

Original Research Article

Cross sectional study to know prevalence of depression, anxiety, and stress in chronic obstructive pulmonary disease patients


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Abstract

Background: Chronic obstructive pulmonary disease is a chronic disease with significant disability. Psychiatric co morbidities like depression anxiety and stress will worsen the situation and affect the course of illness and increase the morbidity, mortality.

Aim: To study the prevalence of depression, anxiety and stress in COPD patients.

Materials and Method: Cross sectional study conducted on 100 patients who were attending Government T.B. and Chest hospital as outpatient and inpatient departments. Study conducted through interview basis with semi structured intake proforma, Depression anxiety stress scale and finally social support assessed with social support questionnaire.

Results: Data analyzed using SPSS22. The relation of various factors analyzed using one sample t test. Prevalence of depression anxiety and stress were 48%, 40%, 40% respectively. The age of the patient, duration of the stay in the hospital, duration of illness were significantly associated with depression, anxiety and stress.

Conclusion: It is very much needed to assess the depression, anxiety and stress in COPD Patients to improve quality of life in these patients.

Key words

Chronic obstructive pulmonary disease, Depression, Anxiety, Stress, Social support.

Introduction

Chronic obstructive pulmonary disease (COPD) is a general name for the chronic airflow obstruction state characterized by air flow limitation that is not fully reversible. This state is progressive and associated with an abnormal inflammatory response of the lungs to noxious agents like cigarette smoke, biomass fuels and occupational agents. This airflow limitation caused by a mixture of small airway disease (obstructive bronchiolitis) and parenchymal destruction (emphysema). COPD is a multi-component disease with extra-pulmonary effects.

COPD is the 4th largest cause of death in the world, which kills more than 3 million people every year [1]. According to World Health Organisation (WHO), COPD will become the third biggest cause of death by the year 2030, and it is anticipated that mortality rates due to COPD will increase by 160% over next two decades [2]. Most COPD patients die because of other co morbid conditions that accompany COPD rather than pulmonary cause. These include ischemic heart disease, diabetes, hypertension, renal disease, skeletal muscle dysfunction, osteoporosis and depression [3].

The physical, emotional and social impact of COPD is correlated with development of depression and anxiety [4]. Patients with anxiety and depression are also at high risk of developing COPD due to smoking.

The pathophysiology of anxiety and depression among COPD patient is complex and poorly understood.

The variables associated with depression and anxiety in patients with COPD include physical disability, long term oxygen therapy, low body mass index, severe dyspnoea, percentage of predicted FEV1<50%, poor quality of life, presence of co morbidities, living alone, female gender, low social class status [5, 6].

COPD is a progressive condition with major impact on patients health related quality of life. It is associated with significant co morbidities and extra pulmonary manifestations [7]. The quality of life is particularly complicated by concurrent depressive disorder as depressive mood lowers the driving force needed to cope with the chronic disease and debilitating effect of the disease may be enforced by depressive mood. Mislabelling of depressive symptoms as side effects of COPD might lead to under detection and under treatment of depression [8].

Many studies reported that prevalence of anxiety, depression and stress in COPD is higher than that in other advanced chronic diseases [9]. Concurrent psychiatric disorders like depression and anxiety in COPD patients leads to increased morbidity, impaired quality of life due to poor adherence to medication and pulmonary rehabilitation [10]. Co-existing anxiety worsens dyspnoea and cough. This results in increased hospital stay, increased dosage of medication and risk of adverse drug effects [11].

Macro, et al. (2006) reported high rates of anxiety and depression (28.2 and 18.8% respectively) in these patients compared to controls (6.1 and 3.5%). Study concluded that female patients reported more anxiety and depression and high levels of dyspnoea strongly correlated with depression [12].

Lou, et al. also found more prevalence of depression (cases 35.7%, controls 7.5%) and anxiety (cases 18.3% controls 5.3%) in COPD patients compared to controls [13]. In a systematic review of 410 studies the prevalence of clinical anxiety ranged from 10-55% and that of depression ranged from 0-42% among COPD patients [9]. It was also observed that only few people are receiving treatment [14]. Effect of depression and anxiety on COPD Patients revealed more exacerbations and more hospitalizations [15, 16].

The prevalence rates of depression and anxiety in COPD patients in India showed high rates of depression ranging from 62-72% [17, 18, 19].

Despite their impact on the morbidity associated with COPD these psychological co morbidities are rarely addressed [11]. Majority of cases go unrecognised due to lack of awareness, or due to overlap of symptoms. So there is need for research in this area to know the prevalence and to know the risk factors.

Aim

- To estimate the prevalence of depression anxiety and stress in patients with chronic obstructive pulmonary disease (COPD).

Objectives

- To evaluate the depression, anxiety and stress in COPD patients.
- To study factors associated with depression anxiety and stress in COPD patients.
- To study association of social support with depression, anxiety and stress.

Materials and methods

Institutional ethical committee approval for study was taken. Cross sectional study was conducted at Government TB and Chest Hospital affiliated to Osmania Medical College from July 2017 to December 2017. About 100 patients attending outpatient and inpatient departments were interviewed.

Inclusion criteria

- Patients aged 30 to 65 years.
- Patients satisfying GOLD criteria for the diagnosis of COPD attending the inpatient and out-patient departments of pulmonary medicine at Government TB and Chest Hospital.

Exclusion criteria

- Patients who did not consented for the study.
- Patients with other chronic illness.

- Patients with previous history of mental illness.
- Patients with mental retardation.

Material

- Written informed consent form.
- Semi structured intake proforma.
- Depression anxiety and stress scale (DASS).
- Sarason social support questionnaire (SSQ; Short version).

Semi structured intake proforma

The form has socio-demographic details of age, gender, education, socioeconomic status, marital status and disease factors like total duration of illness, duration of hospital stay, etc.

Depression Anxiety and Stress Scale (DASS)

The DASS was a set of three self-report scales designed to measure the negative emotion states of depression, anxiety and stress. Each of the three DASS scales contains 14 items, divided into sub scales of 2-5 items with similar content. A study done by Nieuwenhuijsen, et al. [20] to assess psychometric properties of DASS concluded that the internal consistency of the DASS subscales was high with cronbach's alphas of 0.94, 0.88, and 0.93 for depression, anxiety and stress respectively.

Sarason Social Support Questionnaire (SSQ; short version)

The SSQ Sarason, et al. [21] is a quantitative, psychometrically sound survey questionnaire intended to measure social support and satisfaction with said support. It has a good test-retest reliability and convergent internal construct validity. The shortened version of SSQ is a 6 item questionnaire with two part answer.

Method

A cross sectional study was conducted after obtaining written informed consent from patients who were diagnosed as COPD according to GOLD criteria attending Government TB and Chest Hospital. About 100 COPD patients were recruited in the study. They were interviewed as

part of study. Socio demographic details were collected using semi structured intake proforma. Depression anxiety and stress were screened using DASS and social support assessed with SSQ.

Statistical analysis

The data obtained was entered into excel work sheet and analysis was done using SPSS22. The prevalence of depression, anxiety, and stress in COPD calculated. The relation of various factors with depression, anxiety and stress were analysed using sample t tests.

Results

The socio-demographic details of the sample are depicted in **Table - 1**. Disease factors and prevalence of depression, anxiety and stress were shown in **Table - 2**. Among the various factors in

the study group age and duration of illness were significantly correlated with depression, anxiety and stress. Duration of hospital stay correlated significantly with anxiety and depression but not with stress. It was observed that age of the patient had a statistically significant negative correlation with SSQ scores. Very high significance was seen between duration of illness and SSQ scores. The patients with depression showed a negative correlation with SSQ scores with very high significance ($p < 0.0001$). Patients with anxiety ($r = -0.133$, $p = 0.187$) has not shown a negative correlation with SSQ scores whereas stress ($r = 0.200$, $p = 0.046$) showed statistically significant negative correlation with SSQ scores as shown in **Table - 3**. Distribution of study population according to social support questionnaire was presented in **Figure - 1**.

Table - 1: Socio-demographic details.

		Frequency	Percent	Valid Percent	Cumulative %
Region	Rural	80	80.0	80.0	80.0
	Urban	20	20.0	20.0	100.0
	Total	100	100.0	100.0	
Education	Illiterate	60	60.0	60.0	60.0
	Primary	12	12.0	12.0	72.0
	Middle	16	16.0	16.0	88.0
	Secondary	8	8.0	8.0	96.0
	Intermediate	4	4.0	4.0	100.0
	Total	100	100.0	100.0	
Occupation	Unemployed	8	8.0	8.0	8.0
	Unskilled	28	28.0	28.0	36.0
	Farmer/Shop owner	36	36.0	36.0	72.0
	Semi-skilled	12	12.0	12.0	84.0
	Skilled	16	16.0	16.0	100.0
	Total	100	100.0	100.0	
SES	Lower	20	20.0	20.0	20.0
	Lower Middle	12	12.0	12.0	32.0
	Upper Lower	64	64.0	64.0	96.0
	Upper Middle	4	4.0	4.0	100.0
	Total	100	100.0	100.0	
Compliance	Good	40	40.0	40.0	40.0
	NA	20	20.0	20.0	60.0
	Poor	40	40.0	40.0	100.0
	Total	100	100.0	100.0	

Table - 2: Disease factors and prevalence of depression, anxiety and stress.

		Frequency	Percent	Valid Percent	Cumulative Percent
Spirometry (Obstruction)	Mild	20	20.0	20.0	20.0
	Moderate	40	40.0	40.0	60.0
	Severe	32	32.0	32.0	92.0
	Very severe	8	8.0	8.0	100.0
	Total	100	100.0	100.0	
Depression	Nil	52	52.0	52.0	52.0
	Mild	812	12.0	12.0	64.0
	Moderate	28	28.0	28.0	92.0
	Severe	8	8.0	8.0	100.0
	Total	100	100.0	100.0	
Anxiety	Nil	60	60.0	60.0	60.0
	Mild	20	20.0	20.0	80.0
	Moderate	20	20.0	20.0	100.0
	Total	100	100.0	100.0	
Stress	Nil	60	60.0	60.0	60.0
	Mild	24	24.0	24.0	84.0
	Moderate	16	16.0	16.0	100.0
	Total	100	100.0	100.0	
SSQ	Fairly Dissatisfied	4	4.0	4.0	4.0
	Little Dissatisfied	24	24.0	24.0	28.0
	Little Satisfied	16	16.0	16.0	44.0
	Fairly Satisfied	24	24.0	24.0	68.0
	Very Satisfied	32	32.0	32.0	100.0
	Total	100	100.0	100.0	

Table – 3: Parameters.

Parameters	One-Sample Statistics			One-Sample Test	
	N	Mean	Std. Deviation	Test Value = 0	
				T	Sig. (2-tailed)
Age	100	56.92	6.388	89.110	.000
duration of hospital stay (days)	100	3.68	3.967	9.277	.000
duration of illness (months)	100	31.20	33.921	9.198	.000
depression score	100	8.68	7.466	11.627	.000
anxiety score	100	6.00	4.981	12.046	.000
stress score	100	9.88	8.319	11.877	.000
SSQ score	100	27.40	7.435	36.855	.000
Satisfaction	100	4.560	1.2462	36.590	.000

Discussion

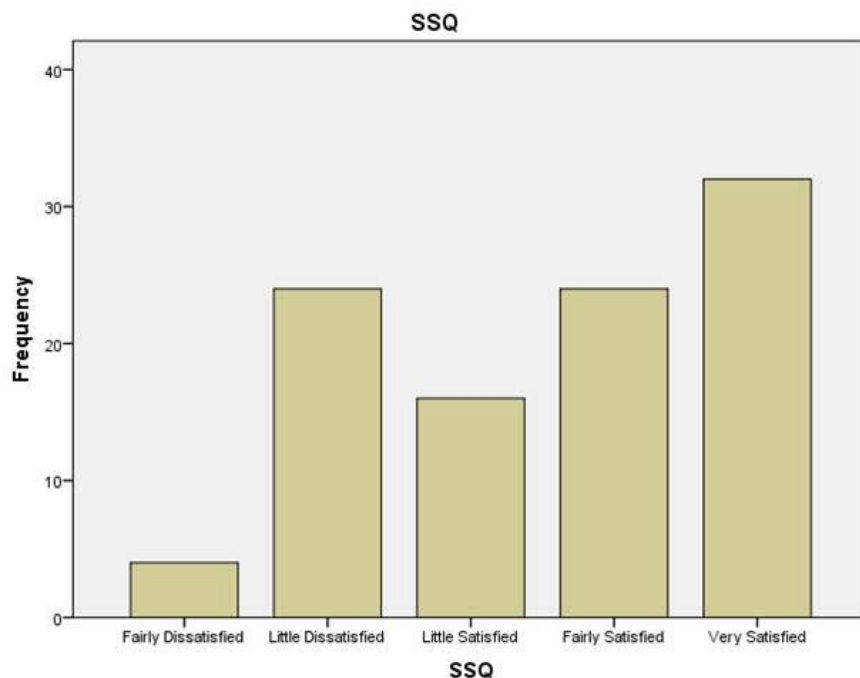
Present study was a cross sectional study conducted on 100 patients who were attending Government TB and chest hospital. It was found that prevalence of depression, anxiety and stress

were 48%, 40% and 40% respectively. Similar finding were depicted in many studies. In a study conducted by Negi, et al. [19] the prevalence of depression was 49.2%. Abbas, et al. [17] reported prevalence rates of 36.37% of anxiety

and 57.02% of depression in COPD patients. A case control study by Lou, et al. [13] reported depression of 35.7% versus 7.2% and anxiety of

18.3% versus 5.3%. Yohannes, et al. [9] in his review reported prevalence of anxiety ranging from 10to 55%.

Figure – 1: Distribution of study population according to social support questionnaire.



Age

The mean age of study population was 56.92 with SD of 6.388 years. Negi, et al. [19] observed mean age of 62.69 years with SD of 0.84 years in his study. In De S, et al. [18] study mean age of sample was 61.7 years with SD of 6.5 years. Izbella, et al. [22] reported mean age of study population as 63.2 years with SD of 6.5 years. Above studies are nearly matching our study in terms of age.

Domicile

Present study sample represented by 80% from rural area and 20% from urban area. These findings were consistent with the study conducted by Negi, et al. [19] with 76.2% from rural area and 23.8% from urban area. Izbella, et al. [22] had 60.78 % of sample from rural area and 39.22 from urban area. The current study conducted in a tertiary care government hospital setting where many rural people visit as it is a referral centre and known to many people.

Education

In current study 60% were illeterates, 12% were with primary education, 16% were with middle school education, 8% with secondary education and 4% with intermediate. Negi, et al. [19] showed that 54%were illeterates and 20.6% did primary education whereas Izbella, et al. [22] study sample reported 26.47% with primary education and 55.88 % with secondary education. Our sample was mostly from rural area and belongs to upper lower class so literacy may be at low level.

Socio economic status

According to kuppuswamy's scale 64% of the sample belong to upper lower class. Abbas et al study also showed 64.46 % of samples were from lower/poor class.

Depression, anxiety and stress

In our study, only age factor was showed a significant association with depression, anxiety and stress whereas other studies showed

correlation between low education, poor socioeconomic conditions with depression, anxiety and stress. Abbas, et al. [17] found association between depression and anxiety with low education, high social status, and urban region. Negi, et al. [19] also observed significant correlation between depression and low education, occupational status. But they didn't find any association with age and gender. In accordance with our study Gudmundson, et al. [23], Marco, et al. [12] could not find a statistically significant association between socio demographic factors with depression or anxiety.

Present study has not showed a significant association between severity of airflow obstruction in depression anxiety and stress. Similar findings were found in many studies done by Lou, et al. [13] and Gudmundson, et al. [23] and Marco, et al. [12] but few studies conducted by Garuti, et al. [24] and Negi, et al. [19] found significant correlation with severity of obstruction. Being a tertiary care centre they were hopeful about effective treatments and the acceptance of illness may be strong due to educational and cultural back ground.

Age of the patients appear to be significantly correlated with depression ($p < 0.0001$), anxiety ($p < 0.00010$) and stress ($p < 0.01$) in this study. Lou, et al. [13] also found significant correlation between age with depression ($p = 0.003$) and anxiety ($p < 0.0001$). A cross sectional study from Bhopal [18] observed a strong relationship with low level of education, poor socioeconomic status, and advanced age. Garuti, et al. [24] also observed similar association in the work titled impact of comprehensive pulmonary rehabilitation on anxiety and depression in hospitalized COPD patients.

Duration of hospital stay was significantly associated with both depression ($r = 0.212, p = 0.03$) and anxiety ($r = 0.368, p < 0.0001$) but was not associated with stress ($r = 0.180, p = 0.073$) in the study Mousses, et al. [25] in his study found that depression and anxiety were important risk factors for increased hospital admissions. Maurer, et al. [26] in his study on anxiety and

depression in COPD patients concluded that untreated depression and anxiety were found with longer hospital stay and to have more exacerbations.

Present study revealed that Duration of illness was found to be greater risk factor for depression ($r = 0.530, p < 0.0001$), anxiety ($r = 0.408, p < 0.0001$) and stress ($r = 0.474, p < 0.0001$). Mousses, et al. [25] also found duration of illness as major determinant for depression in COPD patients and anxiety was positively correlated with duration of illness.

The assessment of social support in these patients revealed 32% were very satisfied, 24% fairly satisfied, 16% were little satisfied, 24% little dissatisfied, 4% were fairly dissatisfied. Age of the patients was associated with significant negative correlation with SSQ scores ($r = 0.220, p = 0.028$). Duration of illness also showed negative correlation with SSQ scores.

Patients with depression ($r = 0.422, p < 0.00010$) and stress ($r = 0.200, p = 0.046$) showed a negative correlation with SSQ scores with high significance but patients with anxiety had not shown any correlation. Similarly Grodner, et al. [27] also found a negative correlation of with depression and anxiety. Gudmundson, et al. [23] found high prevalence of depression in patients who are living alone without support.

Conclusion

It is very much needed to assess the depression, anxiety and stress in COPD Patients to improve quality of life in these patients.

Limitations

- Small sample size.
- Not a prospective study.
- Study done in a tertiary care centre so can't be replicated at community level.
- As there were disproportionate distributions of factors like gender, socioeconomic status, education

significant relationships could not established.

Implications

Depression anxiety and stress are more prevalent in patients with COPD that adversely affect exacerbations, duration of hospital stay, morbidity, mortality thus affecting quality of life and economic burden on family and government. Hence these co morbidities need to be identified and treated effectively for better outcome.

Need for further research

Further research need to be done with large sample size with prospective design in order to establish statistically significant correlations.

References

1. Salvi S. COPD: The neglected epidemic. Textbook of Pulmonary and Critical Care Med., Vol 2, Ed: Jindal SK, Jaypee Publications, 2011; p. 971-974.
2. The Global Burden of Disease, WHO 2013 July, www.who.int/healthinfo/global_burden_disease/projections/en. Accessed on 15 Oct 2017.
3. Limaye S, Salvi S. Risk factors for COPD. Textbook of Pulmonary and Critical Care Med., Vo 2, Ed: Jindal SK, Jaypee Publications, 2011; p. 987-992.
4. DiMatteo MR, Lepper HS, Croghan TW. Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. Arch Intern Med., 2000; 160: 2101-7.
5. Kunik ME, Roundy K, Veazey C, Soucek J, Richardson P, Wray NP, Stanley MA. Surprisingly high prevalence of anxiety and depression in chronic breathing disorders. Chest Journal, 2005 Apr 1; 127(4): 1205-11.
6. Van Manen JG, Bindels PJ, Dekker FW, IJzermans CJ, Van der Zee JS, Schade E. Risk of depression in patients with chronic obstructive pulmonary disease and its determinants. Thorax, 2002 May 1; 57(5): 412-6.
7. Quint JK, Baghai-Ravary R, Donaldson GC, Wedzicha JA. Relationship between depression and exacerbations in COPD. European respiratory journal, 2008 Jul 1; 32(1): 53-60.
8. Dudley DL, Glaser EM, Jorgenson BN, Logan DL. Psychosocial concomitants to rehabilitation in chronic obstructive pulmonary disease: Part i. Psychosocial and psychological considerations. Chest, 1980 Mar 31; 77(3): 413-20.
9. Willgoss TG, Yohannes AM. Anxiety disorders in patients with COPD: a systematic review. Respir Care, 2013 May; 58(5): 858-66.
10. Mikkelsen RL, Middelboe T, Pisinger C, Stage KB. Anxiety and depression in patients with chronic obstructive pulmonary disease (COPD). A review. Nord J Psychiatry, 2004; 58(1): 6.
11. Hill K, Geist R, Goldstein RS, Lacasse Y. Anxiety and depression in end-stage COPD. Eur Respir J., 2008; 31(3): 667-677.
12. Di Marco F, Verga M, Reggente M, Casanova FM, Santus P, Blasi F, Allegra L, Centanni S. Anxiety and depression in COPD patients: The roles of gender and disease severity. Respiratory medicine, 2006 Oct 31; 100(10): 1767-74.
13. Lou P, Zhu Y, Chen P, Zhang P, Yu J, Zhang N, Chen N, Zhang L, Wu H, Zhao J. Prevalence and correlations with depression, anxiety, and other features in outpatients with chronic obstructive pulmonary disease in China: a cross-sectional case control study. BMC pulmonary medicine, 2012 Dec 1; 12(1): 53.
14. Kunik ME, Roundy K, Veazey C, Soucek J, Richardson P, Wray NP, Stanley MA. Surprisingly high prevalence of anxiety and depression in

- chronic breathing disorders. *Chest Journal*, 2005 Apr 1; 127(4): 1205-11.
15. Xu W, Collet JP, Shapiro S, Lin Y, Yang T, Platt RW, Wang C, Bourbeau J. Independent effect of depression and anxiety on chronic obstructive pulmonary disease exacerbations and hospitalizations. *American journal of respiratory and critical care medicine*, 2008 Nov 1; 178(9): 913-20.
 16. Iyer AS, Bhatt SP, Garner JJ, Wells JM, Trevor JL, Patel NM, Kirkpatrick D, Williams JC, Dransfield MT. Depression is associated with readmission for acute exacerbation of chronic obstructive pulmonary disease. *Annals of the American Thoracic Society*, 2016 Feb; 13(2): 197-203.
 17. Abbas Waseem SM, Hossain M, Azmi SA, Rizvi SA, Ahmad Z, Zaidi SH. Assessment of anxiety and depression in COPD patients-A pilot study. *Current Neurobiology*, 2012; 3(2): 112-116.
 18. De S. Prevalence of depression in stable chronic obstructive pulmonary disease. *Indian J Chest Dis Allied Sci.*, 2011 Jan-Mar; 53(1): 35-9.
 19. Negi H, Sarkar M, Raval AD, Pandey K, Das P. Presence of depression and its risk factors in patients with chronic obstructive pulmonary disease. *Indian J Med Res.*, 2014 Mar; 139(3): 402-8.
 20. Nieuwenhuijsen K, de Boer AG, Verbeek JH, Blonk RW, van Dijk FJ. The Depression Anxiety Stress Scales (DASS): detecting anxiety disorder and depression in employees absent from work because of mental health problems. *Occup Environ Med.*, 2003 Jun; 60 Suppl 1: i77-82.
 21. Sarason IG, Levine HM, Basham RB, Sarason BR. Assessing social support: the social support questionnaire. *Journal of personality and social psychology*, 1983 Jan; 44(1): 127.
 22. Izabella Uchmanowicz, Beata Jankowska-Polanska, Urszula Motowidlo, Bartosz Uchmanowicz, Mariusz Chabowski. *Int J Chron Obstruct Pulmon Dis.*, 2016; 11: 963-970.
 23. Gudmundsson G, Gislason T, Janson C, Lindberg E, Ulrik CS, Brøndum E, Nieminen MM, Aine T, Hallin R, Bakke P. Depression, anxiety and health status after hospitalisation for COPD: a multicentre study in the Nordic countries. *Respiratory medicine*, 2006 Jan 31; 100(1): 87-93.
 24. Garuti G, Cilione C, Dell Orso D, Gorini P, Lorenzi MC, Totaro L, Cirelli G, Clini E. Impact of comprehensive pulmonary rehabilitation on anxiety and depression in hospitalized COPD patients. *Monaldi Archives for Chest Disease*, 2003 Jan; 59(1): 56-61.
 25. Moussas G, Tselebis A, Karkanas A, Stamouli D, Ilias I, Bratis D, Vassila-Demi K. A comparative study of anxiety and depression in patients with bronchial asthma, chronic obstructive pulmonary disease and tuberculosis in a general hospital of chest diseases. *Ann Gen Psychiatry*, 2008 May 21; 7: 7.
 26. Maurer J, Rebbapragada V, Borson S, Goldstein R, Kunik ME, Yohannes AM, Hanania NA. ACCP workshop panel on anxiety and depression in COPD. anxiety and depression in COPD: Current understanding, unanswered questions, and research needs. *Chest*, 2008 Oct; 134(4 suppl): 43S-56S.
 27. Grodner S, Prewitt LM, Jaworsk BA, Myers R, Kaplan RM, Ries AL. The impact of social support in pulmonary rehabilitation of patients with chronic obstructive pulmonary disease. *Ann Behav Med.*, 1996 Sep; 18(3): 139-45.