

Helplessness in Chronic Obstructive Pulmonary Disease Patients: Assessment and Correlation with Sociodemographic Factors and Spirometry-based Severity

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Abstract

Introduction: Mortality attributable to chronic obstructive pulmonary disease (COPD) in India is estimated to be among the highest in the world. Although identification and management of symptoms and signs of chronic lung diseases have improved, the psychosocial burden is often unrecognized and neglected. Psychological distress increases dependence on others, causes less effective self-management and longer hospital stays, and is known to greatly influence the disease progression. **Aim:** The aim of this study is to assess the degree of helplessness among COPD patients and establish its correlation with sociodemographic factors and disease severity. **Subjects and Methods:** This was a cross-sectional study carried out in a secondary care hospital of Delhi. A predesigned, pretested COPD Helplessness Index (CHI) questionnaire was administered to 224 participants aged 40 years or above, after obtaining informed consent. Global Initiative for Chronic Obstructive Lung Disease staging system for COPD was used to categorize patients according to their disease severity. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) software version 17.0. Moreover, $P < 0.05$ was considered significant. **Results:** CHI was found to be directly related with COPD severity ($P < 0.001$). Elderly patients, males, illiterates, and smokers were found to have a higher CHI score showing helplessness in study participants. **Conclusions:** There is a strong correlation between helplessness and pulmonary function with age, gender, literacy, and smoking status having a significant influence on the psychological state of COPD patients. An integrated effort on the part of the patients, doctors, and the society is required to reduce the burden of COPD.

Keywords: Chronic Obstructive Pulmonary Disease Helplessness Index, chronic obstructive pulmonary disease, helplessness, psychosocial

INTRODUCTION

The WHO defines chronic obstructive pulmonary disease (COPD) as a lung disease characterized by progressive and irreversible chronic obstruction of lung airflow that interferes with normal breathing.^[1] COPD is a major cause of morbidity and mortality across the globe responsible for 5% of all deaths in 2015.^[1] It is estimated that by 2030, COPD will become the third leading cause of death worldwide.^[1] Low- and middle-income countries such as India shoulder much of the burden with 90% of the total COPD-related deaths, where effective strategies for prevention and control are not always implemented or accessible.^[1,2]

Despite this enormous health burden, COPD remains an under-researched disease in India with lack of awareness among patients regarding prevention and care. COPD involves a gradual and progressive decline in the lung

function which results in increased dyspnea. The experience of breathlessness can be distressing and difficult to understand and control. A significant correlation has been established in the development of psychiatric comorbidities such as depression and anxiety in chronic diseases because of its impact on daily activities, sleep, and social life of patients.^[3-6] Although identification and management of the physical signs and symptoms of chronic lung diseases have improved, the psychosocial burden is often unrecognized and neglected. Maurer *et al.* suggested that the prevalence of psychological

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comorbidities is more in COPD compared to other chronic disorders.^[7]

Psychological factors can create a vicious cycle by escalating breathlessness, physiological arousal, and panic. It has been shown that there is a strong correlation between psychological factors and reported levels of dyspnea in the advanced stages of COPD.^[8] The presence of psychological distress creates greater dependence on others, less effective self-management of respiratory symptoms, and longer hospital stays. Psychological factors may also be a risk factor for exacerbation of pulmonary disorders.^[8]

COPD Helplessness Index (CHI) is a new tool to measure helplessness among patients with COPD and is associated concurrently with psychological health status, as developed and validated by Omachi *et al.*^[9]

Patient self-management is believed to be a key element of successful COPD treatment.^[10] However, self-management practices in COPD can be complex and burdensome. Psychological factors play a role in how well patients respond to attempts to improve self-management skills in COPD. Physical conditioning and social support have been shown to be associated with brief inpatient period and better rehabilitation in these patients.^[11] If patients are to live with chronic disease and maintain a good quality of life, it is imperative that these issues are not only recognized but also managed.

We, therefore, sought to assess, in a specific Indian context, helplessness in COPD patients and its correlation with disease severity and sociodemographic factors and design suitable management strategies. This will enable us to help patients cope better in their lifelong struggle with this debilitating disease.

SUBJECTS AND METHODS

This was a cross-sectional observational study carried out over a period of 4 months (November 20, 2016–March 20, 2017). Two hundred and twenty-four clinically prediagnosed COPD patients attending the Chest Outpatient Department of Deep Chand Bandhu Government Hospital, New Delhi, during the study period were enrolled. An informed consent was obtained from every patient.

Inclusion criteria

Adult cases of clinically prediagnosed COPD with or without complications, aged 40 or above, were included in the study.

Exclusion criteria

Patients with comorbidities arising from causes other than COPD such as renal failure, hepatic failure, known psychiatric illness, and all types of diabetes were excluded from the study.

Data were collected using previous hospital/medical records after getting informed consent. A predesigned, pretested CHI questionnaire was then administered, and the responses were recorded.

Baseline questionnaire

This consisted of questions related to sociodemographic factors such as name, age, sex, occupation, religion, literacy, and smoking status.

Chronic Obstructive Pulmonary Disease Helplessness Index questionnaire

CHI is an internally consistent and valid measure, concurrently associated with health status and predictively associated with COPD exacerbation. The CHI questionnaire consists of 15 questions related to self-management of COPD. Each item was rated using a 0–4-point format by selecting one of the following response categories: “strongly agree,” “agree,” “neutral/neither agree nor disagree,” “disagree,” or “strongly disagree.” In its final form, CHI has a score range of 0–60, with higher scores reflecting greater helplessness.^[9]

Pulmonary function test

Spirometry was performed, and forced expiratory volume in the first second (FEV₁) was determined for each study participant. FEV₁ (% predicted), i.e., maximal amount of air one can forcefully exhale in 1 s was used to determine the severity of COPD.

Data entry and analysis

Severity of COPD was classified based on FEV₁ (Global Initiative for Chronic Obstructive Lung Disease [GOLD], a validated system that classifies people with COPD based on their degree of airflow limitation) in four categories indicating severity of COPD (GOLD 1 \geq 80; GOLD 2 = 50–79; GOLD 3 = 30–49, and GOLD 4 \leq 30).^[12]

The data were entered into the SPSS Inc. Released 2008. SPSS Statistics for Windows, Version 17.0. (Chicago, USA: SPSS Inc.) and summarized through frequency distributions. Suitable graphs were made to enhance visual appeal. Quantitative variables were summarized in terms of mean \pm standard deviation, and their correlations with qualitative variables were established using either ANOVA or unpaired *t*-test. $P < 0.05$ was considered to be statistically significant.

RESULTS

General characteristics of the study population

There were 176 males (78.6%) and 48 females (21.4%). A maximum number of COPD patients (72, 32.1%) were in the age group of 60–69 years followed by those in \geq 70 years' age group (54, 24.1%). Figure 1 shows the age-wise and gender-wise distribution of patients.

The study population consisted of 132 Hindus (58.93%) and 92 Muslims (41.07%). Among the study participants, 154 COPD patients (68.8%) were illiterate. About 75.9% of participants were present or past smokers with maximum being former smokers (=96, 42.9%) and maximum number of patients (41.1%) belonged to GOLD Stage 3 (FEV₁% predicted = 30%–49%) followed by Stage 4 (FEV₁% predicted $<$ 30%) with 28.6% of patients [Table 1].

The mean of CHI score for the study participants is 26.59 ± 7.62 .

Table 1 shows correlation of CHI with sociodemographic factors and COPD severity. The CHI score was significantly higher among males than females (23.33 ± 7.35 , $P = 0.001$), among Hindus as compared to Muslims, in illiterates as compared to literates [Table 1]. CHI score was found to be highest among current smokers as compared to other categories. The difference in CHI score between the groups based on smoking status was found to be statistically significant ($P < 0.001$).

Increasing severity of COPD was linked to a higher CHI score showing helplessness with $P < 0.001$. Age has a significant correlation with FEV₁% predicted ($P < 0.001$) [Figure 2] as well as CHI score ($P = 0.019$) [Figure 2], i.e., if age is increasing, the value of FEV₁% predicted will also decrease.

Table 1: Correlation of Chronic Obstructive Pulmonary Disease Helplessness Index score with sociodemographic factors such as gender, religion, smoking status and education, and severity of chronic obstructive pulmonary disease

Parameter	Category	n	Mean±SD	Range	P
Gender	Male	176	27.48±7.47	11-45	0.001
	Female	48	23.33±7.35	13-37	
Religion	Hindu	132	27.47±7.74	12-45	0.038
	Muslim	92	25.33±7.3	11-40	
Smoking status	Nonsmoker	54	23.56±7.3	11-40	<0.001
	Former smoker	96	26.39±7.27	12-45	
	Current smoker	74	29.07±7.53	14-44	
Education	Illiterate	154	27.86±7.2	12-45	<0.001
	Literate	70	23.8±7.82	11-37	
GOLD stages of COPD severity	1. ≥80%	8	12.25±1.17	11-14	<0.001
	2. 50%-79%	60	19.23±3.61	13-26	
	3. 30%-49%	92	26.33±3.82	17-33	
	4. <30%	64	35.66±3.28	30-45	

COPD: Chronic obstructive pulmonary disease, GOLD: Global Initiative for Chronic Obstructive Lung Disease, SD: Standard deviation

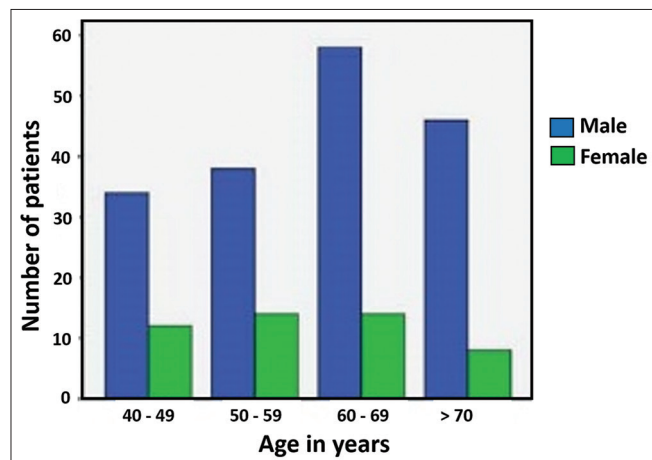


Figure 1: Age- and gender-wise distribution of the study participants

Similarly, with increase in age, the value of CHI will also increase. Furthermore, FEV₁% is significantly correlated with CHI score ($P < 0.001$) i.e. FEV₁ decreases with increase in CHI score [Figure 3].

DISCUSSION

The present study examines correlation of helplessness in COPD patients with disease severity and sociodemographic factors by the use of CHI score. The mean CHI showed a consistent and statistically significant ($P < 0.05$) increase with rising severity (measured as per the GOLD guidelines). This can be attributed to increasing inability to work leading to low self-esteem, sense of worthlessness, financial burdens of the disease, poor mobility, social isolation, and loss of independence with rising severity. The inability to carry out daily living activities makes the patient very dependent on others. This is consistent with a study by van Manen *et al.* in 2002 according to which risk of depression in COPD patients was found to be 2.5 times greater for severe COPD when compared to patients in the control group.^[13]

The mean CHI was found to be significantly higher among illiterate patients as compared to the literates. This can be attributed to the lack of awareness about the disease, treatment modalities, inability to comprehend and follow the guidelines, and lifestyle changes recommended by the physician, and hence, such individuals are more likely to be noncompliant.^[14] Such patients are likely to under-use maintenance therapy, and symptom-relieving drugs are often overused.^[14,15] Studies in asthma and COPD have shown that adherence can be <50% of prescribed medication.^[14]

Analysis showed a relationship of CHI with age and higher age showing a higher CHI score. Problems of the elderly include dependence on family members for hospital visits and lack of support due to growing nature of nuclear families in urban India. In addition, due to cognitive impairment in elderly COPD patients, much of what is said in any medical consultation is forgotten soon after it ends.^[16,17]

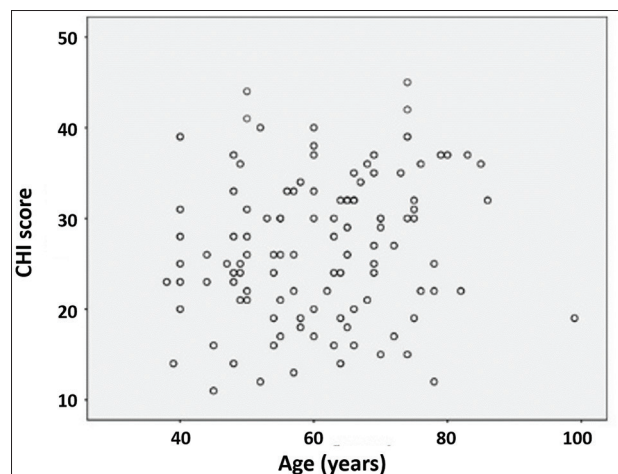


Figure 2: Correlation between age and Chronic Obstructive Pulmonary Disease Helplessness Index score

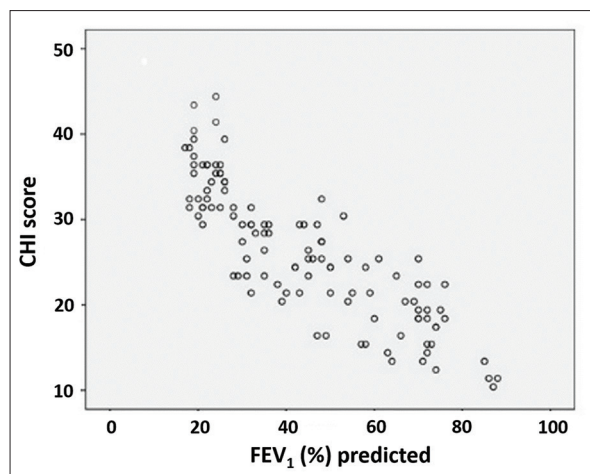


Figure 3: Correlation between volume in the first second (%predicted) and Chronic Obstructive Pulmonary Disease Helplessness Index score

This result is in contrast to the findings of other studies in which young patients present greater levels of anxiety, and older patients report fewer emotional problems (depression, rage, and frustration) as they present less suffering in coping with the disease.^[18-22]

A study revealed a significant correlation between mean CHI score and smoking status and the score being higher in former and current smokers than in nonsmokers. The risk of depression in COPD patients is twice as high among smokers as compared to nonsmokers, and the inability to quit is one of the major contributing factors for helplessness.^[23-27]

The limitations of the study were a few: (1) other sociodemographic factors such as occupation and economic status which can also influence CHI were not assessed. (2) Since the study was done in nonrandomly selected government hospitals, selection bias might be present. (3) Hence, the findings cannot be a reflection of the general population. Only spirometry-derived FEV₁ was considered to determine severity from the GOLD 2017's ABCD assessment tool. The assessment of symptoms/risks of exacerbation was not considered.

CONCLUSIONS

As concluded in the study, COPD progression is intricately linked with the development of helplessness, frustration, and hopelessness. The following measures should be taken to battle the psychological problem in COPD: (1) physicians should be alert of the psychological effects of chronic airway diseases, (2) the patients should be counseled regarding life-style changes, engagement in physical activity and seeking help from family should be stressed upon, (3) the management of psychological problems such as depression and anxiety in COPD patients must be included as a part of undergraduate education, (4) national program for chronic airway disorders must be revised to include standardized protocol associated mental health problems, (5) COPD

patients should be educated about the management of the disease and symptoms such as depression and anxiety, and (6) family and peers must also be counseled to provide support to the patient. Alleviation of the helplessness associated with the disease requires an integrated effort on the part of the patients, doctors, and the community.

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Conflicts of interest

There are no conflicts of interest.

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