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# EVALUATION OF PSYCHIATRIC COMORBIDITIES IN CARDIOVASULAR DISEASE PATIENTS AND ASSESSING THE EFFECTIVENESS OF PSYCHIATRIC INTERVENTION AMONG THEM

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**ABSTRACT**

Mainly, most of the psychiatric co morbidities like anxiety, depression, and psychosis are co-occurring with the cardiovascular patients in diseases like coronary artery disease, myocardial infarction, congestive heart failure, cardiomyopathy, and thus finally results in complicative and interventional treatment for the patients. The main aim of the study is to evaluate and intervene the effectiveness of the psychiatric co morbidities like anxiety, depression, and psychosis in cardiovascular patients by assessing with some of the psychiatric scales like HARS, HDRS, BPRS. In this the study illustrates the complete picture that psychiatric co morbidities like anxiety, depression, psychosis were found mainly in the age group of 50-60 in CVD patients and their prevalence is more in male patients when compared with gender wise by assessing psychiatric scales. Our findings will be useful to researchers and other clinical pharmacists, by assessing all these co morbidities in CVD patients on giving interventional management to the patients. This management finally results in improving treatment effectiveness in cardiovascular patients.

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## INTRODUCTION

### CARDIOVASCULAR DISEASES:

Cardiovascular disease (CVD) is a class of diseases that involve the heart or blood vessels.[7] Cardiovascular disease includes coronary artery diseases (CAD) such as angina and myocardial infarction (commonly known as a heart attack). The underlying mechanisms vary depending on the disease in question. This may be caused by high blood pressure, smoking, diabetes, lack of exercise, obesity, high blood cholesterol, poor diet, and excessive alcohol consumption, among others. High blood pressure results in 13% of CVD deaths, while tobacco results in 9%, diabetes 6%, lack of exercise 6% and obesity 5%. Rheumatic heart disease may follow untreated strep throat.[1]

It is estimated that 90% of CVD is preventable.[2] Prevention of atherosclerosis involves improving risk factors through: healthy eating, exercise, avoidance of tobacco smoke and limiting alcohol intake.[1] Treating risk factors, such as high blood pressure, blood lipids and diabetes is also beneficial.

Epidemiology; Cardiovascular diseases are the leading cause of death globally.[1] This is true in all areas of the world except Africa.[1]Together they resulted in 17.3 million deaths (31.5%) in 2013 up from 12.3 million (25.8%) in 1990.[3] Deaths, at a given age, from CVD are more common and have been increasing in much of the developing world, while rates have declined in most of the developed world since the 1970s.[4] Coronary artery disease and stroke account for 80% of CVD deaths in males and 75% of CVD deaths in females.[1] Most cardiovascular disease affects older adults. The average age of death from coronary artery disease in the developed world is around 80 while it is around 68 in the developing world. Disease onset is typically seven to ten years earlier in men as compared to women.[5]

### CLASSIFICATION:

Cardiovascular diseases are classified into and which includes stroke, heart failure, hypertensive heart disease, rheumatic heart disease, cardiomyopathy, heart arrhythmia, congenital heart disease, valvular heart disease, carditis, aortic aneurysms, peripheral artery disease, thromboembolic disease, and venous thrombosis.[1]

Among these diseases the commonest ones which carry psychiatric comorbidities majorly includes:

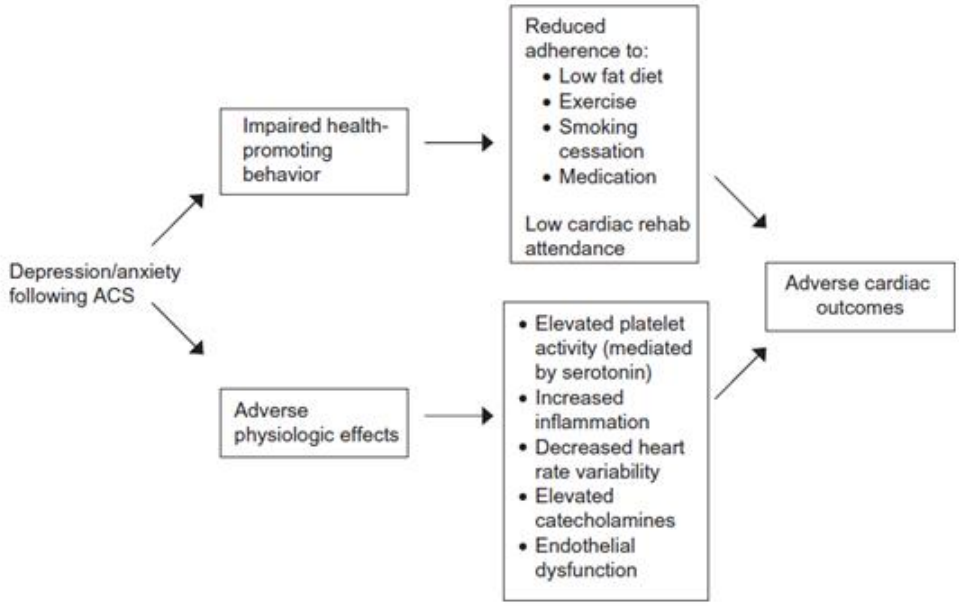
- Heart failure
- Cardiomyopathy
- Congestive heart failure
- Myocardial infarction
- Coronary artery disease

### PREVALANCE OF PSYCHIATRIC COMORBIDITIES:

An excess of anxiety disorders, as well as mood disorders, is found among persons with heart disease. These associations hold across countries despite substantial between-country differences in culture and mental disorder prevalence rates. These results suggest that similar mechanisms underlie the associations and that a broad spectrum of mood-anxiety disorders should be considered in research on the comorbidity of mental disorders and heart disease. Depression and ischemic heart disease are leading sources of disease burden world-wide.[20] Prior research has found that persons with heart disease are more likely to experience depressive illness and that comorbid depression is associated with a two fold or greater increased risk for all-cause mortality, cardiovascular mortality and new cardiovascular events.[21] but convincing evidence that effective treatment of depression improves the prognosis of heart disease is lacking [20]. Multiple comorbidity mechanisms have been proposed to explain the association including health-related behaviours, impairments in autonomic function, elevated levels of proinflammatory cytokines, increased platelet function.

### RELATION OF CARDIOVASCULAR DISEASE WITH THE DEPRESSION:

Cardiovascular disease (CVD) and depression are currently the two most common causes of disability in high-income countries and expected to become so for countries of all income levels by 2030[22]. Apart from the cardiac disease itself it is not uncommon that these patients experience the burden of another condition such as depression, often contributing to the worsening of their somatic illness, thus, entrapping them in a possible vicious circle. Depressive symptoms appear to be associated with severe functional limitation in patients with chronic heart failure (CHF) after discharge, and functional limitation may be viewed as a behavioural factor affecting the progression of the disease. Clinical diagnosis of depression has been found to be a strong predictor of death in patients after a recent myocardial infarction (MI)[23].




**DEPRESSION IN CVD:**

**(a) Adjustment disorder with depressed mood**

(i) Response to stressful life events
(ii) Observed in as many as half of CVD patients
(iii) Often resolves with reassurance, social support, and education
(iv)Sometimes continues as a major depressive disorder

**(b) Major depressive disorder**

(i) Mal-adaptive response to stress ful life events
(ii) Often an underlying 'biological' substrate
(iii) Prevalence compared with the general population: double for ischaemic heart disease and triple for CHF patients.
(iv)Indicates a higher risk of mortality and morbidity
(v) Requires specific intervention[1].

**RELATION BETWEEN ANXIETY AND CVDs:**

Different data indicate that psychological and/or emotional disorders may play an important role in the natural history of heart diseases. Although the major evidence is that related to depression, epidemiological data would indicate that anxiety and panic disorders are highly represented in cardiac patient, thus influencing mortality and morbidity.

**ANXIETY:**

Anxiety disorders are among the most frequent mental disorders encountered in clinical practice. Anxiety is an emotional state commonly caused by the perception of real or perceived danger that threatens the security of an individual. Everyone experiences a certain amount of nervousness and apprehension when faced with a stressful situation. This is an adaptive response and is transient in nature. Anxiety when becomes excessive it can produce uncomfortable and potentially debilitating psychologic (e.g., worry or feeling of threat) and physiologic arousal (e.g., tachycardia or shortness of breath). Some individuals experience persistent, severe anxiety symptoms and possess irrational fears that significantly impair normal daily functioning. These persons often suffer from an anxiety disorder.

**MEDICAL DISEASES ASSOCIATED WITH ANXIETY:**

Anxiety symptoms are an inherent part of the initial clinical presentation of several diseases, thus complicating the distinction between anxiety disorders and medical disorders. If the anxiety symptoms are secondary to a medical illness, they usually will subside as the medical situation stabilizes. However, the knowledge that one has a physical illness (e.g., cancer or diabetes) can trigger anxious feelings and further complicate therapy. Persistent anxiety subsequent to a physical illness requires further assessment for an anxiety disorder. Symptoms of anxiety frequently present in medical disorders include palpitations, tachycardia, chest pain or tightness, shortness of breath, and hyperventilation.

**CLINICAL PRESENTATION:**

Thee DSM –IV classifies anxiety disorder into the following way:

- ✓ GAD,
- ✓ panic disorder (with or without agoraphobia),
- ✓ agoraphobia,
- ✓ SAD,
- ✓ specific phobia,
- ✓ obsessive-compulsive disorder,
- ✓ posttraumatic stress disorder, and
- ✓ acute stress disorder.

Anxiety symptoms must cause significant distress, and impairment in social, occupational, or other areas of functioning and should not be secondary to a drug or illicit substance or a general medical disorder, or occur solely as part of another psychiatric disorder.

**MEDICAL DISEASES ASSOCIATED:**

- generalized anxiety disorder
- panic disorder
- social anxiety disorder

**Treatment:**

The treatment part includes non-pharmacological and pharmacological interventions.

**Non-pharmacological intervention:**

Nonpharmacological treatment modalities in GAD include

1. psychoeducation: includes information on the causes and management of GAD. Anxious patients should be instructed to avoid caffeine, non-prescription stimulants, diet pills, and excessive use of alcohol. Cognitive behavioral therapy (CBT) is the most effective psychologic therapy in GAD patients.
2. short-term counselling,
3. stress management,
4. Psychotherapy,
5. meditation, or exercise.

Psychotherapy or medication alone have comparable efficacy in acute treatment.20 The relapse rate with CBT is less than that of other types of psychologic modalities.20 Controlled trials comparing the efficacy of combining drug and psychotherapy over long-term treatment are lacking.20 The current literature is not clear regarding when to use CBT.

**Pharmacological therapy:**

1. Benzodiazepines: The benzodiazepines are the most effective, safe, and commonly prescribed drugs for the rapid relief of acute anxiety symptoms.
2. Anti-depressants: treatment of choice for the management of chronic anxiety, especially in the presence of comorbid depressive symptoms.
3. Buspirone is an additional anxiolytic option in patients without comorbid depression or other anxiety disorders (e.g., panic disorder and SAD).

**DEPRESSION**

Depression (major depressive disorder) is a common and serious medical illness that negatively affects how you feel, the way you think and how you act. Depression causes feelings of sadness and/or a loss of interest in activities once enjoyed. It can lead to a variety of emotional and physical problems and can decrease a person's ability to function at work and at home.

**The symptom of depression can be generally explained by the following three types.**

1. Emotional symptoms
2. Physical symptoms
3. Intellectual or cognitive symptoms

**EMOTIONAL SYMPTOMS**

- → A major depressive episode is characterized by a persistent, diminished ability to experience pleasure.
- → A loss of interest and pleasure in usual activities, hobbies, or work.
- → Appear sad or depressed.
- → presence of feelings of worthlessness or inappropriate guilt( risk for suicide)
- → reach delusional thoughts.
- → Hallucinations (hearing voices etc).

**PHYSICAL SYMPTOMS:**

**Physical symptoms typically make the patient to seek medical attention.**

→ Chronic fatigue, not able to perform daily activities.
→ Fatigue that worsen in the morning and will not improve with rest.
→ Sleep disturbances especially waking early in the morning.
→ Appetite disturbances and weight loss
→ Loss of sexual interest or libido.

**INTELLECTUAL OR COGNITIVE SYMPTOMS:**

Intellectual or cognitive symptoms include a decreased ability to concentrate, slowed thinking, and a poor memory for recent events. Patients can appear confused and indecisive. Depression should be considered when cognitive symptoms are present in the elderly.

**Treatment:**

Many physicians use a combination of therapy that includes a medication and psychotherapy. Psychotherapy includes talk therapy, cognitive and behavioural therapy, problem solving therapy and inter personal therapy.

**Medications or pharmacological therapy:**

1. SSRIs
2. SNRIs
3. TCAs
4. Anti-depressants

The other option include electroconvulsive therapy, transcranial magnetic stimulation and vagal nerve stimulation.

**MATERIALS AND METHODS:**

➢ STUDY DESIGN: Prospective observational study.
➢ STUDY SITE: General medicine and Obstetrics wards, Rajiv Gandhi Institute of Medical Sciences (RIMS), Kadapa.
➢ STUDY DURATION: 6 months.
➢ SAMPLE SIZE: 84.

**INCLUSION CRITERIA:**

✓ Patients who had been hospitalised due to CVD.
✓ Patients aging between 30-70 years of both the genders.
✓ Patients with or without past psychiatric illness.
✓ Patients willing to participate in the study.

**EXCLUSION CRITERIA:**

✓ Pregnant and lactating women
✓ Patients aging greater than 80 yrs.
✓ Patients with history of substance abused.

**STUDY MATERIALS:**

- Patient data collection profoma ( Annexure-I)
- Patient information consent form (Annexure-II)
- The Hamilton rating scale for depression (Annexure-III)
- The Hamilton rating scale for anxiety (Annexure-IV)
- Patient health related questionnaire (Annexure-VII)

**OBJECTIVES**:

- To identify the CVD patients and who are with associated psychiatric comorbidity.
- To detect and assess the incidence of psychiatric comorbidity in CVD patients.
- To provide intervention based on the severity with the help of physician..
- To evaluate the effectiveness of intervention.
- To educate the patient and their family in recognising the psychotic symptoms.

**METHOD OF STUDY:**

→ Literature review on the study.
→ Preparation protocol and submitted to the institutional review board/ethical committee for approval.
→ Identification and including the patients in the study after obtaining informed consent form as per eligible criteria.
→ A total of 84 patients were enrolled based on inclusion and exclusion criteria, among them 54 were Cardiovascular patients and 30 were postpartum women.
→ Patient demographic details, past medical and psychiatric history, family history, lab investigations were collected.
→ Patients were interviewed by using psychiatric scales.
→ Based on the score the patients were categorised as patient with psychiatric comorbidity / without comorbidity.
→ Patients who found to be associated with comorbidity will be referred for psychiatric intervention.
→ Assessing the effectiveness after 1 month.

**STATISTICAL ANALYSIS:**

Collected data will be analysed by using appropriate statistical analytical technique (t-test) was performed to calculate the P-value for the purpose of comparision of results by using software mainly t-test.

**RESULTS AND DISCUSSION**

A total of 54 cardiovascular patients were recruited for our study as per the eligibility criteria after obtaining the informed consent form (ICF).

**DISTRIBUTION OF STUDY SUBJECTS BASED ON GENDER:**

Out of 54 cardiac patients, 33 patients were male and 21 were female. It is represented in fig: 2 as follows:

**Table 1: Distribution of study subjects based on Gender.**

| Gender | No. Of Patients | Percentage |
|---|---|---|
| Male | 33 | 61.11% |
| Female | 21 | 38.89% |

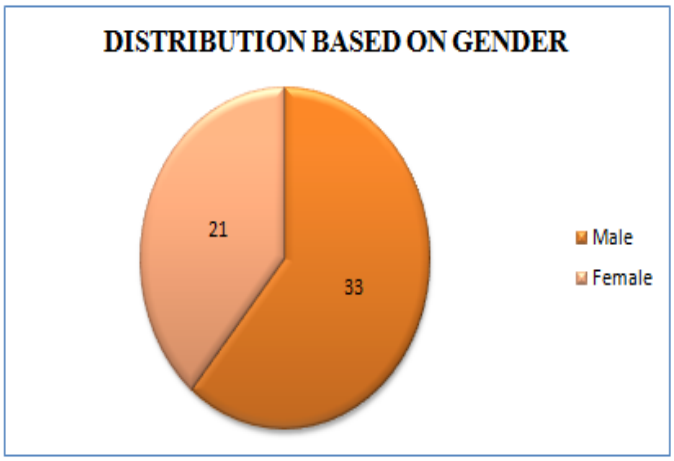



**Fig: 2 Distribution based on Gender.**

**DISTRIBUTION OF SUBJECTS BASED ON AGE:**

Out of 54 cardiac patients 9(16.67%) patients were from age group 30-40, 13(24.07%) were from 41-50, 14(25.93%) were from 51-60, 9(16.67%) were from 61-70 and 9(16.67%) were from 71-80.

**Table: 2 Distribution of cardiac patients based on age.**

| Age | No. of Patients | Percentage |
|---|---|---|
| **30-40** | 9 | 16.67% |
| **41-50** | 13 | 24.07% |
| **51-60** | 14 | 25.93% |
| **61-70** | 9 | 16.67% |
| **71-80** | 9 | 16.67% |

**DISTRIBUTION OF PATIENTS BASED ON PRESENCE OF PAST PSYCHIATRIC HISTORY:**

Out of 54 cardiac disease patients, 53(98.15%) patients had no history of psychiatric disease and 1(1.85%) patient has history of psychiatric disease.

**Table: 3, Distribution of cardiac patients based on presence of past psychiatric disease.**

| Past psychiatric history | No. Of Patients | Percentage |
|---|---|---|
| **Present** | 1 | 1.85% |
| **Absent** | 53 | 98.15% |
| **Total** | 54 | 100.00% |

**DISTRIBUTION BASED ON SEVERITY OF ANXIETY:**

Out of 54 cardiac patients, patients with mild anxiety were most in the age group 51-60, moderate anxiety were more in age group 41-50, severe anxiety were more in age group 61-70. It is represented in **fig:3** as follows.

**Table: 4, Distribution based on severity of anxiety in age group.**

| Age | Mild Anxiety | Moderate Anxiety | Severe Anxiety | No | Total | Percentage |
|---|---|---|---|---|---|---|
| **30-40** | 1 | 5 | 3 | 0 | 9 | 16.67% |
| **41-50** | 3 | 6 | 2 | 2 | 13 | 24.07% |
| **51-60** | 9 | 4 | 1 | 0 | 14 | 25.93% |
| **61-70** | 3 | 1 | 4 | 1 | 9 | 16.67% |
| **71-80** | 3 | 4 | 0 | 2 | 9 | 16.67% |

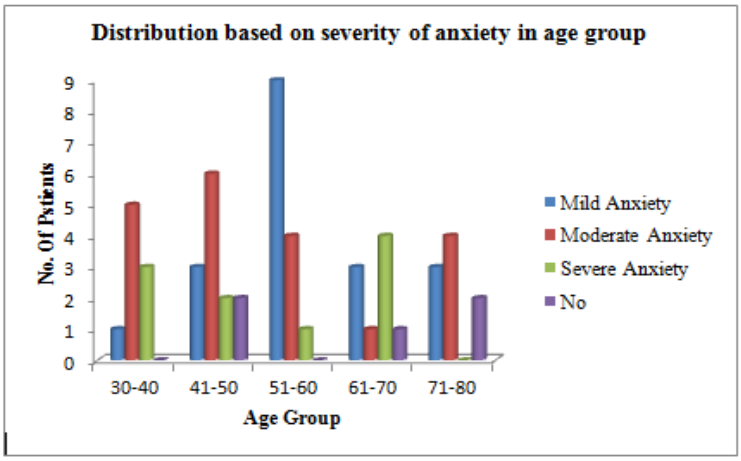



**Fig: 3, Distribution based on severity of anxiety in age group.**

**DISTRIBUTION OF CVD PATIENTS BASED ON SEVERITY OF DEPRESSION IN AGE GROUP:**

- Out of 54 cardiac patients, minimal depression was seen in age group 41-50, mild depression was seen in age group 61-70, moderate and severe depression was repoted to be low.
- It is represented in ***table:5***, ***fig: 4*** as follows.

**Table: 5 Distribution based on severity based on age.**

| Age | No | Minimal | Mild | Moderate | Severe | Total | Percentage |
|---|---|---|---|---|---|---|---|
| **30-40** | 2 | 3 | 2 | 1 | 1 | 9 | 16.67% |
| **41-50** | 5 | 8 | 0 | 0 | 0 | 13 | 24.07% |
| **51-60** | 7 | 5 | 1 | 1 | 0 | 14 | 25.93% |
| **61-70** | 1 | 3 | 3 | 2 | 0 | 9 | 16.67% |
| **71-80** | 4 | 2 | 2 | 1 | 0 | 9 | 16.67% |

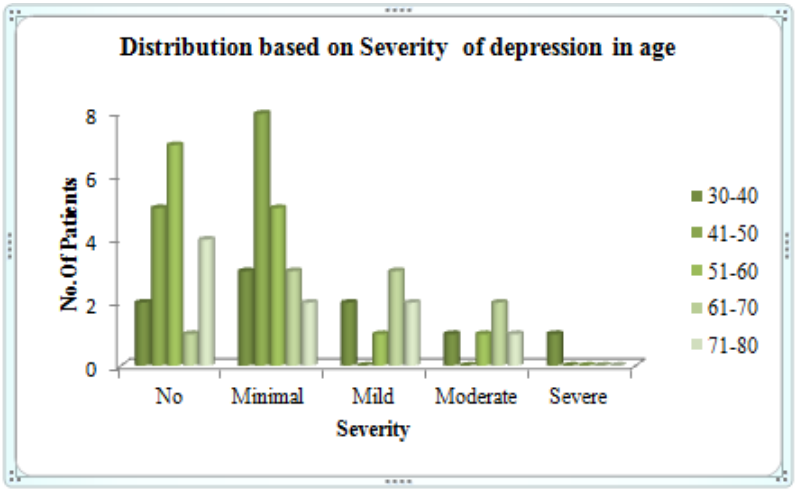



**Fig: 4 Distribution based on severity based on age.**

**DISTRIBUTION OF CVD PATIENTS BASED ON SEVERITY OF ANXIETY IN GENDER:**

- Out of 54 cardiac patients, 33 were male among them, 3 had no anxiety, 12 were with mild anxiety, 13 were with moderate anxiety and 5 were with severe anxiety.
- Similarly among 21 female cardiac patients 2 were with no anxiety, 7 were with moderate anxiety, 7 were with mild anxiety and 5 were with severe anxiety.
- It was represented in ***table:6*** and ***fig: 5*** as follows.

**Table: 6 Distribution of CVD patients based on severity of anxiety in gender.**

| Gender | No | Mild | Moderate | Severe | Total | Percentage |
|---|---|---|---|---|---|---|
| **Male** | 3 | 12 | 13 | 5 | 33 | 61.11% |
| **Female** | 2 | 7 | 7 | 5 | 21 | 38.89% |

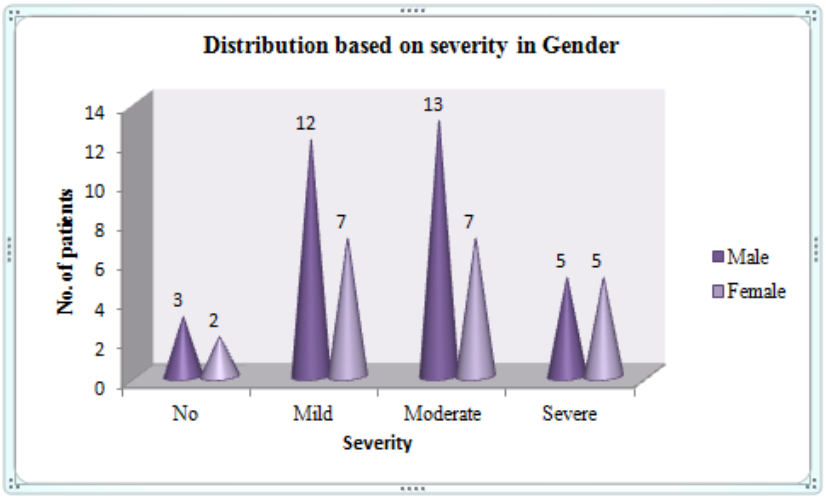



**Fig: 5 Distribution of CVD patients based on severity of anxiety in gender.**

**DISTRIBUTION OF CVD PATIENTS BASED ON SEVERITY OF DEPRESSION IN GENDER:**

- Out of 54 cardiac patients 33 were males among them 8 patients were reported with no depression 16 patients were with minimal depression and mild and moderate depression was reported in 4 patients and only one patient was reported with severe depression. Similarly in female patients 11 had no depression, 5 were with minimal depression, 4 with mild depression, 1 with moderate depression and no severe depression was reported in female patients.
- It is represented in the *table: 7*, and *fig: 6* as follows.

**Table: 7, Distribution of CVD patients based on severity of Depression in Gender.**

| Gender | No | Minimal | Mild | Moderate | Severe | Total | Percentage |
|---|---|---|---|---|---|---|---|
| **Male** | 8 | 16 | 4 | 4 | 1 | 33 | 61.11% |
| **Female** | 11 | 5 | 4 | 1 | 0 | 21 | 38.89% |

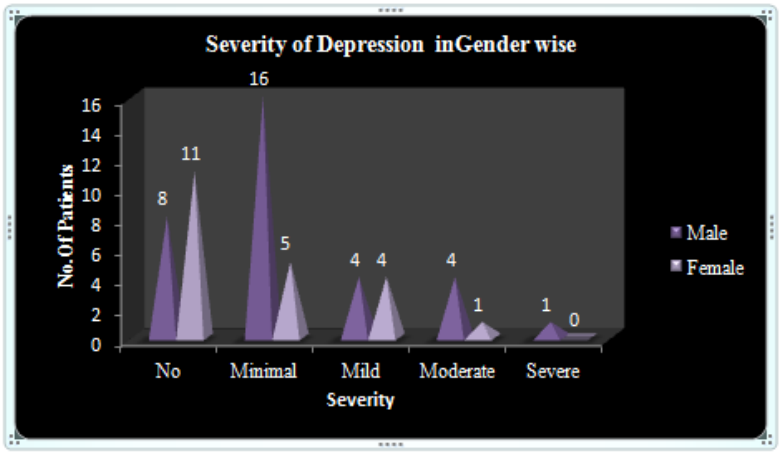



**Fig: 6 Distribution of CVD patients based on severity of Distribution in Gender.**

**DISTRIBUTON OF CVD PATIENTS BASED ON SEVERITY OF ANXIETY IN REFERENCE TO PRESENCE OF PAST CARDIAC HISTORY:**

- Out of 54 cardiac patients, 31 had past cardiac history among them, 3 had no anxiety, 9 had mild anxiety, 14 had moderate anxiety and 5 had severe anxiety. Similarly 23 patients had no past cardiac history among them, 2 had no anxiety, 10 had mild anxiety, 6 had moderate anxiety and 5 had severe anxiety.
- It is represented in ***table:8***, and ***fig: 7*** as follows.

**Table: 8, Distribution of CVD patients based on severity of anxiety in respect to past cardiac history.**

| Past Crdiac History | NO | Mild | Moderate | Severe | Total | Percentage |
|---|---|---|---|---|---|---|
| **Present** | 3 | 9 | 14 | 5 | 31 | 62.00% |
| **Absent** | 2 | 10 | 6 | 5 | 23 | 46.00% |

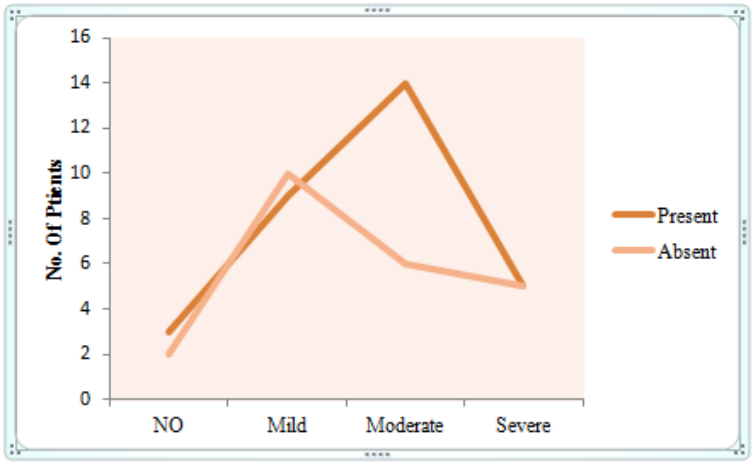



**Fig: 7 Distribution of CVD patients based on severity of anxiety in respect to past cardiac history.**

**DISTRIBUTION OF CVD PATIENTS BASED ON SEVERITY OF DEPRESSION IN RESPECT TO PAST CARDIAC HISTORY:**

- Out of 54 cardiac patients, 31 patients had past cardiac history among them 12 patients had no depression 10 patients had minimal depression, 4 patients had mild depression and moderate depression each and 1 patient had severe depression. Among 23 patients with no past cardiac history, 7 had no depression, 11 had minimal depression, 4 had mild depression, 1 had moderate depression and n patients had severe depression.
- It is represented in table:9 and fig:8, as follows.

**Table: 9, Distribution based on severity of depression in respect to presence of past cardiac history.**

| Past cardiac history | No | Minimal | Mild | Moderate | Severe | Total | percentage |
|---|---|---|---|---|---|---|---|
| Present | 12 | 10 | 4 | 4 | 1 | 31 | 62.00% |
| Absent | 7 | 11 | 4 | 1 | 0 | 23 | 46.00% |

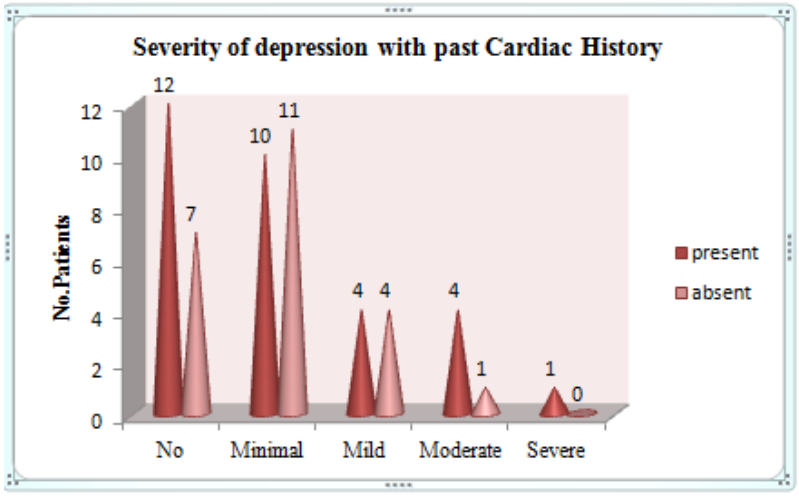



**Fig: 8 Distribution based on severity of depression in respect to presence of past cardiac history.**

**Table: 10, Average scores of each scale at base line and follow-up.**

| Sl.No. | HARS | | EPDS | | BPRS | | PHRQ | |
|---|---|---|---|---|---|---|---|---|
| | Baseline | Follow-up | baseline | Follow-up | Baseline | Follow-up | Baseline | Follow-up |
| 1. | 13 | 10 | 13 | 12 | 17 | 15 | 7 | 7 |
| 2. | 24 | 22 | 9 | 9 | 20 | 20 | 4 | 4 |
| 3. | 10 | 10 | 11 | 11 | 57 | 54 | 9 | 8 |
| 4. | 11 | 10 | 8 | 8 | 42 | 40 | 4 | 4 |
| 5. | 22 | 22 | 18 | 18 | 52 | 50 | 4 | 4 |
| 6. | 17 | 17 | 8 | 8 | 23 | 23 | 4 | 4 |
| 7. | 14 | 13 | 17 | 17 | 29 | 29 | 6 | 6 |
| 8. | 10 | 10 | 7 | 7 | 42 | 40 | 5 | 4 |
| 9. | 13 | 12 | 11 | 11 | 28 | 27 | 3 | 3 |
| 10. | 20 | 8 | 8 | 6 | 23 | 35 | 2 | 5 |
| 11. | 16 | 20 | 14 | 8 | 55 | 22 | 7 | 2 |
| 12. | 8 | 16 | 6 | 15 | 37 | 57 | 5 | 8 |
| 13. | 19 | 17 | 21 | 20 | 32 | 31 | 5 | 5 |
| Average | 15.153 | 14.384 | 11.6153 | 11.538 | 35.153 | 34.0769 | 5.000 | 4.923 |
| p-value | 0.6956 | | 0.9666 | | 0.7459 | | 0.8884 | |

## CONCLUSION

The clinical importance of the bidirectional relationship between psychiatric and physical illness should be appreciated by medical and clinical communities that helps in preventing the worsening of the existing physical illness. Past studies primarily focus on comorbid depression however emerging and other study indicates that anxiety is as important as depression. Anxiety and depression disorders amplify symptoms of some medical illness and worsen clinical outcomes. Early identification of patients with psychiatric comorbidity and developing evidence based medicine treatment strategies helps to improve prognosis and quality of life in patients with cardiovascular diseases.

Psychiatric comorbidity is common in postpartum period and can be detected as early as first week after delivery. The measures that we used to assess psychiatric illness do not always conform with DSM-IV, so differential diagnosis should be further considered to make appropriate clinical decision. It needs larger sample to generalize the finding of our study.

We tried to find the relation and the reason what causing and found a good positive response from patients after performing an intervention based on the severity of associated comorbidity.

Based on the former studies and our study we conclude that the prevalence of psychiatric illness in CVD patients and postpartum women is more. So, it is the responsibility of the clinicians to identify the patients who are risk of developing psychiatric illness and treating them for the purpose of better patient care.

## CONFLICT OF INTEREST:

We do not have any conflict of interest.

## ACKNOWLEDGEMENT:

I thank my Parents who have been the emblem of love and for their encouragement. It is with their support and guidance, I walk through the path of success.

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