

Prevalence of Depression in Patients With COPD, Its Associated Risk Factors and Impact on Health-Related Quality of Life

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ABSTRACT

Objective: To determine the prevalence of depression in patients with chronic obstructive pulmonary disease (COPD), its associated risk factors and impact on health-related quality of life.

Methodology: This cross-sectional, observational study was carried out at Medicine and Psychiatry department from September 2022 to February 2023. Patients aged 40 years or above, both genders with the confirmed diagnosis of COPD, based on clinical assessment and spirometric findings according to the GOLD criteria, were included. Patients were assessed for depressive syndromes through the "Patient Health Questionnaire-9" (PHQ-9). Furthermore, cases were evaluated for their quality of life by St. George's Respiratory Questionnaire "SGRQ". All the relevant data was entered and analyzed by SPSS version 26.

Results: A total of 78 patients were studied; most were over 55 years old (66.7%) and male (74.4%). Overall, 3.6% of COPD patients experienced depression, with mild depression being the most common (35.9%). Depression was significantly more prevalent in females, individuals aged 40–55 years, those with below-matric education, urban residents, and people from poor socioeconomic backgrounds ($p < 0.05$). The most affected group included poor, married males over 55, although younger patients (40–55 years) had higher rates of moderate depression. Duration of COPD was not significantly associated with depression severity ($p > 0.05$).

Conclusion: Study revealed that over 40% of COPD patients experienced depressive symptoms, with severity closely linked to younger age, female gender, low education, rural background, and poverty.

Keywords: COPD; Depression; Prevalence; Risk factors

Introduction

COPD is a leading contributor to illness, death, and healthcare utilization across the globe. It develops primarily due to the inhalation of harmful airborne substances, especially cigarette smoke and environmental contaminants.¹ It is marked by breathing-related issues including shortness of breath, persistent coughing, and mucus discharge, linked to structural changes in the airways and/or alveolar regions. COPD represents a significant challenge to health systems, economies, and societies, increasingly being recognized as a critical public health concern.^{2,3} Individuals suffering from this condition often endure a diminished quality of life, driven by persistent respiratory issues, restricted physical activity, and emotional strain. These factors may contribute to long-term disability, premature retirement, decreased work

output, rising medical expenses, and added strain on caregivers.^{2,4}

In 2019, the worldwide prevalence of COPD among individuals aged 30 to 79 years was estimated at 10.3%, accounting for approximately 391.9 million cases, based on GOLD guidelines.^{5,6} Among those with stable COPD receiving care in primary health settings, the occurrence of depression shows considerable variation, ranging from 10% to 57%.⁶ The underlying link between COPD and mental health conditions such as depression and anxiety remains not fully explained, as the interplay is intricate. The exact biological link between COPD and depressive symptoms is yet to be clearly identified.⁶ Notably, both conditions are believed to have a genetic component, and recent

discussions have raised the possibility that shared genetic factors might contribute to the observed association between COPD and psychological disorders like depression and anxiety.⁶ In the studied population, depression and anxiety were present in 51% and 20% of individuals, respectively.⁷ Those with chronic obstructive pulmonary disease who experienced depression demonstrated notably poorer health-related quality of life compared to their non-depressed counterparts. Additionally, participants suffering from depression exhibited elevated anxiety levels, reduced social support, increased social stress, and greater perceived deterioration in overall quality of life.⁷

A large proportion of individuals affected by both COPD and common mental health disorders live in LMICs. In countries like Pakistan, various contributing elements such as joblessness, financial and political instability, gender disparities, and recent natural calamities may explain the increased occurrence of depression.^{7,8} Gaining insight into how various health conditions interact to cause multiple co-existing illnesses and influence health-related outcomes is essential for crafting effective medical and social policy interventions.⁷

Collectively depression is a common yet often overlooked comorbidity in COPD patients, especially in low- and middle-income countries like Pakistan. It significantly worsens quality of life, treatment adherence, and clinical outcomes. This study is important to determine the prevalence of depression in COPD patients, identify associated risk factors, and evaluate its impact on health-related quality of life. The findings may be helpful to inform integrated care approaches and public health strategies to improve both physical and mental health outcomes in this vulnerable population.

Methodology

A cross-sectional, observational study was carried out at Medicine and Psychiatry department over a period of six months from September 2022 to February 2023. All the patients aged 40 years age or above, both genders with the confirmed

diagnosis of COPD, based on clinical assessment and spirometric findings according to the GOLD criteria, were included in the study. All the patients with previously diagnosed psychiatric disorders, patients with history of currently taking antidepressant or anxiolytic medications, cases with severe chronic comorbid conditions like as malignancies or end-stage organ diseases, and those with recent hospital admissions, cognitive impairment were excluded. Study was done after taking ethical approval from the Research Ethical Committee of Isra University Hospital Hyderabad Ref no. IUH/ASST-DEAN(CS)32/08/22. All participants were fully informed about the purpose of the study, and written informed consent was obtained prior to data collection. Complete medical history and clinical examination was carried out from each case.

All the patients were assessed for depressive syndromes through the "Patient Health Questionnaire-9" (PHQ-9), as a validated tool frequently used in the studies to screening and grade the severity of depression among individuals. WHO-QoL-BREF was used to assess the quality of life. It was containing on 26- item questionnaire that assesses quality of life across four domains: physical health, psychological health, social relationships, and environment. Each domain includes specific questions, and responses are rated on a Likert scale from 1 (poor quality of life) to 5 (excellent quality of life). To assess the associated potential risk factors for depression in COPD patients, variables such as age, gender, socioeconomic status (SES), smoking history, duration of the disease, and the presence of comorbid conditions including diabetes, hypertension, obesity, and other chronic illnesses were carefully considered and analyzed.

Furthermore, cases of the study were evaluated for their quality of life by St. George's Respiratory Questionnaire "SGRQ", a disease-specific instrument used to evaluate the impact on overall health, daily life, and perceived well-being. All the relevant data was entered and analyzed by SPSS version 26. Descriptive

statistics such as mean, standard deviation, and frequencies were used to summarize demographic and clinical characteristics. The prevalence of depression was calculated as a percentage. Associations between depression and risk factors were analyzed using Chi-square tests, taking a p-value ≤ 0.05 as statistically significant.

Results

A total of 78 patients were studied; most were over 55 years old (66.7%) and male (74.4%). The majority were married (94.9%), had education below matric level (74.4%), and lived in urban areas (64.1%). Most participants belonged to a poor socioeconomic class (73.1%), with over half (56.4%) dependent on others. Active smoking was common (84.6%), and 32.1% had a family history of illness. Substance use was low, with 78.2% reporting no use, and 29.5% of patients were on medications. Table I

More than half (56.4%) showed no signs of depression. Mild depression was observed in 35.9% of individuals, while 6.4% experienced moderate depression. Only 1.3% of the participants were found to have severe depression. Table II

Younger patients aged 40–55 years experienced higher levels of moderate depression compared to older age groups, with a statistically significant association ($p=0.010$). Gender also played a role, as females showed a greater tendency toward mild and moderate depression compared to males ($p=0.036$). Educational status was another important factor, with individuals having education below the matric level experiencing significantly higher depression severity ($p=0.012$). Furthermore, residence and socioeconomic status were strongly associated with depression, as patients from urban areas and those belonging to the progressive nature of COPD and its typical onset in older adults. The majority were married (94.9%), which may reflect the social structure and cultural norms of the region, where marriage is common in middle and younger age groups. Educational status was below matriculation in 74.4% of the participants, suggesting limited health literacy, which may contribute to poor

poor socioeconomic backgrounds exhibited higher levels of depression ($p=0.020$ and $p=0.010$, respectively). In contrast, marital status and duration of COPD did not show any statistically significant relationship with the severity of depression, indicating that personal and environmental factors may have a stronger influence on mental health outcomes in COPD patients. Table III

Depression severity increases among COPD patients, their quality of life (QOL) tends to decline. Patients with no depression generally report a better QOL, with 38.5% rating it as excellent. In contrast, those with mild to severe depression report lower QOL, with severe depression showing no patients reporting excellent QOL. Overall there was a significant link between depression severity and QOL $p=0.002$. Table IV

Discussion

COPD is a serious health concern that adversely affects mental well-being. Individuals with COPD experience higher levels of depression and anxiety compared to those in the general population. This study evaluated the prevalence of depression among

78 patients with COPD, while also identifying associated risk factors and assessing its impact on health-related quality of life (QoL). The demographic profile of the participants showed a predominance of males (74.4%), which is consistent with global trends, as smoking the primary risk factor for COPD is more common among men in many regions, including Pakistan. A significant proportion of patients were aged over 55 years (66.7%), reflecting

disease management and delayed recognition of depressive symptoms. Most participants resided in urban areas (64.1%), which could be due to greater accessibility to healthcare facilities in cities, resulting in higher reporting and diagnosis rates. A large number (73.1%) belonged to a lower socioeconomic background, a known determinant of both poor physical

health and higher rates of psychological distress.

In this study, around 43.6% study population found with signs of depression, particularly as mild depression was in 35.9% cases, while moderate and severe depression was observed in 6.4% and 1.3% cases respectively. Overall prevalence of depression among COPD patients in our study was slightly higher than the pooled global prevalence of 34.5% reported by Xie et al,⁹ suggesting a potentially greater psychological burden in our population. However, it was notably lower than the 67.2% prevalence reported by Ayub et al.¹⁰ This variation in findings could be attributed to several factors, including differences in sample size, regional and cultural contexts, demographic characteristics such as age and gender, or the diagnostic tools and criteria used to assess depression. For instance, the use of different depression scales or cut-off scores can significantly influence reported rates of the prevalence.

In this study, higher levels of depression were observed in older patients (>55years), while higher levels of moderate depression were seen in younger patients (age, 40–55 years), ($p=0.010$). In terms of gender, females showed a greater tendency toward mild and moderate depression compared to males ($p=0.036$). Educational status was another important factor, with individuals having education below the matric level experiencing significantly higher depression severity ($p=0.012$). Furthermore, residence and socioeconomic status were strongly associated with depression, as patients from rural areas and those belonging to poor socioeconomic backgrounds exhibited higher levels of depression ($p=0.020$ and $p=0.010$, respectively). In contrast, marital status and duration of COPD did not show any statistically significant relationship with the severity of depression, indicating that personal and environmental factors may have a stronger influence on mental health outcomes in COPD patients. In line with our findings, in the study of Alam et al¹¹ male gender, older age, illiteracy, history of smoking were significantly associated with COPD. However, contrary to our findings, they reported higher prevalence of COPD among rural residents. Another study conducted by Himani et al¹² exhibited significant risk of depression among individuals aged over 59 years,

males, and retired/unemployed ($p < 0.05$). Similarly, Schane et al¹³ also reported a higher prevalence among female COPD patients than men (43.7% vs. 35.9% respectively), With younger age, smoking, marital status, and educational level as risk factors depressive in COPD.

In this study, an inverse relationship was observed between the severity of depression and HRQoL in patients with COPD. Patients without depression reported significantly better quality of life, with 38.5% rating their HRQoL as excellent, in contrast to those with mild to severe depression who reported lower QoL scores. The statistically significant relationship ($p = 0.002$), indicating that as depression severity increased, HRQoL declined. These findings align with previous research by Blakemore et al¹⁴ who reported a strong association between worsening depression symptoms and reduced HRQoL ($p < 0.001$).

Similarly, Ng et al¹⁵ found that COPD patients with comorbid depression experienced a 12% to 37% decline in multiple HRQoL domains, even after controlling for disease severity and other confounders. Other studies found that the quality of life of individuals with COPD is significantly affected by limited physical activity, emotional stress, and heightened levels of anxiety.^{16- 18} These consistent findings highlight the critical need for integrating mental health screening and management into the routine care of COPD patients to enhance overall quality of life. Present study, while informative, possesses several limitations, like sample size was relatively small and limited to a single tertiary care center, and data were collected through self-reported questionnaires, which may be subject to reporting bias. Furthermore, we did not evaluate other psychological conditions like anxiety or cognitive impairment, which may also influence HRQoL and the study also lacked follow-up, which could have provided insights into the progression of depression and QoL over time. Hence further longitudinal studies are recommended to explore causal relationships and track changes in depression and HRQoL over time. Incorporating validated clinical interviews along with self-report tools could enhance the accuracy of psychological

assessment. Additionally, examining other mental health conditions, social support systems, and treatment adherence would offer a more comprehensive understanding of factors affecting QOL in COPD patients.

Conclusion

Study concluded the considerable burden of depression among patients with COPD, with over 43.6% experiencing varying levels of depressive

symptoms. Prevalence and its severity were significantly associated with several socio-demographic risk factors, including younger age, female gender, low educational attainment, urban residence, and poor socioeconomic status. Findings underscore the need for routine psychological screening and integrated mental health support in the clinical management of COPD, particularly for high-risk subgroups, to improve both mental well-being and physical health outcomes.

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