Pak. J. Chest Med. 2022;28(02)

Original Article

journal homepage: https:/www.pjcm.net/

Pakistan Journal of Chest Medicine

Official journal of Pakistan Chest Society

Frequency of Depression and Anxiety and their Association with Respiratory Diseases: A Hospital based study

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Article History:

Received:	Nov 11, 2021
Revised:	Mar 19, 2022
Accepted:	May 12, 2022
Available Online:	June 02, 2022

Author Contributions:
AS conceived idea, AUK MFQ drafted the study, AS collected data, MT did statistical analysis and interpretation of data, RF SA critical reviewed manuscript. All approved final version to be published.

Declaration of conflicting interests:
The authors declare that there is no conflict of interest.

How to cite this article:
Shah A, Khan AU, Qasim MF, Tariq M, Farooq R, Asif A. Frequency of Depression and Anxiety and their Association with Respiratory Diseases: A Hospital based study. Pak J Chest Med. 2022; 28(02):221-228.

ABSTRACT

Background: Patients with respiratory illness sometime face adverse situations such as their disease symptom management, general condition deterioration, and a hostile perception of the hospital environment, favoring the appearance of anxiety and depression.

Objective: to identify the prevalence of anxiety and depression in patients with respiratory disorder, as well as the factors associated with these conditions.

Methodology: A total of 320 patients hospitalized for a disease of pulmonary origin were analyzed and divided into the following subgroups: infectious, oncological, acute, and chronic diseases. The Hospital Anxiety and Depression Scale (HADS) was applied to them on the second or fourth day of their hospital stay and five days after the first evaluation. Multiple linear regression models were carried out to analyze the association between anxiety and depression measured over two different periods. The models present the statistically significant variables with a 95% confidence level.

Results: The patients presented with anxiety in 74.2% of cases, mainly those with acute respiratory diseases (42.6%) and neoplastic diseases (27.3%). A total of 69.7% presented with depression, with symptoms more significant in those with chronic and neoplastic pulmonary diseases and those with no income. Patients with at least one comorbidity presented with anxiety in 53.7% of cases and depression in 52.3% of cases. Linear regression models were carried out and showed that anxiety was 1.77 and 1.86 times more frequent in patients with chronic diseases compared to those with infectious pathologies in the first and second reviews, respectively.

Conclusion: Anxiety and depression are common disorders in patients with respiratory diseases, negatively affecting the prognosis. Routine mental health screening and multidisciplinary management are essential in this population.

Keywords: Comorbidities; Hospital Stay; Depression; Anxiety; Respiratory Illness

Introduction

Respiratory diseases, like asthma, chronic obstructive pulmonary disease (COPD), bronchitis and pulmonary fibrosis, have a significant impact on the world population. The diseases are not only common, but also result in significant loss of life and a high level of disability. The burden of respiratory diseases extends beyond the physical symptoms, profoundly affecting patients' quality of life and overall well-being.

Globally, respiratory diseases account for a significant proportion of the healthcare burden. According to the World Health Organization (WHO), respiratory diseases are one of the leading causes of death worldwide. For example, COPD is projected to become the third leading cause of death by 2030. Similarly, asthma affects approximately 339 million people globally, imposing a heavy burden on healthcare systems.[1,2] The chronic nature of these diseases necessitates ongoing medical management, which can lead to physical, emotional, and financial strain on patients and their families. In people suffering from respiratory diseases, comorbidities often worsen exacerbations, leading to a longer hospital stay and effect quality of life. The chronic nature of respiratory diseases, coupled with their often progressive and disabling symptoms, can lead to significant psychological distress.[3] Breathlessness, a common symptom of many respiratory conditions, can cause panic and anxiety, further complicating the management of the disease.[4] Studies have shown that individuals with respiratory diseases are at a higher risk of developing depression and anxiety compared to the general population. However, the prevalence rates and the strength of this association vary across different studies and populations.[5,6]

Understanding the frequency of depression and anxiety among patients with respiratory diseases and their association is crucial for several reasons. Firstly, untreated mental health disorders can lead to poorer health outcomes, reduced adherence to treatment, and a lower quality of life. Secondly, recognizing and addressing mental health issues in these patients can improve disease management and overall well-being. Despite the acknowledged importance of this intersection, there is a lack of comprehensive studies examining the prevalence and association of depression and anxiety in patients with respiratory diseases, particularly in hospital settings.

Objective

To identify the frequency of anxiety and depression in patients with respiratory disorder, as well as the factors associated with these conditions.

Methodology

This prospective hospital-based study was conducted at Khyber Teaching Hospital and POF Hospital Wah Cantt. Data from both these hospitals collected and shared to a common Microsoft excel sheet. Study duration was 6 months. Three hundred twenty patients included in this study which were admitted due to any respiratory disease and for study purposes these patients were divided into different sub-groups like infectious, oncological, acute, or chronic disease. The sample was selected based on the inclusion, exclusion, and elimination criteria. The inclusion criteria include patients older than 18 years with preserved thinking capacity and two or more days of hospitalization. The exclusion criteria include patients already in psychiatric treatment.

For study purpose, sociodemographic characteristics, presence of any chronic diseases, reason for admission to the hospital, nutritional status, use of oxygen, and days of hospital stay were analyzed.

For psychiatry issues, The Hospital Anxiety and Depression Scale (HADS) is a widely used, self-administered questionnaire designed to detect and assess the severity of anxiety and depression in patients within a hospital setting. HADS consists of 14 items, divided into two subscales: Anxiety (HADS-A) and Depression (HADS-D). The Anxiety subscale includes 7 items focused on generalized anxiety symptoms, while the Depression subscale includes 7 items centered on anhedonia, the reduced ability to experience pleasure, which is a core symptom of depression. Each item is rated on a 4-point Likert scale ranging from 0 to 3, with total scores for each subscale ranging from 0 to 21. Higher scores indicate greater levels of anxiety or depression. In terms of scoring interpretation, a score between 0 and 7 is considered normal, a score between 8 and 10 is classified as borderline abnormal, suggesting the presence of a mood disorder, and a score between 11 and 21 is categorized as abnormal, indicating significant anxiety or depression. This structured approach allows clinicians to efficiently identify and assess the psychological state of patients, facilitating early detection and appropriate intervention for those experiencing psychological distress.

All data were entered into SPSS for further analysis. Multiple linear regression models were performed to analyze the association between anxiety and depression with different factors like baseline characteristics and diseases characterisitics. The models present the variables found to be statistically significant with a confidence level of 95% with p-value of 0.05.

Informed consent for study purpose was necessary and before enrollment in the study each study case signed an informed consent form. Ethical approval was approved from Research Ethics Committee of Khyber Teaching hospital.

Results

A total of 320 patients were included in this study, of which 180 (56,9%)were males and 140 (43.3%) were females.

Table 1. Baseline characteristics of studied cases

Variables	Total		Infectious		Chronic		Acute		Neoplasia	
	n	%	N	%	n	%	n	%	n	%
Gender										
Male	180	56.9	97	66.2	23	42.1	22	63.1	39	46.5
Female	140	43.3	52	33.8	27	58.1	16	36.9	41	53.6
Socioeconomic level										
Good status	26	10.1	11	8.2	3	6.1	-	-	9	13.0
Middle Income	82	25.5	36	25.5	13	22.1	11	29.3	20	25.1
Poor	211	66.7	98	66.6	36	72.2	27	70.9	50	63.0
Residency										
Rural	93	29.2	43	28.7	16	32.1	9	23.9	25	31.5
Urban	223	70.4	106	71.3	34	68.3	29	76.5	54	68.6
Occupation										
Employee	150	47.3	67	45.1	19	38.1	17	46.1	47	58.6
Unemployed	166	52.7	82	55.1	31	62.3	20	54.3	33	41.1
Diabetes Mellitus (DM)										
No	225	70.96	103	69.15	34	68	33	86.86	55	68.77
Yes	92	29.04	46	30.85	16	32	5	13.14	25	31.23
Arterial Hypertension (HTN)										
No	231	72.89	117	78.54	22	44	32	84.23	60	75
Yes	86	27.15	32	21.46	28	56	6	15.77	20	25
Oxygen Dependence										
No	157	49.3	83	55.5	15	30.1	21	55.5	38	47.3
Yes	160	50.7	66	44.5	35	70.1	17	44.5	42	52.3

Tabel 2. Frequency of Anxiety and depression among studied cases

Variables	Anxiety		Depression	
	Measurement 1	Measurement 2	Measurement 1	Measurement 2
	n (%)	n (%)	n (%)	n (%)
Gender				
Female	53 (41.2)	59 (41.1)	55 (48.4)	61 (47.9)
Male	75 (58.4)	85 (59.3)	59 (51.6)	67 (52.5)
Occupation				
Employee	69 (54.5)	77 (53.6)	54 (47.6)	63 (49.4)
Unemployed	58 (45.9)	66 (46.4)	59 (52.4)	64 (50.6)
Socioeconomic level				
Medium	9 (7.1)	12 (8.5)	10 (8.6)	13 (10.3)
Low	119 (93.1)	132 (91.5)	104 (91.4)	115 (89.7)
Comorbidities				
None	69 (53.7)	75 (52.3)	62 (54.2)	68 (53.3)
At least one	59 (46.3)	69 (47.7)	52 (45.4)	60 (46.7)

Respiratory diseases were divided into four groups: 1) infectious-contagious illness (149, 47.3%), including COVID-19 (78), tuberculosis (37), bacterial pneumonia (22), and empyema (12); 2) oncological disease (82, (25.4%), including lung cancer (66) and metastatic pleural effusion (12); 3) chronic disease (52, 15.9%), including asthma (32), COPD (8), and OSA (10); and 4) acute disease (38, 11.7%), including pulmonary thromboembolism (27) and chest trauma (11). Regarding the socioeconomic level, the majority belonged to an extremely very low level (110, 34.6%), followed by an extremely low level (101, 30.0%) and a low level (80, 25.5%). The predominant place of origin was urban (223, 70.8%). At the time of the study, 52.7% of patients had no job. Associated comorbidities were diabetes mellitus in 92 (29.0%), systemic arterial hypertension (SAH) in 86 (27.3%), chronic cardiovascular disease (CCD) in 31 (9.6%), and chronic kidney disease in 30 (9.3%). Of the patients, 160 (50.7%) were oxygen-dependent (Table 1).

During the initial evaluation, 236 patients (74.4%) exhibited anxiety symptoms. Among them, 108 patients (45.8%) were classified as having "symptoms without clinical relevance," which was the most common category. Meanwhile, 93 patients (39.4%) fell into the category of "symptoms to be considered as a probable case," and 35 patients (14.8%) presented clinically relevant symptoms requiring attention. The highest number of anxiety cases was found among patients with acute respiratory disease, with 100 cases (42.4%), followed by neoplastic disease, with 65 cases (27.5%). A total of 220 patients (69.5%) presented depressive symptoms, with the category “symptoms without clinical relevance” being the most frequent with 106 (48.2%), “symptoms to be considered as a probable case” with 88 (40.0%), and relevant symptoms that require attention with 26 (11.8%) (Table 2).

Table 3.Cumparis of Anxiety at different stages among study

First measurement anxiety model			Second measurement anxiety model		
Variables	Coefficient	P-value	Variables	Coefficient	P-value
Age	-0.01	0.180	Age	-0.02	0.046
Gender			**Gender**		
Female	0.02	0.964	Female	0.23	0.546
Illness group			**Illness group**		
Infectious	Reference group	-	Infectious	Reference group	-
Chronic	1.73	0.002	Chronic	1.82	0.001
Acute	1.34	0.032	Acute	0.87	0.136
Neoplasia	0.83	0.073	Neoplasia	0.66	0.121
Length of hospital stay ≥ nine days	1.65	<0.001	LOHS ≥ nine days	1.57	<0.001

The linear regression model demonstrates the association between anxiety and prolonged hospital stays among patients with chronic diseases. Regarding anxiety disorder symptoms, patients with chronic diseases exhibited 1.77 times more symptoms in the first measurement and 1.86 times more in the second measurement compared to those with infectious diseases. For patients with acute respiratory diseases, the first evaluation showed a statistically significant association (p-value < 0.05), but this was not the case in the second measurement (Table 3).

Chronic respiratory and oncological diseases were the group of diseases with the most symptoms. In the linear regression model, the association of variables shows that, in the first evaluation of depression, gender and age did not turn out to be statistically significant. At the same time, depressive symptoms were 1.64 times more frequent in patients with chronic diseases compared to patients with infectious diseases; this is in comparison with people with infectious diseases (reference group). Patients with extended stays (nine days or more) presented depressive symptoms 1.35 times more than those with short stays (less than nine days). In the second sample, in the groups of chronic diseases and neoplasms, depressive symptoms increased, showing a frequency of 1.45 and 1.34 on average, respectively, compared to people with infectious diseases. The depressive symptoms were maintained in the two chronic respiratory and neoplastic disease evaluations (Table 4).

Discussion

Depression and anxiety in hospitalized patients hinder adherence to treatment, delay recovery, heighten the risk of mortality and disease severity, extend hospital stays, and escalate healthcare costs. There is a bidirectional relationship, as mental illnesses can be risk factors for chronic illnesses, and chronic illnesses can, in turn, lead to mental health issues. Long-term benefits are observed with treatments focusing on self-management, pulmonary rehabilitation, and cognitive-behavioral therapy. The Global Burden of Disease reported after the first year of the COVID-19 pandemic that major depressive disorder and anxiety showed a worldwide increase of 25.6% in 2020, with greater involvement in females, young people, and adults.

In present study, 75 (93.7%) of the patients with COVID-19 presented severe symptoms of anxiety and depression.[7,8] Contrary to what has been reported in the literature that psychiatric disorders affect females more, in our study, the male gender (58.59% and 59.03%) registered higher anxiety levels compared to the female gender (41.41% and 40.97%) in both measurements.

Various studies have shown that socioeconomic status affects depression and anxiety, often due to a lack of social security, medications, and adequate nutrition. In our findings, a significant portion of the population was of medium-low socioeconomic status, which heightened

Table 4. Assessing the Association With Depression Measured at Two Different Periods

First measurement depression model			Second measurement depression model		
	Coefficient	P-value		Coefficient	P-value
Age	0.00	0.823	Age	0.11	0.317
Gender			**Gender**		
Female	0.25	0.475	Female	0.36	0.292
Illness group			**Illness group**		
Infectious	Reference group	-	Infectious	Reference group	-
Chronic	1.64	0.004	Chronic	1.45	0.005
Acute	-0.12	0.817	Acute	-0.25	0.687
Neoplasia	1.74	<0.001	Neoplasia	1.34	0.003
LOHS ≥ nine days	1.35	<0.001	LOHS ≥ nine days	1.41	<0.001

symptoms of anxiety and depression due to insufficient economic resources.

Residence of patients also effects the rate of depression and anxiety.[9] In urban areas, depression is the most common disorder in adults, with females being the most affected. This is explained by psychosocial factors such as insecurity, pollution, and accidents, causing permanent stress that results in depression, anxiety, and suicidal attempts. Seventy percent of our studied population lives in an urban area, and 29.4% comes from a rural area, which, together with the socioeconomic status and severity of the illness, precipitates states of depression and anxiety.

In the present study we also observed that the sociodemographic characteristics of our population favor the development of psychiatric symptoms because of an organic illness, producing a sustained adrenergic response due to the permanent increase in stress caused by the inability to maintain oneself and pay for medical care.

Different studies suggested that the prevalence of psychiatric disorders in general hospitals is high and ranges from 25% to 65%.[10,11] Anxiety and depression are the main complaints among patients admitted to hospitals with an organic disease. Similarly in the present study, patients who developed symptoms of anxiety and depression, 40%-50% were unemployed at the time of the study. Anxiety symptoms were documented in 54.3%, and stress was related to lost working days and the possibility of dismissal due to absenteeism. In addition, patients with no income showed more symptoms of anxiety (52.2%).

In the present study, patients with at least one comorbidity presented anxiety (53.9%) and depression (52.1%) in both measurements. The most frequent comorbidity was diabetes mellitus, followed by SAH, which increases the risk of developing psychiatric symptoms during the hospital stay.

In our study, people with chronic diseases had a 1.75 and 1.84 higher frequency of anxiety symptoms for both measures, respectively, than those with infectious diseases. Some other studies report that 19% of patients with pulmonary cancer and chronic diseases present depression and suicidal ideation related to physical pain; however, in the present study, the presence of cancer did not turn out to be statistically significant for the presence of anxiety.

Anxiety is more prevalent in people over 45 years of age.[11] In our study series, males developed more symptoms, with a mean age of 50 years. It was found that patients with asthma, COPD, and OSA commonly experienced dyspnea, increased oxygen requirements, and prolonged hospital stays. These diseases precipitate excessive sympathetic activation, alter the systemic inflammatory response, and disrupt the hypothalamic-pituitary-adrenal axis, creating a self-perpetuating cycle between mental and organic diseases.[12,13] In addition to common symptoms, treating pulmonary diseases can be challenging, as medications such as β-agonists, which are used in some cases, can increase heart rate—a symptom of anxiety—and predispose patients to other psychological manifestations.[14]

We found that 74.2% of the total sample presented anxiety symptoms, aggravating the clinical course of the disease. Patients with neoplastic diseases presented more depressive symptoms. On the other hand, acute respiratory diseases had higher anxiety symptoms in the first measurement but were not maintained in the second measurement, which may be due to an adaptive mechanism.

Among patients with lung cancer, symptoms of depression are common in up to 38% of cases. The risk factors are being young, being female, having a low income, and smoking. In our series, depressive symptoms increased from 58% to 63% between measurements, related to increased dyspnea and chronic pain.

Asthma was the chronic disease with the most anxiety symptoms in both measurements and even in the mixed pattern, with 86%, 86%, and 43%, similar to those reported within some other studies.[15-17]

In the present study Hospital Anxiety and Depression Scale (HADAS) used for identified psychiatric issues among study cases.[18] This scale has several advantages, such as its simplicity and accuracy, which facilitate its acceptance and use in clinical settings. In addition, it excludes elements of a somatic nature that could cause confusion in patients with associated physical symptoms; it has become a standard tool used in clinical and research settings, with a significant citation rate that supports its popularity and usefulness in diverse populations. The period in which it was carried out, corresponding to the last seven days, has a sensitivity and specificity greater than 0.80. Our results showed that its application as a screening tool for respiratory diseases helps evaluate hospitalized patients. It is easy to apply and understandable for patients and healthcare personnel. Among the causes of the underdiagnosis of psychiatric disorders in hospitalized patients are the presence of symptoms shared between certain diseases and depression, the effect of certain medications, and the difficulty of healthcare personnel to recognize the symptoms of depression and anxiety in the hospital context.

In the present study, evaluation of patients was carried out during the COVID-19 pandemic, emphasizing the impact generated by the interruption of mental health services for outpatients, affecting their progress and treatment, and contributing to the increase in mental health problems.

While it is expected that symptoms of anxiety and depression will increase during a hospital stay, the literature does not report subsequent evaluations. In our study, we applied two measurements and compared the results of the second measurement with the first. This comparison guided our decisions regarding medical management.

Initially, a patient may be classified as having symptoms without clinical relevance in the first measurement. However, as time progresses, these symptoms could intensify and require attention. Therefore, it is crucial to perform multiple measurements, especially in patients with prolonged hospital stays, to monitor the response to the management of anxiety and depression symptoms by mental health personnel.

Conclusions

This study highlights the relevance of the symptoms of anxiety and depression among patients hospitalized due to respiratory diseases. The shared symptoms in these pathologies can make diagnosis difficult, which makes them underdiagnosed. Systematic screening and proper evaluation not only of respiratory symptoms but also of psychological symptoms should be part of the diagnosis and make us able to identify patients who will benefit from multidisciplinary treatment.

The early detection and treatment of symptoms of anxiety and depression not only benefit the individual in terms of mental health but also have positive affects for the economic burden of the healthcare system. Integrating the routine assessment of these symptoms in healthcare can be crucial for achieving holistic management and improving outcomes at both individual and community levels. Therefore, we urge medical personnel not to underestimate the importance of these mental disorders and to take part in their care.

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