Scientific Research Publishing

Journal of Biosciences and Medicines, 2023, 11, 48-57
https://www.scirp.org/journal/jbm
ISSN Online: 2327-509X
ISSN Print: 2327-5081

Anxiety, Depression and Quality of Life in Patients with Chronic Obstructive Pulmonary Disease

Ping Li[1], Yanjuan Xiang[2], Donghong Wang[3], Qingdong Zhang[4*]

[1]Physical Examination Center, The First Affiliated Hospital of Dali University, Dali, China
[2]Department of Ophthalmology, The First Affiliated Hospital of Dali University, Dali, China
[3]Department of Respiratory Medicine, The First Affiliated Hospital of Dali University, Dali, China
[4]Department of Anesthesiology, The First Affiliated Hospital of Dali University, Dali, China
Email: *2829194407@qq.com

How to cite this paper: Li, P., Xiang, Y.J., Wang, D.H. and Zhang, Q.D. (2023) Anxiety, Depression and Quality of Life in Patients with Chronic Obstructive Pulmonary Disease. *Journal of Biosciences and Medicines*, **11**, 48-57.
https://doi.org/10.4236/jbm.2023.113006

Received: February 7, 2023
Accepted: March 7, 2023
Published: March 10, 2023

Abstract

Background: Chronic Obstructive Pulmonary Disease (COPD) is a common and frequently occurring disease, which not only has a higher fatality rate, but also leads to loss of labor force and an obvious decrease in the quality of life in the course of long-term disease, patients with chronic obstructive pulmonary disease complicated with anxiety and depression are a major public health problem. **Objective:** To investigate the status of anxiety, depression and quality of life and related factors in patients with COPD. **Methods:** One hundred patients admitted to the Department of Respiratory and Critical Care Medicine of the First Affiliated Hospital of Dali University with chronic obstructive pulmonary disease evaluated by anxiety self-assessment scale, depression self-assessment scale and quality of life rating scale for patients with chronic obstructive pulmonary disease. **Results:** The incidence of anxiety in COPD patients was 82.5%, and the incidence of depression was 87.3%. The probability of both anxiety and depression was high, and the prevalence of women was significantly higher than that of men. Correlation analysis and logistic regression results showed that education level was negatively correlated with the occurrence of anxiety, and age was positively correlated with the occurrence of anxiety. Elderly patients were prone to anxiety and had lower quality of life. **Conclusion:** The older and less educated the COPD patients are, the higher the incidence of anxiety and depression, and the higher the incidence in female patients.

Keywords

Chronic Obstructive Pulmonary Disease, Anxiety, Depressive Disorders

1. Introduction

Chronic obstructive pulmonary disease (COPD) is a kind of disease characterized by incompletely reversible airflow limitation, and airflow limitation is gradually aggravated. COPD has a high incidence and recurrence rate in China. After suffering from COPD, patients not only have obvious physical symptoms but also often combined with anxiety, depression, and other adverse psychological problems. Patients' adverse emotional reactions tend to worsen with the aggravation of the disease, and adverse emotions may reduce the enthusiasm and compliance of patients in treatment, thus forming a vicious circle and seriously affecting the life safety of patients [1].

Studies have shown that anxiety and depression are almost three times more common in patients with COPD than in the general population [2]. COPD patients not only have a high incidence of depression and anxiety, but also have a strong correlation between anxiety and depression [3].

With the development of the "physio-psycho-social" medical model, clinical nursing staff should gradually improve their understanding of patients' psychological disorders, and it is necessary to assess the quality of life of patients. Moreover, this region is a remote and economically underdeveloped area, so the evaluation of anxiety, depression, and quality of life of COPD patients can provide guidance for the clinical nursing management of patients. The aim of this study was to investigate the current status and related factors of anxiety, depression, and quality of life in patients with COPD, and lay the foundation for continuous nursing.

2. Materials and Methods

2.1. General Information

A total of 100 hospitalized patients diagnosed with chronic obstructive pulmonary disease admitted to the Department of Respiratory and Critical Care Medicine of the First Affiliated Hospital of Dali University from January 2020 to October 2020 were enrolled.

Inclusion criteria: Both sexes, aged more than 45 years, and without acute or chronic diseases of other systems, neurological and mental diseases, and communication disorders.

2.2. Anxiety, Depression, and Quality of Life Scores

Questionnaire Survey

The questionnaire was distributed to the patients by the nursing staff who were responsible for the questionnaire survey, and the general content included age, gender, education level, and economic situation. Self-rating anxiety scale (SAS) and self-rating depression scale (SDS) were used to evaluate anxiety and depression (**Table A1** and **Table A2**). The quality of life of patients was evaluated by the COPD quality of life scale. The main statistical indicator of SAS was the total score. At the end of the evaluation by the self-evaluator, the score of each of the

20 items was summed, and then multiplied by 1.25 to obtain the whole part to obtain the standard score. The SDS index was the total score. The scores of each of the 20 items were summed to obtain a crude score. The standard score is equal to the integer part after multiplying the crude score by 1.25. The upper limit of normal for the total crude score was 41, and the standard total score was 53. After completing the questionnaire, the nursing staff who were responsible for the questionnaire survey took back the score form.

Statistical analysis was performed using R version 4.2.2. Measurement data conforming to normal distribution were expressed as mean ± standard deviation ($x \pm s$). Fisher's exact test was used to compare the incidence of anxiety and depression between male and female groups. Spearman correlation analysis was used to analyze the correlation between age, gender, education level and economic situation, and anxiety and depression. The relationship between SAS, SDS score, age, and COPD quality of life score was analyzed by Pearson correlation analysis. Univariate logistic regression was used to screen out the independent variables related to SAS, SDS, and COPD patients' quality of life scores from age, gender, education level, and economic situation, and multivariate logistic regression was performed.

3. Results

3.1. General Data of Patients

A total of 100 valid questionnaires were received, including 63 males and 37 females, aged 70 ± 8 years. The distribution of education level was a below primary in 12 cases, primary school in 54 cases, junior high school in 14 cases, senior high school or technical secondary school in 13 cases, and junior college in 7 cases. The distribution of economic conditions was medium in 56 cases, poor in 31 cases and rich in 13 cases (Table 1).

3.2. Scores of Anxiety, Depression and Quality of Life of COPD Patients

3.2.1. Anxiety Score

Among the 100 COPD patients, 12 had no anxiety, 29 had mild anxiety, 56 had moderate anxiety, and 3 had severe anxiety (Figure 1).

There were 63 male patients, and 52 cases (82.5%) had different degrees of anxiety. Of the 37 female patients, 36 (97.0%) had varying degrees of anxiety (Figure 2). By Fisher's exact test, the incidence of anxiety in females was significantly higher than that in males ($p < 0.05$).

The patient's age, gender, education level, and economic situation were used as independent variables, the presence or absence of depression was used as the dependent variable, and spearman correlation analysis was performed (Table 2). There was a significant negative correlation between education level and the presence of anxiety ($p < 0.05$, spearman correlation coefficient = 0.25), and gender was also significantly correlated with the presence or absence of anxiety ($p < 0.05$, spearman correlation coefficient = 0.22).

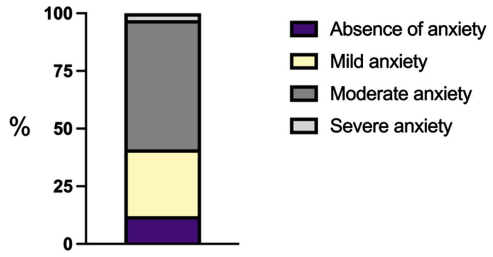

Figure 1. Bar chart of percentage anxiety in 100 patients with COPD.

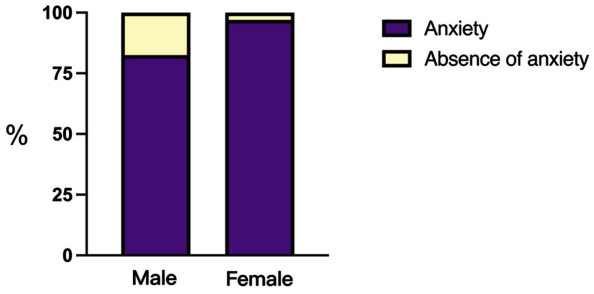

Figure 2. Bar chart of percent anxiety in men and women.

Table 1. The socio-demographic characteristics of the patients.

	Data
Gender (male/female)	63/37
Age (years)	70 ± 8
Education level	
Below primary	12
Primary	54
Junior high	14
Senior high	13
Technical secondary	7
Economic conditions	
Poor	31
Medium	56
Rich	13

Table 2. Correlation Analysis of anxiety factors in Patients with COPD.

	Spearman correlation coefficient	p-value
Age	0.13	0.19
Gender	0.22	<0.05
Education level	−0.25	<0.05
Economic situation	−0.07	0.51

Univariate logistic analysis was used to screen out the independent variables related to the anxiety state, and then the relevant independent variables were substituted into the multiple logistic regression (Table 3). Age and education level are the influencing factors of anxiety in COPD patients. The older the patients are, the more likely they are to have anxiety, and the higher their education level, the less likely they are to have anxiety.

3.2.2. Depression Score

Among 100 patients, 8 patients had no depression, 47 patients had mild depression, and 45 patients had moderate depression (Figure 3).

Among 63 male patients, 55 (87.3%) had different degrees of depression. A total of 37 female patients reported varying degrees of anxiety (Figure 4). By Fisher's exact test, the incidence of depression was significantly higher in women than in men ($p < 0.05$).

Spearman correlation analysis was performed on the patient's age, gender, education level, and economic situation as independent variables and whether depression was the dependent variable (Table 4). Only gender was significantly associated with the presence or absence of a depression ($p < 0.05$, spearman correlation coefficient = 0.23).

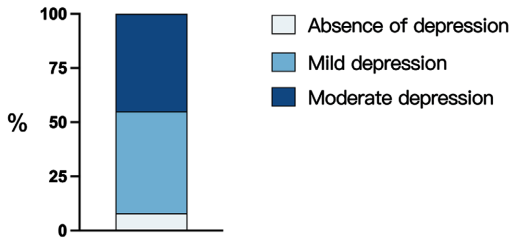

Figure 3. Bar chart of percentage depression in 100 patients with COPD.

Table 3. Logistic analysis of anxiety factors in patients with COPD.

	Univariate logistic regression analysis			Multivariate logistic regression analysis		
	O	CI 95%	p-value	O	CI 95%	p-value
Age	7.61	1.39 - 142.3	0.06			
Gender	1.09	1.00 - 1.18	<0.05	1.11	0.27 - 0.84	<0.05
Education level	0.56	0.33 - 0.94	<0.05	0.49	1.02 - 1.23	<0.05
Economic situation	0.77	0.3 - 2.0	0.58			

Table 4. Correlation analysis of depression factors in COPD patients.

	Spearman correlation coefficient	p-value
Age	0.01	0.91
Gender	0.23	<0.05
Education level	−0.15	0.14
Economic situation	0.02	0.83

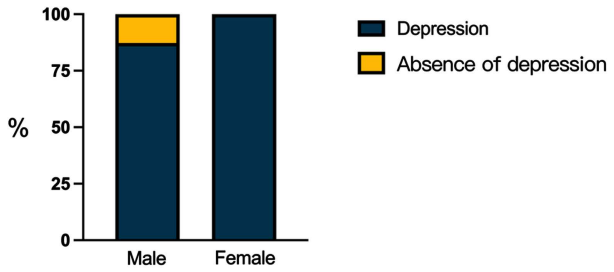

Figure 4. Bar plots of percentage depression among men and women.

The age, gender, education level, and economic situation of the patients were used as independent variables, and depression was used as the dependent variable. Univariate logistic regression and multivariate logistic regression were used, and no risk factors were found to be related to depression.

3.2.3. Quality of Life Score of COPD Patients

Pearson correlation analysis showed that the age of patients was positively correlated with the quality of life score of COPD patients, but the correlation was small ($r = 0.23$, $p < 0.05$). There was no significant correlation between the scores of SAS and SDS and the scores of quality of life in COPD patients. spearman correlation analysis showed that gender, education level, and economic status had no significant correlation with the quality of life score of COPD patients.

4. Discussions

Chronic obstructive pulmonary disease (COPD) is a common chronic disease. Its repeated attacks and progressive aggravation not only bring a serious economic burden to the patient's family but also increase the patient's psychological pressure, which is easy to produce negative emotions such as anxiety and depression. COPD patients with depression and anxiety have reduced treatment compliance, increased risk of hospitalization, and physical and psychological double hits, which seriously reduce the quality of life of patients [4].

In this study, the incidence of anxiety in COPD patients was 88%, and the incidence of depression was 92%. 46.00% and 25.34% of patients with chronic respiratory diseases in Jiangsu Province had depression and anxiety, respectively. About 3% of patients hospitalized with acute exacerbation of COPD in Beijing had anxiety and/or depression, and 9% of patients hospitalized with acute exacerbation of COPD in Taipei had depression [5] [6]. The reason for the large difference in the incidence of anxiety and depression may be that this region is an economically and medically underdeveloped region, and the patients' lack of understanding of the disease or other economic and other reasons lead to delayed medical treatment and severe illness. The incidence of anxiety and depression in patients with severe COPD in Shanghai is also as high as 85.37% and 64.41% [7]. Therefore, strengthening the publicity of the hazards of COPD and early treatment can greatly reduce the incidence of anxiety and depression in

COPD patients.

The results of this study show that the incidence of anxiety and depression in female patients with COPD is significantly higher than that in male patients, which is consistent with the results of most studies [8] [9]. Women are more sensitive and easily affected by their own and external factors, so the incidence of depression and anxiety is higher.

This study also suggests that there is a negative correlation between the degree of education and the occurrence of anxiety in COPD patients. Patients with low education level are prone to anxiety, and those with high education level are vice versa. In many studies on the relationship between diseases and anxiety and depression, education level is negatively correlated with anxiety and depression [10]. Patients with high education level can access disease-related information through a variety of channels, increase the correct understanding of the disease and prognosis, reduce the fear of the disease, so as to reduce the incidence of depression and anxiety.

In this study, as a risk factor for anxiety, age is positively correlated with the occurrence of anxiety. The older the patients are prone to anxiety, and the younger the patients are, the lower the quality of life of COPD patients. With the increase of age, the deterioration of the body's organ function, the patient's tolerance to COPD is gradually reduced, and the same symptoms may be more severe. In addition, the condition of COPD is aggravated year by year, and the older the age, the longer the medical history may be, the more serious the symptoms are, and the worse the quality of life of the patients.

In general, focusing on patients' mental health problems is not only the need for the development of the "physio-psycho-social" medical model, but also to better improve the quality of life and treatment effect of patients. In clinical nursing, we should strengthen the nursing and psychological counseling for COPD patients with female, old age and low education level, strengthen the propaganda of the disease, improve the understanding of the disease, so as to reduce the incidence of anxiety and depression in patients with high risk factors.

5. Conclusion

The older and less educated the COPD patients are, the higher the incidence of anxiety and depression, and the higher the incidence in female patients.

6. Limitations of the Study

Our failure to assess COPD severity is also a major limitation of this study. No formal sample size estimation was performed in this study. The instruments we used to evaluate anxiety and depression were self-report measures and are therefore susceptible to reporter bias.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Volpato, E., Toniolo, S., Pagnini, F., *et al.* (2021) The Relationship Between Anxiety, Depression and Treatment Adherence in Chronic Obstructive Pulmonary Disease: A Systematic Review. *International Journal of Chronic Obstructive Pulmonary Disease*, **16**, 2001-2021. https://doi.org/10.2147/COPD.S313841

[2] Thapa, N., Maharjan, M., Shrestha, T.M., *et al.* (2017) Anxiety and Depression among Patients with Chronic Obstructive Pulmonary Disease and General Population in Rural Nepal. *BMC Psychiatry*, **17**, Article No. 397. https://doi.org/10.1186/s12888-017-1550-5

[3] Zhao, Z., Zhang, D., Sun, H., *et al.* (2022) Anxiety and Depression in Patients with Chronic Obstructive Pulmonary Disease and Obstructive Sleep Apnea: The Overlap Syndrome. *Sleep and Breathing*, **26**, 1603-1611. https://doi.org/10.1007/s11325-021-02500-2

[4] Zhou, X., Li, J., Gu, W., *et al.* (2017) Prevalence and Associated Factors of Anxiety and Depression among Patients with Chronic Respiratory Diseases in Eight General Hospitals in Jiangsu Province of China: A Cross-Sectional Study. *Psychiatry Research*, **251**, 48-53. https://doi.org/10.1016/j.psychres.2017.01.070

[5] Feng, L., Li, J., Lv, X., *et al.* (2022) Temporal Trends in Anxiety and Depression Prevalence and Their Association with Adverse Outcomes in Patients Hospitalized for Acute Exacerbations of Chronic Obstructive Pulmonary Disease in Beijing, China, from 2004 to 2020. *Front Psychiatry*, **13**, Article No. 996451. https://doi.org/10.3389/fpsyt.2022.996451

[6] Ho, T.W., Tsai, Y.J., Ruan, S.Y., *et al.* (2014) In-Hospital and One-Year Mortality and Their Predictors in Patients Hospitalized for First-Ever Chronic Obstructive Pulmonary Disease Exacerbations: A Nationwide Population-Based Study. *PLOS One*, **9**, Article No. 996451. https://doi.org/10.1371/journal.pone.0114866

[7] Liu, D., Zou, Y. and Wang, Y. (2022) Investigation on the Relationship between Sleep Quality and Depression and Anxiety in Hospitalized Patients with Different Levels of AECOPD. *Computational and Mathematical Methods in Medicine*, **2022**, e114866. https://doi.org/10.1155/2022/5901552

[8] Barrueco-Otero, E., Refoyo Matellán, B., Martín Puente, J., *et al.* (2022)Prevalencia de síntomas depresivos y diagnóstico de sospecha de depresión en pacientes con EPOC. *Atención Primaria*, **54**, Article ID: 102236. https://doi.org/10.1016/j.aprim.2021.102236

[9] Wu, D., Zhao, X., Huang, D., *et al.* (2022) Outcomes Associated with Comorbid Anxiety and Depression among Patients with Stable COPD: A Patient Registry Study in China. *Journal of Affective Disorders*, **313**, 77-83. https://doi.org/10.1016/j.jad.2022.06.059

[10] Zhang, Z.Y., Yu, J.J., Zeng, W.T., *et al.* (2022) Association between Antenatal Depression and Adverse Perinatal Outcomes: A Prospective Cohort Study. *Journal of Affective Disorders*, **323**, 490-495. https://doi.org/10.1016/j.jad.2022.12.008

Appendix

Table A1. Self-Rating Depression Scale (SDS).

Name: Date:				
Make check mark (√) n appropriate column	A little of the time	Some of the time	Good part of the time	Most of the time
1. I feel down-hearted and blue				
2. Morning is when I feel the best				
3. I have crying spells or feel like it				
4. I have trouble sleeping at night				
5. I eat as much as I used to				
6. I still enjoy sex				
7. I notice that l am losing weight				
8. I have trouble with constipation				
9. My heart beats faster than usual				
10. I get tired for no reason				
11. My mind is as dear as it used to be				
12. I find it easy to do the things l used to				
13. I am restless and can't keep still				
14. I feel hopeful about the future				
15. I am more irritable than usual				
16. I find it easy to make decisions				
17. I feel that I am useful and needed				
18. My life is pretty full				
19. I feel that others would be better off if l were dead				
20. I still enjoy the things to do				

Table A2. Self-Rating Anxiety Scale (SAS).

Name: Date:				
For each item below, please place a check mark (v) in the column which best describes how often you felt or behaved this way during the past several days				
Bring the form with you to the office for scoring and assessment during your office visit				
Place check mark (√) in correct column	A little of the time	Some of the time	Goof part of the time	Most of the time
1. I feel more nervous and anxious than usual	1.	2.	3.	4.
2. I feel afraid for no reason at all	1.	2.	3.	4.

Continued

3. I get upset easily or feel panicky	1.	2.	3.	4.
4. I feel like I am falling apart and going to pieces	1.	2.	3.	4.
5. I feel that everything is all right and nothing bad will happen	1.	2.	3.	4.
6. My arms and legs shake and tremble	1.	2.	3.	4.
7. I am bothered by headaches neck, and back pain	1.	2.	3.	4.
8. I feel weak and get tired easily	1.	2.	3.	4.
9. I feel calm and can sit still easily	1.	2.	3.	4.
10. I can feel my heart beating fast	1.	2.	3.	4.
11. I am bothered by dizzy spells	1.	2.	3.	4.
12. I have fainting spells or feel like it	1.	2.	3.	4.
13. I can breathe in and out easily	1.	2.	3.	4.
14. I get feelings of numbness and tingling in my fingers and toes	1.	2.	3.	4.
15. I am bothered by stomach aches or indigestions	1.	2.	3.	4.
16. I have to empty my bladder often	1.	2.	3.	4.
17. My hands are usually dry and warm	1.	2.	3.	4.
18. My face gets hot and blushes	1.	2.	3.	4.
19. I fall asleep easily and get a good night's rest	1.	2.	3.	4.
20. I have nightmares	1.	2.	3.	4.