

## A Study to Evaluate the Prevalence of Anxiety and Depression in Cardiopulmonary Patients

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### Abstract

*Background and purpose:* Earlier the recognition of psychological states like anxiety and depression had shown the poor prognosis and non-adherence to the interventions given in chronic illness. There are few studies in India evaluating the association between the psychological impairments with cardiac and chronic pulmonary diseases. Future studies with larger sample and longer periods of follow up are needed to validate the findings and to assess the long term burden of psychological issues following the chronic disorders. The aim of this study is to evaluate the prevalence of anxiety and depression in cardiopulmonary patients. *Methods:* A survey of a sample size of 300 had done among cardiac and pulmonary disease patients. Participants completed a questionnaire along with the demographic information about them; designed to determine symptoms of anxiety and depression. Responses are summarized for each item and the data was analyzed to examine the relationship between the diseases and the psychological impairments like anxiety and depression. *Results:* The study investigated the prevalence of undiagnosed anxiety and depression in cardiac and pulmonary patients. This study illustrates the prevalence of cardiac and pulmonary patients that 36% of patients suffered from anxiety and 62.67% had depression in cardiac illness; and in pulmonary patients 38.67% suffered from anxiety and 72% had depression. The study revealed positive outcomes that anxiety and depression symptoms are present in cardiac and pulmonary patients based on HADS score. *Discussion and conclusion:* The prevalence of anxiety and depression in Indian patients following the cardiac and pulmonary disorders are high. This study proves an association between the cardiopulmonary diseases and symptoms of anxiety and depression. It shows that it is important to screen for symptoms of anxiety and depression in cardiac and pulmonary patients for possibility of depression and anxiety treatment. Detection and management of these mental disorders may ameliorate prognosis of the cardiac and pulmonary diseases and improve the adaptation and quality of life of these patients.

**Keywords:** Anxiety; Depression; Cardiac Diseases; Pulmonary Diseases; HADS.

### Introduction

Cardiopulmonary diseases are the disorders that affect the normal functioning of the heart and lungs which will lead to the worsening of physical, mental and social well-being of an individual. Common cardiopulmonary diseases comprises of: Cardiovascular diseases includes coronary heart diseases, rheumatic heart diseases, valvular heart diseases; congestive heart failure; diseases of

pulmonary circulation. There are several Pulmonary diseases which includes COPD, asthma, chronic restrictive pulmonary diseases, pneumonia, tuberculosis [1]. Cardiovascular Diseases (CVD) is considered as the most dominant chronic disease which is spreading globally in different parts of the developing world [2]. It is predicted that by 2020, CVD will be act as a leading cause of death and disability in the developing nations [3]. Globally, in United States over 6,00,000 people die because of CVD. Worldwide over 80% of the deaths are due to the CVD which is most commonly occur in lower and middle income countries. India is a developing country, in 2006 it was predicted that it accounts for 40-60% of CVD cases and the incidence is continuously increasing from 2% to 6% in rural region while 4% to 12% in urban region [3,6]. Epidemiological studies reveals that in India 32

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million people are suffering from CHD and among those 30% are below 40 years of age [7] and by 2015 it will become the most leading cause of mortality in India [8]. As India is a developing country for the youth, the age group of >60 years in which majority of the population are poor includes 5% of the total population suffering from CVD and the level may increase by 2016 [2]. Chronic Respiratory Diseases is another most common disease now-a-days. The most common among them are COPD and asthma. The COPD is expected to be the third leading cause of death in 2020 globally [9]. In the context of WHO, worldwide approximately 3 million people die because of COPD [10]. It has been estimated that Asthma would have affected approx. 300 million people around the world [11]. In the Indian context, several studies had done based on the prevalence of asthma and COPD. At the state level, the prevalence of asthma in Chandigarh, Delhi, Bangalore, and Kanpur has been estimated to be 2.38% in individuals of over 15 years of age. Respiratory symptoms are present in 4.3-10.5% of individuals [12].

Comorbid psychological impairments like anxiety and depression acts as a risk factor for increased disease severity [13]. Depression and anxiety occur at higher rates among patients suffering from CVD [14] and pulmonary disorders [15]. Patients with several chronic physical illnesses including heart disease and chronic respiratory diseases are suffering from anxiety [16]. Both short term and long term recoveries are affected by Anxiety [17] as it can lead to interfere with taking medications, taking proper diet, getting a quality sleep, connecting with family members and friends and again go back to their jobs [18]; while long term depression can lead to poor adherence and reduces the chances of quitting smoking, taking medications, exercising, and attending cardiac rehabilitation [19]. The depressive and anxiety symptoms can lead to a significant impact on the patients quality of life and lead to poor prognosis of the disease [20]. Researchers suggest that depression and anxiety remain unrecognized in patients with coronary heart disease and chronic lung diseases. Depression is highly prevalent and under-recognized and among 31-45% of patients with CVD suffer from depressive symptoms and symptoms of anxiety are also seen in patients with acute cardiac conditions and in patients with stable CAD and in patients with pre and post CABG [24].

As anxiety and depression remains unrecognized, thus screening of these symptoms are extremely important [26]. Anxiety and depression were assessed by using Hospital Anxiety and Depression Scale (HADS) [16,27]. The HADS has the advantage

of screening out both the depression (HADS-D) and anxiety (HADS-A) in a single scale [29]. HADS is a widely used instrument for assessing anxiety and depression symptoms. HADS was developed by Zigmond and Snaith in 1983 [30]. The scale has been widely used in more than 25 countries and translated in many languages. It consists of 14 questions which comprising 7 for anxiety and 7 for depression [29,32]. HADS is a reliable and valid instrument for assessing anxiety and depression in chronic illnesses. The scores can be taken from the range of 0-21 for each anxiety and depression. A score of 0-7 is considered as Normal, 8-10 is Mild, 11-14 is moderate and 15-21 is severe [31]. Recent research has highlighted that increased levels of anxiety and depression has to be identified so that psychological intervention should be given on time [32]. The pulmonary/cardiac rehabilitation and psychotherapy play a significant role in lowering these symptoms [33]. It was shown that exercise can reduce the symptoms of depression and anxiety in Coronary Heart Diseases(CHD) and Chronic Lung Diseases(CLD) like asthma, COPD [35,36]. However to prevent poor prognosis of the disease the rehabilitation program includes exercise, strength training, relaxation, counselling and stress management [36,37]. Thus it becomes necessary to identify these symptoms for the early intervention. The main objective of this study is to evaluate the prevalence of anxiety and depression in cardiac patients and in patients suffering from respiratory disorders.

## Methodology

### *Sample Size*

300 Patients were included in the study.

### *Source of subjects*

Safdarjung Hospital, New Delhi

### *Sample Method*

Convenient Sampling

## Method of selection

### *Inclusion Criteria*

1. Age group between 20-70 years,
2. Both the genders males and females,

3. Able to understand and follow commands appropriately,
4. Haemodynamically stable patients,
5. Including patients of both cardiac and pulmonary patients.

#### *Exclusion Criteria*

1. Subjects who are not able to answer,
2. Subjects who had unstable chronic problems,
3. Any other neurological or musculoskeletal problems affecting the present illness,
4. Any diagnosed psychological disorders,
5. Subjects having language barriers.

#### **Methods of assigning subjects**

The subjects were non-randomly selected. 300 subjects were taken from which 150 subjects were suffering from cardiac illness and 150 subjects were suffering from pulmonary disorders.

#### *Study design*

It is a Non-experimental cross-sectional survey study.

#### *Instrumentation*

Hospital Anxiety and Depression Scale (HADS)

#### *Protocol*

A sample size of 300 patients both male and female participated in the study. Among 300 Patients, 150 were cardiac patients and 150 were pulmonary patients; and they were provided with a Hospital Anxiety and Depression Scale (HADS) questionnaire.

#### *Procedure*

The study is observational in nature and is a survey based study so as to accommodate patients of both genders. The subjects were selected from the general community setting and all had an illness history of at least 5 years. Subjects were taken from the Department of Cardiothoracic and Vascular Surgery (CTVS) for cardiac disease and for the pulmonary disease subjects were taken from the OPD of the Respiratory Department of the Safdarjung Hospital. The study included a set of questionnaire known as

Hospital Anxiety and Depression Scale (HADS). Subjects were included based on the inclusion and exclusion criteria. The subjects were made to sit relaxed so as to prevent their distraction from the outside environment. The attendants were made to sit outside in order to avoid any disturbance while answering the questionnaire. Once the subject becomes relaxed and comfortable with the environment, history regarding the disease and the demographic details of the subject were taken. Once all the details were taken. Subjects were explained regarding the significance of the questionnaire that how the information would be useful in improving their social and emotional wellbeing and helps in preventing the worsening of the symptoms and prognosis of the existing illness. The subjects were asked to complete a questionnaire composed of statements relevant to their generalized anxiety and depression. The subjects were asked to read out aloud one or other phrases of the questionnaire. This also provides opportunity to provide assurance that, as with all clinical information, it is a confidential document which will aid their doctor to help. Major emphasis was given on confidentiality of the data collected from the subjects participated and the interview was only conducted after the consent taken from the subjects.

#### **Data Analysis**

The data was analyzed using statistical software namely SPSS 18.0 and Microsoft word and excel has been used to generate graphs, tables, etc. The independent t-test and Mann-Whitney test was applied for the comparison of HADS-A and HADS-D score, including parameters like age and gender within the group. The independent t-test was applied for the comparison between the gender and age of the group. The test was applied at 95% confidence interval and p value set at 0.05. The results were taken to be significant if  $p < 0.05$ .

#### **Results**

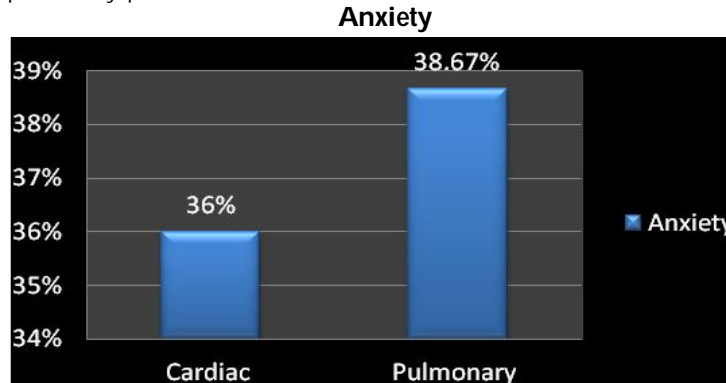
The demographic data was analyzed by comparing means of descriptive. The mean of age (minimum 20 years and maximum 70 years) is 43.06. Between the group analysis indicate that the difference in the distribution of demographic data (age) between cardiac and pulmonary patients was not statistically significant 'p' value 0.877. A total of 152 males and 148 females are participated in the

study in which cardiac patients included 62 males and 88 females, pulmonary patients included 90 males and 60 females. The prevalence of anxiety score in cardiac patients was 36% and depression score was 62.67%. The prevalence of anxiety score in

**Table 1:** Percentage of prevalence of Anxiety score between cardiac and pulmonary patient

Anxiety score	Total no of patients	Anxiety	Percentage
Cardiac	150	54	36%
Pulmonary	150	58	38.67%

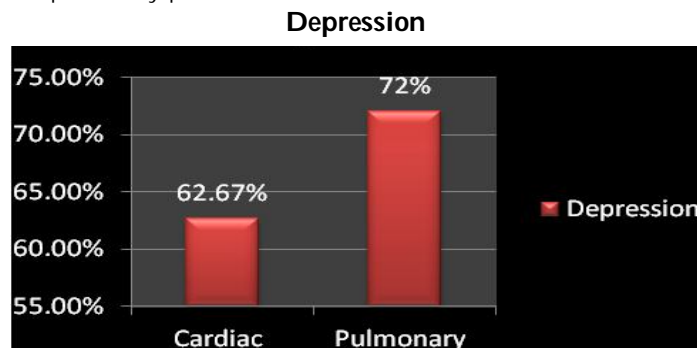
**Fig. 1 :** Percentage of prevalence of Anxiety score between cardiac and pulmonary patient



**Table 2:** Percentage of prevalence of Depression score between cardiac and pulmonary patient

Depression score	Total no of patients	Depression	Percentage
Cardiac	150	94	62.67%
Pulmonary	150	108	72%

**Fig. 2:** Percentage of prevalence of Depression score between cardiac and pulmonary patient



pulmonary patients was 38.67% and depression score was 72%.

Multiple Comparisons between Cardiac and Pulmonary patients based on scoring of HADS:

**Anxiety scoring:** The total number of patients under Normal scoring is 188 (Cardiac n=96, Pulmonary n=91), under mild scoring 85 (Cardiac n= 47 , Pulmonary n=38) , under moderate scoring 25 (Cardiac n=7, Pulmonary n= 18), under severe scoring 2 (Cardiac n=0, Pulmonary n=2).

**Depression Scoring:** The total number of patients under Normal scoring 98 (Cardiac n=56, Pulmonary n=42), under Mild scoring 117 (Cardiac n=59, Pulmonary n=58), under Moderate scoring 82 ( Cardiac n=34, Pulmonary n=48), under severe scoring 3 (Cardiac n=1, Pulmonary n=2).

Comparison according to Gender within the groups:

Within cardiac patients analysis showed that there is a significant difference in the score values HADS-D (Male 7.35 ±2.60, Female 8.78 ±2.71) of depression('p' value 0.002) and HADS-A (Male

5.77±2.25, Female 7.30 ±2.33) of anxiety ('p' value 0.000) between gender. Within pulmonary patients analysis showed that there is no significant difference in the score values HADS-D (Male 8.72 ±2.74, Female 9.35 ±2.82) of depression ('p' value 0.152) and HADS-A (Male 7.01 ±2.77, Female 7.80 ±3.20) of anxiety ('p' value 0.281) between gender.

## Discussion

In the present study, we investigated the prevalence of undiagnosed anxiety and depression in cardiac and pulmonary patients. This study illustrates the prevalence of cardiac and pulmonary patients that 36% of patients suffered from anxiety and 62.67% had depression in cardiac illness; and in pulmonary patients 38.67% suffered from anxiety and 72% had depression. The study revealed positive outcomes that anxiety and depression symptoms are present in cardiac and pulmonary patients based on HADS score. The raised mean difference of anxiety score (Cardiac 6.67 ±2.41, Pulmonary 7.32 ±2.97) and depression score (Cardiac 8.19 ±2.75, Pulmonary 8.97 ±2.78) in all cardiac and pulmonary conditions indicate that most of the subjects are suffering from subclinical anxiety and depression irrespective of the disease severity.

Cardiovascular disease (CVD) is considered as the leading cause of deaths in globally as well as in middle and low income countries like India. Some previous studies had stated that there was a range of anxiety (5%-10%) and depressive (15-20%) symptoms in cardiac outpatient wards. Acute psychological stressors and personality characters proved to act as risk factors for cardiovascular diseases, and the recent study concluded that anxiety and depression are the independent risk factors that affects that affects the mortality and morbidity of the patients with cardiac disease. Respiratory diseases are the leading cause of morbidity and the prevalence of diseases asthma, COPD are high. Female sex, advancing age, lower socio-economic status were associated with significantly higher odds in having asthma [33]. The prevalence of depression COPD in general population of India varies from 21% to 83% and a large study from the urban areas of the south India reported the prevalence of depression were 25.7% among population of more than 60 years of age [44].

Studies had concluded that rate of anxiety symptoms in COPD are higher, ranging from 13% to 51%, and are higher in patients with heart failure, cancer and other medical conditions [36]. In the present study it was found that the rate of anxiety

symptoms are approximately same in patients with cardiac and pulmonary diseases. Studies had found that the prevalence of depression in COPD patients with severe airway obstruction ( $FEV_1 < 50\%$ ) was 25% and that they had a 2.5 times greater risk of depression that controls who were comparable for demographic variables. It was found that living alone, reversibility in  $FEV_1\%$  predicted, respiratory symptoms, and physical impairments were related to depression in patients with COPD. In recent study it was found that there is an association between the chronic pain and depression. Chronic respiratory diseases are associated with chronic psychogenic and somatic pain, frequent hospital admissions, dependency on hospital and oxygen. This metaphorically suffocating disease may increase the percentage of depression in patients with pulmonary disease [15]. Several studies had reported that so many factors are responsible for a higher rate of depressive symptoms in pulmonary patients as they are having longer periods of suffering, hospitalizations, sense of hopelessness and social cutoff [33]. Depression in patients with chronic pulmonary diseases are also having anxiety and it increases with an increase in the chronicity of the disease. Patients with pulmonary disease cannot able to cope with their daily needs adequately, thus this will lead to increase in anxiety and depression in patients and will be responsible for the worsening of the condition [15]. The findings of the current study revealed that pulmonary patients had higher depressive symptoms than cardiac patients.

Women are more sensitive to psychological trauma; cardio-vascular events can result in vulnerability to trauma or deterioration of the previous psychological trauma or anxiety symptoms. The results of our study, supported by the previous study, indicated that the prevalence of depression is relatively high in women with cardiac disease as that of male. The changes in the performance of autonomous nervous system and decrease in regulatory of vagus nerve can affect regulation of blood pressure and possibly the escalation of blood pressure. Besides, depression through the promotion of unhealthy behaviours like unhealthy diet, lack of exercise and physical activity can result in hypertension. From another point of view, depression can be one of the side effects of anti-hypertension medicine or can independently develop in hypertensive patients. The prevalence of depression is high in patients with CHD and it is having a significant impact on patients quality of life and treatment adherence [8]. Depression and

anxiety in cardiac diseases associated with progression of the illness [5].

This study shows that psychological impairments anxiety and depression are present following cardiac and pulmonary illness. These symptoms were measured by using a scale, Hospital Anxiety and Depression Scale (HADS) [28]. Evidence shows the HADS to be valid and reliable measuring instrument which can analyse a two-factor solution in accordance with HADS subscales for anxiety (HADS-A) and Depression (HADS-D). Anxiety and depression have prognostic importance in patients with stable CAD and respiratory disorders [40]. Thus the patients with elevated symptoms of anxiety and depression seems to be a good strategy for recruitment in clinical trials and preventing the consequences of psychological risks.

### Limitations

1. Limitation is the small sample size of the study.
2. The number of patients are taken from the single centre.
3. Another limitation is the language barrier.

### Conclusion

Anxiety and Depression symptoms are common in cardiac and pulmonary diseases and the prevalence of anxiety and depression in Indian patients following the cardiac and pulmonary disorders are high. This study proves an association between the cardiopulmonary diseases and symptoms of anxiety and depression. The level of anxiety and depression were compared and it was found that depressive symptoms are present more in pulmonary patients as that of cardiac patients. It also show that women in cardiac illness are more likely to develop depressive symptoms as that of men.

It shows that it is important to screen for symptoms of anxiety and depression in cardiac and pulmonary patients for possibility of depression and anxiety treatment. Detection and management of these mental disorders may ameliorate prognosis of the cardiac and pulmonary diseases and improve the adaptation and quality of life of these patients.

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