

To Evaluate the Depression and Anxiety Symptoms in Coronary Artery Disease Patients

Amol Patange¹, Md Munnawar S Hussain²

Abstract

Background: Depression, anxiety, and anxiety disorders may play a significant role in heart health and have been implicated in the development and progression of both coronary artery disease and heart failure.

Material and Methods: This is descriptive cross-sectional study design was used to find out the anxiety and depression of patients with CAD attending at Khaja banda Nawaz institute of medical sciences. Semi structured interview schedule for the sociodemographic variables, disease related variables, behaviour related variables, and support system was developed by researcher based on extensive literature review. Hospital Anxiety and Depression Scale (HADS), developed by Zigmond and Snaith and validated by Risal et al. was used to assess anxiety and depression.

Result: In our study, out of 70 respondents, 57.8% were between the ages of 40-60 years. The mean age of the respondents was 52.23±7.83 years. Similarly, 60.7% were male and 80.3% were living with their spouse. Moreover, that two-thirds (66.1%) of the respondents were diagnosed with myocardial infraction followed by angina pectoris (20.2%) and ischemic heart failure (13.7%). The 27.4% of the respondents had anxiety caseness and 19.6% had borderline anxiety. Similarly, 26.2% of the respondents had borderline depression and 23.8% had depression caseness.

Conclusion: In coronary artery disease and depression are cause a significant decrease in quality of life for the patient and impose a significant economic burden on society. Anxiety and depression have great correlation in CAD patients. Furthermore, shows that there was significantly positive correlation between anxiety and depression.

Keywords: Depression; Anxiety; Myocardial infraction; Angina pectoris; Ischemic heart disease.

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Introduction

Depression and anxiety disorders are common and persistent-and they have a lasting impact on quality of life, functioning, and cardiac health.¹ In this article, we review the associations between negative psychological states and cardiovascular health, the physiologic and health behavior mechanisms that may mediate these relationships, ways to diagnose depression and anxiety disorders, and safe and

effective treatments for these disorders.

Among patients with heart disease, such as coronary artery disease or heart failure, depression and anxiety disorders are extremely common. In these populations, 20% to 40% have elevated depressive symptoms, and 15% to 20% suffer from Major depressive disorder (MDD).² Anxiety may be even more common than depression. A recent meta-analysis suggests that over 50% of patients with heart failure have elevated rates of anxiety,

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and 13% meet criteria for an anxiety disorder.³ These prevalence rates are significantly higher than those in the general population and highlight the high-risk status of cardiac patients for these disorders.

Depression, anxiety, and anxiety disorders may play a significant role in heart health and have been implicated in the development and progression of both coronary artery disease and heart failure.⁴ Depression confers a 2-fold increased risk of mortality and adverse cardiac events after myocardial infarction or heart failure and has been linked to poor outcomes after cardiac surgery.⁵ The evidence for depression's links to cardiac health is so strong that the American Heart Association (AHA) labelled depression a risk factor for poor medical outcomes following acute coronary syndrome.⁶

The links between depression, anxiety, and cardiovascular disease are complex and involve psychological, biological, and behavioral mechanisms.⁷ Depression, arrhythmias, and coronary artery disease frequently co-occur because they share common behavioral and pathophysiological drivers-unhealthy lifestyle, autonomic dysregulation, hypothalamic-pituitary-adrenal (HPA) axis dysregulation, endothelial dysfunction, and inflammation-that are intricately related to one another.⁸

Physiological mechanisms: Autonomic dysregulation, HPA axis dysregulation, inflammation, and endothelial dysfunction all may mediate the relationship between psychiatric illness and heart health. In depression, anxiety, and cardiovascular disease, an autonomic imbalance with sympathetic predominance is common; these disease states potentiate each other through the autonomic nervous system.⁹ Chronic stress can lead to inflammation, as well as alterations in cortisol levels via the HPA axis, which in turn leads to lasting, deleterious changes in the limbic system.¹⁰

Inflammation also promotes depression and anxiety by reducing monoamine neurotransmitters in the brain, by activating anxiety-related neurocircuitry, and by decreasing antidepressant response; moreover, it has been implicated in the development of cardiovascular plaque formation.¹¹ Finally, endothelial dysfunction is directly related to inflammation and is associated with depression, anxiety, and cardiovascular disease.¹² Ultimately, it is likely that a combination of these shared physiologic processes and lifestyle choices may help explain the observed relationships between depression, anxiety, and cardiovascular health.

Material and Methods

This is descriptive cross-sectional study design was used to find out the anxiety and depression of patients with CAD attending at Khaja banda Nawaz Institute of Medical Sciences. The nonprobability, purposive sampling technique was used to select the required sample size. Researcher identified the sample from OPD by verbally asking the patients about their age and purpose of visit to OPD. Ten medical files were reviewed to confirm the information given by patient. Semi structured interview schedule for the sociodemographic variables, disease related variables, behaviour related variables, and support system was developed by researcher based on extensive literature review. Hospital Anxiety and Depression Scale (HADS), developed by Zigmond and Snaith in 1983 and validated among Nepalese people by Risal et al. on 2015, was used to assess anxiety and depression. It had 7 items related to anxiety and 7 items related to depression.¹³

Statistical Analysis

The data was edited, coded, and entered in excel sheet and then entered into SPSS 20th version for analysis. Data was analysed using descriptive statistics, i.e., frequency, percentage, mean, and standard deviation to describe the patient's demographic variables, anxiety, and depression. Chi square test was used to determine association between different selected variables with level of anxiety and level of depression. Spearman's correlation coefficient test was used to find out the relationship between anxiety and depression of the patients with CAD.

Results

In our study, table 1 shows that, out of 70 respondents, 57.8% were between the ages of 40-60 years. The mean age of the respondents was 52.23±7.83 years. Similarly, 60.7% were male and 80.3% were living with their spouse.

Table 1: Sociodemographic variables of the respondents. n= 70.

Socio-demographic Variables	Frequency	Percentage
Age Group (in years)		
19-39	14	19.6
40-64	40	57.8
65 above	16	22.6

Mean ± SD=52.23±7.83 Min:18 Max: 80

Sex		
Male	42	60.7
Female	28	39.3
Living with		
Spouse	56	80.4
Single	14	19.6
Type Family		
Nuclear	35	50.6
Joint	35	49.4
Educational Status		
Literate	43	61.9
Illiterate	27	38.1
Employment Status after illness		
Employment	44	63.1
Unemployment	26	36.9
If employment, occupation (n=70)		
Housework	21	30.2
Agriculture	14	20.7
Service	18	25.5
Business	17	23.6

Table 2: Disease related variables of the respondents. n= 70

Variables	Frequency	Percent
Type of CAD		
Angina pectoris	14	20.2
Myocardial Infraction	46	66.1
Ischemic heart failure	10	13.7
Mode of treatment		
Medical	22	30.9
Surgical	48	69.1

Presence of co-morbidities		
Yes	35	50.0
No	35	50.0
Family history of CAD		
Yes	8	11.9
No	62	88.1

In our study, table 2 shows that two-thirds (66.1%) of the respondents were diagnosed with myocardial infraction followed by angina pectoris (20.2%) and ischemic heart failure (13.7%). Regarding mode of treatment, more than two-thirds (69.1%) of the respondents had surgery. Likewise, half of the respondents (50.0%) had other comorbid conditions.

Table 3: Level of anxiety and depression of the respondents. n = 70

Level	Frequency	Percentage
Anxiety		
No anxiety (0-7)	37	53.0
Borderline anxiety (8-10)	14	19.6
Anxiety caseness (11-21)	19	27.4
Depression		
No depression (0-7)	35	50.0
Borderline depression (8-10)	18	26.2
Depression caseness (11-21)	17	23.8
Total	70	100

Table 3 shows that 27.4% of the respondents had anxiety caseness and 19.6% had borderline anxiety. Similarly, 26.2% of the respondents had borderline depression and 23.8% had depression caseness.

Table 4: Association of level of anxiety with different variables.

Variable	Level of Anxiety			p-value
	No Anxiety n (%)	Borderline anxiety n (%)	Anxiety caseness n (%)	
Gender				
Male	23 (62.1)	8 (57.1)	8 (42.1)	<0.001
Female	14 (37.8)	6 (42.8)	11 (57.8)	
Living with				
Spouse	25 (67.5)	9 (64.2)	13 (68.4)	0.024
Single	12 (32.4)	5 (35.7)	6 (31.5)	
Occupation status				
Housework	3 (8.1)	3 (21.4)	11 (57.8)	0.013
Agriculture	4 (10.8)	3 (21.4)	5 (26.3)	
Services	11 (29.7)	6 (42.8)	2 (10.5)	
Business	19 (51.3)	2 (14.2)	1 (5.2)	
Economic Status				
Enough to run family	26 (70.2)	10 (71.4)	12 (63.1)	<0.001
Not Enough to run family	9 (24.3)	4 (28.5)	7 (36.8)	

In table 4 shows that the level of anxiety was significantly associated with sex of the respondents where females had more anxiety cases than males. Moreover, respondents who were living single had more anxiety caseness than respondents who were living with their spouse. Similarly, respondents

who were involved in housework had more anxiety caseness than other occupation. The results further demonstrated that respondents whose family income is not sufficient to family had more anxiety caseness than respondents whose family income is not enough to run family.

Table 5: Association of level of depression with different variable.

Variable	Level of depression			p-value
	No Anxiety n (%)	Borderline anxiety n (%)	Anxiety caseness n (%)	
Living with				
Spouse	21 (60.0)	11 (61.1)	6 (35.2)	<0.001
Single	14 (40.)	7 (38.8)	11 (64.7)	
Education Status				
Literate	24 (68.5)	12 (24.0)	5 (29.4)	<0.001
Illiterate	11 (31.4)	6 (66.6)	12 (70.5)	
Level of Education				
Up to secondary	16 (45.7)	10 (55.5)	10 (58.8)	0.013
Above Secondary	19 (54.2)	8 (44.4)	7 (41.1)	
Occupation status				
Housework	9 (25.7)	8 (44.4)	9 (52.9)	0.001
Agriculture	3 (8.5)	5 (27.7)	6 (35.2)	
Services	11 (31.4)	2 (11.1)	1 (5.8)	
Business	12 (34.2)	3 (16.6)	1 (5.8)	
Presence of Co Morbidities				
Yes	13 (37.14)	9 (50)	11 (64.7)	0.023
No	22 (62.8)	9 (50)	6 (35.2)	
Family History of CAD				
Yes	9 (25.7)	8 (44.4)	6 (35.2)	0.501
No	26 (74.2)	10 (55.5)	11 (64.7)	

In table 5 shows that respondents who were living single had more depression caseness than respondents who were living with their spouse. Likewise, level of depression was more prevalent among illiterate respondents having CAD than literate respondents having CAD, which further demonstrate that the higher the education the lower the depression cases. Moreover, respondents who were involved in agriculture had more depression caseness than other occupation.

Table 6: Relationship between anxiety and depression score of the respondents. n= 70.

Variables	Anxiety	Depression
Anxiety	1	–
Depression	0.325	1

Table 6 shows that there was significantly positive correlation between anxiety and depression (0.325).

Discussion

Out of 70 patients, 27.4% of the patients have anxiety caseness & 19.6% have borderline anxiety. This observation is virtually same to the study showed by Meneghetti C et al.,¹⁴ where 48.4% of CAD patients have anxiety. Equally, studies showed by Carvalho et al.,¹⁵ and Rothenbacner et al.,¹⁶ showed 32.5% and 8.3% of anxiety between CAD patients, correspondingly. Anxiety between CAD patients is more in the current study which could be due to joblessness position after sickness, lack of knowledge, lack of awareness concerning forecast of CAD, and incomplete therapy facility in the healthcare setting.

In this study, 23.8% patients have depression caseness and 23.8% and 26.2% had borderline depression, whereas studies showed in Meneghetti

C et al.,¹⁴ and Rothenbacner et al.,¹⁶ showed that 26.4% and 5.9% of CAD patients have depression, correspondingly. Depression in CAD patients is more in this study which could be due to lack of awareness and limited convenience and availability of health services facility along with health insurance.

In this study, sex of the patients was suggestively linked with level of anxiety of the CAD patients where females have more level of anxiety than males. This observation is reinforced by the studies showed in Carvalho et al.,¹⁵ and Shibeshi et al.,¹⁷ which presented the more level of anxiety in female CAD patients. Females are more prone to have anxiety which could be due to their multiple roles, gender discrimination, or other family problems. Living status was alternative significant variable which effect the level of anxiety of CAD patients where patients who were existing alone have higher level of anxiety than the patients living with spouse. This finding is reliable with the study conducted in Chopra et al.,¹⁸ which exposed that patients who were living alone had more anxiety. This could be due to lack of physical, emotional, and economic provision amongst those CAD patients who were living alone.

Moreover, family revenue and profession status were also linked with level of anxiety of CAD patients where patients whose annual family revenue was not adequate to run their family had more anxiety level. However, study showed in Khan A et al.,¹⁹ presented that there was no significant relative of anxiety with socioeconomic and profession status of CAD patients. The discrepancy in observing could be due to difference in sample size and sample characteristics. This study establishes that the patients who had higher level of self-esteem have lower level of anxiety likened to patients who have lower level of self-esteem ($p \leq 0.001$). In contrast to this observation, the study showed in Carvalho et al.,¹⁵ exposed that the patients who have more self-esteem score will have higher level of anxiety. This inconsistency in the observation of the studies could be due to presence of different nature of sample and health service facilities which helps to manage their more self-esteem.

The findings of the study presented that level of anxiety was not related with age and comorbid circumstances of the CAD patients. This observing contradicts with the observing of the study showed in Shibeshi et al.,¹⁷ where age was significantly linked with level of anxiety. Similarly, study showed in India 16 presented that level of anxiety of CAD patients had significant association with comorbid

condition. The discrepancy in observing might be due to difference in sample size, study setting, and characteristics of sample. The observing of the study presented that people who were living alone have higher level of depression ($p \leq 0.001$) than the patients living with their spouse. This observing is similar to the study showed in Eng H et al.,²⁰ where patients living alone have more depression than the patients living with their spouse. This could be due to lack of ultimate care and support of family members which is pivotal to the individual who are diseased. Likewise, patients who had greater level of education had lesser level of depression ($p=0.017$). In contrast to this observing, study conducted in Eng H et al.,²⁰ revealed the education level to be not linked with depression. This discrepancy in observing might be due to presence of different nature of samples and study setting of the study.

Likewise, occupation was recognised as one of the influencing variable for the level of depression of CAD patients ($p=0.001$) in which patients who were involved in housework had greater level of depression compared to patients involved in others occupations (agriculture, service, and business). In contrast to this observing, the study conducted in Khan A et al.,¹⁸ revealed that occupation status was not linked with level of depression. This could be due to use of various tool or inclusion of different nature of sample population. The observing of the study exposed that the comorbidities were significantly linked with the level of depression of CAD patients and this observing is reliable with the study conducted in Eng H et al.,²⁰ This could be due to more symptoms related to the linked diseases which interrupt the daily activities of the CAD patients which caused them to feel more depressed. Additionally, physical exercise was significantly linked with the level of depression ($p=0.001$) of the CAD patients where the patients who did regular exercise have low level of depression. This could be due to role of exercise in decrease of stress in the individual and improvement of the overall well-being.

Further, this study exposed that there was significant link among self-esteem and level of depression of the CAD patients where patients with greater level of self-esteem had lesser level of depression. This could be due to association of positive self-esteem with mental well-being, happiness, adjustment, success, achievements, and satisfaction where low self-esteem can donate to negative outcomes such as depression. In contrast to this observing, the observing of study conducted in Carvalho et al.,¹⁵ exposed that the patients who

had higher self-esteem score had greater level of depression. This discrepancy in the observing of the study might be due to inclusion of various group of sample population in the studies. In this study level of depression was not significantly linked with sex of the CAD patients, whereas study conducted in Carvalho et al.,¹⁵ showed that depression had significant association with sex of the patients. The discrepancy in findings could be due to difference in sample population and study setting.

Conclusion

In conclusion, coronary artery disease and depression are both highly prevalent diseases. Both of them cause a significant decrease in quality of life for the patient and impose a significant economic burden on society. Anxiety and depression have great correlation in CAD patients. So, psychiatry visits by specialties along with assessment by nurses in cardiovascular patients are recommended for case finding in anxiety and depression.

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