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Anxiety And Depression In Preoperative Patients Undergoing Valvular Heart Surgery: A Cross-Sectional Study

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Abstract
Background: *Valvular heart disease (VHD) is a major contributor to global cardiovascular morbidity and mortality. Beyond the physiological burden, patients awaiting cardiac surgery often experience significant psychological distress. This study aimed to assess the prevalence of anxiety and depression and identify associated factors among preoperative patients scheduled for valvular heart surgery.*
Methods: *A quantitative, descriptive cross-sectional study was conducted in the Cardiothoracic and Vascular Surgery (CVTS) ward of a KGMU hospital in Lucknow, India. A purposive sample of 84 adult patients scheduled for valvular heart surgery was recruited. Data on sociodemographic and clinical variables were collected. Anxiety and depression were assessed one day before surgery using the Hospital Anxiety and Depression Scale (HADS). Data were analyzed using descriptive statistics, Chi-square tests, and Spearman's correlation.*
Results: *A significant portion of patients exhibited borderline to abnormal psychological distress. For anxiety, 40.5% of patients scored as borderline abnormal and 15.5% as abnormal. For depression, 53.6% were borderline abnormal and 32.1% were abnormal. A statistically significant association was found between female gender and higher anxiety levels ($p = 0.048$) and between living in a nuclear family and higher depression levels ($p = 0.017$). No other demographic or clinical variables were significantly associated with anxiety or depression. A moderate, significant positive correlation was found between anxiety and depression scores ($r = 0.367$, $p = 0.001$).*
Conclusion: *Anxiety and depression are highly prevalent among patients awaiting valvular heart surgery. The findings highlight the vulnerability of specific subgroups, such as female patients and those with smaller family units. These results underscore the critical need for routine psychological screening and integrated psychosocial support as a standard component of preoperative care for this patient population.*
Keywords: *Valvular Heart Surgery, Preoperative, Anxiety, Depression, HADS, Cardiac Surgery, Psychological Assessment.*

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I. Introduction

Cardiovascular diseases (CVDs) remain the leading cause of death globally, with valvular heart disease (VHD) being a significant and growing component of this burden (1, 2). While rheumatic heart disease continues to be a major cause of VHD in developing nations, degenerative valve diseases are more prevalent in high-income countries, reflecting a complex and evolving epidemiology (3, 4). The diagnosis of VHD and the subsequent decision to undergo major cardiac surgery is a life-altering event that imposes a substantial psychological burden on patients.

The preoperative period is a time of heightened stress, characterized by uncertainty about surgical outcomes, fear of pain and death, and concerns about recovery and future quality of life. This emotional turmoil frequently manifests as anxiety and depression (5). Preoperative anxiety is characterized by feelings of apprehension, tension, and autonomic arousal, while depression may present as persistent sadness, loss of interest, fatigue, and feelings of hopelessness (6).

Previous research has established a link between preoperative psychological distress and adverse postoperative outcomes, including increased morbidity, longer hospital stays, and delayed recovery (7, 8). Studies have reported that a high percentage of patients undergoing cardiac surgery experience significant levels of anxiety and depression (9). Identifying the prevalence of these conditions and the factors that place patients at

higher risk is a critical first step in developing targeted interventions. However, data from the Indian subcontinent, particularly concerning patients with VHD, remains limited.

This study, therefore, aimed to assess the level of anxiety and depression and to identify associated sociodemographic and clinical factors among preoperative patients scheduled for valvular heart surgery at a tertiary care center in India.

II. Methods

Study Design and Setting

A quantitative, descriptive cross-sectional study was conducted between December 2024 and February 2025. The study took place in the inpatient ward of the Department of Cardiothoracic and Vascular Surgery (CVTS) at King George's Medical University (KGMU), a major tertiary care and referral hospital in Lucknow, India.

Participants and Sampling

The target population comprised all adult patients admitted for valvular heart surgery. A purposive sampling technique was used to recruit participants. The sample size was calculated to be 84, based on an expected prevalence of anxiety of 32%, a 95% confidence level, and a 10% margin of error.

Inclusion criteria were: (a) adult patients (aged >18 years) diagnosed with VHD and scheduled for surgery, and (b) willingness to provide informed consent. Patients undergoing emergency surgery or those with cognitive impairments that affected their ability to participate were excluded.

Data Collection and Instruments

After obtaining informed consent, data were collected one day prior to the scheduled surgery. Three tools were used:

1. **Sociodemographic Proforma:** A structured questionnaire was used to collect data on age, gender, education, marital status, residence, family type, occupation, and income.
2. **Clinical Variables Proforma:** Information on diagnosis, history of previous heart surgery, comorbidities, and receipt of preoperative counseling was extracted from medical records.
3. **Hospital Anxiety and Depression Scale (HADS):** This widely validated 14-item self-report scale was used to measure psychological distress. It consists of two 7-item subscales for anxiety (HADS-A) and depression (HADS-D). Each item is scored on a 4-point Likert scale (0-3). For each subscale, scores of 0-7 are considered normal, 8-10 as borderline abnormal, and 11-21 as abnormal (case level).

Ethical Considerations

Ethical clearance was obtained from the Institutional Ethics Committee of KGMU (Ref: 2987/Ethics/2025). Written informed consent was obtained from all participants before data collection. Confidentiality and anonymity were maintained throughout the study.

Statistical Analysis

Data were analyzed using SPSS software. Descriptive statistics (frequencies, percentages) were used to summarize participant characteristics and the levels of anxiety and depression. The Chi-square test was used to determine associations between categorical demographic/clinical variables and HADS categories (normal, borderline, abnormal). Spearman's correlation coefficient was calculated to assess the relationship between anxiety and depression scores. A p-value of <0.05 was considered statistically significant.

III. Results

Participant Characteristics

A total of 84 patients participated in the study. The majority of patients were in the 18-30 year age group (34.5%). A higher proportion were female (63.1%) and resided in rural areas (75.0%). Over half of the participants were unemployed (58.3%) and had a monthly family income of less than ₹10,000 (54.8%). The most common diagnosis was Mitral Stenosis (MS) (63.1%). The majority of patients (84.5%) had no previous history of heart surgery, and 79.8% had no major comorbidities. (Table 1).

Table 1: Key Sociodemographic and Clinical Characteristics of Participants (N=84)

Variable	Category	Frequency (%)
Gender	Female	53 (63.1)
	Male	31 (36.9)
Age Group	18-30 years	29 (34.5)

	31-50 years	37 (44.0)
	>50 years	18 (21.5)
Residence	Rural	63 (75.0)
	Urban	21 (25.0)
Family Type	Joint	45 (53.6)
	Nuclear	39 (46.4)
Primary Diagnosis	Mitral Stenosis (MS)	53 (63.1)
	Mitral Regurgitation (MR)	12 (14.3)
	Other	19 (22.6)
Previous Heart Surgery	No	71 (84.5)
	Yes	13 (15.5)

Levels of Anxiety and Depression

As measured by the HADS, a substantial proportion of patients demonstrated psychological distress. For the anxiety subscale (HADS-A), 44.1% of patients scored in the normal range, 40.5% in the borderline abnormal range, and 15.5% in the abnormal range. For the depression subscale (HADS-D), 14.3% scored as normal, 53.6% as borderline abnormal, and 32.1% as abnormal (Figure 1).

Frequency and Percentage Distribution of Depression Levels (n=84)

Depression Level	Frequency (f)	Percentage (%)
Normal	12	14.29
Borderline Abnormal	45	53.57
Abnormal	27	32.14
Total	**84**	**100.00**

Summary: The results show that among the 84 patients, 14.29% had normal levels of depression, while a majority (53.57%) had borderline abnormal depression and 32.14% had abnormal levels of depression.

Factors Associated with Anxiety and Depression

Chi-square analysis revealed a statistically significant association between gender and anxiety levels (χ^2=6.089, p=0.048). A higher proportion of female patients reported borderline or abnormal anxiety compared to male patients.

A significant association was also found between family type and depression levels (χ^2=8.184, p=0.017). Patients from nuclear families were more likely to have borderline or abnormal depression scores compared to those from joint families.

No other sociodemographic variables (age, education, residence, income, occupation) or clinical variables (diagnosis, comorbidities, previous surgery) showed a statistically significant association with either anxiety or depression scores.

Correlation between Anxiety and Depression

Spearman's correlation analysis indicated a statistically significant, moderate positive correlation between HADS-A and HADS-D scores (r = 0.367, p = 0.001). This suggests that patients with higher levels of anxiety also tended to have higher levels of depression.

IV. Discussion

This study provides valuable insight into the psychological state of patients awaiting valvular heart surgery in a major Indian tertiary care center. The primary finding is the high prevalence of borderline to abnormal levels of both anxiety and depression in this population, with over half experiencing some level of anxiety and more than 85% experiencing some level of depression. This confirms that significant psychological distress is a common, rather than exceptional, part of the preoperative experience for VHD patients, a finding consistent with international literature (8, 9, 10).

A key finding of our study was the significant association between gender and anxiety, with female patients reporting higher levels of distress. This is a robust finding that has been reported in other studies on

preoperative anxiety in cardiac surgery (11, 12). This vulnerability may be attributed to various factors, including different coping mechanisms, societal roles, or a higher biological predisposition to anxiety disorders among women. This highlights the need for gender-sensitive approaches in preoperative psychological assessments.

Another significant finding was the association between family type and depression. Patients from nuclear families exhibited higher levels of depression than those from joint families. In the Indian cultural context, joint families often provide a broader and more integrated network of emotional and logistical support (13). The relative lack of this extensive support system in nuclear families may contribute to feelings of isolation and depression when facing a major life stressor like heart surgery. This suggests that assessing a patient's social support system is a crucial element of the preoperative workup.

The moderate positive correlation between anxiety and depression scores is an expected but important finding. It underscores the high comorbidity of these two conditions and reinforces the necessity of screening for both simultaneously, as the presence of one often indicates a risk for the other.

Limitations

This study has several limitations. First, its cross-sectional design precludes any inference of causality. Second, the use of a purposive sampling method at a single center may limit the generalizability of the findings to other settings or populations. Finally, the reliance on self-report measures, while standard, may be subject to reporting bias.

Implications for Clinical Practice

Despite these limitations, the study's findings have important clinical implications. The high prevalence of distress strongly argues for the integration of routine psychological screening into standard preoperative protocols for all patients undergoing valvular heart surgery. The HADS is a brief and effective tool for this purpose. Early identification of at-risk individuals would allow for timely intervention, such as psychoeducational programs, counseling, or psychiatric referral. Interventions should be tailored to consider risk factors such as female gender and limited family support. A multidisciplinary approach, involving surgeons, nurses, and mental health professionals, is essential to holistically address the complex needs of these patients.

V. Conclusion

A substantial proportion of patients awaiting valvular heart surgery experience significant levels of anxiety and depression. Female gender was a significant predictor of anxiety, while living in a nuclear family was associated with a higher risk of depression. These findings highlight the urgent need to move beyond a purely biomedical focus in preoperative care and to implement routine, systematic psychosocial assessment and support to improve the overall well-being and potentially the surgical outcomes of this vulnerable patient population.

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