

Original Research Article

Study of Anxiety, Depression and quality of Life in Patients with Chronic Obstructive Pulmonary Disease**Manasa Marthi¹, G.V.Ramana Rao^{2*}, R. Rama Krishnam Raju³, Purna Prasanth Dayala⁴**¹*Postgraduate, Department of Psychiatry, Alluri Sitarama Raju Academy of Medical Sciences, Eluru, Andhra Pradesh, India*²*Associate Professor, Department of Psychiatry, Alluri Sitarama Raju Academy of Medical Sciences, Eluru, Andhra Pradesh, India*³*Professor & HOD, Department of Psychiatry, Alluri Sitarama Raju Academy of Medical Sciences, Eluru, Andhra Pradesh, India*⁴*Assistant Professor, MNR Medical College, MNR Nagar, Fasalwadi, Narsapur Road, Sangareddy, Telangana, India***Received: 30-11-2021 / Revised: 25-12-2021 / Accepted: 06-01-2022****Abstract**

Introduction: Neuropsychiatric symptoms associated with chronic lung disease include increased psychological distress as well as impairments in neuropsychological functioning. The most common psychiatric disorders in such patients are anxiety and depression. In addition, psychological distress in individuals with COPD is associated with restricted activities of daily living and impaired quality of life. **Objectives:** To assess the prevalence of anxiety, depression, Health related QOL and also correlate them with sociodemographic variables in COPD patients. **Material and Methods:** An observational, analytical, cross-sectional, clinical study was adopted to assess the anxiety, depression and quality of life among patients with COPD. The sample size was 150 patients diagnosed with COPD from a tertiary care teaching hospital. **Results:** Results were categorised in to observational as well as analytical data. Depression (51%) or Anxiety (55%) are commonly prevalent in COPD patients. There is significant association between severity of COPD, and total score of HRQoL in those suffering from anxiety. **Conclusion:** The current study concludes that there is an increased prevalence of anxiety and depression in patients with Chronic Obstructive Pulmonary Disease. It is observed that there is a deterioration of health-related quality of life as the chronicity of the disease increases.

Key words: COPD, Anxiety, Depression, Health related QOL (HRQoL)

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Introduction

Neuropsychiatric symptoms associated with chronic lung disease include increased psychological distress as well as impairments in neuropsychological functioning. The most common psychiatric disorders in patients with chronic respiratory diseases are anxiety and depression. In addition, psychological distress in individuals with COPD is associated with restricted activities of daily living and impaired quality of life. Functional capacity of patients with COPD is more strongly associated with emotional/psychosocial factors (Example: depression, anxiety, somatization, low self-esteem, attitude towards treatment, social support) than with physiological indicators.

Depression in COPD

Varying prevalence rates have been reported from various parts of the world, ranging from 5% to more than 45%. This is because of variation in the study participants and also due to various psychological tools used for screening. Depression in patients with COPD is most commonly marked by feelings of hopelessness and pessimism, decreased appetite, reduced sleep, increased lethargy, concentration difficulty, and social withdrawal. Depression is associated with impairment in functional abilities and performing activities of daily living, poorer self-reported health, impaired self-management of disease exacerbations, and poor health behaviours.

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Anxiety in COPD

The prevalence of anxiety in patients with COPD ranges from 2% to over 50% in various studies around the world. Anxiety is associated with reduced functional ability and rehospitalisation in patients with chronic lung disease. Symptoms of anxiety are both psychological and physiological in nature. Physiological signs of arousal are tachycardia, sweating, dyspnoea, tremor etc. Symptoms of anxiety may overlap with symptoms of depression.

Health Related Quality of Life in COPD

CDC has defined HRQoL as "an individual's or group's perceived physical and mental health over time." HRQoL as an important patient-reported outcome measure in COPD has gained attention in the past few years both as an individual descriptive measure as well as an endpoint in clinical studies. Quality of life assessment helps to evaluate the efficacy of medical interventions and also detects the risk of psychological or behavioural problems. The strength of the influence of COPD on HRQoL was represented along a continuum ranging from lung function, functional status (physical and psychosocial) to wellness.

Aim of the study

1. The aim of this study is to determine the prevalence of anxiety and depression in COPD patients.
2. To find out the Correlation of anxiety and Depression with health-related quality of life of COPD patients.

Material and Methods

An observational, analytical cross-sectional, clinical study was adopted to assess the anxiety, depression and quality of life among

patients with COPD. All those patients diagnosed with chronic obstructive pulmonary disease that attended the pulmonology outpatient department of a teaching hospital, Southern India, and got admitted as inpatients were the study population. The sample size was 150 patients diagnosed with COPD.

Inclusion Criteria

1. Patients with a diagnosis of COPD confirmed by spirometry as an FEV₁/FVC ratio less than 0.70 according to GOLD criteria (Global initiative for chronic Obstructive Lung Disease)
2. Age group between 30 to 80 years that includes both males and females

Exclusion Criteria

1. Patients having known psychiatric disorders (mainly depression and anxiety)
2. Patients with cognitive impairment
3. Patients with serious or unstable diseases (such as cardiovascular, neurological and musculoskeletal diseases)
4. Patients with acute exacerbations of COPD

Sampling Technique

Consecutive sampling technique was used

Study period

The study was conducted for a period of 2 years between September 2018 to August 2020

Description of the tools used

The tools used for the data collection consists of semi structured interview schedule specifically designed for the present study

1. **The hospital anxiety and depression scale:** The Hospital Anxiety and Depression Scale (HADS) was used to measure anxiety and depression.
2. **Saint George's Respiratory Questionnaire:** SGRQ is a standardized, self-administered questionnaire for measuring impaired health and perceived HRQoL in airways disease. Validity and Reliability of the tools: The internal consistency measured with traditional Cronbach's alpha was 0.87 for HADS Anxiety and 0.81 for HADS Depression respectively [1]. The Cronbach's alpha for various versions of St. George's Respiratory Questionnaire ranges from 0.80 to 0.94 [2].

Methodology

All consecutive patients of COPD attending the Outpatient Department and admitted as inpatients are diagnosed by history and clinical examination. They were screened for the severity of COPD using GOLD criteria. After taking informed consent from the participants, socio-demographic and clinical data were collected, and questionnaires applied.

Statistical Analysis

The data was recorded in the form of mean and standard deviation for continuous variables, frequencies and percentage for categorical variables, Chi-square or Fischer exact test for comparing categorical variables, Unpaired t-test - for comparing continuous variables and ANOVA test for comparing means of three or more groups. Spearman's or Pearson correlation was done to detect the relationship between continuous variables. The statistical significance difference level was set at p value < 0.05 . All statistical analyses were conducted using SPSS version 25.

Results

This section contains the description and analysis of the data collected which are tabulated and described as follows.

Observational data

Distribution of respondents according to demographic variables, clinical variables, test variables.

Analytical data

This category contains the relationship between 1. Socio-demographic and test variables 2. Clinical and test variables.

Observational data

This includes various sociodemographic variables like Age, Gender, Marital Status, Educational Status, Occupational status, Domicile, Socioeconomic status. Clinical variables include Smoking Status, H% Smoking, Duration of illness, Severity COPD. Test variables include Prevalence of Anxiety, Depression and Health Related Quality of Life (HRQoL) (Table 1 & 2).

Sociodemographic Variables

The Mean age of the participants (N=150) in years is 49.72 with standard deviation of 12.48. Male Gender predominates the study group when compared to the Female Gender (80.7% vs. 19.3%). Majority of the study subjects are married (84%). Majority of the participants (60.7%) are either illiterates or studied up to Primary education only. Unskilled workers formed the majority of the study sample (46.7%) followed by semiskilled workers (44%). Among the participants 62% are from rural background and 38% are from urban background. Majority of the sample belongs to the lower middle class (44.7%) followed by Upper Lower Class (24.7%) (Table 1 & 2).

Clinical variables

49.3% of the sample is constituted by active smokers followed by ex-smokers who constitute 22%. Around 83% of the patients have H% smoking either in the present or past. Mean value of the duration of the illness of the sample in months is 45.14 \pm 39.5. Among the COPD population 64% belong to GOLD-2 & GOLD-3 categories of severity while the least severe category (GOLD-1) constitute 23.3% and most severe (GOLD-4) category constitute 12.7% only. (Table 1 & 2)

Test Variables

Prevalence of anxiety in the given sample was 54.7% with mean score of 8.17 \pm 3.378. Prevalence of Depression in the given sample was 50.7% with mean score of 7.63 \pm 4.06. Among the components of QOL score, higher scores were seen in activity score (62.12 \pm 23.86) followed by symptom score (51.35 \pm 17.21). The mean score of HRQoL is 50.71 \pm 16.4 (Table 1 & 2).

Analytical Data

There is a significant negative correlation among ages of the patient and anxiety (r value -0.280) as well as depression (r value -0.275) scores. There is no significant correlation between age and components of quality of life. Males are found to have a higher prevalence of depression than females ($P=0.009$). There was a higher prevalence of anxiety in married people than others ($P=0.034$). There was no significant association between marital status and the prevalence of depression and quality of life. There was a significant association between educational status and prevalence of anxiety. As the literacy rate improves, there was a decrease in the prevalence of anxiety ($P=0.04$). There was no significant association between educational status and prevalence of depression as well as the quality of life. There was no significant association among occupational status and prevalence of anxiety, depression as well as quality of life. There was no significant association among Domicile and prevalence of Anxiety, Depression as well as Quality of Life. There was no significant association among socio-economic status and prevalence of anxiety, depression as well as quality of life. (Table 3)

There was no significant association among smoking status and prevalence of anxiety, depression as well as quality of life. There was a significant association between H% of smoking and prevalence of anxiety ($P=0.007$). No significant association was found among the history of smoking and the prevalence of depression as well as quality

of life. There was a significant correlation between duration of disease with the prevalence of anxiety, depression, as well as symptoms score, impacts score and total score of quality of life. As there is an increase in the duration of disease, there will be an increase in anxiety ($r=0.561$), depression($r=0.561$) and a decrease in

quality of life($r=1$). There was a significant association among the severity of COPD and prevalence of anxiety as well as symptoms score($r=0.527$), impacts score($r=0.951$) and total score of quality of life($r=1$). (Table 4)

Table 1: Distribution of respondents according to Demographic, Clinical & test data Variables

Age	21-40 years	36(24%)
	41-65years	93(62%)
	66-80years	21(14%)
	Mean age	(49.72+/-12.48)
Gender	Male	80.7%
	Female	19.3%
Marital Status	Married	126(84%)
	Unmarried	6(4%)
	Widowed/Divorced	18(12%)
Educational Status	Illiterate	43(28.7%)
	Primary school education	48(32%)
	Secondary School Education	22(14.7%)
	Intermediate	18(12%)
	Graduation	12(8%)
Occupational Status	Post graduation	7(4.7%)
	Unskilled	70(46.7%)
	Semiskilled	66(44%)
Domicile	Skilled	14(9.3%)
	Rural	93(62%)
Socio Economic Status	Urban	57(38%)
	Lower	13(8.7%)
	Upper Lower	37(24.7%)
	Lower middle	67(44.7%)
	Upper Middle	25(16.7%)
	Upper	8(5.3%)

Table 2: Distribution of respondents according to Clinical & test data Variables

Smoking Status	Non Smoker	15(10%)
	Tobacco Chewing	11(7.3%)
	Ex Smoker	33(22%)
	Passive Smoker	17(11.3%)
	Smoker	74(49.3%)
H% Smoking	Present	124(82.7%)
	Absent	26(17.3%)
Duration of illness in years	1-4	89(59.34%)
	5-8	46(30.67%)
	9-12	15(10.00%)
	Mean duration in months	45.14+/-39.5
Severity of COPD	GOLD-1	35(23.3%)
	GOLD-2	50(33.3%)
	GOLD-3	46(30.7%)
	GOLD-4	19(12.7%)
Prevalence of Anxiety	No Anxiety	68(45.3%)
	Anxiety	82(54.7%)
	Mean score	8.17 ± 3.378
Prevalence of Depression	No Depression	74(49.3%)
	Depression	76(50.7%)
	Mean Score	7.63 ± 4.0656
Components of Quality Of Life (QoL)	Symptoms Score	51.35 ± 17.21
	Activity Score	62.12 ± 23.86
	Impacts Score	43.99 ± 17.32
	Health Related QOL(HRQoL)	50.71 ± 16.41

Table 3: Association between Socio demographic and Clinical Variables

Socio demographic Variables	Anxiety	Depression	HRQoL
Age	Significant Negative Correlation r value -0.280	Significant Negative Correlation r value -0.275	No significant correlation
Gender	No difference between males and females P=0.63	Males are found to have higher prevalence of depression than females P=0.009	No difference between males and females

Marital Status	Higher prevalence of Anxiety in married persons than others P=0.034	No significant association	No significant association
Educational Status	Significant association between educational status and prevalence of Anxiety. Anxiety is more common among illiterates and less educated persons P=0.04	No significant association	No significant association
Occupational Status	No significant Association	No significant Association	No significant Association
Domicile	No significant Association	No significant Association	No significant Association
Socio Economic Status	No significant Association	No significant Association	No significant Association

Table 4: Association between Clinical and Test variables

Clinical Variable	Anxiety	Depression	HRQoL
Smoking Status	No significant Association	No significant Association	No significant Association
H% Smoking	Significant Association between H% Smoking & the prevalence of Anxiety P=0.007	No significant Association	No significant Association
Duration of Disease	Significant Association Present r=0.561	No significant Association r=0.561	No significant Association r=1
Severity of COPD	No significant Association present. GOLD-3 severity of COPD has a higher prevalence of Anxiety	No significant Association present.	Significant Association between severity of COPD as well as symptoms score(r=0.527), Impacts score(r=0.951) & Total score of QOL (r=1)

Discussion

This current study investigates the prevalence of anxiety, depression and its correlation with health-related quality of life, Demographic Variables of COPD patients. Their relationships with various sociodemographic, clinical factors are being discussed. Comparison with other previously conducted studies was made. Out of 150 patients, 121(80.7%) constituted males, and 29 (19.3%) were females. Regarding the marital status, 126 (84%) were married, 6 (4%) were unmarried, and 18 (12%) were either separated or widowed or divorced. Among them, 43 (28.7%) did not have any educational qualification, 48 (32%) completed primary education, 22 (14.7%) completed secondary school education, 18 (12%) had an intermediate qualification, 12 (8%) completed graduation, and 7 (4.7%) had post-graduation as educational qualification. Considering the occupational status, 70 (46.7%) were unskilled, 66 (44%) were in the semi-skilled profession and 14 (9.3%) in the skilled profession. Among them, 93 (62%) were from a rural background, and 57 (38%) were from an urban background. Categorized under Modified Kuppuswamy Classification, 13 (8.7%) were from lower socio-economic status, 37 (24.7%) were from the upper lower class, 67 (44.7%) belonged to lower middle class, 25 (16.7%) from an upper middle class, 8 (5.3%) were from upper socio-economic status.

Clinical Variables of COPD patients

Regarding smoking status, 15 (10%) members were non-smokers, 11 (7.3%) had the habit of tobacco chewing, 33 (22%) were ex-smokers, 17 (11.3%) were passive smokers, and 74 (49.3%) members were active smokers. These were re-grouped as persons with a history of smoking of 124 (82.7%) and 26 (17.3%) members with no smoking history, respectively. Mean duration of disease in months in the sample was 45.14 ± 39.58 . The mean score of anxiety in this study is 8.17 ± 3.37 . In our study, the prevalence of anxiety is 54.7%. This is supported by previous studies with similar prevalence of anxiety such as studies done by Wells et al[3], Funk et al[4], Pumar et al[5], Ratcliff et al[6]. The mean score of depression in this study was found to be 7.63 ± 4.06 . The prevalence of depression was found to be 50.7%. This is similar to the studies done by Mc Sweeny et al[7], Light et al[8], Yohannes et al[9,10], Moussas et al[11], Funk et al[4], Pumar et al[5], Zhou et al[12]. These wide ranges in the prevalence of

anxiety and depression are attributable to a wide range of study samples, varied socio-demographic distribution and the presence of confounding variables like the presence of other chronic illnesses. The mean scores of symptoms score, activity score, impacts score and total Health-Related Quality of Life scores were 51.35 ± 17.21 , 62.12 ± 23.86 , 43.99 ± 17.32 and 50.71 ± 16.41 respectively. This is similar to the study done by Farag et al[13] in which activity score was the highest, indicating that dyspnoea is the most worrying symptom of COPD affecting Health-Related Quality of Life.

The most common finding in various studies with higher scores was observed in the activity component of Saint George's Respiratory Questionnaire. Higher total scores were found in the quality of life, indicating poorer quality of life in chronic patients of COPD. The findings of the present study suggested that there was a significant association among the following variables. Gender is significantly associated with the duration of illness in this sample ($p = 0.002$) with longer duration in females than males. This is similar to that of Xiao et al[14] in which they observed that females had a longer duration of illness when compared to males with the significant association.

There was a significant negative correlation with age of the patient and the mean anxiety score ($r = -0.280$; $p=0.001$) which is similar to that of Dua et al[15] in which they observed a significant association of age with the presence of psychiatric comorbidity in COPD patients. A significant association is seen between the married population and prevalence of anxiety ($p = 0.034$) in the present study. Illiteracy is significantly associated with the prevalence of anxiety ($p = 0.04$) which is similar to that of Zhou et al[12] with a higher prevalence of anxiety in low literacy group when compared to a middle and high literacy group.

Presence of history of smoking in the past and/or present is significantly associated with the prevalence of anxiety ($p = 0.007$). GOLD-3 type of severity of COPD was significantly associated with the prevalence of anxiety ($p = 0.00$). This is similar to the studies done by Mayank Sarawag et al[16]. There is a significant positive correlation between duration of disease and the mean anxiety score ($r = 0.291$; $p=0.000$) which is similar to the studies done by Ruth Sneha et al[17]. Age of the patient is negatively correlated with the mean depression score ($r = -0.275$; $p = 0.001$) which is similar to the study done by Dua et al[15]. Male gender is significantly associated with the prevalence of depression ($p = 0.009$). Among 121 males, 53.7%

had anxiety symptoms, and 45.5% had depressive symptoms, whereas 58.6% of females had anxiety symptoms, and 72.4% of females had depressive symptoms. This is similar to the findings by Laurin et al[18] in which they found that more women met diagnostic criteria for anxiety and depressive disorders. There is a significant positive correlation between duration of disease and mean depression score ($r = 0.289$; $p = 0.000$) which is similar to study done by Moussas et al[11] Rosinczuk et al[19], used SGRQ for assessing the quality of life and found that it is negatively correlated with age of the patient and also dyspnoea, longer duration of illness decreases the quality of life which is similar to the present study.

There is a significant difference between means of Health-Related-Quality of Life based on the severity of COPD ($F = 2.766$; $p = 0.044$) with similar findings in studies done by Ferrer et al[19] Reduced activities of daily living and poor quality of life were most closely associated with depression scores in studies done by Yohannes et al[10] and Omachi et al, which is similar to the present study[20]

Conclusion

The current study concludes that there is an increased prevalence of under-diagnosed and untreated anxiety and depression in patients with Chronic Obstructive Pulmonary Disease without any previous psychiatric co morbidities. It is observed that there is a deterioration of health- related quality of life as the chronicity of the disease increases.

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