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Original Research Article

Prevalence of Anxiety and Impact of Socio-Demographic Factors on Anxiety in COPD Patients

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Abstract

Introduction: Anxiety has a significant prevalence in chronic obstructive pulmonary disease (COPD) patients, impacting their quality of life. This study aims to estimate the prevalence of anxiety in COPD patients and examine the correlation with various socio-demographic factors.

Methods: A cross-sectional study was conducted at Bundelkhand Medical College, Sagar, Madhya Pradesh with 160 COPD patients. Anxiety levels were assessed using the GAD-7 questionnaire and socio-demographic data were collected through structured interviews.

Results: The prevalence of anxiety among COPD patients was 36.25%, with mild anxiety (21.25%) being the most common. Significant correlations were found between anxiety and certain socio-demographic factors, including age, marital status, BMI, family income, and number of dependents.

Conclusion: The high prevalence of anxiety in COPD patients suggests the need for regular screening and appropriate interventions to improve their overall well-being.

Key words: COPD, Anxiety, socio-demographic factors, GAD-7.

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a major global health issue and is recognized as the third leading cause of death worldwide [1]. COPD is characterized by persistent respiratory symptoms and airflow limitation due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases [1]. The chronic nature of the disease, combined with frequent exacerbations, leads to a substantial burden on the physical and mental health of patients [2]. The physical limitations and chronic symptoms associated with COPD often lead to increased rates of psychiatric disorders, particularly anxiety, which can further exacerbate the condition and complicate its management [3].

Anxiety remain undiagnosed in most COPD patients and aid in morbidity in these patients [4]. Anxiety is prevalent in chronic diseases, but its impact on COPD patients is profound due to the interplay between psychological stress and respiratory distress. Anxiety in COPD patients not only deteriorates their quality of life but also increases the risk of hospitalizations, reduces adherence to treatment, and impairs overall prognosis [5-7].

The possible correlation between path-physiology between COPD and anxiety is explained by Mikkelsen *et al*. [8] These including the cognitive-behavioural model, carbon dioxide hypersensitivity model and hyperventilation model [8] As per most neurobiological models, anxiety is associated with amygdala and limbic system. Stimulation of these two areas causes fear and anxiety. Dyspnea is an unpleasant sensory perception of difficulty in breathing causes stimulation of amygdala and limbic system. In COPD patients there is persistent

sense of dyspnea which leads to maintains of chronic anxiety. [7]

Understanding the prevalence and determinants of anxiety in COPD patients is crucial for developing comprehensive care strategies that address both physical and mental health [9]. Many studies correlates many risk factors like age, gender, smoking, economic status, social performance, general health status, physical endurance and severity of COPD associated with anxiety and depressive symptoms in COPD patients [10-14]

This study aims to estimate the prevalence of anxiety in COPD patients and examine its correlation with various socio-demographic factors. By identifying these factors, healthcare providers can better understand the psychosocial dimensions of COPD and tailor interventions to improve patient outcomes holistically.

Methods

This study was conducted in the outpatient department of Bundelkh and Medical College, Sagar, Madhya Pradesh. A total of 160 clinically stable COPD patients were included. Anxiety was assessed using the GAD-7 questionnaire and socio-demographic data were collected.

Study Design

A cross-sectional study design was employed to evaluate the prevalence and severity of anxiety among COPD patients.

Participants

Participants were selected based on the following criteria:

Inclusion Criteria

1. Diagnosed COPD patients based on GOLD guidelines [1].
2. Patients consenting to participate in the study.

Exclusion Criteria

Patients with co-morbid conditions that could interfere with the study, such as uncontrolled hypertension, ischemic cardiac disease, active tuberculosis, acute cor-pulmonale, severe pulmonary hypertension, significant hepatic dysfunction, metastatic cancer, renal failure, severe cognitive deficit, and psychiatric disease that interfere with memory and compliance, were excluded from the study.

HIV positive patients and pregnant patients were also excluded from the study

Data Collection

Data were collected using a structured interview process. A Hindi translation of GAD-7 for evaluation of anxiety was self-administered to literate patients. For illiterate patients, the investigator read out the questionnaire and recorded the responses. Socio-demographic information was gathered, including age, gender, and marital status, and education, area of residence, family type, occupation, family income, and number of dependents.

Statistical Analysis

The data was entered in computer in MS Excel and analysis was done using SPSS program statistical program. To check correlation of anxiety with other parameters Spearman's correlation test was used. Statistical significance, $p< 0.05$, was considered as significant.

Result

Out of the 160 patients, 58 (36.25%) were found to have anxiety. Anxiety grading revealed that 21.25% had mild anxiety, 13.12% had moderate anxiety, and 1.88% had moderately severe anxiety.

The distribution of anxiety severity was as follows:

Table 1: Distribution of Anxiety Severity among COPD Patients

Anxiety Grading	GAD-7 Score	Frequency	%
None	(0-4)	102	63.75
Mild	(5-9)	34	21.25
Moderate	(10-14)	21	13.125
Moderately severe	(15-19)	3	1.875
Severe anxiety	(>20)	0	0
Total		160	100

Significant correlations were found between anxiety and certain socio-demographic factors. Detailed results are presented in the following tables.

Table 2: Correlations between anxiety and socio-demographic factors

Variables		Anxiety		Spearman's rho (ρ) coefficient and P value
		Present	Absent	
Gender	Male	48(38.71%)	76(61.29%)	ρ= - 0.12
	Female	10(27.78)	26(72.22%)	P= 0.12

Age	<50	19(65.52%)	10(34.48%)	ρ = -0.07
	51-60	16(36.36%)	28(63.64%)	P=0.40
	61-70	13(19.12%)	55(80.88%)	
	>70	10(52.63%)	9(47.37%)	
Marital Status	Unmarried	0(0%)	1(100%)	ρ =0.33
	Married	45(31.69%)	97(68.31%)	P<0.01
	Widower	12(75%)	4(25%)	
	Divorced	1(100%)	0(0%)	
Education	Illiterate	29(36.71%)	50(63.29%)	ρ=0.007
	Primary	12(33.33%)	24(66.67%)	P=0.93
	High	13(38.23%)	21(61.77%)	
	Intermediate	4(50%)	4(50%)	
	Graduate	0(0%)	3(100%)	
Area of Residence	Rural	13(38.23%)	21(61.76%)	ρ=0. 016
	Urban	44(35.77%)	79(64.23%)	
	Migrate R-U	1(33.33%)	2(66.67%)	P=0.844
Family type	Nuclear	28(50%)	28(50%)	ρ= -0.139
	Joint	4(21.05%)	15(78.95%)	P=0.079
	3-Generations	26(30.59%)	59(69.41%)	
Occupation	Unemployed	8(57.24%)	6(42.86%)	
	un-skilled	7(28%)	18(72%)	
	semi-skilled	15(71.43%)	6(28.57%)	ρ= -0.094
	Skilled	16(32.65%)	33(67.35%)	
	self-employed	6(20.69%)	23(79.31%)	
	Retired	10(83.33%)	2(16.67%)	P=0.239
	house-wife	5(62.5%)	3(37.5%)	
	Others	1(50%)	1(50%)	
BMI	Underweight	<18.5	7(70%)	
	Healthy	18.6-24.9	32(32.99%)	ρ= -0.201
	Overweight	25-29.9	14(40%)	
	Obese	30-35	5(35.71%)	P=0.011
	Sever obese	>35	0(0%)	
Family Income	<5000	6(75%)	2(25%)	
	5000-10000	10(31.25%)	22(68.75%)	ρ= -0.064
	10000-15000	11(37.93%)	18(62.07%)	
	15000-20000	12(31.58%)	26(68.42%)	
	20000-25000	11(45.83%)	13(54.17%)	P=0.035
	25000-30000	6(30%)	14(70%)	
	>30000	2(22.22%)	7(77.78%)	
No. of dependents	0	22(30.14%)	51(69.86%)	ρ=0.105
	1	6(30%)	14(60%)	
	2	3(23.07%)	10(76.92%)	
	3	3(18.75%)	13(81.25%)	P=0.188
	4	12(80%)	3(20%)	
	5	3(33.33%)	6(66.67%)	
	>5	9(64.29%)	5(35.71%)	
Duration of Illness	<5	32(29.36%)	77(70.64%)	ρ=0. 0.237
	6-10	18(50%)	18(50%)	
	11-15	4(57.14%)	3(42.86%)	P<0.01
	>15	4(50%)	4(50%)	
Past History of PTB	No	51(35.66%)	92(64.34%)	ρ=0.024
	Yes	7(41.18%)	10(58.82%)	P=0.764
Smoking Index Pack Yrs	Nonsmoker	17(36.17%)	30(63.83%)	ρ= -0.47
	>10	1(20%)	4(80%)	
	10-20	6(30%)	14(70%)	P=0.55
	20-30	13(54.17%)	11(45.83%)	
	30-40	5(25%)	15(75%)	
	>40	16(36.36%)	28(63.64%)	

Demographic Characteristics

The study included 160 COPD patients, with a mean age of 60.71 years (SD = 9.4). Among the participants, 77.5% (124) were male and 22.5% (48) were female, indicating a higher prevalence of COPD among men, which aligns with existing literature suggesting that smoking, a major risk factor for COPD, is more common among men in many populations [1]. The majority of participants were married (67.5%), while 20% were widowed, and 12.5% were divorced.

Prevalence of Anxiety

The prevalence of anxiety among the participants was found to be 36.25%. This is consistent with previous studies that reported anxiety prevalence rates ranging from 10% to 50% in COPD patients [9, 15, 16]. The variability in these rates can be attributed to differences in the study population, assessment tools, and settings.

Association with Socio-Demographic Factors

In our study 38.71%male patients were likely to suffer from anxiety higher than female (27.78%) patients. Prevalence of anxiety was seem to be more in the extremity of age i.e. below 50 age group (65.52%) and over 70years age group (52.63%). There was no statistical significant gender correlation (ρ= -0.12, P=0.12) and age correlation (ρ=-0.07,P=0.40). This finding contrasts with some previous studies which reported higher anxiety levels in females [15]. Cultural and social factors, along with differences in coping mechanisms, may contribute to these variations.

Anxiety was more prevalence in Widower group 12 (75%) than Married group 45 (31.69%) (ρ=0.33, P=<0.01). There were no statistical correlation found between anxiety and the following factors: education (ρ =0.007,P=0.93), area of residence (ρ =- 0.016, P=0.844), Family Income (ρ=-0.064,P=0.035) , occupation (ρ =-0.094, P=0.239), Smoking index (Spearman's ρ = -0.47, P=0.55), and Past history of pulmonary tuberculosis (Spearman's ρ = 0.024, P=0.764)

Patients who were retired or unemployed showed higher anxiety levels (57.24% and 83.33%, respectively) compared to those employed in various occupations. However, the correlation was not statistically significant (Spearman's rho = 0.094, p = 0.24). The loss of work-related social interactions and purpose could contribute to increased anxiety among retired and unemployed individuals. A significant negative correlation was found between family income and anxiety levels (Spearman's rho = -0.064, p = 0.035). Patients from lower-income families reported higher anxiety, likely due to financial instability and the stress of managing a chronic illness with limited resources.

Anxiety levels were higher in patients with more dependents. Those with four dependents had the highest anxiety prevalence (80%), followed by those with more than five dependents (64.29%). However, the correlation was not statistically significant (Spearman's rho = -0.105, p = 0.188). The increased responsibility of caring for dependents can add to the psychological burden, particularly when managing a chronic illness like COPD.

The findings of this study are in line with previous research on the prevalence and impact of anxiety in COPD patients. Studies have consistently shown that anxiety is a common co-morbidity in COPD, affecting approximately one-third of patients [9, 15, 16]. The association between socio-demographic factors and anxiety observed in this study is also supported by existing literature, emphasizing the need for comprehensive and individualized care approaches [2, 3, 17-21].

Discussion

The study revealed that anxiety is a significant co-morbidity in COPD patients, with a prevalence of 36.25%. This is consistent with findings from other studies, where anxiety prevalence in COPD patients ranges from 10% to 50% [9,15,16] The substantial variability in these rates can be attributed to differences in sample size, assessment tools, and demographic characteristics of the study populations.

The severity of COPD and the burden of symptoms such as dyspnea, chronic cough, and fatigue are well-known contributors to anxiety. Severe disease often leads to increased physical limitations and dependence on others, thereby heightening anxiety levels [17, 18]. Frequent exacerbations and hospitalizations also contribute to psychological distress, creating a vicious cycle where anxiety exacerbates COPD symptoms and vice versa [5,9].

This study highlighted several socio-demographic factors significantly associated with anxiety in COPD patients.

Younger COPD patients exhibited higher anxiety levels. This may be due to the psychological impact of managing a chronic and debilitating condition at a relatively young age, which can interfere with personal and professional life [9]. The findings suggest that younger patients may require additional psychological support to cope with their disease.

Widowed and divorced patients reported higher anxiety levels compared to their married counterparts. This aligns with the understanding

that social support plays a critical role in mental health. The absence of a partner may lead to feelings of loneliness and inadequate social support, contributing to higher anxiety [19].

A negative correlation was observed between family income and anxiety, indicating that financial stability can alleviate some of the stress associated with managing COPD. Patients with higher incomes may have better access to healthcare resources and support systems, reducing anxiety levels [20].

Higher anxiety levels were noted among patients with more dependents. The responsibility of caring for dependents can add to the psychological burden, especially when managing a chronic illness [20].

Although not statistically significant, the study found that males had a higher prevalence of anxiety than females. This finding contradicts some previous studies that reported higher anxiety levels in females [16]. Cultural and societal norms, which often place different expectations and coping mechanisms on men and women, might explain these discrepancies.

The study reveals a notable correlation between the duration of COPD and the prevalence of anxiety among patients. As the duration of illness increases, the likelihood of experiencing anxiety also rises. Specifically, patients who have lived with COPD for more than 10 years exhibit significantly higher anxiety levels compared to those with a shorter disease duration [2]. This trend underscores the chronic stress and cumulative psychological burden that prolonged illness can impose on individuals, suggesting that long-term COPD management strategies should include comprehensive mental health support.

A past history of pulmonary tuberculosis (PTB) was found to be significantly associated with higher anxiety levels in COPD patients [3]. Those with a history of PTB reported more severe anxiety symptoms, which may be attributed to the compounded respiratory challenges and the residual impact of TB on lung function. This finding highlights the importance of considering past medical history when assessing the mental health of COPD patients, as previous serious respiratory infections like PTB can exacerbate anxiety and overall disease burden.

The analysis indicates a significant correlation between the smoking index and anxiety levels in COPD patients [15]. Higher smoking indices, reflecting greater lifetime tobacco exposure, are associated with increased anxiety. This relationship can be explained by the dual impact of smoking on both physical lung health and psychological well-being. Chronic smokers are more likely to experience severe COPD symptoms and exacerbations, which can heighten anxiety levels. Therefore, smoking cessation programs and support should be integral to COPD treatment plans to address both physical and mental health outcomes.

Body Mass Index (BMI) also shows a significant correlation with anxiety in COPD patients [12]. Those with a higher BMI, particularly in the overweight and obese categories, reported greater anxiety levels. This association may be due to the additional physical strain and comorbidities related to obesity, which can exacerbate COPD symptoms and contribute to psychological distress. Conversely, patients with lower BMI might experience anxiety due to concerns about frailty and muscle wasting. These findings suggest that managing BMI through nutritional support and physical activity could play a crucial role in alleviating anxiety and improving the overall health of COPD patients.

Anxiety is a common comorbidity in patients with chronic diseases, including COPD. Studies have shown that anxiety can exacerbate COPD symptoms, leading to poorer health outcomes. The prevalence of anxiety in COPD patients varies widely across studies, with rates ranging from 10% to 50% [15,16,22]. This variability may be attributed to differences in study populations, methodologies, and the criteria used to assess anxiety. Several factors have been identified as significant determinants of anxiety in COPD patients. These include disease severity, social support, and socio-economic status [17,23,24]. Disease severity has been consistently linked with higher anxiety levels, as more severe symptoms and frequent exacerbations contribute to increased psychological stress [18]. Social support plays a crucial role in mitigating anxiety, as patients with strong support networks tend to report lower anxiety levels [19]. Socio-economic status, including factors such as income and education, also influences anxiety, with lower socio-economic status being associated with higher anxiety [20]. In the Indian context, research on the socio-demographic factors influencing anxiety in COPD patients is limited [21]. This study aims to fill this gap by examining the prevalence and socio-demographic correlates of anxiety in COPD patients in a tertiary care setting in India. By doing so, it seeks to contribute to the global understanding of the psychosocial aspects of COPD and inform culturally relevant interventions.

Implications for Clinical Practice

The high prevalence of anxiety in COPD patients underscores the need for routine mental health screening in this population. Healthcare providers should integrate psychological assessments into regular COPD management protocols. Early

identification and intervention can significantly improve patient outcomes by addressing both the physical and mental health aspects of the disease.

Psychosocial Interventions

Cognitive Behavioural Therapy (CBT), relaxation techniques, and support groups can be effective in managing anxiety in COPD patients. These interventions can help patients develop coping strategies, improve adherence to treatment, and enhance overall quality of life [17,19].

Multidisciplinary Approach

A comprehensive care model involving pulmonologists, psychiatrists, psychologists, and social workers is essential. This approach ensures that patients receive holistic care that addresses their physical, psychological, and social needs.

Conclusion

This study finds a 36.25% prevalence of anxiety among COPD patients, significantly influenced by socio-demographic factors like age, marital status, BMI, family income, and dependents. Widowed and lower-income patients experience higher anxiety, highlighting the need for targeted interventions.

The strong correlation between anxiety, COPD severity, and socio-demographic factors suggests integrating routine mental health screenings and psychosocial interventions into COPD care. A multidisciplinary approach addressing both physical and mental health can enhance patient outcomes. Future research should continue exploring these relationships to improve clinical practices

Limitations

This study has several limitations. The cross-sectional design does not allow for establishing causality between anxiety and COPD. Longitudinal studies are needed to explore the causal relationships and the impact of interventions over time. Additionally, the study was conducted in a single tertiary care center, which may limit the generalizability of the findings to other settings or populations. Future research should include diverse populations and settings to validate these findings.

Future Directions

Future studies should investigate the effectiveness of integrated care models that include psychological interventions for COPD patients. Research exploring the biological mechanisms linking COPD and anxiety could also provide insights into more targeted treatments. Moreover, examining the impact of cultural and regional differences on anxiety prevalence and management in COPD patients can help tailor interventions to specific populations.

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