

## ORIGINAL ARTICLE

# Effects of Anxiety, Depression and Health Status on Hospitalized COPD Patients: A Study in DMCH

Mohammad Aminul Islam<sup>1</sup>, Adnan Yusuf Choudhury<sup>2</sup>, Biswas Akhtar Hossain<sup>3</sup>, Md. Mohiuddin Ahmad<sup>4</sup>, Hena Khatun<sup>5</sup>, Md. Osman Goni<sup>6</sup>, Biswas Shaheen Hassan<sup>7</sup>

### Abstract

*Anxiety depression and poor health status is common complaints of COPD patients, not least if they have history of repeated hospitalization for exacerbations. The aim of this study was to analyze the interrelationship between health status, anxiety, depression and physical status in discharged COPD patients after hospitalization. It was a prospective study of 118 patients in the indoor of Dhaka Medical College Hospital. Data included demographic information, lung function and co-morbidity. The hospital anxiety and depression scale and St. George's Respiratory questionnaire (SGRQ) were applied to all patients. Among the COPD patients health status was poor those with anxiety, depression or both. Higher GOLD stages were significantly associated with increasing impairment in health status. In conclusion, patient with psychological disorders have poor health status. Anxiety and depression screening may help to identify patients with poor quality of life and an urgent need for intervention in order to improve their health status.*

*[Chest & Heart Journal 2016; 40(1) : 1-5]*

### Introduction

Chronic obstructive pulmonary disease (COPD) is associated with intermittent exacerbations characterized by acute deterioration in the symptoms of chronic dyspnoea, cough and sputum production. These acute exacerbations are the main cause for hospitalization in COPD patients and they are also associated with deterioration in health status and lung function.<sup>1 and 2</sup> Health status is a very important outcome variable. To evaluate health status valuable questionnaires have been developed that are used mainly for research purposes on groups.<sup>3</sup> This has been done

in epidemiological studies and in studies on medications and in evaluating the efficacy of new drugs<sup>4, 5 and 6</sup> including large trials with inhaled corticosteroids and long-acting anticholinergic medications.<sup>6, 7 and 8</sup> Other factors are also important for the well-being of the COPD patient, including psychological status. Depression has been described with increased frequency in patients with COPD.<sup>9</sup> Anxiety is also important in patients with chronic diseases, especially if the disease can be life threatening as is COPD.<sup>10</sup> Anxiety and depression can be evaluated with a questionnaire that is short and easy to administer.<sup>11</sup> A study on

1. Assistant Professor, Respiratory Medicine, Dhaka Medical College
2. Assistant Professor, Respiratory Medicine, Dhaka Medical College
3. Associate Professor, Respiratory Medicine, Dhaka Medical College
4. Associate Professor, Respiratory Medicine, NIDCH, Mohakhali, Dhaka.
5. MD (Chest Diseases, Thesis part), NIDCH
6. Assistant professor, Thoracic Surgery, Dhaka Medical College
7. Assistant Professor, Respiratory Medicine, NIDCH, Mohakhali, Dhaka.

**Correspondence to:** Dr. Mohammad Aminul Islam, email: [chest.medicine.aminul@gmail.com](mailto:chest.medicine.aminul@gmail.com))

patients with obstructive lung diseases receiving emergency care found that those with anxiety and depression were at much higher risk of hospitalization or relapse 1 month later.<sup>12</sup> There is limited information on the interrelationships between the measures of health status, anxiety and depression, and physical status. Such knowledge could potentially enable better individual care for patients with COPD.

The aim of this study was to analyze simultaneously in a prospective indoor setting health status, anxiety, depression, physical status and their interrelationships before discharge after hospitalization for COPD exacerbation

### Methods:

This is a prospective study of patients hospitalized with acute exacerbations of obstructive airway disease in the indoor of Dhaka Medical College Hospital.

Patients were included provided that they had been admitted with acute exacerbations of COPD during the year 2015-2016. All patients with asthma were excluded and reported are only data from those fulfilling criteria for COPD according to the Global Initiative for Chronic Obstructive Pulmonary Disease ([www.GOLDCOPD.com](http://www.GOLDCOPD.com)) stage 1 or higher.<sup>2</sup>

The following data were collected at discharge:

1. Questionnaire that included information on smoking history, type of living and family situation (living at home, assisted at home, nursing home, with spouse, alone or with others) in addition to educational level.
2. Spirometry, body weight and height. Predicted values for forced expiratory volume in 1 s ( $FEV_1$ ) and forced vital capacity (FVC) were calculated.
3. Health status was assessed using the disease-specific St. George's Respiratory Questionnaire (SGRQ). It has three components: symptoms, activity and impact, in addition to the total score.<sup>8</sup>
4. From the patient records, information was collected on treatment during the hospitalization and at discharge. Assessment of co-morbidity was based on the diagnosis used by the treating physician. Diabetes mellitus was considered to be present if medications were used for diabetes.

Hypertension, ischemic heart disease or atrial fibrillation were considered to be present when diagnosed by the attending physician and when the patient was using appropriate medications.

### Statistics:

The  $\chi^2$ -test, *t*-test and one-way analysis of variation were used in the univariable analyses, whilst multiple linear regression was used in the multiple variable analyses. SGRQ scores were analysed as a continuous variable and then checked for normality. A *P*-value of <0.05 was considered statistically significant.

### Results:

A total of 118 patients with COPD were enrolled in the study. The demographics of the study patients are shown in Table 1. Of those admitted, one-fourth were current smokers but most of the patients in the study had an extensive smoking history in the past. Women had significantly lower life-time tobacco exposure compared with men. Furthermore, women were more likely to be living alone than men.

Spirometry at discharge was performed in all the patients. The mean  $FEV_1$  was low (38.5% of predicted value) suggesting significant disease. Most of the patients were in stages III and IV. There was a non-significant trend that the men had more severe COPD than women (*P*=0.07). The use of long-term oxygen therapy was relatively high (23.6%) and co-morbidities were common, with nearly half of the patients being diagnosed with cardiovascular disease and 10% having diabetes mellitus. Further details of the study patients are given in Table 1

Almost half of the study population suffered from anxiety and/or depression. Both anxiety and depression were more common in current smokers compared with non-smokers (*P*<0.001) while no significant relationship was found between psychological status and age, education, living conditions, lung function, LTOT or somatic co-morbidity (Table 2)

### Health status

The mean total score on the SGRQ was 58, suggesting overall poor health among these severely affected COPD patients in the study. COPD patients with anxiety, depression or both had significantly higher scores in all domains and the total score of the SGRQ, suggesting a worse

health status than those who did not suffer from psychiatric co-morbidity (Table 3)

### Effects of psychological condition on health condition

Lung function and psychological status both have a large impact on health status as measured by

the SGRQ (Table 4). A significant impairment in health status was seen with decreasing FEV<sub>1</sub> for all domains except symptoms. Depression alone or anxiety with depression had clinically significant effects on all domains and anxiety alone had effects on all domains except symptoms. The effects were substantial

**Table-I**  
*Patients characteristics*

	All	Males	Females	P-value
Number	128	93	35	<.5
Age (years)	69.4±10.4	71.0±9.4	67.8±11.2	0.001
Smokers (%)	25.8	23.6	28.0	0.32
Pack years smoking	33.7±23.9	38.9±27.0	28.8±19.2	<0.0001
College education (%)	30.7	33.3	28.1	0.25
Living alone (%)	52.1	37.6	66.2	<0.0001
FEV <sub>1</sub> (% of predicted)	38.5±18.2	36.4±16.2	40.5±19.7	0.01
FVC (% of predicted)	61.7±20.3	58.7±17.8	64.5±22.1	0.002
Cardiovascular diseases (%)	45.0	48.3	41.7	0.17
Diabetes (%)	10.6	10.2	10.9	0.82

**Table-II**  
*Demographics and psychological disorders.*

	None	Anxiety only	Depression only	Anxiety and depression
Number	23	27	41	37
Women (%)	47.0	56.8	38.7	62.0
Age (years)	70.0±10.7	67.9±9.4	72.3±6.6	67.9±11.3
Smokers (%)	19.4	23.5	23.3	43.0
Pack years smoking	33.3±23.4	34.9±21.4	38.0±35.1	31.4±22.9
College education (%)	31.8	35.8	12.9	31.6
Living alone (%)	19.2	56.8	50.0	48.7
FEV <sub>1</sub> (% of predicted)	39.6±18.4	38.4±19.0	36.6±15.9	39.2±16.9
FVC (% of predicted)	61.1±20.5	64.1±20.0	59.5±13.1	62.1±21.1
LTOT (%)	5.3	23.5	35.5	27.8
CV diseases (%)	41.1	49.4	48.4	53.2
Diabetes (%)	10.4	8.6	16.1	10.1

FEV<sub>1</sub>: forced expiratory volume in 1 s; FVC: forced vital capacity; LTOT: long-term oxygen therapy; CV: cardiovascular.

**Table-III**  
*Health status and psychological condition.*

	All	None	Anxiety	Depression	Anxiety and depression
Number	128	37	28	32	31
SGRQ points					
Symptoms	61.1±20.2	68.0±16.0	69.7±17.4	69.0±17.2	69.0±17.2
Activity	62.7±23.6	69.3±18.8	70.9±19.3	74.7±16.8	74.7±16.8
Impact	40.3±19.1	52.1±18.5	55.9±17.8	53.6±17.9	53.6±17.9
Total	52.3±17.8	61.8±15.0	64.1±14.0	64.2±14.6	64.2±14.6

**Tabl-IV**  
*Relationship between lung function and psychological and health status.*

SGRQ components	Symptoms estimate* (95% CI)	Activity estimate (95% CI)	Impact estimate (95% CI)	Total estimate (95% CI)
FEV <sub>1</sub> (% pred)**	“0.59 (“1.74, 0.57)	“4.10 (“5.33, “2.87)	“2.29 (“3.42, “1.16)	“2.59 (“3.56, “1.62)
Anxiety	3.32 (“1.89, 8.53)	5.77 (0.26, 11.3)	9.49 (4.37, 14.6)	7.09 (2.68, 11.5)
Depression	6.04 (“1.71, 13.8)	5.06 (“3.21, 13.3)	14.8 (7.24, 22.4)	10.3 (3.83, 16.8)
Anxiety and Depression	6.02 (0.68, 11.4)	12.0 (6.25, 17.7)	13.2 (8.02, 18.5)	11.9 (7.39, 16.33)

\*Estimates are regression coefficients derived from multiple linear regression.

## Discussion

The main findings of our prospective study of a small group of COPD patients were that patients being discharged after hospitalization for acute exacerbation had a high prevalence of anxiety and depression and also a poor health status. Women and current smokers were more likely to suffer from more significant anxiety or depression. There was a close relation between health status and psychological condition among these severely affected COPD patients who were close to being discharged from the hospital. Their health status may be expected to improve with increasing time from recovery after their exacerbation<sup>17</sup> but we are not aware of studies on the time course on the interrelationship between health status and psychological condition.

The prevalence of poor health status, anxiety and depression found are in accordance with those of some other studies. In a recent study by van Manen it was shown that the risk for depression in stable COPD patients from general practice was 2.5 times greater in patients with severe COPD (FEV<sub>1</sub><50% of predicted) compared to controls.<sup>18</sup> Living alone, respiratory symptoms and physical impairment were also significantly associated with the risk for depression. In the COPD group, as a whole, 21.6% were depressed compared to 17.5% in the control group. In another study by the same author, where the prevalence of co-morbidity in patients with chronic airway obstruction was studied, depression was found to be more common in the study group than among the controls.<sup>9</sup> Heart disease and diabetes were not more common in the patients with chronic airway obstruction than in the control group. A study from Japan on 218 male patients with COPD of differing severity showed higher scores on SGRQ (worse

health status) with increasing severity of disease<sup>19</sup>; and also a correlation between the HAD scale and SGRQ. In another study, patients with COPD reported anxiety with increased frequency and this correlated with severity of disease.<sup>20</sup> In a recent study, GOLD stages II and higher, marked a dramatic worsening of health status as measured by SGRQ, but psychological status was not analysed simultaneously.<sup>21</sup>

## Conclusion:

From a clinical point of view, our study underlines how important it is to identify those COPD patients who suffer anxiety and depression at discharge after an acute exacerbation and to pay attention to these commonly encountered complaints. This study shows that special attention needs to be put on females with COPD and current smokers. The HAD scale is a simple and effective way to screen patients for anxiety and depression. It requires only a short time to apply and analyse and is well standardised, all of which makes it attractive for this purpose.<sup>11, 14, 15 and 16</sup> Further studies should be conducted evaluating the effect of treatment of anxiety and depression and also to analyse whether simple screening tests such as the HAD scale can be used to select those that could benefit from specific therapy based on future randomised trials.

**Source of support : Nil**

**Conflict of Interest : None declared**

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