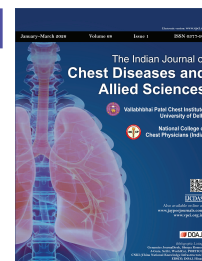


Anxiety, Depression, and Quality of Life in Patients with Chronic Obstructive Pulmonary Disease

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ABSTRACT

Background: Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality worldwide. Psychological comorbidities, especially anxiety and depression, are common in COPD and strongly influence health-related quality of life (HRQoL), healthcare utilization, and clinical outcomes.

Objectives: To provide a comprehensive narrative review of the prevalence, mechanisms, clinical consequences, assessment, and management of anxiety and depression in COPD, with a focus on implications for quality of life (QoL) and practice in India.

Methods: Narrative synthesis of contemporary literature (2010–2025), including systematic reviews, meta-analyses, randomized controlled trials, and pertinent observational studies.

Results: Prevalence estimates vary by setting and assessment method, with pooled estimates suggesting that approximately 25–40% of stable COPD patients have clinically significant depressive symptoms and 20–46% have anxiety. Anxiety and depression correlate strongly with poorer QoL (pooled correlations: depression $r \approx 0.45$ – 0.50 ; anxiety $r \approx 0.30$ – 0.40), increased exacerbations, hospital admissions, worse adherence, and higher mortality. Mechanisms are multidimensional biological (inflammation, hypoxia), behavioral (inactivity, nonadherence), and cognitive/affective (catastrophizing, reduced self-efficacy). Pulmonary rehabilitation (PR), exercise interventions, cognitive-behavioral therapies, and targeted pharmacotherapy improve symptoms and HRQoL in many patients.

Conclusion: Anxiety and depression substantially degrade QoL in COPD. Routine screening and integrated management—combining pulmonary, psychological, and social care—are essential. In India, scalable models using community health workers, telemedicine, and culturally adapted psychological interventions should be prioritized.

Keywords: Anxiety, Chronic obstructive pulmonary disease, Depression, India, Pulmonary rehabilitation, Quality of life.

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ABBREVIATIONS USED IN THIS ARTICLE

CAT = COPD assessment test; CBT = Cognitive-behavioral therapy; COPD = Chronic obstructive pulmonary disease; CRP = C-reactive protein; GAD-7 = Generalized anxiety disorder-7; HADS = Hospital anxiety and depression scale; HRQoL = Health-related quality of life; IL-6 = Interleukin-6; LASI = Longitudinal ageing study in India; PHQ-9 = Patient health questionnaire-9; PR = Pulmonary rehabilitation; QoL = Quality of life; SGRQ = St. George's respiratory questionnaire; TNF- α = Tumor necrosis factor alpha.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a progressive respiratory disorder characterized by persistent respiratory symptoms and airflow limitation. COPD is a major public health problem, ranking among the top causes of death and disability worldwide. Beyond respiratory impairment, COPD is frequently accompanied by a high burden of comorbid illnesses, including cardiovascular disease, metabolic disorders, and psychiatric conditions. Anxiety and depression are prominent among these psychiatric comorbidities, and their presence complicates management and worsens outcomes. The aim of this narrative review is to examine current evidence on the prevalence, pathophysiological links, clinical consequences, measurement, and management of anxiety and depression in COPD, with emphasis

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on their impact on quality of life (QoL) and applicability to clinical practice in India.

EPIDEMIOLOGY: HOW COMMON ARE ANXIETY AND DEPRESSION IN COPD?

Prevalence estimates for anxiety and depression in COPD vary considerably, reflecting differences in disease severity, clinical

setting (community vs tertiary care), assessment instruments, and cultural factors. Meta-analytic and large-scale studies conducted in the past decade report that clinically significant depressive symptoms occur in approximately 25–40% of outpatients with COPD, and anxiety disorders or symptoms in 20–46%.^{1–3} In cohorts with advanced disease or recent hospitalization for exacerbation, prevalence rates are higher, with some studies reporting depressive symptoms in up to 50–60% and anxiety in 40–70%.

Recent systematic reviews highlight global heterogeneity but consistently identify psychological distress as highly prevalent and often under-recognized. In India, epidemiological data are limited yet emerging. Analysis of national and sub-national datasets [e.g., longitudinal ageing study in India (LASI) wave analyses] and smaller institutional studies indicate substantial psychological morbidity among Indian COPD patients, particularly in rural and low-resource populations where biomass exposure, low literacy and socioeconomic stressors compound disease burden.⁴

PATHOPHYSIOLOGY AND MECHANISMS LINKING COPD WITH ANXIETY AND DEPRESSION

The relationship between COPD and psychological comorbidity is multifactorial, reflecting interactions among biological, behavioral, cognitive and social mechanisms:

Biological Pathways

Systemic inflammation, neuroinflammatory signaling and hypoxia are proposed biological mediators. Elevated circulating inflammatory markers [e.g., C-reactive protein (CRP), interleukin-6 (IL-6), tumor necrosis factor alpha (TNF- α)] are observed in both COPD and major depressive disorder; chronic inflammation may therefore contribute to mood dysregulation. Hypoxia may impair neurocognitive function and mood through altered neurotransmitter metabolism. Additionally, sleep disturbances and nocturnal desaturation further exacerbate mood symptoms.

Symptom-driven Psychological Responses

Dyspnea is a powerful driver of anxiety (panic-like responses, fear of suffocation) and behavioral avoidance. Recurrent breathlessness and fear of exacerbations amplify anticipatory anxiety and contribute to social withdrawal and depressive symptoms.

Behavioral and Functional Mechanisms

Reduced physical activity and exercise intolerance produce deconditioning, which worsens breathlessness and fosters a downward spiral of inactivity and low mood. Depression also reduces motivation and adherence to treatment, thereby worsening disease control.

Cognitive and Psychosocial Mechanisms

Catastrophic thinking about breathlessness, loss of self-efficacy, social isolation, stigma (especially in smoking-related diseases), and socioeconomic stressors contribute to persistent anxiety and depression in COPD patients.

IMPACT ON QUALITY OF LIFE AND CLINICAL OUTCOMES

Health-related quality of life (HRQoL) is consistently poorer in COPD patients with anxiety and/or depression. Studies using disease-specific instruments [St. George's Respiratory Questionnaire (SGRQ), COPD Assessment Test (CAT)] and generic HRQoL measures

(SF-36/12) demonstrate clinically and statistically significant decrements in QoL domains among those with psychological comorbidity. Meta-analytic data show moderate to strong correlations between depression and poorer QoL (correlation coefficients around 0.45–0.50) and modest correlations for anxiety (≈ 0.30 –0.40).^{1,2}

Clinical consequences extend beyond QoL: Anxiety and depression are associated with increased exacerbation frequency, higher rates of hospitalization and readmission, greater healthcare utilization, and in some studies, higher mortality. Depression in COPD has been linked with increased risk of 30-day readmission and longer length of stay. Psychological comorbidities also predict poorer responses to pulmonary rehabilitation (PR) and lower rates of completion of rehabilitation programs.

ASSESSMENT: SCREENING AND MEASUREMENT TOOLS

Routine identification of anxiety and depression in COPD requires practical, validated screening tools suited to busy clinical settings. Commonly used instruments include:

- Hospital anxiety and depression scale (HADS): A 14-item instrument with separate anxiety and depression subscales; widely used in respiratory clinics.
- Patient health questionnaire-9 (PHQ-9): Valid for depressive symptom screening; commonly used in primary and secondary care.
- Generalized anxiety disorder-7 (GAD-7): A brief screening tool for anxiety.
- COPD-specific and health-status tools (CAT, SGRQ) contain domains that correlate with psychological distress and can prompt further assessment.

Screening should be complemented by clinical assessment to differentiate adjustment reactions, primary psychiatric disorders, and somatic contributors (e.g., hypoxia, thyroid disease, medication side-effects). In India, brief validated translations of PHQ-9 and GAD-7 facilitate screening in multiple languages and primary care settings.

MANAGEMENT STRATEGIES

Integrated management addressing both respiratory and psychological needs offers the best chance of improving QoL. Management interventions fall into pharmacological, psychological, rehabilitative, and system-level strategies.

Pulmonary Rehabilitation and Exercise

Pulmonary rehabilitation is a cornerstone of COPD care and strongly impacts both physical and psychological outcomes. PR programs improve exercise capacity, reduce dyspnea, and consistently reduce symptoms of anxiety and depression while improving HRQoL. Recent trials and guidelines emphasize flexible PR delivery models—center-based, home-based, and hybrid approaches—to increase access.⁵ In resource-limited settings, structured home-based PR and community-led exercise initiatives may be pragmatic and effective.

Psychological Therapies

Cognitive-behavioral therapy (CBT), mindfulness-based interventions, and brief counseling have demonstrated benefits in reducing anxiety and depressive symptoms in COPD, with

variable effects on QoL. Trials such as the TANDEM trial evaluated CBT-informed approaches targeted at breathlessness, with mixed results—highlighting the need for tailored, patient-centered interventions and selection of suitable endpoints.⁶ Digital CBT and telepsychology may improve reach, particularly in India, where geographic barriers limit access to specialist mental health services.

Pharmacotherapy

Antidepressants (SSRIs, SNRIs) and anxiolytics play a role in treating comorbid mood and anxiety disorders. Evidence specific to COPD is limited by small trials and heterogeneity, but SSRIs are generally considered first-line for major depressive disorder in COPD, balancing efficacy and side-effect profiles. Caution is warranted with benzodiazepines because of potential respiratory depression; non-benzodiazepine options and short-term use with careful monitoring are preferred when anxiolysis is required. Collaborative care models with psychiatric input facilitate safe prescribing and monitoring.

Self-management and Education

Education on disease prognosis, inhaler technique, exacerbation management, and action plans reduces uncertainty and empowers patients, which can alleviate anxiety. Behavioral activation and motivational interventions can increase activity levels, indirectly improving mood and QoL.

Social and System-level Interventions

Addressing social determinants—financial strain, caregiver support, and access to oxygen or bronchodilators—reduces contributors to psychological distress. Integrated care pathways, training respiratory clinicians in basic mental health screening, and leveraging community health workers and telemedicine can extend mental health support in India.

EVIDENCE FOR EFFECTIVENESS OF INTERVENTIONS

Randomized trials and systematic reviews indicate that multimodal interventions provide the greatest benefit. Pulmonary rehabilitation shows robust evidence for improving exercise capacity, dyspnea, psychological symptoms and HRQoL.^{5–7} Several trials of CBT and mindfulness report reductions in anxiety and depression but variable improvements in QoL metrics; differences in trial populations, severity of COPD, and intervention intensity likely explain heterogeneity. Pharmacotherapy trials in COPD are limited; however, observational data suggest that treating depression is associated with better adherence and possibly reduced exacerbations.

SPECIAL CONSIDERATIONS: EXACERBATIONS, COMORBIDITIES AND END-STAGE DISEASE

Acute exacerbations of COPD often precipitate or worsen anxiety and depression. In the post-exacerbation period, psychological symptoms are predictors of readmission and poor recovery. In advanced COPD and palliative care settings, complex symptom burden (refractory dyspnea, fatigue, cachexia) and existential distress require integrated palliative and psychiatric care. Comorbid

conditions—cardiovascular disease, diabetes, chronic pain—further compound psychological morbidity and must be managed holistically.⁸

INDIAN CONTEXT: CHALLENGES AND IMPLEMENTATION STRATEGIES

India faces a substantial COPD burden driven by tobacco use, biomass fuel exposure, and air pollution. Several contextual challenges influence the management of psychological comorbidities: limited mental health workforce, stigma, geographic barriers, language diversity, and variable healthcare access. However, India also offers strengths—community health worker networks (e.g., ASHAs), telemedicine expansion, and growing digital health adoption—which can be leveraged.⁹

Practical strategies for India include: task-shifting mental health screening to trained primary care workers; using brief validated tools (PHQ-9, GAD-7) in local languages; implementing home-based PR and community exercise groups; integrating mental health modules into existing chronic disease programs; and using telepsychology and mobile health platforms to deliver CBT and behavioral activation. Pilot programs combining PR with mental health screening in tertiary centers have shown feasibility and patient acceptability.

RESEARCH GAPS AND FUTURE DIRECTIONS

Despite a growing evidence base, several knowledge gaps deserve attention:

- Causality and longitudinal mechanisms: well-designed prospective cohorts and mechanistic studies are needed to disentangle directionality between mood disorders and COPD progression.
- Intervention trials in LMIC settings: large randomized controlled trials testing culturally adapted CBT, scalable PR models and collaborative care in India are lacking.
- Biomarkers: research into inflammatory and neuroendocrine biomarkers linking COPD with mood disorders could identify novel therapeutic targets.
- Implementation science: studies evaluating how to integrate mental health care into routine pulmonary services, including cost-effectiveness analyses, are essential.
- Digital and task-shared interventions: evaluating effectiveness, acceptability, and equity of telepsychology and community-delivered models in India.

PRACTICAL RECOMMENDATIONS FOR CLINICIANS

- Screen all COPD patients annually (and after severe exacerbations) for anxiety and depression using brief tools (PHQ-9, GAD-7, or HADS).
- Refer patients with moderate-to-severe symptoms, suicidal ideation, or complex psychiatric histories to mental health specialists.
- Offer or refer to pulmonary rehabilitation for patients with dyspnea, reduced activity or psychological distress; tailor programs to local resources (home-based when necessary).

- Consider pharmacotherapy (SSRIs) for major depressive disorder and consult psychiatry for complex cases; avoid chronic benzodiazepine use when possible.
- Include caregivers in education and self-management planning; address social determinants and link to community resources.
- Document psychological assessments and follow-up plans in clinical records; audit outcomes such as PR uptake, readmissions, and QoL.

CONCLUSION

Anxiety and depression are prevalent and clinically important comorbidities in COPD that substantially impair quality of life and increase healthcare utilization. Mechanisms are multidimensional, and effective management requires integrated, patient-centered approaches combining pulmonary rehabilitation, psychological therapies, pharmacotherapy when appropriate, and system-level interventions. For India, scalable models that leverage community health workers, telemedicine, and culturally adapted psychological interventions are promising. Future research should prioritize longitudinal, mechanistic and implementation studies to inform context-appropriate interventions.

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AUTHORS CONTRIBUTION

RK and AKM contributed to the conception and design of the study, data acquisition, analysis, and manuscript preparation. Both the authors reviewed and approved the final version of the manuscript.

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