

## Research Article



## A Prospective Study on Assessment of Prevalence of Depression and Impact of Patient Counseling on Knowledge, Attitude and Practice of Patients With COPD in A Multispecialty Tertiary Care Hospital

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### ABSTRACT

A hospital based prospective observational study was done at a tertiary care hospital over a period of six months to assess the severity of dyspnoea, depression and knowledge, attitude, and practice (KAP) of COPD patients. About 100 physician diagnosed COPD (Chronic obstructive pulmonary disease) patients were included in the study. Modified medical research council dyspnoea scale, Hamilton depression rating scale and suitably designed KAP questionnaire were used for data collection. Data were collected from case records and direct interview method. A counseling was provided to all the participants about disease, life style modification and medication use. From the study, it was found that majority of the patients (44%) were affected with Grade-3 dyspnoea and 88% patients were affected with depression. A positive correlation between the severity of dyspnoea and depression was identified. A significant relationship between depression with age and smoking status was also identified. After counseling assessment indicated that the KAP was significantly increased comparing with before counseling assessment. This study point out the need of clinical pharmacist along with other health care professionals for implementing adequate therapeutic strategies for the management of co morbid depression in COPD patients for improving clinical outcomes and better quality of life of patients.

**Keywords:** COPD, Dyspnoea, Depression, KAP, Patient counseling.

### INTRODUCTION

According to the Global initiative for chronic obstructive lung disease (GOLD), chronic obstructive pulmonary disease (COPD) is a preventable and treatable one with few significant extra pulmonary effects that leads to severity in individual patients<sup>1</sup>. It is a slowly progressing disease characterized by air flow obstruction with the symptoms of persistent cough, exertional dyspnoea and wheezing<sup>1, 2</sup>. Prolonged exposure to noxious gases, smoking of tobacco and industrial pollutants are the major factors responsible for the development of COPD<sup>3, 4</sup>. In COPD, neutrophils, macrophages and T-lymphocytes are increased in various parts of lung which is facilitated by inflammatory mediators such as cytokines, chemokines and oxidants which may responsible for bronchitis and emphysema, the major pathologic abnormalities of COPD<sup>4</sup>.

COPD remains a major public health problem<sup>5</sup> and it is the second most common non infectious disease in the world<sup>3</sup>. Exacerbations of COPD are a notable cause of considerable morbidity and mortality<sup>6</sup>. Globally, it is a major cause of long term morbidity and mortality and in the United States; it is the fourth leading cause<sup>5</sup>. It accounts 5% of all deaths worldwide and in 2020 it will be the third leading cause of death globally<sup>2</sup>. In India, it represents 2.8% of total deaths in the year of 1990 and expects to rise to 6.5% in the year of 2020<sup>3</sup>.

Depression is one of the serious concerns among many other aspects of COPD. Prolonged hospitalization, impaired physical and social activities may lead to depression. However, patients with depression also make

some attempts to improve their health. So that, assessing the symptoms of depression is an important part of comprehensive COPD treatment. Inadequate care and treatment of depression leads to poor quality of life and premature death<sup>7-11</sup>.

Beliefs about illness as well as medicines may influence the patient compliance. Also, the state of basic education and general knowledge about the illness and treatment may influence the health and therapeutic outcome and enhance the patient compliance. With this view, the present study was designed to evaluate the prevalence of depression and to assess the impact of counseling on the knowledge, attitude and practice (KAP) of the COPD patients.

### METHODS

With proper approval from institutional ethical committee (R/ADMIN-08/0), a prospective observational study was conducted for a period of six months from January-2017 to June-2017 in the Department of pulmonary critical care and sleep medicine, Cosmopolitan Hospitals Pvt. Ltd., Thiruvananthapuram, Kerala, south India. The inclusion criteria consist of patients of both sexes in the age group of 45-65 years diagnosed with COPD. Totally 100 in-patients willing to participate were enrolled in the study. Patients with incomplete medical records, affected with other psychiatric disorders and admitted in critical condition were excluded from the study. The participants were informed about the study and their consent was obtained in prescribed format. All information relevant to study was collected from case records and direct interview with patients. The



demographic characters, clinical based details such as duration of disease, number of drugs in usage, their dose and frequency were documented in the pro forma.

Severity of dyspnoea among study subjects was assessed by using Modified medical research council (MMRC) dyspnoea scale. Based on this scale, the severity of dyspnoea was grouped in to 4 grades which are shown in Table 1.

**Table 1:** The modified medical research council (MMRC) dyspnoea scale

Grade of dyspnoea	Description
0	Not troubled by breathlessness except on strenuous exercise
1	Shortness of breath when hurrying on the level or walking up a slight hill
2	Walks slower than people of the same age on the level because of breathlessness or has to stop for breath when walking at own pace on the level
3	Stops for breath after walking about 100m or after a few minutes on the level
4	Too breathless to leave the house or breathless when dressing or undressing

Level of depression of study subjects was assessed by using Hamilton depression rating scale (HAM-D). This scale classify the depression of patient in to several category based on the score obtained. The score of 0-7 indicates the patients are normal, 8-13 indicates the mild depression, 14-18 indicates moderate depression, 19-22 indicates severe depression and the score of 23 & above indicates very severe depression. Assessment was done by interview with the concerned patient or their caregivers. The knowledge, attitude and practice (KAP) of the study subjects was assessed by using suitably designed questionnaire. After assessment, counseling was provided to each patients about disease, life style modification and medication usage with the aid of suitable validated patient information leaflet. After completion of counseling, once again the assessment of KAP of the patients was conducted to identify the impact of counseling. The collected data was analyzed by using SPSS (statistical package for the social sciences) software (version 16.0). The effect of patient counseling on KAP was plotted using Paired T-test.

## RESULTS

A prospective observational study was conducted for a period of six months from January-2017 to June-2017, among the 100 COPD in-patients of Department of Pulmonary Critical care and Sleep Medicine, Cosmopolitan Hospitals Pvt. Ltd., Thiruvananthapuram, Kerala, south India. Information was collected by direct interview method and the data collected was analyzed by using SPSS software.

The demographic data of study subjects showed that majority of them, 67 patients (67%) were males and remaining 33 patients (33%) were females. Regarding with age, the results showed that 60 of 100 study subjects (60%) were aged between 61-65 years, 20 patients (20%) belong to 56-60 years age group. 11 patients (11%) were come under 45-50 years and only 9 patients (9%) were aged between 51-55 years age group. It was found that majority of the study subjects were educated. 28 candidates (28%) were studied up to high school level. 26 candidates (26%) were completed higher secondary level. 18 candidates (18%) were graduates, 12 candidates (12%) were completed primary school level. 10 participants (10%) were post graduates and only 6 candidates (6%) were illiterates. Among 100 patients, 56 candidates (56%) had smoking habit and only 44 patients (44%) were non-smokers. Analysis of duration of prevalence of COPD among study subjects revealed that 63 patients (63%) had the history of illness for more than 5 years and only 37 patients (37%) had the duration of less than five years (Table 2).

**Table 2:** Baseline data of COPD patients under study

Variables	Count	Percentage (%)
<b>Age</b>		
45 – 50	11	11.0
51 – 55	9	9.0
56 – 60	20	20.0
61 – 65	60	60.0
<b>Sex</b>		
Male	67	67.0
Female	33	33.0
<b>Smoking Habit</b>		
Smokers	56	56.0
Non-smokers	44	44.0
<b>Duration of COPD</b>		
Less than 5 years	37	37.0
More than 5 years	63	63.0
<b>Educational status</b>		
Illiterate	6	6.0
Primary	12	12.0
High school	28	28.0
Higher secondary	26	26.0
Graduation	18	18.0
Post graduation	10	10.0

From the results of dyspnoea severity assessment; it was found that 12 patients (12%) were come under Grade-0 category. The number of patients came under Grade-1 category was 16 (16%). 19 patients (19%) had Grade-2 level of dyspnoea. 44 patients (44%) were affected with Grade-3 dyspnoea. Only 9 patients (9%) were affected with Grade-4 level of dyspnoea. Analysis of severity of depression revealed that 12 patients (12%) were normal.



16 patients (16%) were found with mild depression. 20 patients (20%) were affected with moderate depression. 40 patients (40%) had severe depression and 12 patients (12%) were very severely depressed. From this result it was clear that 88 out of 100 patients (88%) were depressed and only 12 patients (12%) were non-depressed.

The results of analysis of association between depression and smoking habits are shown in Table 3. It showed that smokers were mainly affected with depression. 94.6% of depressed patients were smokers and only 5.4% of smokers were non-depressed.

**Table 3:** Association between depression and smoking status of study subjects

	Non depressed		Depressed		$\chi^2$	p
	Count	Percentage	Count	Percentage		
Non smokers	9	20.5	35	79.5	5.32*	0.021
smokers	3	5.4	53	94.6		

\* - Significant at 0.05 level

It was also found that a significant association between depression and age was exist. The results showed that most of the depressed patients were elder (96.7%). They belong to 61-65 years age group (Table 4).

**Table 4:** Association between depression and age of study subjects

Age	Non depressed		Depressed		$\chi^2$	p
	Count	Percentage	Count	Percentage		
45 -50	8	72.7	3	27.3	43.62**	0.000
51 - 55	1	11.1	8	88.9		
56 - 60	1	5.0	19	95.0		
61 - 65	2	3.3	58	96.7		

\*\* - Significant at 0.01 level

Table 5 shows the relationship between the severity of dyspnoea and depression. The results showed that nine (75%) 0-Grade dyspnoea patients were in non-depressed stage. However 3 patients (25%) of this grade were affected with mild depression. 3 patients (18.8%) of Grade-1 dyspnoea were normal in terms of depression, 12 patients (75%) of this grade were affected with mild depression and only one patient (6.3%) of this grade was moderately depressed. 17 moderately depressed patients (89.5%) were fall under Grade-2 dyspnoea category. From this grade, one patient (10.6%) present in each category

of mild and severe depression. It was noted that Grade-0 and 1 category patients were neither severely nor very severely depressed. Only one patient of Grade-2 dyspnoea was severely depressed but this count was increased to 38 (86.4%) in Grade-3 dyspnoea patients. 4 patients (9.1%) of Grade-3 were very severely depressed. Grade-4 dyspnoea patients were not found in normal, mild and moderate depression category. Only one patient (11.1%) of this category was severely depressed, but 8 patients (88.9%) were very severely depressed.

**Table 5:** Relationship between the severity of dyspnoea and depression among study subjects

Severity of dyspnoea	Severity of depression									
	Normal		Mild		Moderate		Severe		Very severe	
	Count	%	Count	%	Count	%	Count	%	Count	%
Grade - 0	9	75.0	3	25.0	0	0.0	0	0.0	0	0.0
Grade - 1	3	18.8	12	75.0	1	6.3	0	0.0	0	0.0
Grade - 2	0	0.0	1	5.3	17	89.5	1	5.3	0	0.0
Grade - 3	0	0.0	0	0.0	2	4.5	38	86.4	4	9.1
Grade - 4	0	0.0	0	0.0	0	0.0	1	11.1	8	88.9

r = 0.948; p = 0.000

In the KAP assessment, it was found that the KAP of the patients were poor before counseling, but it was significantly improved after counseling. The results are shown in Table 6. The mean value of knowledge score was 1.2 before counseling but it was increased to 3.5 after counseling. The same scenario was found in the

mean scores of attitude and practice part also. In attitude section the mean value of score was 2.4 before counseling. But it reached 9.3 after counseling. Similarly the 0.7 mean score of practice part before counseling was increased to 4.4 after counseling.

**Table 6:** KAP of study subjects before and after counseling

Variable	Before counseling		After counseling		N	Mean difference	Paired t	p
	Mean	SD	Mean	SD				
Knowledge	1.2	0.8	3.5	0.5	100	2.3	28.83**	0.000
Attitude	2.4	1.0	9.3	0.8	100	6.9	55**	0.000
Practice	0.7	0.7	4.4	0.6	100	3.7	42.07**	0.000

\*\*Significant at 0.01 level

## DISCUSSION

In the present study, it was found that the majority of patients were males (67%) comparing with females (33%). This may be due to the increased risk of smoking among males than females. Similar result were observed in a previous study conducted by Harish Negi *et al.* In that study, out of 126 COPD patients 93 (73.81%) were males and 33 (26.19%) were females. The results of the study conducted by Chavannes NH *et al* showed that out of 147 patients 111 (76%) were males and 36 (24%) were females. Similar results were observed in studies of Jennifer A Cleland *et al*, Ivan Duenas-Espin *et al*, Quint JK *et al* and Nobuyuki Horita *et al*.

The results showed that majority of patients were in the age group between 61-65 years (60%). It suggests that the risk for developing COPD increases with age. This finding was supported by the report of Nobuyuki Horita *et al.* It showed that the average age was  $72.0 \pm 9.0$  years. A study conducted by Quint JK *et al* also showed that the mean age was  $70.9 \pm 8.6$ .

The results of smoking status assessment revealed that the percentage of smokers (56%) was higher compared to non-smokers (44%). All the female participants were non-smokers. This suggests that development of COPD has a strong link with smoking. That is smoking is a prominent cause and risk factor for COPD. The result of this study was supported by the reports of Ivan Duenas-Espin *et al*, Chavannes NH *et al* and Harish Negi *et al*.

The results indicated that more number of patients (63%) having the duration of illness more than five years which indicates the chronic nature of this disease. It was found that most of the patients were studied up to high school level (28%) followed by higher secondary (26%), degree (18%), primary (12%) and post graduation (10%). Only 6% of participants were illiterates. This result may vary in accordance with the area of living, economic status etc. The present study indicated that the educational status has no relationship with the development of COPD.

In this study, it was identified that more number of patients (44%) were affected with Grade-3 dyspnoea. Grade-4 severity was least observed because the present study excluded critically ill patients and generally, most of the Grade-4 dyspnoea can found in critically ill patients and in that condition they cannot communicate effectively. The result of present study on dyspnoea was in agreement with a previous study conducted by Harish

Negi *et al*, it showed that about 34.1% patients were affected with Grade-3 dyspnoea. On the contrary, the results of the study conducted by Jennifer A Cleland *et al* showed that Grade-2 was more observed (41.2%) compared to Grade-3 dyspnoea (39.2%).

In the present study, it was found that majority of patients were severely depressed (40%), followed by moderately depressed (20%), mild depression constitute 16% and 12% were normal. Another one 12% were very severely depressed. Summarily, 88% patients were affected with depression and only 12% patients were non-depressed. The depression was associated with age and smoking status. It was found that 96.7% depressed patients were belonging to 60-65 years age group which clearly indicates the relationship between increases of age with depression. This may be due to reduced physical activity, reduced social contact and presence of other comorbidities in elder patients. On agreement with this result, the study conducted by Chavannes NH *et al* reported that major depressive symptoms were seen in elder patients comparing with normal adults. But no association between age and depression was found in the study conducted by Harish Negi *et al*. The percentage of smokers among depressed patients were higher (94.6%) comparing with non-smokers (79.5%). This indicated that smoking has a significant effect on the development of depressive symptoms among COPD patients. But contradictory results were presented by the studies conducted by Harish Negi *et al*, and Chavannes NH *et al*. They stated that smoking behavior did not remain associated with depressive symptoms. The present study was unable to find out the relationship between depression and gender as the number of male and female patients were not equal.

The present study identified that when the severity of dyspnoea increases, the severity of depression also increases simultaneously. There was a positive correlation between the two variables ( $r = 0.948$ ) and the relationship was significant at 0.01 level ( $p = 0.000$ ). As the severity of dyspnoea increases the patient itself feels it like a burden. Moreover, severe dyspnoea affected patients are unable to walk even a short distance. This in turn creates a feeling of not worthy in individuals such that they are becoming a burden to their family, relatives and society and they are not good for any others. This negative thoughts progresses and leads to depression. The study conducted by Harish Negi *et al* also reported similarly. It states that dyspnoea was significantly



associated with development of depressive symptoms. There is often a negative emotional balance associated with COPD, patients feel guilty that they did not cease smoking, feel that there is a stigma attached with the disease and often have feelings of frustration, fear and hopelessness. A study conducted by Nobuyuki Horita *et al* showed strong link between dyspnoea and depression. The positive predictive value in this study was 0.73 for MMRC dyspnoea score of 2.5

The results showed that there was a poor score on KAP of patients before counseling which reflected the lack of knowledge about COPD. There was no significant differences in the KAP score of patients on the basis of educational status. But a significant increase of KAP score was observed in after counseling assessment. Similar results were observed in the study of Thomas Reema *et al* and Raksha Thakrar *et al*. From this, it was clear that, the patient education improved the KAP of the patients and they were able to answer satisfactorily to the same questions which were posed during baseline.

### CONCLUSION

The present study was conducted to assess the level of dyspnoea and depression among COPD patients and the relationship between them. The present study revealed a positive correlation between the severity of dyspnoea and depression. It was also found that smoking and age of the patients had a strong link with the development of depression. Understanding the nature of depressive symptoms and its proper treatment is important for improving the patients' quality of life. Importantly, the data suggest that the diagnosis and treatment for depression should be considered for all COPD patients. Because the depression may remain easily undiagnosed due to under presentation and the symptoms are not very specific. The present study also assessed the KAP of the patients and the impact of counseling on it. The baseline KAP suggested that the patients had a poor perception of their disease. Patient education improved the KAP of the patients and they were able to answer satisfactorily to the same questions that were posed during baseline. The result showed a significant improvement after counseling. For patients with COPD, health education focusing on disease and need for long term treatment, provided by the clinical pharmacist plays an important role in improving the ability to cope up with illness and health status. It is also effective in accomplishing certain goals including smoking cessation. Pharmacists are in an ideal position to provide patient education and optimize patient care. Greater understanding about the illness and a change in the attitude and practice would in turn results in a better therapeutic outcome. For future research, the study

should be done with larger sample size and for longer duration as multicenter study.

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