

## ORIGINAL ARTICLE

# Prevalence of Depression in Patients with Chronic Obstructive Pulmonary Disease (COPD) Attending a Tertiary Care Hospital of Bangladesh

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### Abstract:

**Background:** Chronic obstructive pulmonary disease (COPD) has increased several folds in the developing countries and the disease is accompanied with several co-morbidities among which depression is a major one. Still now there is a lack of data regarding the proportion and risk factors of depression among the patients with COPD in Bangladesh. The aim of the study was to assess the proportion of depression and associated risk factors in patients with COPD.

**Methods:** A cross-sectional study was performed in the Respiratory wing of Department of Internal Medicine, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. 100 patients with COPD was selected purposively and grouped into different stages by clinical examination and spirometry according to Global Initiative for Obstructive Lung Disease (GOLD). A questionnaire was administered among the respondents to collect the data regarding their socio-demographic conditions followed by SCID (The structured clinical interview for DSM-IV Axis -I disorders) and Bangla version of Depression Anxiety Stress Scale-21 (DASS-21-BV) for diagnosis and assessment of severity of depression.

**Results:** The mean age of the respondents was  $58.98 \pm 8.20$  years. All the patients with COPD were male. The proportion of depression among patients with COPD was 78%. Among the patients with COPD, 36% had severe depression, 29% had moderate depression and 4.0% had extremely severe depression. The risk factors of depression among patients with COPD were urban residence (OR=5.67,  $p=0.001$ ), Stage 2 COPD (OR= 2.17,  $p=0.061$ ) and duration of symptoms 0 to 4 years (OR=5.50  $p=0.001$ ).

**Conclusion:** This study shows the proportion of depression in Bangladeshi patients with COPD. The study highlights the importance of routine screening for depression of all patients with COPD in all healthcare settings and implementation of effective strategies for proper prevention and management of depression in those patients.

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## Introduction

Many studies have documented a high rate of depression and anxiety among patients suffering from COPD<sup>1,2,3,4,5</sup>. It is a severe treatment-resistant pulmonary disease with varying impact on the patient's general physical condition, functioning and quality of life. It is assumed that a successful treatment of co-morbid depression leads to improved quality of life and less restricted general functioning<sup>6</sup>. A review of epidemiologic studies demonstrates a prevalence of co-morbid depression in a range of 6%–80% of patients with COPD, with an average among the majority of the strongest studies of approximately 40%. This compares to a rate of 15% in the general population<sup>2,7,8,9,10</sup>. To manage this co-morbidity as effectively as possible it is important to first understand the potential contributors to an individual patient's depression. Chronologically, the earliest risk may be a genetic predisposition to depression, followed by the environmental assaults imposed by the respiratory illness itself and finally the direct neuropsychiatric effects of chronic respiratory disease. A single study focusing on determinants of depression in patient with COPD found that the risk of depression was significantly increased for subjects who lived alone, who had poor reversibility of FEV1 on spirometry and those who suffered severe functional impairment<sup>11</sup>. Adequate credible local evidence is scarce on depression among patients with COPD. The current study was focused on the frequency and relation of depression with Bangladeshi patients with COPD as well as normal population.

## Materials and Methods:

It was a cross sectional observational study conducted from January 2014 to December 2015 for a period of 2 years. The study was conducted in 100 patients with COPD attending the indoor and outdoor Department of Internal Medicine & Respiratory Medicine of Bangabandhu Sheikh Mujib Medical University.

The diagnosis of patients with COPD was confirmed by working consultant. Spirometry was done for confirmation and staging of COPD according to

GOLD (Global Initiative for Chronic Obstructive Lung Disease) at indoor and OPD of Department of Medicine and Respiratory Medicine of Bangabandhu Sheikh Mujib Medical University (BSMMU)<sup>12</sup>. Patients with COPD were grouped into four stages according to FEV1, Stage I= (>80% Predicted), Stage II= (50-79% Predicted), Stage III= (30-49% Predicted) and Stage IV= (<30% Predicted). Patients were informed about the purpose of the study. Ethical issues were also being informed to them. Then, after taking the written consent, data collection procedure was initiated by the researcher himself. The socio-demographic information was collected by using the semi structured questionnaire. This information was collected by face- to- face interview from the literate patient. In case of illiterate and severely ill patient data was collected from the patient's attendant. Then SCID (Structured Clinical Interview for DSM-IV disorders) was applied on cases and diagnosis of Depressive disorder was assigned as per DSM IV (Diagnostic and Statistical Manual of Mental Disorder) criteria<sup>13</sup>. Then the subjects were clinically interviewed with Bangla version of Depression Anxiety Stress Scale-21 Bangla version (DASS-21-BV) for assessment of severity of depression.

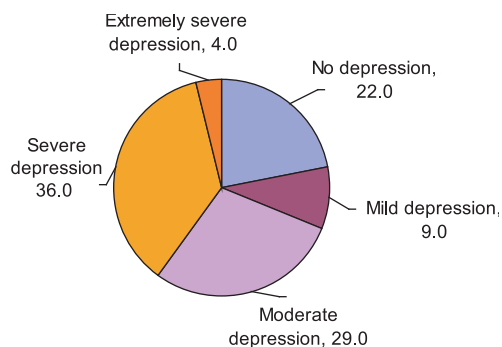
SCID (The Structured Clinical Interview for DSM-IV disorders) - Is a semi structured interview for making the major DSM-IV disorder diagnosis (American Psychiatric Association, 1994)<sup>13</sup>. This was applied by researcher himself and the diagnosis was made with context of DSM-IV Text Revision (DSM-IV TR).

Diagnostic and Statistical Manual of Mental Disorder (DSM-IV) criteria- for diagnosis psychiatric morbidity. DSM-IV Text Revision (DSM-IV-TR) was published in 2000 and is referred to as DSM-IV-TR to distinguish it from the originally published book in 1994 (American Psychiatric Association, 1994)<sup>13</sup>.

Depression Anxiety Stress Scale-21 Bangla version (DASS 21 BV): It is a self-reported 21 questionnaire having 4 likert scale for assessment of severity of Depression Anxiety and Stress. The likert number 0,1,2 or 3 indicates how much the statement applied

to you over the past week. There are no right or wrong answers. The rating scale is as follows: 0-did not apply to the patient at all, 1-applied to the patient to some degree, or some of the time, 2-applied to the patient to a considerable degree, or a good part of time, 3-Applied to the patient very much, or most of the time. Using DASS scoring template specific question for assessment of depression level (question no-3,5,10,13,16,17,21) was applied and the number of result was added up and then the total number was multiplied by 2. The rating of depression level was normal when number is = 0-9, mild when number was = 10-13, moderate when number is = 14-20, severe when number is = 21-27, extremely severe when number is more than 28. The scale was established by Lovibond, S.H. & Lovibond, P.F. in 1995<sup>14</sup>. It is adopted, translated and Validated in Bangla by Dr. S M Abu Hena Mostafa Alim, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.

After collecting the data it was checked and rechecked for omission, inconsistencies and improbabilities. Data analysis was performed by statistical package for social science (SPSS), version-22. The prevalence of depression and other categorical variables were reported as proportion with 95% confidence interval (CI). Then percentage and severity of depression among the patients with COPD was estimated on the socio-demographic variables of the patient and other relevant factors. The protocol was approved by the Institutional Review Board of the Bangabandhu Sheikh Mujib Medical University, Dhaka.



**Fig.-1:** Pie diagram showing the level depression in patients with COPD

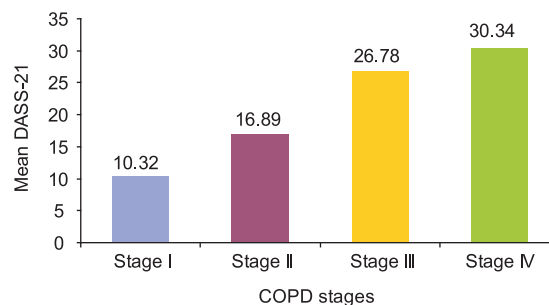
## Results:

For assessing the depression a total 100 subjects was targeted. The mean age of the respondents was  $58.98 \pm 8.20$  years. All the patients with COPD were male and smoker whether current or Ex-smoker. Low literacy (64% primary & under-primary education) was prevalent in our population. 87% of the total sample had a yearly income less than 10000 who are considered low income population of the country. Among 100 patients with COPD, maximum 42% patients were stage II, 38% patients were stage I, 18% patients were stage III and only 2.0% patients were in stage IV.

The proportion of depression among patients with COPD was 78%. Among the patients with COPD, 36% had severe depression, 29% had moderate depression and 4.0% had extremely severe depression. The risk factors of depression among patients with COPD were urban residence (OR=5.67,  $p=0.001$ ), Stage 2 COPD (OR= 2.17,  $p=0.061$ ) and duration of symptoms 0 to 4 years (OR=5.50  $p=0.001$ ).

The risk factors which are found to be involved with the development of depression among patients with COPD were urban residence (OR=5.67,  $p=0.001$ ), Stage II COPD (OR=9.50,  $p=0.001$ ), duration of symptoms of COPD 0 to 4 years (OR=5.50,  $p=0.001$ ).

The bar diagram showing the mean DASS-21 BV score in different stages of patients with COPD was  $10.32 \pm 1.1$ ,  $16.89 \pm 1.32$ ,  $26.78 \pm 2.1$  and  $30.34 \pm 3.24$  in stage I, stage II, stage III and stage IV respectively.



**Fig.-2:** Level of depression among different stages of patients with COPD

**Table-I**  
*Strength of association of a set of independent variables with status of depression (N=100)*

Variables	Depression in patients with COPD(n=78)	No depression in patients with COPD (n=22)	OR	95% CI Lower & Upper	P value
Age					
30-39	6	1	1.75	0.19 – 40.74	1.0
40-49	32	12	0.58	0.20 – 1.66	0.259
≥50	40	9	5.00	0.88 – 2.50	0.786
Residence					
Rural	27	13	0.37	0.12 – 1.07	0.038*
Urban	51	9			
Stage of COPD					
Stage 1	26	12	0.42	0.14 – 1.20	0.070
Stage 2	38	4	4.28	1.21 – 16.54	0.010*
Stage 3	12	6	0.48	0.14 – 1.72	0.199
Stage 4	2	0	-	-	-
Duration of symptoms					
0-5 years	48	8	2.80	0.95 – 8.39	0.035*
6-10 years	14	7	0.47	0.14 – 1.55	0.158
11-15 years	10	5	0.50	0.13 – 1.95	0.250
≥16 years	6	2	0.83	0.13 – 6.51	0.831

Multivariate analysis for risk factors for depression in patients with COPD

N=Number of study population

n=Number in each group

NS=Not significant

\*= Significant

## Discussion

The current study shows that the proportion of depression among the patients with COPD is 78%. The proportion of depression of the current study was in line with result of the study conducted by Dey in Madhyapradesh, which found that almost 70% COPD patients were depressed<sup>15</sup>. The screening tool used in that study was Patient Health Questionnaire (PHQ) and the mean age (61.7±9.6 years) of the respondents of that study was nearly similar to the mean age (58.98±8.20) of the respondents of the current study. Kunik *et al.* (2005) in the USA also found that 80% patients with chronic breathing disorder had depression<sup>10</sup>. However, that study included all chronic breathing disorders, namely, COPD, asthma and bronchiectasis. Solano *et al.* (2006) found the proportion of depression to be 71.0% and that is comparable with the result of current study<sup>16</sup>.

The current study shows the mean DASS- 21 score of stage 2 and stage 3 COPD were 16.89±1.32 and 26.78±2.1. A study conducted by Dey found mean PHQ score of same stages were 13±.5.4 and 15.5±3.36 which were in line of the present study,

because DASS score 14 to 20 = PHQ score 10-14 and DASS 21-27= 15-19<sup>15</sup>.

According to the finding of the current study, COPD patients those are of urban residence, stage 2 COPD and duration of symptoms 0-4 years are significantly more likely to develop depression. Manen *et al.* found that patients with mild to moderate COPD severity are not at increased risk for depression but patient with severe COPD had higher risk of depression<sup>11</sup>. However, Wagena *et al* did not find any significant association between severity of COPD and level of depression<sup>17</sup>. The risk factors found in the study of Schane *et al.*<sup>24</sup> were female gender, marital status, educational status, co-morbid diabetes, arthritis and difficulty in walking<sup>18</sup>. This study was done among the US population who were e"50 years of age. The current study had no female respondents and hence no valid comparison could be done regarding the gender. Among the other risk factors, educational level was also found to be a risk indicator of our study. The variation among the risk factors of these two studies may be due to the difference of culture, economic condition and health-care facilities of the



US population and Bangladeshi population. Manen *et al* also found that living alone was a risk factor of depression among patients with COPD in Dutch population <sup>11</sup>. This study, did not find any significant association of age, sex with depression among patients with COPD.

### Conclusion:

Depression among COPD patients is very high. Urban people are more affected. Baseline screening of depression among these patients can be helpful and should be a part of management. Being a hospital based study, our results do not represent the overall situation but reflects the necessity towards a more extensive search for this evil co-existence.

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