Journal of Cardiovascular Disease Research

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

Original Research Article

A Prospective Study on Cardiac Patients with Depression and Anxiety Symptoms in Tertiary Hospital

[1]Dr. Sushil Z George,[2]Dr.Neena John

[1] Assistant Professor, Dept. of Psychiatry, Vels Institute of Medical Science

[2] Associate Professor, Indian Institute of Public Health, Hyderabad

Corresponding Author: Dr. Neena John

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 prospective study design was used to find out the anxiety and depression of patients with CAD attending at Vels Medical College and Hospital. 48 patients were recruited. The studyperiodwas from Jan 2022 to June 2022. 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

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

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

be even more common than depression. A recent meta-analysis suggests that over 50% of patients with heart failure have elevated rates of anxiety, 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 prospective study to find out the anxiety and depression of 48 patients with CAD attending at Vels Medical College and Hospital . The studyperiodwas from Jan 2022 to June 2022. 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

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

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

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

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)	

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

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				0.023
Yes	13 (37.14)	9 (50)	11 (64.7)	
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).

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

Discussion

Out of 170 patients, 27.4% of the patients had anxiety caseness and 19.6% had borderline anxiety. This finding is almost similar to the study conducted by Meneghetti C et al [14] where 48.4% of CAD patients had anxiety. Similarly, studies conducted by Carvalho et al. [15] and Rothenbacner et al. [16] showed 32.5% and 8.3% of anxiety among CAD patients, respectively. Anxiety among CAD patients is higher in the present study which might be due to unemployment status after illness, illiteracy, lack of awareness regarding prognosis of CAD, and limited counselling facility in the healthcare setting. In this study, 23.8% patients had depression caseness and 26.2% had borderline depression, whereas studies conducted in Meneghetti C et al [14] and Rothenbacner et al. [16] showed that 26.4% and 5.9% of CAD patients had depression, respectively. Depression in CAD patients is higher in this study which might be due to lack of awareness and limited accessibility and availability of health services facility including health insurance. In this study, sex of the patients was significantly associated with level of anxiety of the CAD patients where females had higher level of anxiety than males. This finding is supported by the studies conducted by Carvalho et al. [15] and Shibeshi et al [17] which showed the higher level of anxiety in female CAD patients. Females are more prone to have anxiety which might be due to their multiple roles, gender discrimination, or other family problems. Living status was another significant variable which influence the level of anxiety of CAD patients where patients who were living alone had higher level of anxiety than the patients living with spouse. This finding is consistent with the study conducted by Chopra et al. [18] which revealed that patients who were living alone had more anxiety. This might be due to lack of physical, emotional, and financial support among those CAD patients who were living alone. Moreover, family income and occupation status were also associated with level of anxiety of CAD patients where patients whose annual family income was not sufficient to run their family had higher anxiety level. However, study conducted in Khan A et al [19] showed that there was no significant relation of anxiety with socioeconomic and occupation status of CAD patients. The discrepancy in findings might be due to variation in sample size and sample characteristics. This study found that the patients who had higher level of self-esteem had lower level of anxiety compared to patients who had lower level of self-esteem ($p \leq 0.001$). In contrast to this finding, the study conducted in Carvalho et al. [15] revealed that the patients who had higher self-esteem score had higher level of anxiety. This discrepancy in the finding of the studies might be due to inclusion of different nature of sample and health service facilities which helps to maintain their higher self-esteem. The findings of the study showed that level of anxiety was not associated with age and comorbid conditions of the CAD patients. This finding contradicts with the finding of the study conducted by Shibeshi et al [17] where age was significantly associated with level of anxiety. Likewise, study conducted by Chopra et al. [18] showed that level of anxiety of CAD patients had significant association with comorbid condition. The discrepancy in findings might be due to variation in sample size, study setting, and characteristics of sample. The finding of the study showed that people who were living alone had greater level of depression ($p \leq 0.001$) than the patients living with their spouse. This finding is similar to the study conducted in Eng H et al. [20] where patients living alone had more depression than the patients living with their spouse. This might 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 higher level of education had lower level of depression ($p=0.017$). In contrast to this finding, study conducted in Eng H et al. [20] revealed the education level to be not associated with depression. This discrepancy in findings might be due to inclusion of different nature of samples and study setting of the study. Similarly, occupation was identified 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 higher level

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

of depression compared to patients involved in others occupations (agriculture, service, and business). In contrast to this finding, the study conducted by Khan A et al [18] revealed that occupation status was not associated with level of depression. This might be due to use of different tool or inclusion of different nature of sample population. The finding of the study revealed that the comorbidities were significantly associated with the level of depression of CAD patients and this finding is consistent with the study conducted in Eng H et al. [20] This might be due to more symptoms related to the associated diseases which interrupt the daily activities of the CAD patients which caused them to feel more depressed. Moreover, physical exercise was significantly associated with the level of depression (p=0.001) of the CAD patients where the patients who performed regular exercise had low level of depression. This might be due to role of exercise in reduction of stress in the individual and enhancement of the overall well-being. Further, this study revealed that there was significant association between self-esteem and level of depression of the CAD patients where patients with higher level of self-esteem had lower level of depression. This might be due to association of positive self-esteem with mental well-being, happiness, adjustment, success, achievements, and satisfaction where low self-esteem can contribute to negative outcomes such as depression. In contrast to this finding, the finding of study conducted in Carvalho et al. [15] revealed that the patients who had higher self-esteem score had higher level of depression. This discrepancy in the finding of the study might be due to inclusion of different group of sample population in the studies. In this study level of depression was not significantly associated 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 might be due to variation 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 cardiologist in cardiovascular patients are recommended for case finding in anxiety and depression.

Reference

1. Thombs BD, Bass EB, Ford DE, et al. Prevalence of depression in survivors of acute myocardial infarction. *J Gen Intern Med.* 2006;21:30-38.
2. Rutledge T, Reis VA, Linke SE, et al. Depression in heart failure a meta-analytic review of prevalence, intervention effects, and associations with clinical outcomes. *J Am Coll Cardiol*. 2006;48:1527-1537.
3. Huffman JC, Celano CM, Beach SR, et al. Depression and cardiac disease: epidemiology, mechanisms, and diagnosis. *Cardiovasc Psychiatry Neurol*. 2013
4. Easton K, Coventry P, Lovell K, et al. Prevalence and measurement of anxiety in samples of patients with heart failure: meta-analysis. J Cardiovasc Nurs. 2015. Accessed November 1, 2016.
5. Martens EJ, Smith OR, Winter J, et al. Cardiac history, prior depression and personality predict course of depressive symptoms after myocardial infarction. *Psychol Med*. 2008;38:257-264.
6. Grace SL, Abbey SE, Irvine J, et al. Prospective examination of anxiety persistence and its relationship to cardiac symptoms and recurrent cardiac events. *PsychotherPsychosom*. 2004;73:344-352.
7. Wulsin LR, Singal BM. Do depressive symptoms increase the risk for the onset of coronary disease? A systematic quantitative review. *Psychosom Med*. 2003;65:201-210.

ISSN: 0975-3583, 0976-2833 VOL 13, ISSUE 05, 2022

8. Garfield LD, Scherrer JF, Hauptman PJ, et al. Association of anxiety disorders and depression with incident heart failure. *Psychosom Med*. 2014;76:128-136.
9. Van Melle JP, de Jonge P, Spijkerman TA, et al. Prognostic association of depression following myocardial infarction with mortality and cardiovascular events: a meta-analysis. *Psychosom Med*. 2004;66:814-822.
10. Blumenthal JA, Lett HS, Babyak MA, et al. Depression as a risk factor for mortality after coronary artery bypass surgery. *Lancet*. 2003;362:604-609.
11. Lichtman JH, Froelicher ES, Blumenthal JA, et al. Depression as a risk factor for poor prognosis among patients with acute coronary syndrome: systematic review and recommendations: a scientific statement from the American Heart Association. *Circulation*. 2014;129:1350-1369.
12. Celano CM, Millstein RA, Bedoya CA, et al. Association between anxiety and mortality in patients with coronary artery disease: a meta-analysis. *Am Heart J*. 2015;170:1105-1115.
13. Risal A., K. Manandhar, M. Linde, R. Koju, T. J. Steiner, and A. Holen, "Reliability and validity of a Nepali-language version of the hospital anxiety and depression scale (HADS)," Kathmandu University Medical Journal, 2015;13(50):115–124.
14. Meneghetti CC, B. L. Guidolin, P. R. Zimmermann, and A Sfoggia, "Screening for symptoms of anxiety and depression in patients admitted to a university hospital with acute coronary syndrome," Trends in Psychiatry and Psychotherapy, 2017; 39(1):12–18.
15. Carvalho I. G, E. Dos Santos Bertolli, L. Paiva, L. A. Rossi, R. A. S. Dantas, andD. A. Pompeo, "Anxiety, depression, resilience and self-esteem in individuals with cardiovascular diseases," Revista Latino-Americana de Enfermagem, vol. 24, Article ID e2836, 2016.
16. Rothenbacher D, H. Hahmann, B.W¨usten,W. Koenig, and H. Brenner, "Symptoms of anxiety and depression in patients with stable coronary heart disease: Prognostic value and consideration of pathogenetic links," European Journal of Cardiovascular Prevention and Rehabilitation. 2007;14(4):547–554.
17. ShibeshiWA,Y. Young-Xu, andC. M. Blatt, "Anxietyworsens prognosis in patients with coronary artery disease," Journal of the American College of Cardiology, vol. 2007;49(20):2021–2027.
18. Chopra S, A. Sharma, P. P. Verghese, and B. P. Chris, "A descriptive study to assess the psychiatric morbidity among patients with coronary artery disease," 2011.
19. Khan SA, S. Azhar, S. M. Asad et al., "Assessment of anxiety and depression in hospitalized cardiac patients of Faisalabad institute of cardiology, Pakistan," Tropical Journal of Pharmaceutical Research2016;15(11) 2483–2488.
20. H. S. Eng, L. C. Yean, S. Das et al., "Anxiety and depression in patients with coronary heart disease: A study in a tertiary hospital," Iranian Journal of Medical Sciences. , 2011;36(3):201–206.