2 instances per 1,000 person-years in the COPD group and 9.4 cases per 1,000 person-years in the non-COPD control group, according to a recent longitudinal study that included 35,000 patients with COPD and followed them for 10 years.^{9,10} Zafar et al.

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found the health-related quality of life (HR-QOL) in patients using mean total St. George's Respiratory Questionnaire (SGRQ) score to be 23.83 ± 2.69 .¹ Himani et al. evaluated COPD patients for depression and found the prevalence to be 57.2%.⁵ Associated factors causing depression and anxiety in COPD patients include higher body mass index (BMI) and longer COPD duration.⁹ It has been reported that COPD patients often report symptoms indicative of mild to moderate or severe depression, which contributes to lower physical activity and a poor QOL, with more respiratory symptoms and exacerbations increasing mortality and morbidity.¹¹ Similarly for anxiety in COPD, data suggests that healthcare providers need to pay more attention to assessing anxiety and uncertainty components on a regular basis among COPD patients and instituting appropriate management.¹² The fact that individuals with COPD who have three or more comorbidities are more likely to be hospitalised frequently and may die sooner than those who do not has come to light over the past 20 years. The prognosis of patients with COPD is influenced by extrapulmonary diseases. Lung cancer, heart failure (HF), coronary heart disease (CAD) and other comorbidities are frequently associated with tobacco use. COPD is the direct cause of comorbidities, such pulmonary artery disease (PAD) and malnutrition. Anxiety and depression are two of the comorbidities that significantly increase the burden of COPD-related illness, particularly by lowering treatment adherence and lowering QOL.¹³

A recent systematic review and meta-analysis of 25 studies with long-term follow-up revealed that the relationship between COPD and depression is likely to be bi-directional, as depression may be both a cause and a consequence of COPD.¹⁴ However, the exact mechanisms linking COPD with depression and anxiety have not been identified.¹⁵ COPD has affected the QOL of patients, leading to disability, which ultimately affects the patient's families.¹ The physical symptoms of the disease restrict the daily activities of the patient. The common psychological symptoms, such as anxiety and unemployment, lead to social dependence, which leads to demographic burden in the society.¹⁶ Although the exact process by which depression and anxiety worsen COPD is yet unknown, it may entail both psychological and physical elements.¹⁷ Identification and development of appropriate treatment strategies is critical to improving the QOL of COPD patients and reducing their healthcare utilisation.¹

The current study was planned to determine the frequency of depression and anxiety in COPD patients, and to determine the impact of anxiety and depression on HR-QOL.

Patients and Methods

The cross-sectional, analytical study was conducted at the Family Medicine and Pulmonology outpatient department (OPD) of the Indus Hospital, Karachi, from June 14 to December 14, 2022. After approval from the institutional ethics review board, the sample size was calculated using 57.2% prevalence of depression in COPD, 7% margin of error and 95% confidence interval (CI). The sample was raised using non-probability consecutive sampling technique. Those included were patients aged 40-80 years having COPD for >1 year. Non-consenting patients, those unable to understand the questionnaire due to cognitive impairment or having difficulty communicating with the researcher, patients with history of dementia, delirium, mania, bipolar effective disorder or posttraumatic stress, patients already diagnosed as having depression or prior anti-depressant treatment, those with controlled hypo- or hyper-thyroidism, and those with congestive heart failure (CHF), asthma, chronic renal failure, chronic kidney disease (CKD), chronic liver disease (CLD) and stroke were excluded. Prior to enrolment, informed consent was taken from each patient.

Brief history about demographic information and duration of COPD was taken from the patients. The researchers interviewed the patient in a conducive environment assuring the patient confidentiality. The Hospital Anxiety and Depression Scale (HADS)¹⁸ was used to diagnose depression and anxiety. HADS is a 14-point scale used to determine depression and anxiety separately; 7 items for each anxiety and depression, with each being rated 0-3 to indicate the severity of difficulty experienced. Patients having HADS of >8 were labelled depressed or anxious separately. Moreover, the SGRQ¹⁹ was used to evaluate the QOL among the patients. The SGRQ is a validated tool consisting of 50 items divided into three parts; symptoms component, impact component, and activity component. Each response carried separate weighting. Each component score was derived by dividing the summed weights, unique for all questions, by the maximum possible weight. A total score was calculated as the sum of scores on the three parts. Scoring ranged 0-100, with higher scores indicating poor QOL. The overall internal reliability of the SGRQ, anxiety scale and depression scale were 0.965, 0.932 and 0.926, respectively. However, internal reliability for each SGRQ domain was 0.756 for symptoms, 0.878 for activity, and 0.952 for impact.

Data was analysed using SPSS 25. Data normality of continuous variables was assessed using the Kolmogorov-Smirnov test. For continuous variables, mean $\pm$ standard deviation or median with interquartile range (IQR) was reported, as appropriate. Cross-tabulation of anxiety and

depression was done with baseline variables using chi-square or Fischer exact test. $P < 0.05$ was taken as significant. Linear regression was used to assess the impact of anxiety and depression on HR-QOL of patients. Effect modifiers, such as age, gender, residence status, type 2 diabetes mellitus (T2DM), dyslipidaemia, hypertension, smoking, physical activity, family monthly income, occupational status, educational status and duration of COPD, were controlled through regression analysis.

Results

Of the 192 patients with mean age 61.44 ± 9.66 years, 139 (72.4%) were male and 170 (88.5%) belonged to urban areas. The median duration of COPD was 10 years (IQR: 8-10 years) (Table 1).

Regarding comorbidities, 56 (29.3%) patients were hypertensive, 46 (24.0%) had DM and 30 (15.8%) had dyslipidaemia. A total of 147 (76.6%) patients were smokers, while 21 (11.0%) were physically inactive. The frequency of anxiety and depression among COPD patients was 74 (38.5%) and 67 (34.9%), respectively (Figure).

Significant associations were found for anxiety with age, employment status, education level, disease duration, comorbidities and physical inactivity (Table 2).

Table-1: Baseline characteristics of the study population (n=192).

Variable	n (%)
Mean Age (years)	61.44±9.66
Residence	
Urban	170 (88.5)
Rural	22 (11.5)
Family Monthly Income	
< 50000	167 (87.0)
≥ 50000	25 (13.0)
Occupational Status	
Employed	47 (24.6)
Unemployed	144 (75.4)
Educational Status	
Illiterate	81 (43.5)
Primary	8
Secondary	07 (3.3)

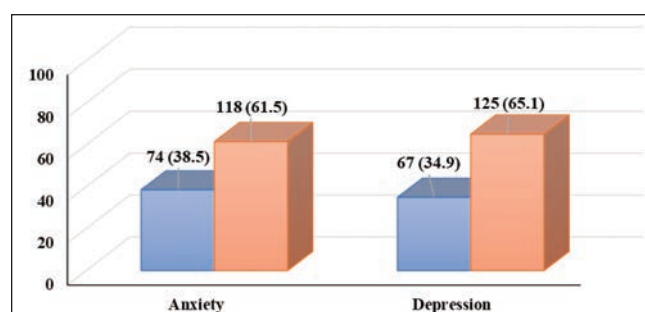


Figure: Anxiety and Depression among the patients.

Table-2: Association of baseline characteristics with anxiety.

Variable	Anxiety		p-value
	No n (%)	Yes n (%)	
Age (years)			
< 60 Years	60 (75)	20 (25)	0.001 [€]
≥ 60 Years	58 (51.8)	54 (48.2)	
Gender			
Male	85 (61.2)	54 (38.8)	>0.99 [€]
Female	33 (62.3)	20 (37.7)	
Residence			
Rural	11 (50)	11 (50)	0.241 [€]
Urban	107 (62.9)	63 (37.1)	
Employment Status			
Unemployed	81 (56.3)	63 (43.8)	0.013 [€]
Employed	36 (76.6)	11 (23.4)	
Education			
Illiterate	42 (51.9)	39 (48.1)	0.042 [€]
Primary	66 (67.3)	32 (32.7)	
Secondary	6 (85.7)	1 (14.3)	
Higher	0	0	
Family Monthly Income			
< 50000	100 (59.9)	67 (40.1)	0.246 [€]
≥ 50000	18 (72)	7 (28)	
Duration of COPD			
< 10 Years	68 (73.1)	25 (26.9)	0.001 [€]
≥ 10 Years	50 (50.5)	49 (49.5)	
Comorbid			
None	80 (69)	36 (31)	0.030 [€]
Single	18 (51.4)	17 (48.6)	
Multiple	20 (48.8)	21 (51.2)	
Smoking			
No	27 (60)	18 (40)	0.818 [€]
Yes	91 (61.9)	56 (38.1)	
Physical Inactivity			
No	117 (68.8)	53 (31.2)	<0.001*
Yes	0 (0)	21 (100)	

[€]Chi-Square *Fischer Exact Test; COPD: Chronic obstructive pulmonary disease.

Significant associations were noted for depression with age, disease duration and physical inactivity (Table 3).

The overall HR-QOL median score was 28.10 (IQR: 25.34-51.89). Domain-specific scores 53.04 (IQR: 35.10-59.14) for symptoms, 46.04 (IQR: 46.04-64.23) for activity, and 13.0 (IQR: 9.70-42.82) for impact. Multivariate models showed that COPD duration, physical inactivity and anxiety/depression were significant predictors of HR-QOL, but after adjusting for confounders, anxiety/depression remained strongly associated with Hr-QOL, with mean scores 22.9 points higher among patients with anxiety/depression compared to those without (95% CI: 18.29-27.5; $p < 0.001$) (Table 4).

Discussion

The presence of comorbid depression and anxiety symptoms in patients with COPD have deleterious effects

Table-3: Association of baseline characteristics with depression.

Variable	Depression		p-value
	No n (%)	Yes n (%)	
Age (years)			
< 60 Years	60 (75)	20 (25)	0.015 [€]
≥ 60 Years	65 (58)	47 (42)	
Gender			
Male	90 (64.7)	49 (35.3)	>0.99
Female	35 (66)	18 (34)	
Residence			
Rural	11 (50)	11 (50)	0.114
Urban	114 (67.1)	56 (32.9)	
Employment Status			
Unemployed	89 (61.8)	55 (38.2)	0.114
Employed	35 (74.5)	12 (25.5)	
Education			
Illiterate	46 (56.8)	35 (43.2)	0.063
Primary	70 (71.4)	28 (28.6)	
Secondary	6 (85.7)	1 (14.3)	
Higher	0	0	
Family Monthly Income			
< 50000	107 (64.1)	60 (35.9)	0.438
≥ 50000	18 (72)	7 (28)	
Duration of COPD			
< 10 Years	69 (74.2)	24 (25.8)	0.010
≥ 10 Years	56 (56.6)	43 (43.4)	
Comorbid			
None	82 (70.7)	34 (29.3)	0.076
Single	22 (62.9)	13 (37.1)	
Multiple	21 (51.2)	20 (48.8)	
Smoking			
No	29 (64.4)	16 (35.6)	0.915
Yes	96 (65.3)	51 (34.7)	
Physical Inactivity			
No	122 (71.8)	48 (28.2)	<0.001
Yes	2 (9.5)	19 (90.5)	

€Chi-Square *Fischer Exact; COPD: Chronic obstructive pulmonary disease.

on physical functioning and on social interaction, increasing fatigue and healthcare utilisation as the patients are not able to take care of themselves the way they should. The current study's main focus was to determine this impact. Depression and anxiety are challenging to identify and treat because their symptoms often overlap with those of COPD, such as having sudden shortness of breath and irritability. Identifying depression and anxiety, and developing appropriate treatment strategies are critical to improving the QOL of COPD patients and reducing their healthcare utilisation which is the task for family care physicians. During the past two decades, there has been increasing recognition that COPD patients with three or more comorbidities are more likely to be frequently hospitalised and may die prematurely compared to COPD patients without comorbidities.¹³

The current study comprised 192 patients, with most of

Table-4: Comparison of baseline characteristics with health-related quality of life.

Variable	Health Related Quality of Life (SGRQ score) Mean±SD	Health Related Quality of Life (SGRQ score)	
		Unadjusted β	Adjusted β
Age			
< 60 Years	33.11±18.3	0.53 (0.23-0.82)	-0.09 (-0.33-0.14)
≥ 60 Years	42.17±21.25		
Gender			
Male	37.94±19.98	Ref	1.87 (-2.56-6.32)
Female	39.58±22.01		
Residence			
Rural	42.32±23.1	Ref	-4.43 (-13.61-4.73)
Urban	37.89±20.18		
Employment Status			
Unemployed	40.15±21.33	Ref	-6.9 (-13.66--0.15)
Employed	33.24±17.15		
Education			
Illiterate	41.8±21.42	Ref	-5.89 (-11.76--0.02)
Primary	35.95±19.58		
Secondary	29.88±10.6		
Family Monthly Income			
< 50000	39.11±20.56	Ref	-5.5 (-14.16-3.16)
≥ 50000	33.61±19.98		
Duration of COPD			
< 10 Years	33.76±18.21	1.89 (1.09-2.7)	0.85 (0.19-1.51) *
≥ 10 Years	42.75±21.67		
Comorbid			
None	36.24±20.23	-0.06 (-7.65-7.51)	7.82 (0.76-14.88)
Single	38.34±16.33		
Multiple	44.55±23.54		
Smoking			
No	38.43±21.15	-0.05 (-6.96-6.86)	
Yes	38.38±20.39		
Physical Inactivity			
No	34.7±17.52	34.53 (26.55-42.5)	18.75 (11.77-25.72) *
Yes	69.23±17.14		
Anxiety / Depression*		29.36 (25.11-33.61)	22.9 (18.29-27.5) *

Linear regressionβ: Beta Coefficient; *Reference Category: No; †: p-value <0.05

COPD: Chronic obstructive pulmonary disease,SGRQ: St. George Respiratory Questionnaire.

them being males and generally aged 60-70 years. Another study reported a similar mean age10 as COPD generally occurs after age 40 years. The current patients came for regular follow-up to the clinics as most of them belonged to urban area and the mean duration of COPD was 10 years.

The frequency of anxiety and depression among the current COPD patients were 38.5% and 34.9%, respectively. Anxiety was plausible in 35.4% and possible in 68.2% patients, whereas depression was probable in 41.7%. Anxiety and sadness symptoms were present in 60.4% of the cases using the HADS questionnaire.²⁰ In one Pakistani study using the same questionnaire, the prevalence of moderate to severe depression and anxiety was 51% (n=149) and 20% (n=59), respectively.³ In a metaanalysis of 26 studies, 19 studies used the Global Initiative for Chronic

Obstructive Lung Disease fixed criteria, and reported the estimated pooled prevalence of COPD 11.1% (95% CI: 7.4-14.8%), and with the lower limit of normal criteria, it was 8.0% (95% CI: 5.6-10.4%).²¹ In the current study, depressed COPD patients reported significantly lower HR-QOL (higher scores on the scale) compared to non-depressed and non-anxious patients, which was in line with another study.²² It has also been reported that participants with depression have significantly higher levels of anxiety, less social support, higher social stress and more subjective QOL impairment.²⁴ A study in Jordan showed that COPD participants had poor QOL, high levels of anxiety and uncertainty.²⁵ One population-based study in Singapore showed that the impact of depression on HR-QOL in COPD was significantly greater than in people without COPD.²⁶

The current study also found that males were more affected with COPD, which may be because males are more exposed to environmental pollution. This result is consistent with a study conducted in Sweden.²⁴⁻²⁶

In the current study, after adjusting the influential factors, anxiety and depression were found to have a significant impact on the QOL of the patients, with patients suffering from either anxiety or depression scoring worse than those who had only COPD. This makes the study more noteworthy as this element has not been studied much in earlier studies. However, duration of smoking and severity of COPD were not found significant, which was surprising because theoretically they seem to have an impact on the QOL of patients and has been reported by studies as well.¹ Furthermore, in physically inactive patients, the HR-QOL was 18.75 (95%CI: 11.77-25.72) points higher compared to those who were active and mobile. Physical inactivity has not been studied much in other studies conducted in Pakistan, which makes the current study significant in this aspect. Plus, separately comorbidities were also studied, and were found to be impacting the QOL of the patients. But the presence of two or more comorbidities was not found significant during regression analysis in the current study, which is different from literature showing that three or more comorbidities were more likely to be frequently hospitalised and may die prematurely compared to COPD patients without comorbidities.¹⁷ The current could not find the association of age, employment status, education level and monthly income, which is contradictory to other studies showing that educated people had good QOL compared to less educated, and advanced age affected QOL.^{5,21}

The current study has a few limitations. First, the cross-sectional design meant causal inferences could not be drawn. Second, the patients were included only from the OPD, which failed to represent COPD population coming

to Emergency Department (ED) or inpatient in various wards. Third, the study did not evaluate the other factors that could be contributing to the anxiety and depression among the patients other than the presence of COPD, which, in the current socioeconomic conditions of the country, could be significant contributors to it. Lastly, a higher margin of error resulting in a lower sample size and the sampling technique may have introduced selection bias, limiting the generalisability of the findings. Large-scale studies are recommended to explore all aspects in depth.

Conclusion

Depression and anxiety are common comorbidities in patients with COPD, and affect the overall HR-QOL of the patients. Recognition and management of depression and anxiety in COPD may improve outcomes and potentially decrease health service utilisation, which is pertinent in a resource-scarce setting. The role of primary care and respiratory physicians is crucial in identifying these patients and treating them with non-pharmacological and pharmacological strategies.

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References

1. Zafar M. Health-related quality of life in patients with chronic obstructive pulmonary disease in Karachi Pakistan—a cross-sectional study. *MAMC J Med Sci.* 2020;6:17-22. doi:10.4103/mamcjms.mamcjms_92_19.
2. International Journal of Pharmacy Research & Technology. [Online] [Cited 2025 January 11]. Available from: URL: doi.org/10.31838/ijprt
3. Husain MO, Chaudhry IB, Blakemore A, Shakoor S, Husain MA, Lane S, et al. Prevalence of depression and anxiety in patients with chronic obstructive pulmonary disease and their association with psychosocial outcomes: a cross-sectional study from Pakistan. *SAGE Open Med.* 2021;9:20503121211032813. doi:10.1177/20503121211032813.
4. Rahi MS, Thilagar B, Balaji S, Prabhakaran SY, Mudgal M, Rajoo S, et al. The impact of anxiety and depression in chronic obstructive pulmonary disease. *Adv Respir Med.* 2023;91:123-34. doi:10.3390/arm91020011.
5. Himani G, Badini A, Nanji K. Depression and its associated factors among patients with chronic obstructive pulmonary disease in Karachi, Pakistan. *Cureus.* 2018;10:e2930. doi:10.7759/cureus.2930.
6. Amin W, Ashmawy R, Sharaf S, Zeina S, Hammouda EA, Mohamed N, et al. Revealing the significance of early detection of chronic obstructive pulmonary disease: insights from healthy lung initiative data at COP27 conference. *BMC Health Serv Res.* 2024;24:872. doi:10.1186/s12913-024-11107-8.
7. Farooqui M, Shoaib S, Afaq H, Quadri S, Zaina F, Baig A, et al. Bidirectionality of smoking and depression in adolescents: a systematic review. *Trends Psychiatry Psychother.* 2023;45:e20210429. doi:10.47626/2237-6089-2021-0429.

8. Siddiqui A, Iqbal S, Salman S, Itaf S, Aurengzaib M, Ahmed I. Anxiety and depression among chronic obstructive pulmonary disease. *Rom J Neurol*. 2021; 20:448-51. doi:10.37897/RJN.2021.4.6.
9. Rahi MS, Thilagar B, Balaji S, Prabhakaran SY, Mudgal M, Rajoo S, et al. The impact of anxiety and depression in chronic obstructive pulmonary disease. *Adv Respir Med*. 2023 Mar 10;91(2):123-34. Duplicate of Ref # 4
10. Horner A, Olschewski H, Hartl S, Valipour A, Funk GC, Studnicka M, et al. Physical activity, depression and quality of life in COPD - results from the CLARA II study. *Int J Chron Obstruct Pulmon Dis*. 2023;18:2755-67. doi:10.2147/COPD.S435278.
11. Tabar NA, Al Qadire M, Thultheen I, Alshraideh J. Health-related quality of life, uncertainty, and anxiety among patients with chronic obstructive pulmonary disease. *F1000Res*. 2021;10:420. doi:10.12688/f1000research.51936.1.
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;22:454-75. doi:10.1183/09059180.00008612.
13. Atlantis E, Fahey P, Cochrane B, Smith S. Bidirectional associations between clinically relevant depression or anxiety and COPD: a systematic review and meta-analysis. *Chest*. 2013;144:766-77. doi:10.1378/chest.12-1911.
14. Hurtado-Ruza R, Álvarez-Calderón-Iglesias O, Becerro-de-Bengoa-Vallejo R, Calvo-Lobo C, San-Antolín M, Losa-Iglesias ME, et al. Self-reported depression and anxiety among COPD patients: a case-control study. *Sao Paulo Med J*. 2022;140:207-12. doi:10.1590/1516-3180.2021.0235.R1.17062021.
15. Yang Y, Niu L, Amin S, Yasin I. Unemployment and mental health: a global study of unemployment's influence on diverse mental disorders. *Front Public Health*. 2024;12:1440403. doi:10.3389/fpubh.2024.1440403.
16. Wu K, Lu L, Chen Y, Peng J, Wu X, Tang G, et al. Associations of anxiety and depression with prognosis in chronic obstructive pulmonary disease: a systematic review and meta-analysis. *Pulmonology*. 2025;31:2438553. doi:10.1080/25310429.2024.2438553.
17. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the Hospital Anxiety and Depression Scale: an updated literature review. *J Psychosom Res*. 2002;52:69-77. doi:10.1016/S0022-3999(01)00296-3.
18. Khan KS, Jawaaid S, Memon UA, Perera T, Khan U, Farwa UE, et al. Management of chronic obstructive pulmonary disease (COPD) exacerbations in hospitalized patients from admission to discharge: a comprehensive review of therapeutic interventions. *Cureus*. 2023;15:e43694. doi:10.7759/cureus.43694
19. Martínez-Gestoso S, García-Sanz MT, Carreira JM, Salgado FJ, Calvo-Álvarez U, Doval-Oubiña L, et al. Impact of anxiety and depression on the prognosis of COPD exacerbations. *BMC Pulm Med*. 2022;22:169. doi:10.1186/s12890-022-01934-y.
20. Jarhyan P, Hutchinson A, Khaw D, Prabhakaran D, Mohan S. Prevalence of chronic obstructive pulmonary disease and chronic bronchitis in eight countries: a systematic review and meta-analysis. *Bull World Health Organ*. 2022;100:216-30. doi:10.2471/BLT.21.286870.
21. Negi H, Sarkar M, Raval AD, Pandey K, Das P. Health-related quality of life in patients with chronic obstructive pulmonary disease in North India. *J Postgrad Med*. 2014;60:7-11. doi:10.4103/0022-3859.128797.
22. Stridsman C, Zingmark K, Lindberg A, Skär L. Creating a balance between breathing and viability: experiences of well-being when living with chronic obstructive pulmonary disease. *Prim Health Care Res Dev*. 2015;16:42-52. doi:10.1017/S1463423614000048.
23. Tabar NA, Al Qadire M, Thultheen I, Alshraideh J. Health-related quality of life, uncertainty, and anxiety among patients with chronic obstructive pulmonary disease. *F1000Res*. 2021;10:420. doi:10.12688/f1000research.51936.1.
24. Tsiligianni I, Kocks J, Tzanakis N, Siafakas N, van der Molen T. Factors that influence disease-specific quality of life or health status in patients with COPD: a review and meta-analysis of Pearson correlations. *Prim Care Respir J*. 2011;20:257-68. doi:10.4104/pcrj.2011.00029.

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NK: Concept, critically reviewed, revision, accountable for content and final approval.

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IS: Data analysis, interpretation, drafting, accountable for content and final approval.