

ASSESSMENT OF DEPRESSIVE SYMPTOMS AND ASSOCIATED FACTORS AMONG GERIATRIC PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A CROSS-SECTIONAL STUDY

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ABSTRACT

Chronic Obstructive Pulmonary Disease (COPD) is a type of respiratory infection which the lungs. COPD Patients have a breathing difficulties like shortness of breath, coughing, and decreased capacity for physical activity. Mostly this disease was affect the Geriatric patients and causes severe symptoms. The primary symptoms of COPD consist of chronic dyspepsia, coughing, mucus production, and intolerance to exercise. These symptoms occur due to a mix of small airway disease, airway inflammation, excessive mucus production, and parenchymal damage like emphysema. This research was completely done by cross sectional study design based upon the dependent variable and independent variable. The symptoms were assessed by the PHQ-9 scale. Various kinds of Tests like Chi-Square test, t-test and ANOVA test were studied. All the data was analysed by using SPSS Software. Our findings indicate that depressive symptom severity in geriatric COPD patients is more closely linked with current diseases like burden, dyspnea, and oxygen dependence than with recent exacerbation or hospitalization counts alone. This strengthens the case for integrating routine depression screening into COPD assessment, especially in elderly patients.

KEYWORDS: COPD, Exacerbation, T-Tests and Dyspnea.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a long-term respiratory condition. It involves considerable physical, functional, and psychosocial challenges. In geriatric patients, the condition is frequently complicated by multiple health issues, weakness, use of many medications, frequent hospital visits, and a gradual decrease in daily functioning. COPD Patients have a breathing difficulties like shortness of breath, coughing, and decreased capacity for physical activity.

Geriatric patients with COPD often face depressive symptoms that can negatively impact treatment adherence, self-management, symptoms perception, healthcare usage, and overall quality of life. Nevertheless, depressive symptoms in COPD frequently go unrecognized in standard clinical practice since focus is typically on respiratory issues and managing exacerbations rather than on mental health conditions. In elderly individuals with COPD, prompt recognition of depressive symptoms is particularly crucial, as aging can heighten psychological sensitivity due to social isolation, decreased physical autonomy, cognitive deterioration, and the presence of several chronic conditions. Chronic obstructive pulmonary disease (COPD) is a prevalent, avoidable and manageable condition. Chronic lung disorder marked by ongoing respiratory symptoms and restricted airflow that is typically progressive and linked to structural changes in the respiratory passages and pulmonary organs. COPD is considered no longer as a singular, uniform illness not solely attributed to smoking, but rather a varied clinical syndrome that emerges from cumulative interactions between genes and the environment throughout life. The primary symptoms of COPD consist of chronic dyspepsia, coughing, mucus production, and intolerance to exercise. These symptoms occur due to a mix of small airway disease, airway inflammation, excessive mucus production, and parenchymal damage like emphysema. Which collectively hinder exploratory airflow and gas exchange. Modern ideas regarding COPD also recognizing significant heterogeneity in symptom burden, structural lung injury, exacerbation risk, inflammatory pathways, and treatment response among patients. Although tobacco smoke remains a major exposure, contemporary evidence indicates that a significant proportion of COPD cases.

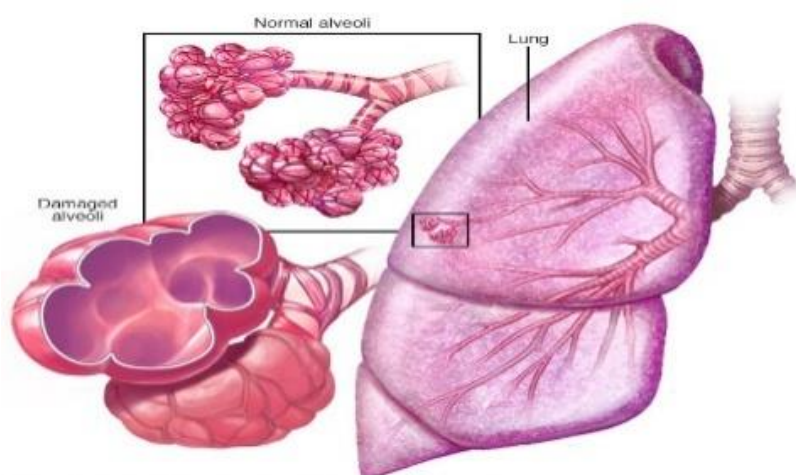


Fig. No. 1: COPD Lung.

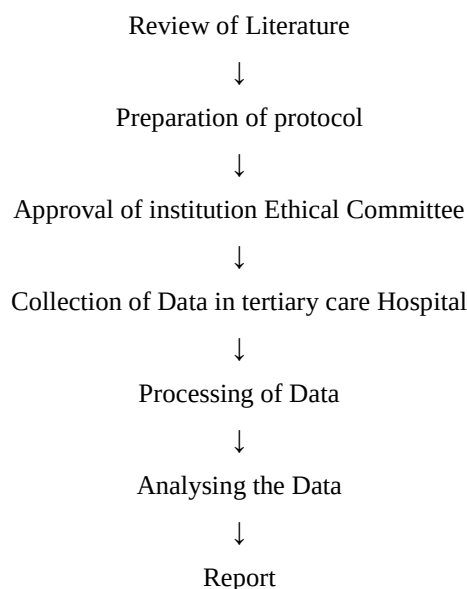
AIM AND OBJECTIVES

Aim

The main aim of this study is to assess depressive symptoms and associated factors among geriatric patients with chronic obstructive pulmonary disease.

Objective

- To measure depression symptoms in older individuals with chronic obstructive Pulmonary disease using the Patient Health Questionnaire (PHQ-9) scale.
- To establish the relationship between depression symptoms and certain characteristics of the lifestyle and demographics of older individuals with chronic obstructive Pulmonary disease.
- To assess the relationship between clinical variables associated with Chronic Obstructive pulmonary disease (COPD) and depression symptoms in older adults.
- To evaluate the relationship between certain treatment-related and comorbidity related parameters and depression symptoms in elderly patients with chronic Obstructive pulmonary disease.

Plan of Work**Materials and Methods (Methodology)**

Study Design: This study will employ a cross-sectional study design.

Study Setting: This study will be conducted in a tertiary care hospital.

Population: The study population will consist of geriatric patients with a confirmed diagnosis of chronic obstructive pulmonary disease attending or admitted to the selected departments during the study period.

Study Duration: The total duration of the study will be 6 months, including study preparation, data collection, data analysis, and report preparation.

Study variable**Dependent variable**

Depressive symptoms assessed using the PHQ-9 scale.

Independent variable

- Demographic factors,
- Lifestyle-related factors,
- COPD-related clinical factors,

- Treatment-related factors,
- Comorbidity-related factors.

Criteria to take the Patient Survey for this research (Inclusion criteria)

- Patients aged 60 years and above.
- Patients with a confirmed diagnosis of chronic obstructive pulmonary disease.
- Patients attending or admitted to the selected departments of the hospital during the study period.
- Patients who are willing to provide written informed consent.
- Patients who are able to understand and respond to the PHQ-9 questionnaire.

Criteria not to take the Patient Survey for this research (Exclusion Criteria)

- Patients with severe cognitive impairment or altered mental status that prevents reliable interview.
- Patients with acute critical illness or severe respiratory distress requiring immediate emergency management.
- Patients with a previously diagnosed major psychiatric disorder that may interfere with the assessment of depressive symptoms.
- Patients who are unwilling to participate.

Sample Size Estimation

Based on a 2023 systematic review and meta-analysis, the pooled prevalence of depression among patients with chronic obstructive pulmonary disease was reported as **34.5%**. The sample size for the present study was estimated using the standard formula for prevalence studies:

$$n = Z^2 \times p \times q / d$$

Where,

n = required sample size

Z = standard normal variate at 95% confidence interval = 1.96

p = estimated prevalence = 34.5%

q = 100 – p = 65.5%

d = allowable error = 7%

Sampling Technique

A convenient sampling technique will be used to recruit eligible geriatric patients with COPD during the study period.

Requirements of Data collection**Data will be collected by using**

- A structured data collection form.
- Patient Health Questionnaire-9 (PHQ-9) Review of patient case records and medical records.
- The structured form will be used to record demographic, lifestyle-related, clinical, treatment related, and comorbidity-related variables.
- The PHQ-9 will be used to assess depressive symptoms among the study participants.

Data Collection Procedure

- Eligible patients will be identified based on the inclusion and exclusion criteria.
- After obtaining written informed consent, data will be collected through patient interview and medical record review.
- Depressive symptoms will be assessed using the **PHQ-9** scale.
- All collected data will be entered into Microsoft Excel for further analysis.

Data Analysis Plan

- All collected data will be entered into Microsoft Excel and analysed using **Statistical package for the Social Science (SPSS)** software.
- Descriptive statistics such as frequency, percentage, mean, and standard deviation will be used to summarize the study variables.
- Inferential statistics will be used to assess the association between depressive symptoms and the selected independent variables.
- The Chi-square test will be applied for categorical variables.
- The independent sample t-test or ANOVA (Analysis of Variance) test will be used for continuous variables wherever applicable.
- A p-value of less than 0.05 will be considered statistically significant.

RESULT AND DISCUSSION

1. Sociodemographic profile of patients

Table 1.1 Age Distribution of patients.

<i>Age group (years)</i>	<i>Number of participants (n)</i>	<i>Percentage (%)</i>
<i>60–64</i>	<i>38</i>	<i>19.5</i>
<i>65–69</i>	<i>69</i>	<i>35.4</i>
<i>70–74</i>	<i>44</i>	<i>22.6</i>
<i>75–79</i>	<i>32</i>	<i>16.4</i>
<i>≥80</i>	<i>12</i>	<i>6.2</i>
<i>Total</i>	<i>195</i>	<i>100.0</i>

Table 1.2: Sex Distribution of Patients.

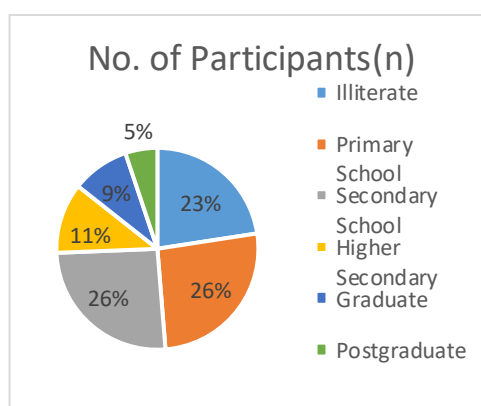
Sex	No. of Participants(n)	Percentage (%)
Male	144	73.8
Female	51	26.2
Others	0	0
Total	195	100

Table 1.3 Marital status of Participants.

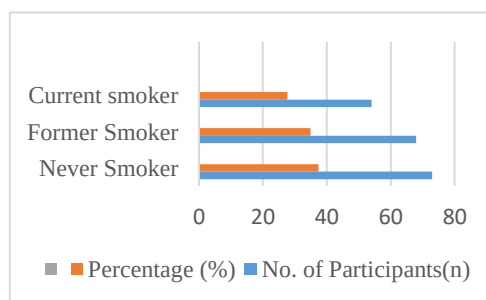
Marital Status	No. of Participants	Percentage (%)
Married	93	47.7
Widowed	53	27.2
Single	32	16.4
Divorced / Separated	17	8.7
Total	195	100

Table 1.4 Educational status of Participants.

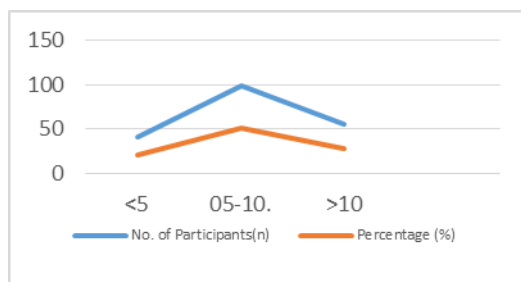
Educational Status	No. of Participants(n)	Percentage (%)
Illiterate	44	22.6
Primary School	51	26.2
Secondary School	50	25.6
Higher Secondary	22	11.3
Graduate	18	9.2
Postgraduate	10	5.1
Total	195	100

**Chart No. 1: Educational status of patients.****2. Life Style related Profile****Table 2.1 Smoking Status of Participants**

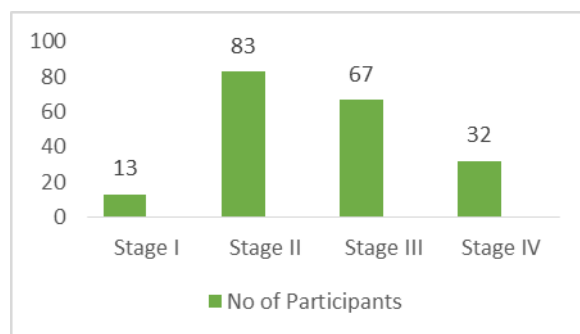
Smoking Status	No. of Participants(n)	Percentage (%)
Never Smoker	73	37.4
Former Smoker	68	34.9
Current smoker	54	27.7
Total	195	100

**Chart No. 2: Smoking Status of Patients.****3. COPD related Clinical Profile**

Duration of COPD(Years)	No. of Participants(n)	Percentage (%)
<5	41	21
5-10	99	50.8
>10	55	28.2
Total	195	100

Table 3.1 Duration of COPD among participants**Chart No. 3: Duration of COPD in Patients.****Table 3.2 GOLD Stage of Distribution of Participates.**

GOLD Stage	No of Participants(n)	Percentage (%)
Stage I	13	6.7
Stage II	83	42.6
Stage III	67	34.4
Stage IV	32	16.4
Total	195	100

**Chart No. 4: Stage of COPD in Patients.****Table No. 3.3 mMRC Dyspnea Score Distribution of Participants.**

mMRC Dyspnea Score	No of Participants(n)	Percentage (%)
Grade 0	20	10.3
Grade 1	46	23.6
Grade 2	74	37.9
Grade 3	40	20.5
Grade 4	15	7.7
Total	195	100

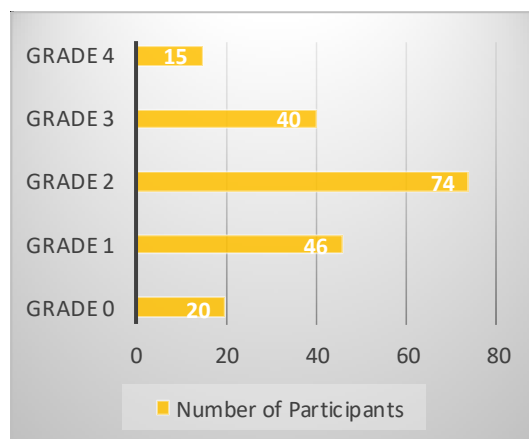
**Chart No. 5: mMRC Dyspnea score of Patients.**

Table No. 3.4 Number of Exacerbation in past Years.

No. Of Exacerbation in past Years	No of Participants(n)	Percentage (%)
0	89	43.6
1	45	25.1
2	26	13.3
3	29	14.9
4	6	3.1
Total	195	100

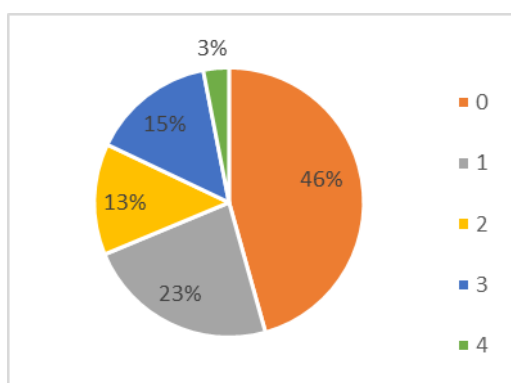


Chart No. 6: Number of Exacerbation in past Years.

Table No. 3.5 Number of patients in Hospitalization in past years.

Number of patients in Hospitalization in past years	No of Participants(n)	Percentage (%)
0	152	77.9
1	31	15.9
2	10	5.2
3	2	1.0
Total	195	100

Table No. 3.6 Oxygen therapy usage among the patients

Oxygen therapy	No of Participants(n)	Percentage (%)
Yes	55	28.2
No	140	71.8
Total	195	100

4. Treatment related profile

Table No. 4.1 Number of COPD Medication was currently used among the Patients

Number of COPD Medication was currently used	No of Participants(n)	Percentage (%)
1	9	4.6
2	51	26.2
3	73	37.4
4	48	24.6
5	14	7.2
Total	195	100

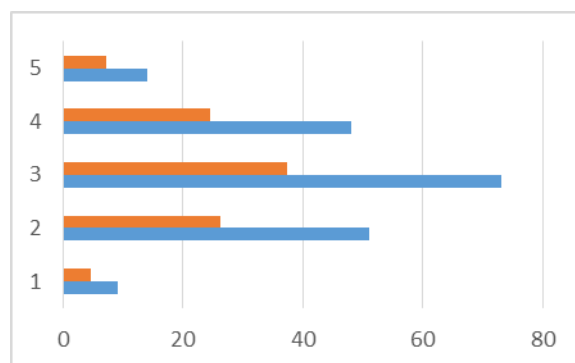


Chart No.7 No. of COPD drug currently used.

Table No. 4.2 Polypharmacy among Parents.

Polypharmacy	No of Participants(n)	Percentage (%)
Yes	123	63.9
No	72	36.1
Total	195	100

Table No. 4.3 Medication adherence among patients.

Medication Adherent	No of Participants(n)	Percentage (%)
Adherent	134	68.7
Non-adherent	61	31.3
Total	195	100

5. Comorbidity Related Profile

Table No. 5.1: Hypertension among Participants.

Hypertension	No of Participants(n)	Percentage (%)
Yes	88	45.1
No	107	54.9
Total	195	100

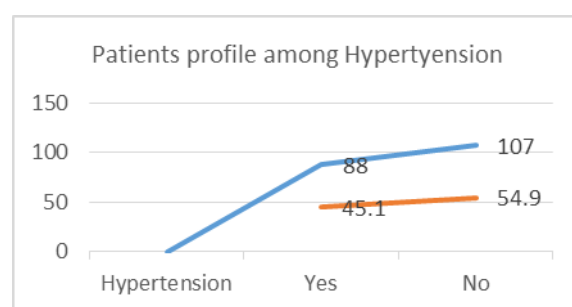


Chart No.8 Hypertension among Participants

Table No. 5.2 Diabetes Mellitus among Participants

Diabetes mellitus	No of Participants(n)	Percentage (%)
Yes	74	37.9
No	121	62.1
Total	195	100

Table No. 5.3 Cardiovascular disease among participants.

Cardiovascular disease	No of Participants(n)	Percentage (%)
Yes	52	26.7
No	143	73.3
Total	195	100

Table No. 5.4 Other comorbidity among participants.

Other comorbidity	No of Participants(n)	Percentage (%)
Yes	95	48.7
No	100	51.3
Total	195	100

Table No. 5.5 Total number of Comorbidity among the participants.

Total number of comorbidities	No of Participants(n)	Percentage(%)
0	27	13.8
1	59	30.3
2	73	37.4
3	32	16.4
4	3	1.5
5	1	0.5
Total	195	100

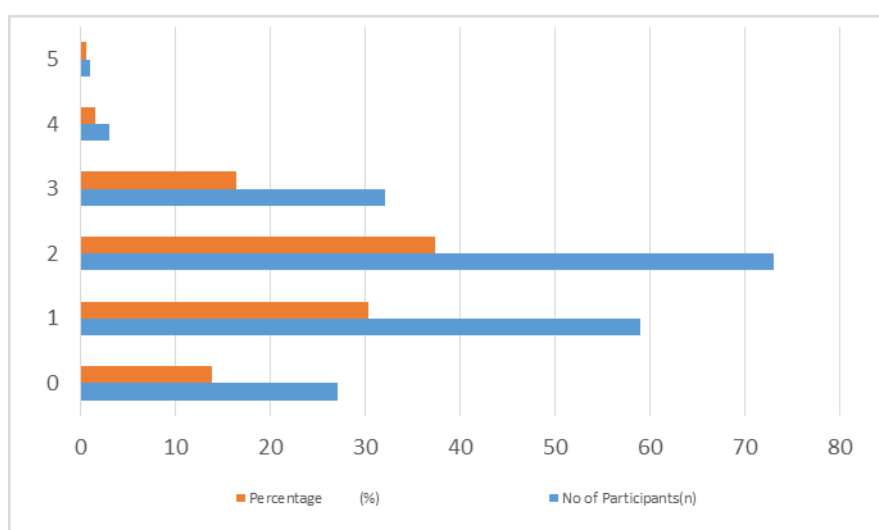


Chart No. 9 Total number of Comorbidity among the patients.

6. Depressive Symptoms among Geriatric COPD Patients

PHQ-9 Score parameter	Value
Mean $\pm$ SD	9.27 $\pm$ 4.82
Median	9
Interquartile range (IQR)	6–13
Minimum score	0
Maximum score	23

Table No. 6.1 Total PHQ-9 Score among Participants

7. Severity Category of Depressive Symptoms among Participants

Severity Category of Depressive Symptoms	No of Participants(n)	Percentage (%)
Minimal Depression	28	14.4
Mild Depression	66	33.8
Moderate Depression	58	29.7
Moderately severe Depression	31	15.9
Severe Depression	12	6.2
Total	195	100

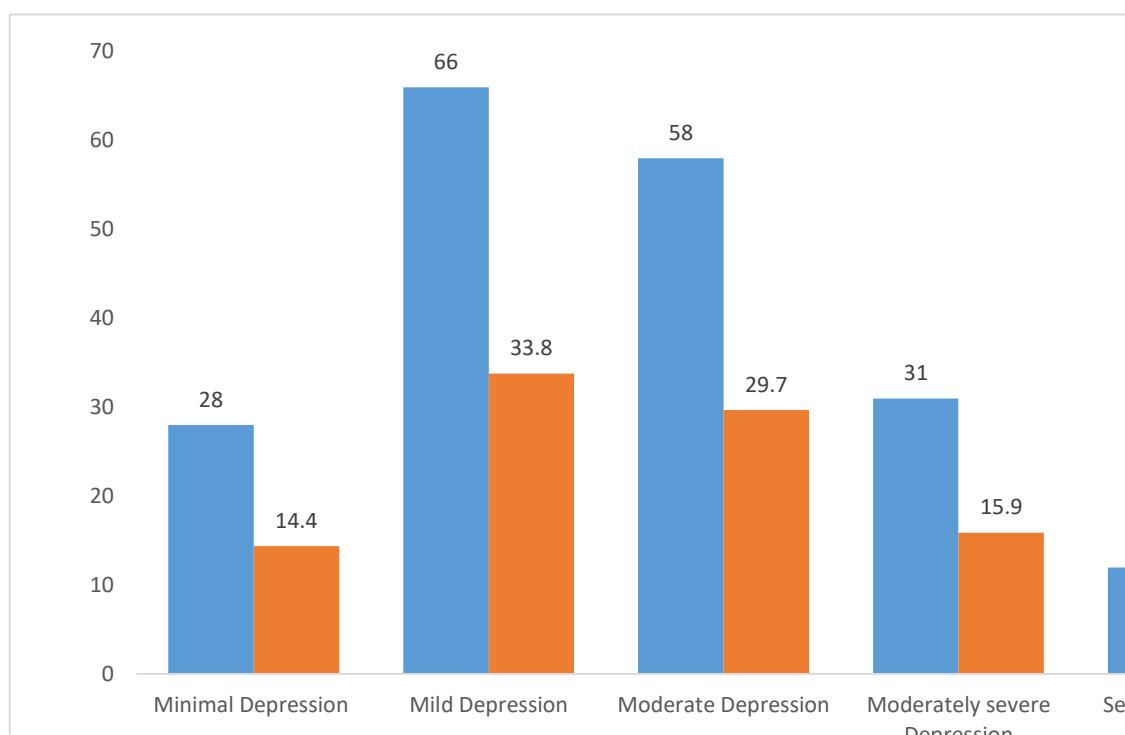


Chart No.10 Severity Category of Depressive Symptoms among Participants.

DISCUSSIONS

In the Research study most of the participants are in the younger-old age range, with the largest proportion aged 65 to 69 years and a mean age of 69.5 years. Males constituted nearly three-fourths of the study population and rural residents formed the majority. In this research half of the participants had COPD for nearly 5.1 to 10 years, most of the patients were in GOLD stage II or III, and Grade 2 dyspnea was the most frequent mMRC category. More than half of the patients had experienced at least one exacerbation in the previous year, and about one-fifth had been hospitalized. In the present study, the mean PHQ-9 score was 9.27 ± 4.82 , with a median of 9 and an interquartile range of 6 to 13, indicating a clinically meaningful burden of depressive symptoms in this geriatric COPD cohort. Only 14.4% of participants were in the minimal category, whereas 33.8% had mild, 29.7% had moderate, 15.9% had moderately severe, and 6.2% had severe depressive symptoms. Thus, 85.6% of the study population had depressive symptoms beyond the minimal level. This suggests that depressive symptom burden in our hospital-based elderly COPD population is substantial and should not be viewed as incidental. Our findings indicate that depressive symptom severity in geriatric COPD patients is more closely linked with current diseases like burden, dyspnea, oxygen dependence than with recent exacerbation or hospitalization counts alone. This strengthens the case for integrating routine depression screening into COPD assessment, especially in elderly patients with advanced disease, prominent breathlessness, and poor adherence patterns.

LIMITATIONS OF THE STUDY

The present study has certain limitations that should be considered while interpreting the findings. First, the study employed a hospital-based cross-sectional design. Second, the study was conducted in a single tertiary care hospital. As a result, the findings may reflect the profile of patients attending that institution and may not be fully generalization to all geriatric COPD populations, particularly those in primary care, community settings, or other geographical regions.

The hospital-based nature of the study may also have led to the inclusion of patients with relatively greater disease burden or treatment complexity compared with the broader COPD population. Third, depressive symptoms were assessed using the PHQ-9, which is a validated screening instrument but not a diagnostic psychiatric tool. Thus, the study identifies the burden and severity of depressive symptoms rather than establishing a formal clinical diagnosis of depressive disorder. In addition, some PHQ-9 items, such as fatigue, sleep disturbance, and reduced energy, may overlap with symptoms commonly experienced in COPD, which could influence the observed scores. Fourth, selected variables such as smoking history, biomass exposure, exacerbation history, and hospitalization history were based partly on patient self-report and medical records, which may be subject to recall bias or documentation limitations.

CONCLUSION

The findings showed that depressive symptoms were highly prevalent in the study population, with the majority of participants having depressive symptoms beyond the minimal level on PHQ-9 assessment. Mild and moderate depressive symptoms were the most common categories, indicating a considerable mental health burden among elderly patients with COPD. The study further demonstrated that depressive symptom severity was significantly associated with sex, marital status, smoking status, GOLD stage, mMRC dyspnea score, oxygen therapy use, number of COPD medications currently used, and medication adherence. In contrast, age, educational status, residence, biomass exposure, duration of COPD, exacerbation history, hospitalization history, polypharmacy, and comorbidity-related variables did not show statistically significant associations in the present study. These findings suggest that depressive symptoms in geriatric COPD patients may be more closely linked with current respiratory burden, treatment-related complexity, and selected social factors than with comorbid conditions alone. The findings of this study may contribute to improving hospital-based screening practices and promoting integrated care for geriatric patients with COPD.

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