# Depression and anxiety among patients with cardiovascular disease in a tertiary care centre

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## Abstract

**Introduction:**

Years of investigation have unveiled numerous connections between cardiovascular diseases (CVDs) and anxiety and depression, and there is even a suggestion that they could mutually contribute to each other. Recent research is starting to reveal a significant occurrence of behavioral risk factors among individuals with anxiety and depression, which could potentially lead to the development of cardiovascular disease.
A descriptive cross-sectional study was conducted with the aim of determining the occurrence of psychiatric coexisting conditions among individuals with cardiovascular diseases and identifying the behavioral risk factors among this group

**Material and Methods:**

The study took place between May 17, 2022, and January 31, 2023, at Nobel Medical College Teaching Hospital in Biratnagar.

To achieve this, a semi-structured questionnaire, which included the Self-Reporting Questionnaire (SRQ-20) developed by the World Health Organization, was employed to screen for psychiatric symptoms in a sample of 200 individuals who were purposefully selected for the study.

**Results:**

Out of the 200 patients examined, 160 (which accounts for 80%) were found to be positive on the SRQ screening, with the majority of them being males, totaling 65.62% (n=105). A significant portion of these patients fell within the age range of 19 to 39 years 50% (n=80).
The behavioral risk factors include smoking at 76.25%, alcohol abuse at 73.75%, physical inactivity at 60%, and obesity at 70%. The distribution of cardiac conditions in the sample included ischemic heart disease in 54.50% of cases, heart failure in 10.50%, cardiomyopathy in 9.00%, rheumatic heart disease in 11.00%, and post-cardiac intervention in 15.00%. Among those with cardiac diseases, 51.25% were experiencing symptoms of depression, 48.75% had anxiety disorders

**Conclusion:**

There was a notable prevalence of depression and anxiety among patients with cardiovascular diseases.

**Key words:**

Behavioral risk factors, cardiovascular disease, Depression and anxiety

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## INTRODUCTION

Cardiovascular disease (CVD) stands as the predominant cause of global mortality. As of 2016, CVDs account for 31% of all deaths worldwide. Nepal, too, is grappling with a rising burden of non-communicable diseases (NCDs), with a prevalence rate of 31%. Among NCDs, CVD constitutes 40% of all reported cases. In individuals with CVD, common mental health issues manifest in the form of depression and anxiety. A study examining patients with Coronary Artery Disease (CAD) revealed that 23.8% experienced depression, while 27.4% had anxiety disorders. Moreover, the level of depression exhibited a significant correlation with factors such as educational and occupational status, presence of comorbidities, engagement in physical exercise, and the self-esteem of the patients.[1,2, 3]

Treating depression and anxiety in CAD patients has demonstrated an enhanced progression in the quality of life. Consequently, the primary objective of this study is to investigate the prevalence of depression and anxiety

among individuals diagnosed with Cardiovascular Disease.[4,5]

## MATERIAL AND METHODS

The cross-sectional study was conducted between May 17, 2022, and January 31, 2023, following the approval (Reference Number: 625/2022) obtained from the Institutional Review Committee of Nobel Medical College Teaching Hospital in Biratnagar.

The formula $n=z^2pq/d^2$ was used to determine the sample size, where n= minimum required sample size, z=1.96 at 95% confidence interval (CI), p = prevalence which was taken to 27.4% of the population, q=1-p, and d = 10% margin of error.[2] Our estimated sample size was 77. However, during the research period all respondents that were positive on the Self-Reporting Questionnaire (SRQ-20) were included which accounted to 160 samples that taken into account.

Sampling Method: The participants included patients of both genders aged 19 years and above, with confirmed Cardiovascular Disease, selected from the Cardiology Outpatient Department at NMCTH. Exclusions comprised individuals in need of urgent cardiac treatment, those with severe mental illnesses, and unconscious patients for whom assessment was not feasible.

The entire sampling technique was employed, and all patients meeting the specified criteria during the designated study period were included in the research.

The study employed the Self-Reporting Questionnaire (SRQ-20), a tool designed by the World Health Organization (WHO) to screen for psychiatric symptoms. A positive SRQ result led to evaluation by a psychiatrist at NMCTH. Adapted for Nepali use by Upadhyaya KD and Pol K in 1998, and Adhikari and Denison in 1999, the SRQ consisted of 20 yes-or-no questions, with a higher threshold of 10 for enhanced specificity based on previous research.[6,7,8]

A semi-structured sociodemographic questionnaire was also utilized, collecting data on gender, age, marital status, family type, and education. Additionally, information on behavioral risk factors, such as smoking, alcohol consumption, physical activity, and obesity, was gathered through specific questionnaires. For instance, smoking status was determined with the question "Are you presently a smoker?" Alcohol consumption in the last 30 days was assessed, and if affirmative, the average amount of standard drinks per day was estimated. Body Mass Index (BMI) was calculated by dividing weight by the square of height in meters.[9]

## RESULTS

**Table 1: Arrangement of individuals who tested positive on the SRQ based on sociodemographic factors (n=160).**

| Socio-demographic variables | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| Male | 105 | 65.62% |
| Female | 55 | 34.38% |
| **Age** | | |
| 19 – 39 | 80 | 50% |
| 40 – 64 | 50 | 31.25% |
| 65 & above | 30 | 18.75% |
| **Marital Status** | | |
| Married | 120 | 75% |
| Single | 40 | 25% |
| **Types of family** | | |
| Nuclear | 105 | 65.62% |
| Joint | 55 | 34.37% |
| **Education** | | |
| Literate | 123 | 76.87% |
| Illiterate | 37 | 23.12% |

**Table 1** displays the sociodemographic characteristics of the chosen patients. The study includes 65.62% males and 34.38% females. A significant portion of the patients falls within the age range of 19 to 39 years, with 75% of them being married and residing in nuclear families. Additionally, he majority of them, specifically 76.87%, are literate.

**Table 2: Behavioral risk factors observed in the subset of individuals who tested positive on the SRQ (n=160).**

| Behavioral risk factor | Frequency | Percentage |
|---|---|---|
| Smoking | 122 | 76.25% |
| Alcohol Abuse | 118 | 73.75% |
| Physical Inactivity | 96 | 60% |
| Obesity | 112 | 70% |

**Table 2** provides information on behavioral risk factors, including smoking at 76.25%, alcohol abuse at 73.75%, physical inactivity at 60%, and obesity at 70%.

**Table 3: Distribution of cardiovascular disease among the respondents (n=200)**

| Cardiovascular Disease | Frequency | Percentage |
|---|---|---|
| Ischemic heart disease | 109 | 54.50% |
| Heart failure | 21 | 10.50% |
| Cardiomyopathy | 18 | 9.00% |
| Rheumatic Heart Disease | 22 | 11.00% |
| Post cardiac Intervention | 30 | 15.00% |

**Table 3** displays the prevalence of cardiovascular diseases among the 200 participants, with the following percentages: ischemic heart disease at 54.50%, heart failure at 10.50%, cardiomyopathy at 9.00%, rheumatic heart disease at 11.00%, and post-cardiac intervention at 15.00%.

**Table 4: Depression and anxiety disorders (n=160)**

| Psychiatric disorder | Frequency | Percentage |
|---|---|---|
| Depression | 82 | 51.25% |
| Anxiety disorders | 78 | 48.75% |

**Table 4** Cardiovascular Disease patient who were experiencing depression at 51.25%, anxiety disorders at 48.75%

## DISCUSSION

Out of the 200 patients, 160 were identified as having depression and anxiety, constituting 80%, a figure comparable to a study by Goyal A et al,10 where 75% of cardiovascular disease patients exhibited these mental health issues. In this study, ischemic heart disease was predominant at 54.50%, differing from research in Dhaka, Bangladesh, where the prevalence was 29.8%.[11]

Among the 200 patients included in our study, 105 (65.62%) were male and 55 (34.38%) were female. This shows a greater burden of cardiovascular incidents in the male population. This higher proportion of male patients is similar to the study done by Sultana et al. in Bangladesh, where they found 60.9% of the included population to be male.[11] In contrast to that, a study done by Shah et al. from Nepal, found the burden of cardiovascular disease complicated by psychiatric illnesses such as anxiety and depression to be more prevalent in the female population. In their study, the female patients constituted 59.2% of the total study population, which is significantly different from our study.[1]

During the course of our study, the most prevalent age group for cardiovascular disease complicated by psychiatric illness was most common in the age group of 19-39 years. This prevalence of the illness in the younger adult age group was different to the findings of Sultana et al. from Bangladesh, Airaksinen from the United States, and Dhital from Nepal, where they found the most affected age group to be around 40-60 years.[1,2,3]

Among the study population, the most common behavioral risk factor for the development of cardiovascular disease and psychiatric illnesses was smoking followed by alcohol. Smoking and alcohol are known risk factors for the development of cardiovascular diseases and psychiatric illnesses.[5] Amin et al. in their respective study also found significant association between the use of smoking followed by alcohol for the development of cardiovascular diseases and psychiatric illness.[12] This finding was also evidenced by Jha et al. in their respectful study.[4] This study found that smoking was prevalent in 76.25% of CVD patients, while alcohol abuse was identified in 73.75%. Additionally, physical inactivity and obesity were observed. This contrasts with a study in Bangalore, India, where smoking was reported in 46.9% and alcohol abuse in 45.4% of patients.[13] The high prevalence of smoking in our study may be influenced by Nepal's higher prevalence of smokers, as reported by gsthr.org.

Despite the growing educational reforms, the development of cardiovascular diseases and psychiatric illness were more prevalent in the literate population, during our study. The development of cardiovascular disease in the literate population can be attributed to the sedentary lifestyle adopted by office workers and easy accessibility to processed foods.[14] This finding is similar in comparison to the study done by Serber et al. from USA, where they found increased cardiovascular and psychiatric illness in the population with increased years of schooling.[15] Similarly Shah et al. and Dhital et al. also found the prevalence of cardiovascular disease complicated by psychiatric co-morbidities to be higher in the literate population.[1,2]

In terms of specific psychiatric conditions in cardiovascular disease patients, 51.25% (n=82) experienced depression, and 48.75% (n=78) had anxiety disorders. This contrasts with a study by Sultana B. et al,[11] and Serber ER et. Al[15], where depression was reported at 20% and anxiety disorders at 45% in cardiac patients. The higher rates of depression and anxiety in CVD patients in this study could be attributed to inadequate government facilities. Similarities were observed with Li Y. et al[16] in terms of depression in cardiovascular disease patients. The levels of depression and anxiety in CVD patients from underdeveloped nations are higher compared to developed nations. In a study by Wu M et al,[17] anxiety and depression rates were 11.72% and 9.20%, respectively.

In the current investigation, there was a notable prevalence of depression and anxiety among the patients with cardiovascular diseases (CVDs). This implies that these co-morbidities may increase in frequency and severity, presenting a significant challenge in the treatment of CVD patients. To

delve deeper into these observations, larger and more comprehensive studies are warranted. Further research should be conducted to investigate potential connections between cardiovascular diseases, depression, anxiety, and behavioral risk factors.

## CONCLUSION

Depression and anxiety were quite common in the patients of cardiovascular disease. The prevalence of depression and anxiety was similar between the patients. The knowledge of psychiatric co-morbidities is equally important in the management of cardiovascular diseases.

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## CONFLICT OF INTEREST

None

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