

The Prevalence & Severity Of Depression In Patients With Chronic Obstructive Airway Disease

Shomaila Awan¹, Asma Ambreen², Nabila Zaheer³, Asma Sabir⁴, Sara Daud⁵ Rizwan Athar⁶

¹ Assistant Professor FUMC, Rawalpindi.

² Associate Professor FFH, Rawalpindi.

³ Senior Registrar Pulmonology, Mayo Hospital Lahore.

⁴ Assistant Professor HITEC-IMS, HIT Taxila

⁵ Consultant TB & Chest diseases, Government General Hospital GMA Faisalabad.

⁶ Consultant Pulmonology, NESCOM Hospital.

Author's Contribution

¹ Conception of study

^{2,4} Experimentation/Study Conduction

^{3,4} Analysis/Interpretation/Discussion

² Manuscript Writing

⁵ Critical Review

⁵ Facilitation and Material analysis

Corresponding Author

Dr. Nabila Zaheer

Senior Registrar

Department of Pulmonology,

Mayo Hospital

Lahore

Email: zaheernabila@gmail.com

Article Processing

Received: 01/09/2022

Accepted: 24/12/2022

Cite this Article: Awan, S., Ambreen, A., Zaheer, N., Sabir, A., Daud, S., & Athar, R. (2023). The Prevalence & Severity Of Depression In Patients With Chronic Obstructive Airway Disease. Journal of Rawalpindi Medical College, 27(1).

DOI: <https://doi.org/10.37939/jrmc.v27i1.2011>

Conflict of Interest: Nil

Funding Source: Nil

Abstract

Objective: To determine the Prevalence & Severity of depression in Chronic Obstructive Airway Diseases (COPD) patients.

Background: Chronic Obstructive Airway Disease is a chronic heterogeneous disease that is also progressive. Depression is a common entity in chronic diseases. COPD causes long-term respiratory symptoms and depression is commonly found in these patients. The symptoms of these two diseases are overlapping and depression in COPD patients needs to be diagnosed and adequately treated. Untreated patients lead to poor control of respiratory symptoms and further deterioration of the illness. Our study aimed to determine the prevalence and severity of depression in COPD patients using the HAM-D score.

Material and Methods: This study was conducted in Medicine & Pulmonology OPD, Fuji Foundation Hospital, Rawalpindi from August 2019 to February 2021. Using a cross-sectional study design, a total of 169 cases of COPD were recruited and tested for the presence or absence of depression using the HAM-D rating scale and observations were recorded.

Results: A total of 169 patients were recruited in this study with a female & male percentages of 59% and 47% respectively. The Mean duration of illness was 11.5 years \pm 6.48. The incidence of Anxiety & Depression was high (45% and 36%) in moderate to severe diseases with a total prevalence of 54 % among participants in the study.

Conclusion: Anxiety & depression is commonly prevalent in COPD patients. Female patients are found to have more psychological disturbance irrespective to their COPD severity. The psychological impairment must be carefully evaluated in patients having COPD.

Keywords: Chronic obstructive pulmonary disease (COPD), Hamilton depression grades (HAM-D), Forced Expiratory Volume in one second (FEV1).

Introduction

Chronic obstructive pulmonary disease (COPD) is a common lung disease & it is preventable and treatable. It affects small airways leading to airflow limitation. It causes symptoms that are persistent and progressive such as shortness of breath, cough, and/or mucus production due to exposure to harmful environmental gasses which include tobacco smoke, indoor air pollution, and occupation dust and chemicals.¹

COPD is defined as having FEV1 <70% predicted value and FEV1/FVC ratio <70%.² FEV1 is defined as the amount of air forced out of the lungs in the first second after having a maximal inhalation. Forced vital capacity (FVC) is calculated as the amount of air forcefully exhaled after a deep breath. COPD is the 3rd leading cause of death worldwide in 2020³. High rates of depression have been associated with untreated and unscreened COPD patients⁴. According to some international studies, mild to moderate depression exists in around 44% to 52% of COPD patients⁵.

Depression is the presence of a persistent low mood and lack of a positive effect having an impact on emotional, physiological, cognitive as well as behavioral symptoms. It presents in a progressive manner with a decline in daily functioning capability⁶. Depressed people with co-morbidities & long-term disability have poor health outcomes. ⁷Depressed patients had found to have more COPD flare-ups and end up in hospitalizations⁸. People with depression almost show the same symptoms as in COPD, like dyspnea, fatigue, and disturbance in sleep. Hence, they show more physical disability and frequent hospital visits⁹. They have more frequent COPD exacerbation in comparison to other patients with higher use of emergency hospital facilities & finances.¹⁰

Studies have shown that the prevalence of depression in moderate to severe COPD patients was 42%¹¹ and 19.6% in mild to moderate disease¹². The prevalence of depression was higher in female patients with COPD¹³. In Pakistan, many other factors can also contribute to the aggravation of Depression as unemployment, poor economic status, male predominance, and recent disasters.¹⁴ Patients with depression have a higher tendency to smoke more which further aggravates COPD¹⁵.

Materials and Methods

This is a cross-sectional study (descriptive) conducted at Fauji Foundation Hospital from August 2019 to February 2021. Using the WHO sample size calculator with a confidence interval of 95%, a sample of 169 patients was calculated. The standard Hamilton questionnaire of Depression based on 21 questions was used to collect the data with informed consent. According to the GOLD criteria, all patients were with moderate to severe COPD as assessed with spirometry. Patients aged forty years or above including both genders and diagnosed with COPD for at least 5 years. Depression is secondary to other chronic diseases or patients with known psychiatric problems was excluded. The Performa was designed with demographic information including age, sex, marital status, and occupation (Table No 1). HAM-D score level of Depression¹⁶ was used with a HAM-D score of 7 or above taken as depression. A score between 7-17 was taken as mild, 18-24 as moderate above 24 was severe depression (Table No 2)

An SPSS version 11 was used for statistical analysis. Mean \pm Standard Deviation is calculated with numerical variables like Age, Gender, duration of COPD, FEV1 status, and HAM-D score. An information sheet in the local language was obtained from all the participants with Written consent or thumb impression. The assessment tool has been translated into Urdu. Grades of Depression were calculated with variables of Age, gender, duration in years and FEV₁ percent predicted grades of COPD.

Results

In our study, the prevalence of depression was 54% (n=92).

The mean age of enrolled patients was 62 years (SD \pm 9.5) having a mean duration of COPD of 11.5 \pm 6.4 years. The sample contained more females (57%) as compared to males (42%).

67% of patients were between 5-15 years (n=62) while 27% (n=25) to 5.4% (n=5) had a duration of 16-25 years and more than 25 years.

There was an increase in the depression scale with the decline of FEV1. Among depressed patients (n=92), 2.2% (n=2) patients were found to have mild COPD, 29.3% (n=27) were suffering from moderate

COPD and 68.5% (n=63) patients had severe COPD. (Table 1)

While assessing different grades of severity of depression, the prevalence of moderate-severe depression was 44.6% (n=41) and 36% (n=33) as compared to 20% (n= 18) mild depression. The mean depression score was found 20.58 ± 6.7 . (Table no 2)

Table-2 Depression grades

Depression grades	Frequency	Percentage
HAMD_1 (MILD)	18	19.6%
HAMD_2 (MODERATE)	41	44.6%
HAMD_3 (SEVERE)	33	35.9%
Total	92	100.0

Correlating the duration of COPD with the severity of depression, 67% (n= 62) of patients were having COPD from 5 to 15 years. Among them, 22% (n=14) were found to have mild depression whereas 50% (n=31) had moderate and 27% (n=17) had severe depression. In patients between 16-25 years, it was found that the majority 53% were severely depressed (Table no.3)

Grades of COPD severity were analyzed with grades of depression and it is noted that out of 68% (n=63) patients having severe COPD (FEV1:30-49%predicted) , 25-27% (n=23- 28) patients had moderate to severe Depression. Among those having moderate COPD (n=27) 10-13, people were found to have moderate to severe depression. This shows that grades of COPD are directly proportional to the prevalence of depression. (Table No.4)

Table-1 Demographic data

		Frequency	%age	Frequency	Percentage
Gender distribution	Male	79		39	42.4
	Female	90		53	57.6
Age distribution	<50 years	27	16	9	9.8
	50-70 years	97	57.4	52	56.5
	>70 years	45	26.6	31	33.7
	> 80% (mild)	10	5.9	2	2.2
Fev1 grades	50-79% (mod)	66	39.1	27	29.3
	30-49%(severe)	93	55	63	68.3
Education	No education	120	71.5	60	65.9
	Up to middle	30	17.1	23	25
	Above matric	19	11.1	9	10.2
Profession	Housewife	72	80.2		
Financial status	Skilled/Professional	120	71.1		
	Average	65	38.5		
	Poor	127	75.1		

Discussion

Chronic obstructive airway disease COPD is a common preventable disease. It is the third major cause of mortality all over the world in 2020³. The standard of health is affected by COPD which is also aggravated by depression and anxiety causing limitations in the activities of patients. Depression is commonly prevalent in Pakistan due to an increase in unemployment, gender inequality, low social economic status, and recent natural disaster¹⁴. The frequency of Depression in our study is found to be 54

% as compared to 57 % in another study done in Karachi in 2018¹⁷. Its frequency is found to be 35% higher in those who are frequent exacerbators of COPD as compared to infrequent exacerbators (12.5)¹⁸. The study also showed that COPD patients had a higher prevalence as compared to those without COPD¹⁹.

The socioeconomic status of the people of Pakistan has a direct impact on Depression. Low income is taken as a strong contributing factor of increased Depression²⁰. COPD patients need a better healthcare facility due to the progressive worsening of the disease; non-

affordability of healthcare led to noncompliance and increase the chances of depression²¹. Due to reduced awareness and education increased severity of COPD in such patients has been found.

Table-4 Stratification of grades of depression and grades of Severity of COPD. (n=92)

COPD Grades	Mild Depression	Moderate Depression	Severe Depression	TOTAL
Mild	2	0	0	2
Moderate	4	10	13	27
Severe	12	23	28	63
Total	18	41	33	92

In our study, Depression is found more prevalent in females¹³. Females are more afflicted by certain psychological factors and gender inequality in our society further triggers their depression and anxiety disorders²². We also found that certain factors as limited ingress of female patients to hospitals, lack of education, and more exposure to biomass fuel²³ were factors leading to increased anxiety and Depression.

Moreover, in our study, the risk of depression was higher in the older age group of 50-70 as they have more psychological impairments which may worsen their depression. In a study, patients more than 70-year age had a 15% higher risk of depression was found in comparison to those less than 50 years of age.²⁴

Table-3 Stratification of Grades of Depression with Duration of COPD (n=92)

Duration of COAD	Mild Depression	Moderate Depression	Severe Depression	Total
5-15yrs	14	31	17	62
16-25yrs	4	8	13	25
26-35yrs	0	2	3	5
Total	18	41	33	92

Of the duration of COPD from 5 to 15 years, 67% were found to have depression, and as the duration of COPD increases (16 to 25 years) the prevalence of depression also increased. Chronic patients with damaged lungs with decreased lung function tests are at more risk of depression. Similarly, as in VanManen et al²⁵ study, it was found that the incidence of depression was 19.6% in mild to moderate COPD patients and 25% in severe COPD patients suggesting a direct relation in the decline of lung function and depression^{25 26}.

STRENGTHS AND LIMITATIONS

The study is affected by certain limitations. While interpreting the findings of this study we found limited available data on the treatment of psychiatric illness. Some patients did not agree to participate in the study so an adequate comparison between participants and nonparticipants could not be evaluated. Female participants were fewer. Although we used a standardized screening tool for depression, but it was self-report proforma and therefore liable to bias.

Conclusion

Depression is a common entity in the COPD population and is found in females predominantly and it is associated with the severity as well as the duration of COPD. We should emphasize culturally and socially appropriate interventions for screening of depression. Healthcare providers must reinforce the existence of depression among COPD patients and inform them by the standard care process in order to achieve better therapeutic outcomes.

References

1. Riley CM, Sciruba FC. Diagnosis and outpatient management of chronic obstructive pulmonary disease: a review. JAMA 2019; 321(8): 786–797. [PubMed]
2. 2 Global Initiative for Chronic Obstructive Lung Disease – GOLD (<https://goldcopd.org>)
3. WHO Global Health Estimates
4. Mirza S, Clay RD, Koslow MA, et al.. COPD guidelines: a review of the 2018 GOLD report. Mayo Clin Proc 2018; 93: 1488–1502. [PubMed] [Google Scholar]
5. Funk G, Kirchheiner K, Burghube O and Hartl S. BODE index versus GOLD classification for explaining anxious and depressive symptoms in patients with COPD, a cross-sectional study. Respir Res. 2015;10(1):1

6. Funk G, Kirchheiner K, Burghube O and Hartl S. BODE index versus GOLD classification for explaining anxious and depressive symptoms in patients with COPD, a cross-sectional study. *Respir Res.* 2015;10(1):1
7. Blakemore A, Dickens C, Chew-Graham CA, et al.. Depression predicts emergency care use in people with chronic obstructive pulmonary disease: a large cohort study in primary care. *Int J Chron Obstruct Pulmon Dis* 2019; 14: 1343–1353. [PMC free article] [PubMed] [Google Scholar]
8. Hitti M. Screening and treating depression in chronic obstructive pulmonary disease patients may help, WebMD. Health News. 2008 Oct 24.
9. Hill K, Geist R, Goldstein RS, Lacasse Y, Anxiety and depression in end-stage COPD, *Eur Respir J* 2018;31:667-77
10. lakemore A, Dickens C, Chew-Graham CA, et al. Depression predicts emergency care use in people with chronic obstructive pulmonary disease: a large cohort study in primary care. *Int J Chron Obstruct Pulmon Dis* 2019; 14: 1343–1353. [PMC free article] [PubMed] [Google Scholar]
11. Julian LJ, Gregorich SE, Earnest G, Eisner MD, Chen H. Screening for depression in chronic obstructive pulmonary disease. *COPD.* 2017 Dec; 6(6):452–8.
12. Felker B, Bush KR, Hare O, Shofer JB, Shores MM, Au DH. Added burden of mental disorders on health status among patients with chronic obstructive pulmonary disease. *Prime Care Companion J Clin Psychiat.* 2010;12(4):858
13. Marco FD, Verga M, Reggente M, Casanova FM, Santus P, Blasi F et al. Anxiety and depression in COPD patients: The roles of gender and disease severity. *Respirat Med.* 2006 11;(10):1767-74
14. Ahmed B, Enam SF, Iqbal Z, et al. Depression and anxiety: a snapshot of the situation in Pakistan. *Int J Neurosci Behav Sci* 2016; 4(2): 32–36. [Google Scholar]
15. Goodwin RD, Lavoie KL, Lemeshow AR, Jenkins E, Brown ES, Fedoronko DA. Depression, anxiety, and COPD: The unexamined role of nicotine dependence. *Nicotine Tob Res.* 2012 ;14 (2):176-83.
16. Zimmerman M, Martinez JH, Young D, Chelminski I, Dalrymple K. Severity classification on the Hamilton Depression Rating Scale. *J Affect Disord* 2013;150:384–388
17. Himani G, Badini A, Nanji K. Depression and its associated factors among patients with chronic obstructive pulmonary disease in Karachi, Pakistan. *Cureus* 2018; 10(7): e2930. [PMC free article] [PubMed] [Google Scholar]
18. Deng D, Zhou A, Chen P and Shuang Q, A New Multidimensional Index to Better Predict Frequent COPD Exacerbators with Inclusion of Depression Score; *Int J Chron Obstruct Pulmon Dis.* 2020; 15: 249–259
19. Wanning Xu, Paul CJ · Shapiro S, Lin Y, Yang T, Platt R et al. Independent Effect of Depression and Anxiety on Chronic Obstructive Pulmonary Disease Exacerbations and Hospitalizations; *Amer J of Resp Med* 2008;37(2) 52-8
20. Tsai T, Livneh H, Lu MC, Tsai P, Chen PC, Chang F. Depression among patients with COPD: a population-based cohort study ; *BMC Public Health* 2013;13:976-84
21. Yohannes M, Alexopoulos S. Depression and anxiety in patients with COPD. *PMC* 2015;23(3)234-8
22. Nicolini A, Barbagelata E, Tagliabue E, et al.. Gender differences in chronic obstructive pulmonary diseases: a narrative review. *Panminerva Med* 2018; 60(4): 192–199. [PubMed] [Google Scholar]
23. Siddharthan T, Grigsby MR, Goodman D, et al.. Association between household air pollution exposure and chronic obstructive pulmonary disease outcomes in 13 low- and middle-income country settings. *Am J Respir Crit Care Med* 2018; 197(5): 611–620. [PMC free article] [PubMed] [Google Scholar]
24. Singh A, Misra N; Loneliness, depression and sociability in old age; *Ind Psychiatry J.* 2009; 18(1):51-5
25. Manen V, Bindels P, Dekker FW, Ijzermans CJ, Zee JS, Schade E. Risk of depression in patients with chronic obstructive pulmonary disease and its determinants. *Eurp J of Thorax* 2002;12(30):412-9