ORIGINAL ARTICLE

Anxiety and Depression among Patients with Chronic Obstructive Pulmonary Disease

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ABSTRACT

Introduction: The prevalence of anxiety and depression among patients with COPD is significantly higher than the general population; there are serious barriers to the recognition and treatment of these co-morbid conditions. The study aimed to identify the anxiety and depression among patients with COPD.
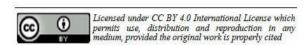
Methods: A cross sectional study design was adopted and consecutive sampling technique was used to collect 131 samples. A structured interview schedule of Beck Depression Inventory and Beck Anxiety Inventory was used.

Results: Low level of anxiety was found among 83(63.4%) of COPD patients whereas 16(12.3%) had potentially concerning levels of anxiety. It also reveals that 31(23.7%) of the COPD patients were suffering from moderate depression, 14(10.7%) had severe depression whereas 7(5.3%) had extreme depression. A total of 28(21.4%) of them were free from depression. There was association between alcohol consumption and depression (p=0.00). Likewise, there was association between age (p=0.03), educational status (p=0.04), types of family (p=0.00), smoking habit (p=0.01), duration of disease diagnosed (p=0.01) and duration of treatment (p=0.00) with anxiety.

Conclusions: It is concluded that one fourth of the COPD patients had moderate level of anxiety as well as depression. Additionally, some of the COPD patients also suffered from extreme depression.

Key words: *Anxiety; chronic obstructive pulmonary disease; depression.*

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INTRODUCTION

Anxiety and depression are common least-treated co-morbidities in patients with chronic obstructive pulmonary disease (COPD). [1] Prevalence of depression in COPD varies according to studies; ranging from 10%-42% in patients with stable COPD, [2] and from 10%-86% in patients with acute COPD exacerbation. [3] Prevalence of depression among COPD patients was 86% in a tertiary level hospital in West Bengal, India. [4]

COPD has a major effect on the lives of the sufferers, which leads to an increased length of hospital stay and a greater risk of mortality and also a major factor that affect the ability to cope and self-manage the condition. [5] Poor health status is significantly associated with increased risks of anxiety and depression. [6] Early assessment and multi-model treatment of anxiety and depression should be part of management in COPD. [7] This study aims to assess the level of anxiety and depression among patients with COPD and its association with various socio-demographic factors.

METHODS

The analytical cross sectional study was conducted in Manipal College of Medical Sciences, Pokhara, Nepal from April 1st to April 30th, 2019, in 131 patients, after getting approval and from Nepal Health Research Council (approval number 3141). The written and informed consent was obtained from all the patients. Patients aged above 40 years, with post bronchodilator, ratio of forced expiratory volume in one second and forced vital capacity (FEV1/FVC) < 70% (GOLD criteria for the diagnosis of COPD), history of smoking, attending OPD were included in the study. The exclusion criteria were patients unwilling to participate in the study, patient having other co-morbidities which included known psychiatric disorders patient, and other significant respiratory or inflammatory disease: asthma, pulmonary tuberculosis, congestive cardiac failure, interstitial lung disease and taking medicines like Beta- blockers and antipsychotics. A standard structured interview schedule (Beck Depression Inventory and Beck Anxiety Inventory) was used to collect data.

The sample size was calculated by standard formula i.e. $n = Z_\alpha^2 \, pq/d^2$ [8] where, n = sample size, p = prevalence (i.e. 86%=0.86) on the basis of the prevalence of depression among COPD patients in India [4], q= 1-p, d = margin of error 6%, z = 1.96 at 95% CI. From the calculation; n= 1.96^{2}x (0.86 x 0.14)/0.06^2=128. However, we included 131 patients in the study. Consecutive sampling method was used to collect sample. Data was analyzed by using descriptive and inferential statistics with the help of Statistical Package for Social Science, version 20. Odds ratio was used to determine the strength of association between selected variables.

RESULTS

A total of 131 COPD patients were included in the study attending OPD of Manipal Teaching Hospital. The level of anxiety and depression are presented in Table 1. There was association between alcohol consumption. The COPD patients who used to consume alcohol were 3.09 times more likely to have depression than the patients who do not consume alcohol. There was no association between age, sex, occupation, marital status, duration of disease diagnosed and duration of treatment with depression as shown in Table 2.

There was association between age, educational status, types of family, smoking habit, duration of disease diagnosed and duration of treatment with anxiety. The COPD patients aged 60 and above were 3.36 times more likely to have moderate and severe anxiety than the COPD patients aged 40-49 years. Similarly, the literate COPD patients were 0.46 times more likely to have moderate and severe anxiety than illiterate patients. Likewise, the COPD patients who were living with joint family were 7.63 times more likely to have moderate and severe anxiety than the patients living with nuclear family. The COPD patients who had smoking habit were 0.33 times more likely to have moderate and severe anxiety than non smokers. The COPD patients who were diagnosed and were under treatment for five years and above were 2.55 and 2.80 times more likely to have moderate and severe anxiety respectively than the patients diagnosed and treated less than 5 years. There was no association between sex, occupation, marital status, alcohol consumption with anxiety as shown in Table 3. The socio-demographic variables of the patients enrolled in the study are tabulated in Table 4. Table 5 represents patients' history of smoking, consumption of alcohol, duration of disease and duration of treatment.

Table 1. Level of anxiety and level of depression

	n=131
Level of anxiety	**Number/Percentage**
Low anxiety	83(63.4)
Moderate anxiety	32(24.4)
Potentially concerning levels of anxiety	16(12.2)
Level of depression	
Normal	28(21.4)
Mild mood disturbance	38(29.0)
Borderline clinical depression	13(9.9)
Moderate depression	31(23.7)
Severe depression	14(10.7)
Extreme depression	7(5.3)

Data presented as number/percentage

Table 2. Association between socio-demographic variables and depression

Characteristics	Total	Depression		*p* value	OR (95% CI)
		No	Yes		
Age					
40-49 years	49	9(18.4%)	40(81.6%)	0.51	0.74(0.30-1.81)
60 years and above	82	19(23.3%)	63(76.7%)		
Sex					
Male	62	15(24.2%)	47(75.8%)	0.45	1.37(0.59-3.17)
Female	69	13(18.8%)	56(81.2%)		
Marital Status					
Married	103	22(21.4%)	81(78.6%)	0.99	0.99(0.36-2.75)
Single	28	6(21.4%)	22(78.6%)		
Educational Status					
Illiterate	43	10(23.3%)	33(76.7%)	0.71	1.17(0.49-2.83)
Literate	88	18(20.5%)	70(79.5%)		
Occupation					
Unemployed	82	19(23.2%)	63(76.8%)	0.51	1.34(0.55-3.25)
Employed	49	9(18.4%)	40(81.6%)		
Type					
Nuclear	38	12(31.6%)	26(68.4%)	0.06	2.22(0.93-5.30)
Joint	93	16(17.2%)	77(82.8%)		
Smoking habit					
No	92	22(23.9%)	70(76.1%)	0.27	1.72(0.64-4.66)
Yes	39	6(15.4%)	33(84.6%)		
Alcohol consumption					
No	47	16(34.0%)	31(66.0%)	0.00	3.09(1.31-7.30)
Yes	84	12(14.3%)	72(85.7%)		
Duration of disease diagnosed					
< 5 years	86	18(20.9%)	68(79.1%)	0.86	0.92(0.38-2.22)
5 years and above	45	10(22.2%)	35(77.8%)		
Duration of treatment					
< 5 years	92	20(21.7%)	72(78.3%)	0.87	1.07(0.42-2.70)
5 years and above	39	8(20.5%)	31(79.5%)		

Data presented as number/percentage, OR: odds ratio, CI: confidence interval

Table 3. Association between socio-demographic variables and anxiety

Characteristics	Total	Anxiety		p value	OR (95% CI)
		Low	Moderate & Severe		
Age					
40-49 years	49	39(79.6%)	10(20.4%)	0.03	3.36(1.48-7.64)
60 years and above	82	44(53.7%)	38(46.3%)		
Sex					
Male	62	40(64.5%)	22(35.5%)	0.79	1.09(0.53-2.24)
Female	69	43(62.3%)	26(37.7%)		
Marital Status					
Married	103	69(66.9%)	34(33.1%)	0.09	2.02(0.87-4.73)
Single	28	14(50.0%)	14(50.0%)		
Educational Status					
Illiterate	43	22(51.2%)	21(48.8%)	0.04	0.46(0.21-0.98)
Literate	88	61(69.3%)	27(30.7%)		
Occupation					
Unemployed	82	51(62.2%)	31(37.8%)	0.72	0.87(0.41-1.82)
Employed	49	32(65.3%)	17(34.7%)		
Type of family					
Nuclear	38	34(89.5%)	4(10.5%)	0.00	7.63(2.50-23.23)
Joint	93	49(52.7%)	44(47.3%)		
Smoking habit					
No	92	52(56.5%)	40(43.5%)	0.01	0.33(0.13-0.80)
Yes	39	31(79.5%)	8(20.5%)		
Alcohol consumption					
No	47	31(66.0%)	16(34.0%)	0.64	1.19(0.56-2.51)
Yes	84	52(61.9%)	32(38.1%)		
Duration of disease diagnosed					
< 5 years	86	61(70.9%)	25(29.1%)	0.01	2.55(1.20-5.38)
5 years and above	45	22(48.9%)	23(51.1%)		
Duration of treatment					
< 5 years	92	65(70.7%)	27(29.3%)	0.00	2.80(1.29-6.08)
5 years and above	39	18(46.2%)	21(53.8%)		

Data presented as number/percentage, OR: odds ratio, CI: confidence interval

Table 4. The Socio-demographic characteristics

Characteristics	n=131 Number/Percentage
Age group in years	
Below 60 years	49(37.1)
60 years and above	82(62.1)
Sex	
Female	69(52.7)
Male	62(47.3)
Religion	
Hindu	96(73.3)
Buddhist	23(17.6)
Muslim	7(5.3)
Christian	5(3.8)
Ethnicity	
Dalit	26(19.8)
Disadvantaged Janajati	4(3.1)
Religious minorities	7(5.3)
Relatively advantaged Janajati	42(32.1)
Upper caste groups	52(39.7)
Marital Status	
Married	103(78.6)
Unmarried	7(5.3)
Widow/widower	21(16.0)
Educational Status	
Illiterate	43(32.8)
Can read and write	38(29.0)
Primary education	25(19.1)
Secondary education	17(13.0)
Higher education	8(6.1)
Occupational status	
Agriculture	48(36.6)
Homemaker	34(26.0)
Business	24(18.3)
Service	11(8.4)
Others	14(10.7)
Type of family	
Nuclear	38(29.0)
Joint	89(67.9)
Extended	4(3.1)

Data presented as number/percentage

Table 5. Alcohol consumption, smoking habit, duration of disease diagnosed and treatment
n=131

Characteristics	Number/Percentage
Alcohol consumption	
No	47(35.9)
Yes	84(64.1)
Smoking habit	
No	92(70.2)
Yes	39(29.8)
Duration of disease diagnosed	
<5 years	86(65.2)
5 years and more	45(34.8)
Duration of treatment	
<5 years	92(69.7)
5 years and more	40(30.3)

Data presented as number/percentage

DISCUSSION

The study reveals that the level of anxiety was low among 83(63.4%) of the COPD patients whereas 16(12.3%) of patients had potentially concerning levels of anxiety. About 78.6% of the patient with COPD had depression whereas 21.4% of them were free from depression. This study differs with the study conducted in Italy, which showed that 28.2% of the COPD patients had depression. [9] Similarly, study also depicts that 31(23.7%) of the COPD patients were suffering from moderate depression with 14(10.7%) of total COPD patients had severe depression whereas 7(5.3%) of them had extreme depression. The finding of the study was supported by the study conducted in China, where, 8.1% of the COPD patients had anxiety and 13.4% of them had depression. [6] Similarly, the study conducted in rural Nepal also revealed that (39.8%) of COPD patients had severe anxiety and 35.5% of COPD patients had severe depression. [12] Likewise, the study conducted in tertiary care hospital of India shows 42.6% had depression and anxiety both, 49.3% of COPD patients had mild to moderate depression, whereas 5.3% were detected with severe depression. [10] Another study conducted in Srilanka showed one fifth of the patients attending the respiratory clinic screened positive for anxiety and depression. [11]

Most of the COPD patients 82(62.1%) belonged to the age of 60 years and above. The mean age of the COPD patients was 62.62 years with standard deviation 12.887, ranging from 40 to 90 years. Similarly the study conducted in rural Nepal, depicts the mean age of 58.24 with standard deviation 12.04, ranging from 40-82 years. [12] In the study, more than half 69(52.7%) of the

patients were female, majority 96(73.3%) were Hindu and 52(39.7%) patients belonged to upper caste group and majority 103(78.6%) of them were married. Whereas the study conducted in Tertiary care of Srilanka 60.8 percent of the participants were females and the majorities (74.7%) were married. [11] Likewise, in this study 47(35.9%) of COPD patients consume alcohol and most of the COPD patients 92(70.2%) had habit of smoking, whereas, the study conducted in China which shows; nearly 40 percent of the participants had history of smoking [6] and the study conducted in rural Nepal, majority (66.9%) of the respondents in COPD group had a history of smoking and chewing tobaccos. [12] Regarding diagnosis and treatment, 86(65.2%) of the patients were diagnosed COPD within last 5 years and 92(69.7%) of the patients receiving treatment for less than 5 years.

The study illustrates, there was significant association between alcohol consumption and depression whereas there was no significant association between age, sex, occupation, marital status, duration of disease diagnosed and duration of treatment with depression. The study conducted in rural Nepal depicts the age and education level of the participants showed significant association with the level of depression. [12] Another study conducted by using Hospital Anxiety and Depression Scale shows that, higher rates of depression and anxiety symptoms are seen in patients with COPD even in earlier stages of the disease. [13]

This study also reflects the significant association between age, educational status, types of family, smoking habit, duration of disease diagnosed and duration of treatment with anxiety. There was no significant association between sex, occupation, marital status, alcohol consumption with anxiety which is supported by the study conducted in rural Nepal [12] whereas the study conducted in Shanghai, China, showed that female patients were more likely to suffer from anxiety than male patients (aOR = 6.41, 95% CI:1.73-23.80). [6] Likewise, study conducted in Srilanka also showed that marital status and monthly income of the participants had significant association with level of anxiety. [11] Similarly the study done in Tribhuvan University Teaching Hospital (TUTH), Kathmandu, Nepal revealed that patient's age, ethnicity, educational status, marital status, current working status, duration of illness, history of previous hospitalization were significantly associated with anxiety among the COPD patients. [14]

CONCLUSION

It is concluded that one fourth of the COPD patients has moderate level of anxiety as well as depression. Additionally, some of the COPD patients also suffer from extreme depression. Likewise, anxiety level is high among illiterate COPD patients. Hence, it is recommended that early assessment and multi-model treatment of anxiety and depression should be part of management in COPD.

CONFLICT OF INTEREST

None

SOURCES OF FUNDING

None

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