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Exploring Anxiety, Fatigue, and Sleep Patterns Among Cardiothoracic Vascular Surgery Patients at Pt. BD Sharma University of Health Sciences, Rohtak: A Cross-sectional Study

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Abstract

Valvular heart disease (VHD) is a significant health issue globally, particularly in developing countries like India where rheumatic heart disease is a major cause of cardiac morbidity and mortality. This study focused on evaluating pre-operative anxiety, fatigue, and sleep quality in 100 patients undergoing heart valve repair or replacement at a tertiary center in India. Using a descriptive cross-sectional design, the study employed the GAD-7 scale, Fatigue Assessment Scale, and a sleep-quality scale to measure these variables. Results showed that a majority of the patients experienced moderate levels of anxiety (81%), fatigue (89%), and sleep quality disturbances (61%). The study found no statistically significant association between these conditions and demographic or most clinical variables ($P > 0.05$). However, there was a significant association between sleep quality and specific clinical variables like history of childhood rheumatic diseases and co-morbid conditions ($P < 0.05$). The findings suggest that anxiety, fatigue, and sleep disturbances are common among patients awaiting valve surgery, and that certain clinical factors related to sleep quality warrant further attention. These insights could help in improving pre-operative care and management for patients with VHD.

Keywords: Valvular heart disease (VHD), rheumatic heart disease, sleep-quality scale, co-morbid conditions, anxiety, fatigue, sleep

INTRODUCTION

Valvular heart disease (VHD) stands out as a significant cardiovascular condition, with its prevalence varying based on age, gender, and distinct societal factors. VHD can arise from various factors, such as rheumatic, degenerative, traumatic, congenital, and infectious heart conditions. In developing nations, VHD remains prevalent, primarily due to the rising incidence of rheumatic heart disease (RHD), a condition triggered by infection with group A beta-hemolytic streptococcus bacteria, particularly when adequate medical treatment is not received. Additionally, industrialized countries have witnessed an increase in VHD prevalence over recent years, attributed to the growing occurrence of degenerative valve diseases.

Surgery plays a crucial role in the treatment of patients with VHDs, contributing to reduced mortality rates and an improved quality of life. After coronary artery bypass graft surgery, heart valve replacement surgery ranks as the second most common type of heart surgical procedure. This

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procedure is associated with various postoperative complications, with previous research indicating mortality rates ranging from 4.3 to 14% following heart valve replacement. Differences in the occurrence and frequency of VHDs are noted between developed and developing nations. Yet, research focusing on VHDs within Iran, a developing country, remains limited. Thus, this research aimed to evaluate the postsurgical complications and death rates among individuals receiving heart valve replacement surgery at a primary medical facility in our nation. Heart valve diseases represent a significant contributor to global cardiovascular morbidity and mortality, placing a substantial burden on healthcare systems. In India, the leading cause of cardiac morbidity and mortality is RHD. Among the VHDs, the rheumatic mitral valvular disease is the most commonly encountered, aortic valvular disease ranks second in the incidence, tricuspid valve disease occurs occasionally, and pulmonary valve disease rarely.

Results from an epidemiological study revealed a prevalence rate of up to 5.1/1000 in rural populations and 1.6/1000 in urban populations for heart valve diseases. The identification of calcific aortic stenosis dates to 1904 when it was initially considered an uncommon lesion primarily observed through autopsy studies. Not until the 19th century was it recognized as a distinct clinical entity [1–5].

The experience of undergoing cardiac surgery can be a challenging ordeal for patients, both physically and mentally. The stress associated with major cardiac surgery often stems from concerns and anxieties about the surgery's outcomes, given the crucial involvement of the heart as a vital organ. Patients awaiting significant heart surgery commonly encounter notable physical and psychological stressors, including heightened anxiety, uncertainties, depression, and concerns regarding the surgery’s results. These factors have the potential to exacerbate existing symptoms and negatively impact physiological parameters before, during, and after surgery, leading to a disrupted recovery process. Significant alterations in an individual's regular lifestyle can trigger anxiety, with one such event being the experience of undergoing valvular heart surgery. Hospitalization, irrespective of the medical condition, is known to induce anxiety among patients receiving surgical care. If not identified and addressed, prolonged anxiety can lead to increased stress levels, potentially disrupting both the well-being of the patients and their overall prognosis.

Within the realm of preoperative nursing care, addressing preoperative anxiety poses a notable challenge. A significant proportion of patients identified for major heart surgery commonly undergo anxiety, which is considered an expected and widely acknowledged reaction. Numerous factors contribute to anxiety related to cardiac surgery, such as intense chest pain, ensuing fatigue, concerns about disability, fear of mortality, and persistent symptoms despite undergoing heart surgery. Anxiety, characterized by its unpleasant nature, affects patients on emotional, physical, and psychological planes. In the preoperative period, the patients awaiting heart surgery may experience a high level of anxiety and symptoms of depression, impaired functional status, chest pain, and shortness of breath due to worries, fears, and outcomes of surgery. Symptoms of anxiety, stress, depression, and pain are usual disturbances in patients with VHD undergoing valvular heart surgery.

Presently, India experiences a greater prevalence of heart disease and cardiac surgeries in comparison to other nations globally. While there have been prior studies assessing preoperative anxiety in cardiac surgery patients conducted in various countries, there exists a research void concerning the Indian population. Given the widespread representation of the Indian population, the outcomes of this study will provide novel insights into preoperative anxiety among individuals undergoing cardiac surgery for the scientific community [6–9].

NEED OF THE STUDY

With the increasing incidence of cardiovascular disorders, there is a notable rise in the annual number of cardiac surgeries performed. Such surgical procedures, as significant medical interventions, lead to considerable physical and psychological transformations in patients' lives. Patients commonly undergo psychological distress, manifesting as anxiety, fatigue, and changes in sleep quality.

On an international scale, VHD, while less prevalent compared to coronary disease, heart failure, or hypertension, holds significance for several reasons. Firstly, VHD remains common and often necessitates intervention. Secondly, noteworthy transformations have taken place in the presentation and treatment of the disease in recent years. Third, the domain lacks sufficient registries or clinical trials relative to other cardiac conditions. Furthermore, targeted surveys on valve heart disease are notably missing. A 2011 study in Turkey examining patients in line for surgery discovered that a majority displayed increased levels of anxiety before the operation. It was observed that anxiety was more acute among women than men. The study also indicated that well-educated individuals might have a clearer understanding of the risks associated with surgery, potentially leading to less anxiety. In contrast, those with less education might face higher anxiety due to a lack of information and understanding. The study found no clear link between a patient's age and their level of pre-surgical anxiety. Interestingly, patients undergoing surgeries of moderate intensity exhibited higher anxiety levels than those undergoing major operations. As per the 2014 WHO Global Health Estimate and the Global Burden of Disease Study 2010, cardiovascular diseases encompass a range of conditions, including RHD, ischemic heart diseases, hypertension, stroke, cardiomyopathy, myocarditis, endocarditis, and assorted other circulatory disorders. Congenital heart diseases are categorized independently. The experience of undergoing cardiac surgery signifies a substantial life change for both patients and their families. Throughout the preoperative and postoperative phases, patients commonly contend with feelings of fear, fatigue, anxiety, poor sleep quality, pain, and depression. Notably, individuals with elevated levels of preoperative anxiety and depression face a heightened risk of mortality.

The aim of this study was to determine the level of anxiety and fear in patients undergoing valvular heart surgery and to define the relationship between chronic fatigue levels, muscle strength, functional exercise capacity, quality of sleep, and depression.

With few public-run cardiac centers, it was a difficult task to manage a huge patient load on limited beds by the management. The nonavailability of beds forced the clinician to keep the patient waiting for admission on a trolley or postpone the surgery.

Self-reporting estimates of anxiety are also variable. Patients awaiting valvular heart surgery often experience heightened anxiety, especially when confronted with the uncertainty of an undisclosed surgery date. The fear of mortality before the surgery, rather than during the surgical procedure itself, emerges as a predominant and distressing preoccupation. Anxiety also presents as an autonomic symptom, potentially exacerbating symptoms associated with VHD. Following surgery, while there may be a decrease in anxiety levels compared to the preoperative phase, the severity of anxiety might not necessarily diminish to subclinical levels, indicating a potential need for intervention. Similar to depression, a complicating factor in accurately identifying anxious patients during the surgery recovery process is the significant increase in autonomic-arousal symptoms post surgery. Additionally, a noteworthy observation was the inadequate counseling provided by doctors regarding the treatment plan and procedure, contributing to patient dissatisfaction, heightened anxiety, apprehension, and aggression. Therefore, building upon the aforementioned concepts and survey findings, the objective of this study is to investigate preoperative anxiety and fatigue levels among patients undergoing valvular heart surgery at PGIMS Rohtak. The process of undergoing cardiac surgery can be a demanding experience for patients, encompassing both physical and psychological stress. Individuals awaiting major heart surgery commonly face substantial physical and psychological stressors characterized by heightened anxiety, uncertainties, depression, and concerns about the surgical outcomes [10–15].

OBJECTIVES

- To assess the degrees of anxiety, fatigue, and quality of sleep in patients undergoing Cardiothoracic Vascular surgery.
- To determine the association between anxiety, fatigue, and sleep quality with general demographic and clinical variables.

HYPOTHESIS

H_{01}: There will not be significant high anxiety, fatigue, and low sleep quality in patients undergoing cardiothoracic vascular surgery.

H_1: There will be significant high anxiety, fatigue, and low sleep quality in patients undergoing cardiothoracic vascular surgery.

H_{02}: There will not be an association between anxiety, fatigue, and sleep quality with selected demographic and clinical variables.

H_2: There will be an association between anxiety, fatigue, and sleep quality with selected demographic and clinical variables.

METHODOLOGY

In Figure 1, the complete methodology steps are mentioned in detail.

Sampling Criteria

Inclusion Criteria

1. The patient underwent cardiac surgery for the first time.
2. Patients of both genders aged 18 years and above.
3. Patients who are willing to participate.

Exclusion Criteria

1. Patients suffering from syndromic psychiatric illness.
2. Patients who are on psychotropic medications will be excluded.
3. Patients who could not follow the instructions or were unwilling.

Tool for Data Collection

The following tools are used to collect data:

Section A: Self-structured questionnaires used for demographic data and for clinical data. Demographic variables include age, sex, marital status, education, occupation, economic status, religion, and residence.

Clinical variable: diagnosis, surgery, history of any childhood rheumatic diseases, dental diseases/treatment, family history of heart diseases, duration of diseases, comorbid condition, lifestyle, and physical activity.

Standard Tools Used to Assess Anxiety (GAD-7), Fatigue, and Sleep Disturbance

Section B: GAD-7 used to assess anxiety.

Section C: Fatigue assessment scale (FAS) is used to assess fatigue.

Section D: The sleep quality scale was employed to evaluate the quality of sleep.

ETHICAL CONSIDERATION

- Permission was obtained from the higher authority [HOD of cardiothoracic and vascular surgery (CTVS) intensive care unit (ICU), PGIMS Rohtak].
- Participants who expressed their willingness to partake in the study provided informed consent before being included.

PROCEDURE FOR FINAL DATA COLLECTION

Prior to gathering data for the current study, authorization was secured from the Principal of the College of Nursing Pt. BD Sharma, PGIMS, Rohtak, and consent was also granted by the Head of the Department of CTVS, PGIMS, Rohtak. The data was collected from March 13, 2023, to April 16, 2023.

On the first day, the nursing officers of CTVS were informed, and all eligible patients were identified from the ICU records. After that, one separate list of eligible subjects was prepared, and 100 subjects were selected using the purposive sampling technique.

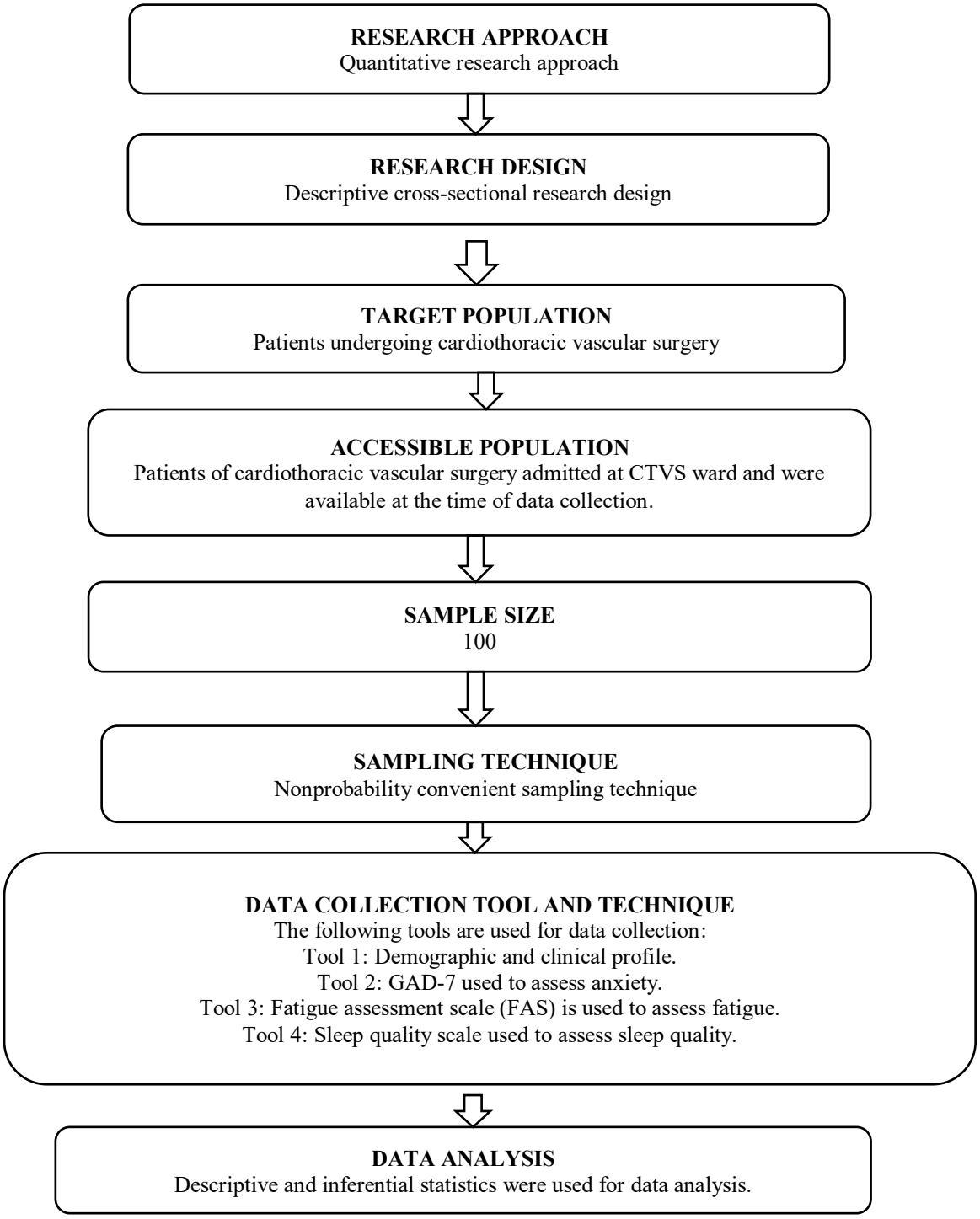

Figure 1. Flowchart of research methodology.

All participants were fully informed about the study's goals and assured of complete confidentiality. Before commencing the procedure, written consent was acquired from every participant involved. Then, data was collected using the interview method. It took almost 20–25 minutes for data collection to complete the questionnaires per subject.

DATA ANALYSIS PLAN

The collected data underwent analysis using a combination of descriptive and inferential statistical techniques.

- Data analysis aimed to employ both descriptive and inferential statistical approaches.
- SPSS 20.0 software was employed for the data analysis process.
- Sample characteristics were depicted through parameters like frequency and percentage distribution, presented in the form of tables, charts, and graphs.

The relationship between demographic variables was assessed using a Chi-squared test.

ORGANIZATION OF THE DATA

Section A: Providing an overview of the occurrence and proportion distribution of sociodemographic variables.
Section B: Detailing the occurrence and proportion distribution of clinical variables.
Section C: Evaluation of anxiety, fatigue, and sleep disruption.
Section D: Association of anxiety with sociodemographic variable and clinical variable.
Section E: Association of fatigue with sociodemographic variable and clinical variable.
Section F: Association of sleep quality with sociodemographic variable and clinical variable.

Section A: Providing an Overview of the Occurrence and Proportion Distribution of Sociodemographic Variables

Table 1 shows the frequency and percentage distribution of selected sociodemographic variables like age-group, sex, marital status, education, occupation, economic status, residence, and religion.

Figure 2 represents that the age distribution of samples shows that 11% of patients belong to age 18–28 years, 7% belong to 29–38 years of age, 28% belong to 39–48 years of age, 28% belong to 49–58 years of age and 26% belongs to above 59 years of age (Table 2).

Table 3 and Figure 3 show that, in regard to gender, 54% of patients were male and 46% were female.

In regard to marital status, 75% of patients were married, 14% were unmarried, 10% of patients were widows, and 1% of patients were divorced (Table 4 and Figure 4).

In regard to education level, 28% of patients were illiterate, 33% studied up to primary, 26% patients studied up to secondary, and 13% studied up to senior secondary (Table 5 and Figure 5).

In regard to occupation, 9% of patients were students, 30% of patients were farmers, 27% of patients were on private jobs, 5% of patients were on government jobs, 27% of patients were female housewives, and 2% patients were businessmen (Table 6 and Figure 6).

In terms of income of family per month, 45% of patient's family income is between 10,000–20,000, 51% of patient’s family income is between 20,001 and 30,000, and 4% of patients' family income is between 30,001 and 40,000 (Table 7 and Figure 7).

In regard to residence, 68% of patients had rural residences, and 32% of patients had urban residences (Table 8 and Figure 8).

In regards to religion, 65% of patients were Hindu, 19% patients were Muslim, and 16% patients were Sikh (Table 9 and Figure 9).

Table 1. Frequency and percentage distribution of selected sociodemographic variables status (N = 100).

S.N.	Demographic variable	Frequency	Percentage
1.	**Age-group (in years)**		
a	18–28	11	11%
b	29–38	7	7%

c	39–48	28	28%
d	49–58	28	28%
e	59<	26	26%
2.	**Gender**		
a	Male	54	54%
b	Female	46	46%
c	Transgender	0	0%
3.	**Marital status**		
a	Married	75	75%
b	Unmarried	14	14%
c	Widow	10	10%
d	Divorce	1	1%
4.	**Education**		
a	Illiterate	28	28%
b	Primary	33	33%
c	Secondary	26	26%
d	Senior secondary	13	13%
e	Graduation and above	0	0%
5.	**Occupation**		
a	Student	9	9%
b	Farmer	30	30%
c	Businessman	2	2%
d	Government job	5	5%
e	Private job	27	27%
f	Housewife	27	27%
6.	**Economic status**		
a	10,000–20,000/month	45	45%
b	20,001–30,000/month	51	51%
c	30,001–40,000/month	4	4%
d	Above 40,001/month	0	0%
7.	**Residence**		
a	Rural	68	68%
b	Urban	32	32%
8.	**Religion**		
a	Hindu	65	65%
b	Muslim	19	19%
c	Sikh	16	16%
d	Christian	0	0%

Table 2. Percentage and frequency distribution of age.

S.N.	Demographic variable	Frequency	Percentage
1.	*Age-group (in years)*		
a	18–28	11	11%
b	29–38	7	7%
c	39–48	28	28%
d	49–58	28	28%
e	59<	26	26%

Table 3. Percentage and frequency distribution of gender.

2.	Gender	Frequency	Percentage
a	Male	54	54%
b	Female	46	46%
c	Transgender	0	0%

Table 4. Percentage and frequency distribution of marital status.

3.	Marital status	Frequency	Percentage
a	Married	75	75%
b	Unmarried	14	14%
c	Widow	10	10%
d	Divorced	1	1%

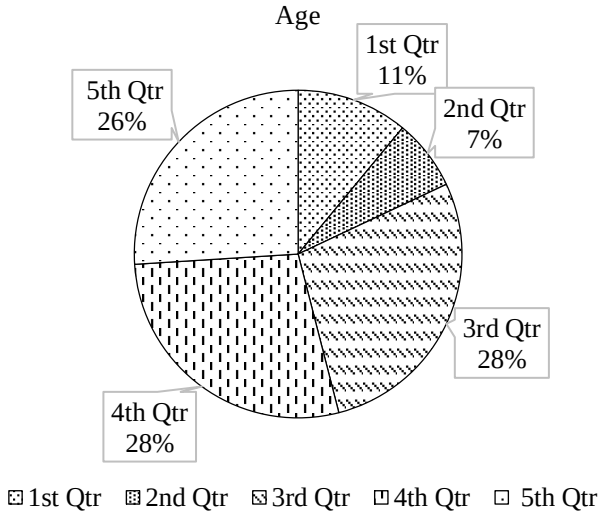

Figure 2. Percentage of the sample according to age.

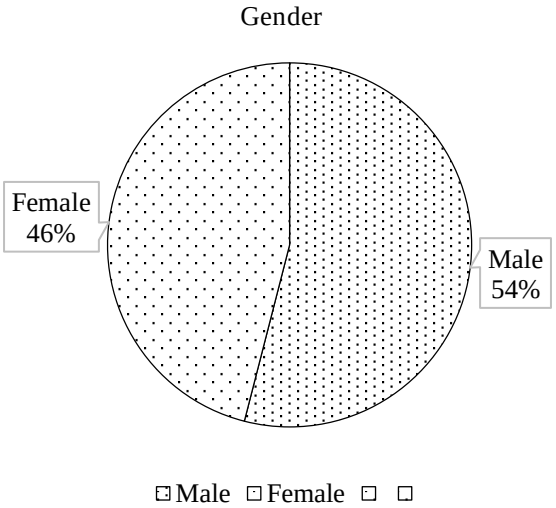

Figure 3. Percentage of samples according to gender.

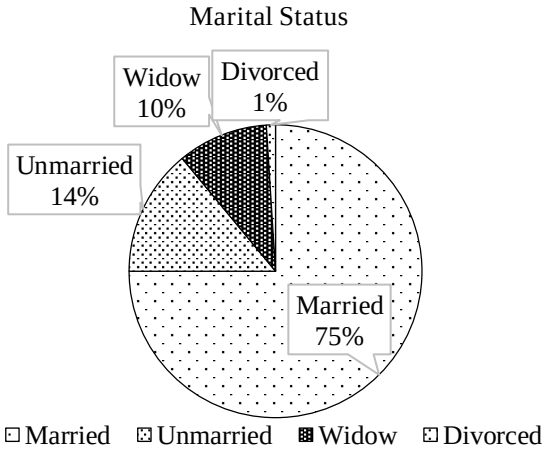

Figure 4. Percentage of samples according to marital status.

Table 5. Percentage and frequency distribution of education.

4.	Education	Frequency	Percentage
a	Illiterate	28	28%
b	Primary	33	33%
c	Secondary	26	26%
d	Senior secondary	13	13%
e	Graduation and above		

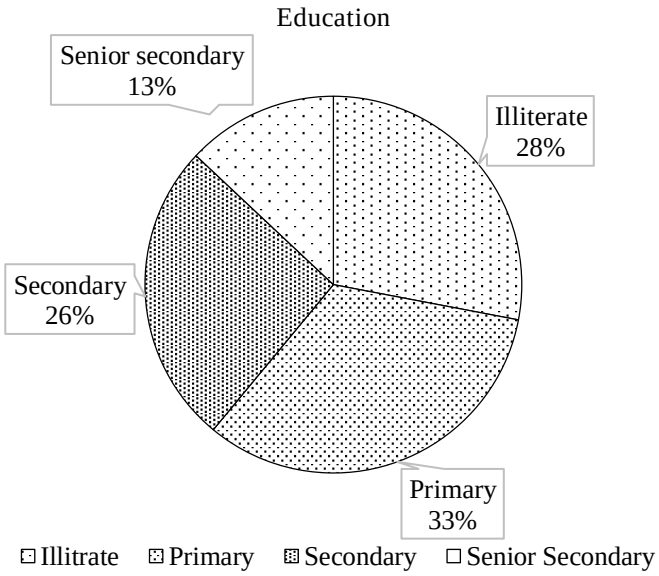

Figure 5. Percentage of samples according to education level.

Table 6. Percentage and frequency distribution of occupation.

5.	Occupation	Frequency	Percentage
a	Student	9	9%
b	Farmer	30	30%
c	Businessman	2	2%
d	Government job	5	5%
e	Private job	27	27%
f	Housewife	27	27%

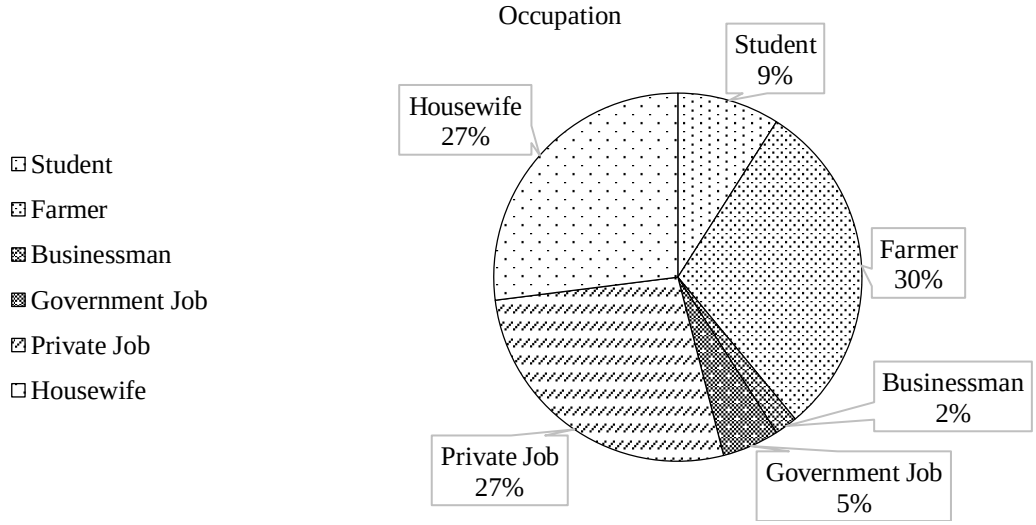

Figure 6. Percentage of samples according to occupation.

Table 7. Percentage and frequency distribution of economic status.

6.	Economic status	Frequency	Percentage
a	10,000–20,000/month	45	45%
b	20,001–30,000/month	51	51%
c	30,001–40,000/month	4	4%
d	Above 40,001/month	0	0%

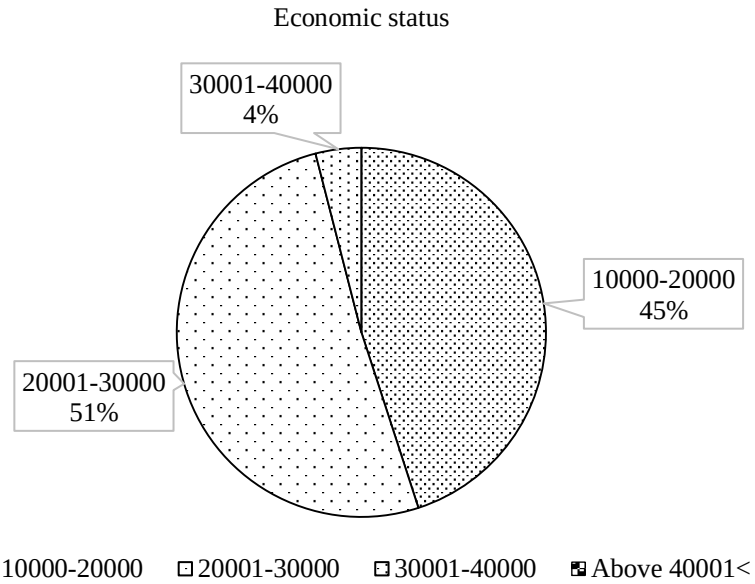

Figure 7. Percentage of samples according to economic status.

Table 8. Percentage and frequency distribution of residence.

7.	Residence	Frequency	Percentage
a	Rural	68	68%
b	Urban	32	32%

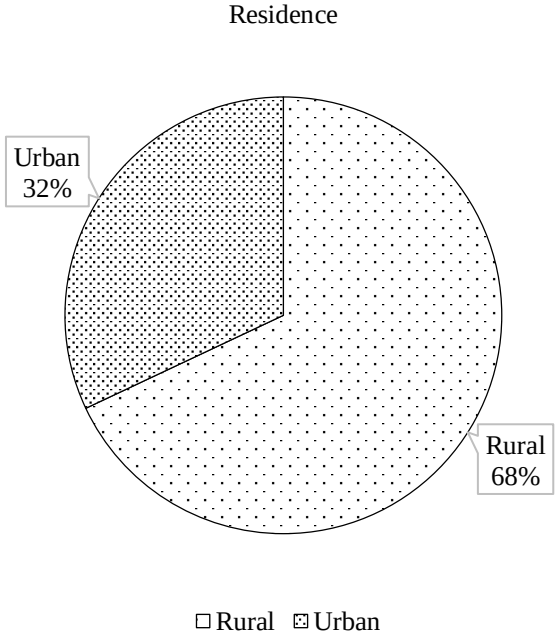

Figure 8. Percentage of samples according to residence.

Table 9. Percentage and frequency distribution according to religion.

8.	Religion	Frequency	Percentage
a	Hindu	65	65%
b	Muslim	19	19%
c	Sikh	16	16%
d	Christian	0	0%

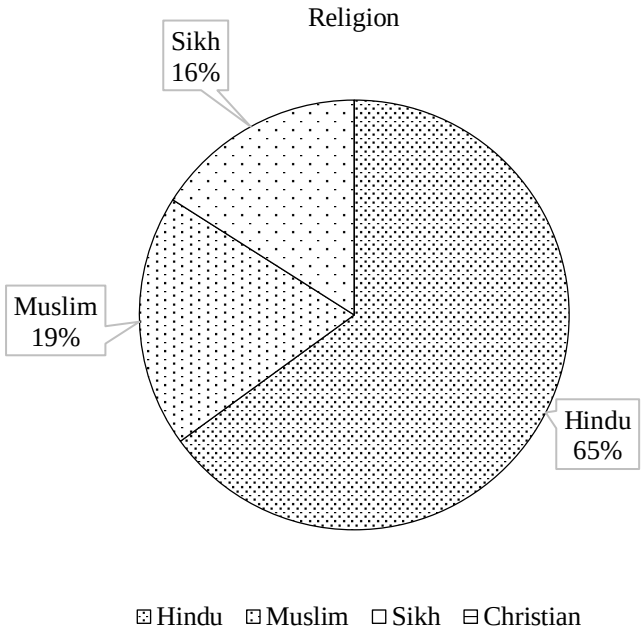

Figure 9. Percentage of samples according to religion.

Section B: Detailing the Occurrence and Proportion Distribution of Clinical Variables

Table 10 shows the frequency and percentage distribution of clinical profiles like diagnosis, surgery, history of any childhood RHDs, dental diseases/treatment, family history of heart diseases, duration of diseases, comorbid conditions, lifestyle, and physical activity.

Table 10. Frequency and percentage distribution of clinical profiles.

S.N.	Sample characteristic	Frequency	Percentage
1.	***Diagnosis***		
a	VHDs	50	50%
b	Coronary artery diseases	36	36%
c	Atrioventricular septal diseases	8	8%
d	Peripheral artery diseases	6	6%
2.	***Surgery***		
a	Valvular replacement/repairment	50	50%
b	Coronary artery bypass grafting	36	36%
c	Atrioventricular septal repairment	8	8%
d	Peripheral artery grafting/repair	6	6%
3.	***History of any childhood RHDs***		
a	Yes	24	24%
b	No	76	76%
4.	***Dental diseases/treatment***		
a	Yes	42	42%
b	No	58	58%
5.	***Family history of heart diseases***		
a	Yes	10	10%
b	No	90	90%

6.	***Duration of diseases (in years)***		
a	0–5	43	43%
b	6–10	57	57%
c	11–15	0	0%
d	Above 15	0	0%
7.	***Comorbid conditions***		
a	Hypertension	21	21%
b	Diabetes mellitus	17	17%
c	Atherosclerosis	2	2%
e	No comorbidity	60	60%
8.	***Lifestyle***		
a	Smoking	16	16%
b	Alcohol	5	5%
c	Smoking/alcohol	18	18%
d	Obesity	13	13%
e	No smoking and alcohol	48	48%
9.	***Physical activity***		
a	Sedentary	5	5%
b	Normal activity	75	75%
c	Excessive work	20	20%

Section C: Evaluation of Anxiety, Fatigue, and Sleep Disruption

Figure 10 shows the anxiety level of patients; 5% of patients have mild levels of anxiety, 81% of patients have moderate levels of anxiety, and 14% of patients have severe levels of anxiety (Table 11).

Figure 11 shows the fatigue level of patients; 11% of patients have no fatigue, and 89% of patients have fatigue (Table 12).

Figure 12 shows sleep quality disturbance: 34% of patients had mild sleep disturbance, 61% of patients had moderate sleep disturbance, and 5% of patients had severe sleep disturbance (Table 13).

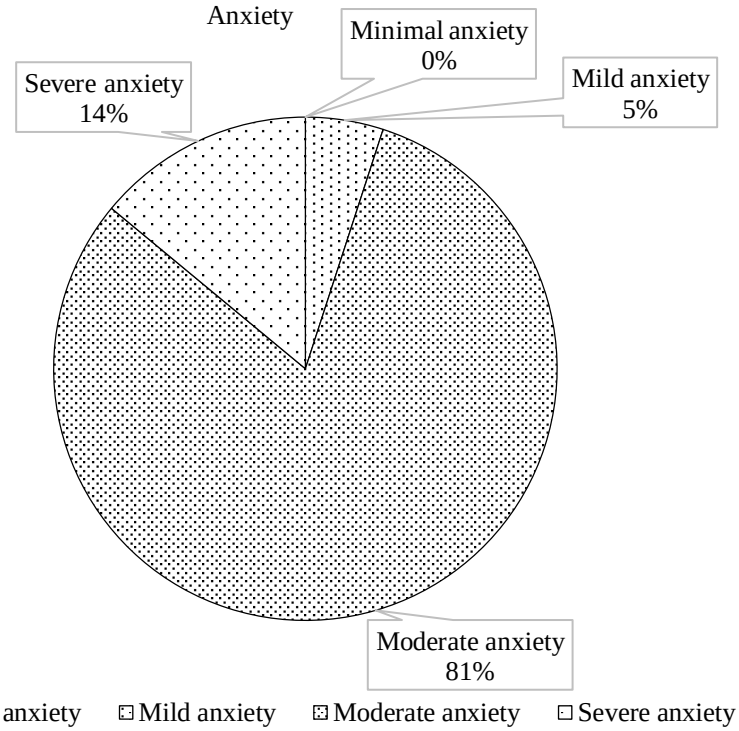

Figure 10. Percentage distribution of anxiety level among samples.

Table 11. Frequency and percentage distribution of anxiety.

Level of anxiety	Score of anxiety level	Frequency	Percentage	Mean±standard deviation (SD)
Minimal anxiety	0–4	0	0%	12.44 ± 2.315
Mild anxiety	5–9	5	5%	
Moderate anxiety	10–14	81	81%	
Severe anxiety	15–21	14	14%	

Table 12. Frequency and percentage distribution of fatigue.

Level of fatigue	Score of fatigue	Frequency	Percentage	Mean±SD
No fatigue	<22	11	11%	27.17 ± 4.238
Having fatigue	22 and 22<	89	89%	

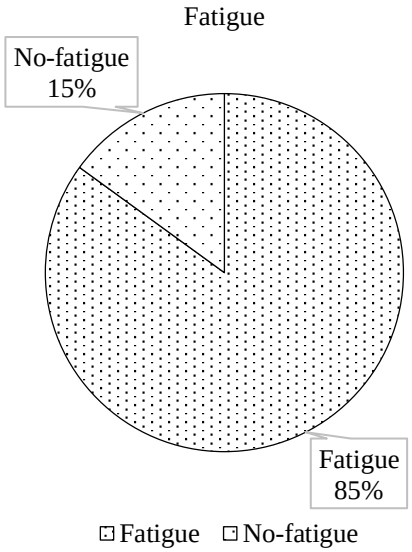

Figure 11. Percentage distribution of fatigue among samples.

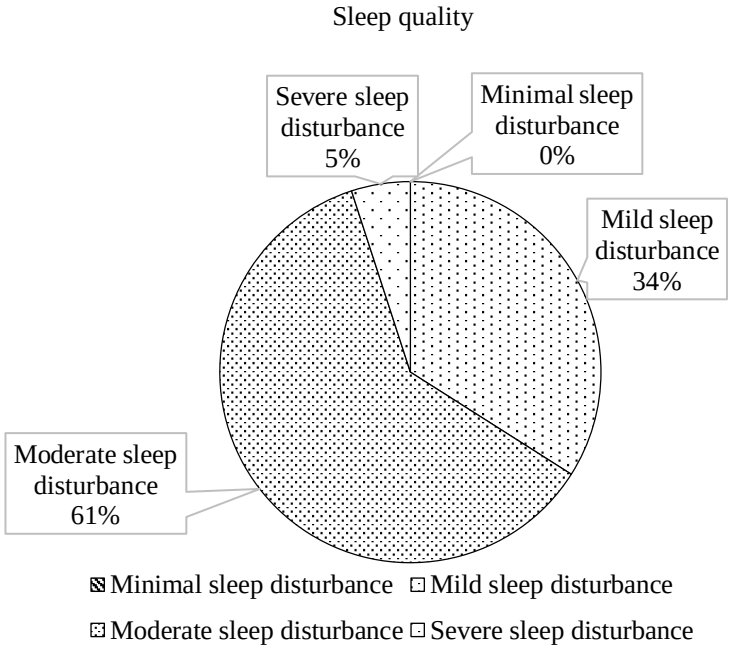

Figure 12. Percentage distribution of sleep quality among samples.

Table 13. Frequency and percentage distribution of sleep quality.

Sleep quality level	Sleep quality score	Frequency	Percentage	Mean±SD
Minimal sleep disturbance	0–21	0	0%	46.71 ± 9.655
Mild sleep disturbance	22–42	34	34%	
Moderate sleep disturbance	43–63	61	61%	
Severe sleep disturbance	64–84	5	5%	

Section D: Association of Anxiety with Sociodemographic Variable and Clinical Variable

Table 14 depicts that:

1. The computed Chi-squared value of 4.511[a] falls below the critical Chi-squared value of 9.49 with 4° of freedom and a significance level of 0.05, indicating that anxiety does not significantly associate with age.
2. The calculated Chi-squared value (1.432[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between anxiety and sex.
3. The observed Chi-squared value of 1.754, being less than the critical value of 7.82 for 3° of freedom at a significance level of 0.05, indicates no substantial link between marital status and anxiety levels.
4. With a Chi-squared result of 5.754 falling below the threshold of 7.82 for 3° of freedom at the 0.05 significance level, there appears to be no significant correlation between educational background and anxiety.
5. The Chi-squared calculation of 1.442, which is under the benchmark of 11.07 for 5° of freedom at a significance level of 0.05, suggests the absence of a significant relationship between one's occupation and one's anxiety levels.
6. A Chi-squared value of 0.599, below the critical value of 5.99 for 2° of freedom with a significance level of 0.05, demonstrates no significant association between economic status and levels of anxiety.
7. The analysis yielded a Chi-squared value of 0.348, below the necessary 3.84 for 1° of freedom at the 0.05 level of significance, which indicates no significant connection between the place of residence and anxiety.
8. With the Chi-squared score of 1.235 not meeting the required value of 5.99 for 2° of freedom at the 0.05 significance level, there is no significant association found between religious affiliation and anxiety.

Table 14. Association of anxiety with selected sociodemographic variables.

S.N.	Sociodemographic variable	F	Have no anxiety	Have anxiety	Chi-square	df	p-value	Result
1.	***Age (in years)***							
a	18–28	11	0	11	4.511[a]	4	0.341	NS
b	29–38	7	0	7				
c	39–48	28	3	25				
d	49–58	28	2	26				
e	59 <	26	0	26				
2.	***Gender***							
a	Male	54	4	50	1.432[a]	1	0.231	NS
b	Female	46	1	45				
c	Other	0	0	0				
3.	***Marital status***							
a	Married	75	5	70	1.754[a]	3	0.625	NS
b	Unmarried	14	0	14				
c	Widow	10	0	10				
d	Divorced	1	0	1				

4.	***Education***							
a	Illiterate	28	0	28	5.754[a]	3	0.124	NS
b	Primary	33	4	29				
c	Secondary	26	1	25				
d	Senior secondary	13	0	13				
e	Graduate and above	0	0	0				
5.	***Occupation***							
a	Student	9	0	9	1.442[a]	5	0.920	NS
b	Farmer	30	2	28				
c	Businessman	2	0	2				
d	Government job	5	0	5				
e	Private job	27	2	25				
f	Housewife	27	1	26				
6.	***Economic status***							
a	10,000–20,000/month	45	3	42	0.599[a]	2	0.741	NS
b	20,001–30,000/month	51	2	49				
c	30,001–40,000/month	4	0	4				
d	Above–40,000/month	0	0	0				
7.	***Residence***							
a	Rural	68	4	64	.348[a]	1	0.555	NS
b	Urban	32	1	31				
8.	***Religion***							
a	Hindu	65	4	61	1.235[a]	2	0.539	NS
b	Sikh	19	0	19				
c	Christian	16	1	15				
d	Muslim	0						

Table 15 depicts that:

1. The calculated Chi-squared value (2.058[a]) is lower than the tabulated Chi-squared value (7.82) at 3° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between anxiety and diagnosis.
2. The Chi-squared result of 2.058, falling beneath the critical threshold of 7.82 for 3° of freedom at a significance level of 0.05, indicates a lack of significant correlation between surgical procedures and anxiety levels.
3. The calculated Chi-squared value (1.662[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between anxiety and a history of childhood rheumatic diseases.
4. The calculated Chi-squared value (0.009[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between anxiety and dental diseases/treatment.
5. The calculated Chi-squared value (0.585[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between anxiety and a history of heart disease.
6. The calculated Chi-squared value (1.136[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between anxiety and the duration of diseases.
7. With a calculated Chi-squared value of 1.589, which is below the tabulated Chi-squared value of 7.82 for 3° of freedom at a significance level of 0.05, it is evident that there is no significant relationship between anxiety and coexisting medical conditions.
8. The calculated Chi-squared value of 5.380 is lower than the tabulated Chi-squared value of 9.49 for 4° of freedom at a significance level of 0.05, indicating that there is no significant association between anxiety and lifestyle factors.
9. The Chi-squared value calculated as 1.754 is less than the tabulated Chi-squared value of 5.99 for 2° of freedom at a significance level of 0.05, thus demonstrating no significant correlation between anxiety and lifestyle aspects.

Table 15. Association of anxiety with clinical profiles.

S.N.	Clinical profile	F	Having no anxiety	Have anxiety	Chi-square	df	p-value	Result
1.	***Diagnosis***							
a	VHDs	50	4	46	2.058[a]	3	0.560	NS
b	Coronary artery diseases	36	1	35				
c	Atrioventricular septal diseases	8	0	8				
d	Peripheral artery diseases	6	0	6				
2.	***Surgery***							
a	Valvular	50	4	46	2.058[a]	3	0.560	NS
b	Replacement/repairment	36	1	35				
c	Coronary artery bypass Grafting	8	0	8				
d	Atrioventricular septal repairment peripheral artery grafting/repair	6	0	6				
3.	***History of any childhood rheumatic diseases***							
a	Yes	24	0	24	1.662[a]	1	0.197	NS
b	No	76	5	71				
4.	***Dental diseases/treatment***							
a	Yes	42	2	40	0.009[a]	1	0.926	NS
b	No	58	3	55				
5.	***Family history of heart diseases***							
a	Yes	10	0	10	0.585[a]	1	0.444	NS
b	No	90	5	85				
6.	***Duration of diseases (in years)***							
a	0–5	43	1	42	1.136[a]	1	0.287	NS
b	6–10	57	4	53				
c	11–15	0	0	0				
d	Above 15	0	0	0				
7.	***Comorbid conditions***							
a	Hypertension	21	0	21	1.589[a]	3	0.662	NS
b	Diabetes mellitus	17	1	16				
c	Atherosclerosis	2	0	2				
d	No comorbidity	60	4	60				
8.	***Lifestyle***							
a	Smoking	16	0	16	5.380[a]	4	0.250	NS
b	Alcohol	5	1	4				
c	Smoking/alcohol	18	2	16				
d	Obesity	13	0	13				
e	No smoking and alcohol	48	2	46				
9.	***Physical activity***							
a	Sedentary	5	0	5	1.754[a]	2	0.416	NS
b	Normal activity	75	5	70				
c	Excessive	20	0	20				

Section E: Association of Fatigue with Sociodemographic Variable and Clinical Variable

Table 16 depicts that:

1. A calculated Chi-squared value of 3.074, which falls below the tabulated Chi-squared value of 9.49 for 4° of freedom at a significance level of 0.05, indicates that there is no significant relationship between fatigue and age.
2. The Chi-squared value calculated as 1.745 is lower than the tabulated Chi-squared value of 3.84 for 1° of freedom at a significance level of 0.05, demonstrating no significant association between fatigue and gender.
3. The calculated Chi-squared value of 1.172 is less than the tabulated Chi-squared value of 7.82 for 3° of freedom at a significance level of 0.05, suggesting that there is no significant association between fatigue and marital status.
4. A calculated Chi-squared value of 2.394, which is below the tabulated Chi-squared value of 7.82 for 3° of freedom at a significance level of 0.05, proves that there is no significant association between fatigue and educational attainment.

5. The Chi-squared value calculated as 1.033 is lower than the tabulated Chi-squared value of 11.07 for 5° of freedom at a significance level of 0.05, indicating no significant association between fatigue and occupation.
6. A calculated Chi-squared value of 0.525, which falls below the tabulated Chi-squared value of 5.99 for 2° of freedom at a significance level of 0.05, demonstrates that there is no significant association between fatigue and economic status.
7. The calculated Chi-squared value of 0.127 is less than the tabulated Chi-squared value of 3.84 for 1° of freedom at a significance level of 0.05, suggesting no significant association between fatigue and residency.
8. The Chi-squared value calculated as 1.245 is lower than the tabulated Chi-squared value of 5.99 for 2° of freedom at a significance level of 0.05, indicating no significant association between fatigue and religious affiliation.

Table 16. Association of fatigue with selected sociodemographic variables.

S.N.	Sociodemographic variable	F	Have no fatigue	Having fatigue	Chi-square	df	p-value	Result
1.	***Age (in years)***							
a	18–28	11	0	11	3.074[a]	4	0.545	NS
b	29–38	7	1	6				
c	39–48	28	3	25				
d	49–58	28	5	23				
e	59 <	26	2	24				
2.	***Gender***							
a	Male	54	8	46	1.745[a]	1	0.187	NS
b	Female	46	3	43				
c	Other							
3.	***Marital status***							
a	Married	75	8	67	1.172[a]	3	0.760	NS
b	Unmarried	14	1	13				
c	Widow	10	2	8				
d	Divorced	1	0	1				
4.	***Education***							
a	Illiterate	28	4	24	2.394[a]	3	0.495	NS
b	Primary	33	5	28				
c	Secondary	26	1	25				
d	Senior Secondary	13	1	12				
e	Graduate and above	0	0	0				
5.	***Occupation***							
a	Student	9	1	8	1.033[a]	5	0.960	NS
b	Farmer	30	4	26				
c	Businessman	2	0	2				
d	Government job	5	0	5				
e	Private job	27	3	24				
f	Housewife	27	3	24				
6.	***Economic status (in ₹/month)***							
a	10,000–20,000	45	5	40	0.525[a]	2	0.769	NS
b	20,001–30,000	51	6	45				
c	30,001–40,000	4	0	4				
d	Above 40,000	0	0	0				
7.	***Residence***							
a	Rural	68	8	60	0.127[a]	1	0.772	NS
b	Urban	32	3	29				
8.	***Religion***							
a	Hindu	65	9	56	1.245[a]	2	0.462	NS
b	Muslim	19	1	18				
c	Sikh	16	1	15				
d	Christian	0	0	0				

Table 17 depicts that:

1. A calculated Chi-squared value of 1.481, which is lower than the tabulated Chi-squared value of 7.82 for 3° of freedom at a significance level of 0.05, indicates that there is no significant association between fatigue and diagnosis.
2. The calculated Chi-squared value of 1.481 is also less than the tabulated Chi-squared value of 7.82 for 3° of freedom at a significance level of 0.05, demonstrating no significant association between fatigue and surgery.
3. The calculated Chi-squared value (0.229) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and a history of childhood rheumatic diseases.
4. The calculated Chi-squared value (0.061[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and dental diseases/treatment.
5. The calculated Chi-squared value (1.373[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and a history of heart disease.
6. The calculated Chi-squared value (1.247[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and duration of diseases.
7. With a calculated Chi-squared value of 1.426, which is lower than the tabulated Chi-squared value of 7.82 for 3° of freedom at a significance level of 0.05, it indicates that there is no significant association between fatigue and comorbid conditions.
8. The calculated Chi-squared value of 6.174 is less than the tabulated Chi-squared value of 9.49 for 4° of freedom at a significance level of 0.05, showing no significant association between fatigue and lifestyle.
9. The calculated Chi-squared value of 4.120 is also lower than the tabulated Chi-squared value of 5.99 for 2° of freedom at a significance level of 0.05, indicating no significant association between fatigue and lifestyle.

Section F: Association of Sleep Quality with Sociodemographic Variable and Clinical Variable

Table 18 depicts that:

1. The calculated Chi-squared value (2.099[a]) is lower than the tabulated Chi-squared value (9.49) at 4° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between sleep quality and age.
2. The calculated Chi-squared value (0.023[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between sleep quality and sex.
3. A Chi-squared value of 0.874 is below the critical value of 7.82 for 3° of freedom at a 0.05 significance level, which indicates an absence of a significant link between sleep quality and marital status.
4. A Chi-squared result of 2.584, falling beneath the benchmark value of 7.82 with 3° of freedom at a significance threshold of 0.05, suggests no substantial relationship exists between sleep quality and educational background.
5. The Chi-squared outcome of 1.433, lower than the standard value of 11.07 for 5° of freedom at a 0.05 level of significance, demonstrates a lack of significant correlation between sleep quality and occupational status.
6. With the Chi-squared metric at 0.553, under the required value of 5.99 for 2° of freedom at a 0.05 significance level, it confirms the absence of a significant association between sleep quality and economic status.
7. The measurement of 0.920 in the Chi-squared test, below the threshold of 3.84 for 1° of freedom at a 0.05 significance level, indicates no significant connection between sleep quality and type of residence.

8. A Chi-squared figure of 0.875, beneath the cutoff of 5.99 for 2° of freedom at a 0.05 significance level, points to no significant association between sleep quality and religious affiliation.

Table 17. Association of fatigue with clinical profile.

S.N.	Clinical profile	F	Have no fatigue	f	Chi-square	df	p-value	Result
1.	***Diagnosis***							
a	VHDs	50	7	43	1.481[a]	3	0.687	NS
b	Coronary artery diseases	36	3	33				
c	Atrioventricular septal defect	8	1	7				
d	Peripheral artery diseases	6	0	6				
2.	***Surgery***							
a	Valvular replacement/repairment	50	7	43	1.481[a]	3	0.687	NS
b	Coronary artery bypass grafting	36	3	33				
c	Atrioventricular septal repairment	8	1	7				
d	Peripheral artery grafting/repair	6	0	6				
3.	***History of any childhood rheumatic diseases***							
a	Yes	24	2	22	0.229	1	0.632	NS
b	No	76	9	67				
4.	***Dental diseases/treatment***							
a	Yes	42	5	37	0.061[a]	1	0.806	NS
b	No	58	6	52				
5	Family history of heart diseases							
a	Yes	10		10	1.373[a]	1	0.241	NS
b	No	90	11	79				
6.	***Duration of diseases (in years)***							
a	0–5	43	3	40	1.247[a]	1	0.264	NS
b	6–10	57	8	49				
c	11–15	0	0	0				
d	Above 15	0	0	0				
7.	***Comorbid conditions***							
a	Hypertension	21	1	20	1.426[a]	3	0.700	NS
b	Diabetes mellitus	17	2	15				
c	Atherosclerosis	2	0	2				
d	No comorbidity	60	8	52				
8.	***Lifestyle***							
a	Smoking	16	2	14	6.174[a]	4	0.187	NS
b	Alcohol	5	2	3				
c	Smoking/alcohol	18	3	15				
d	Obesity	13	1	12				
e	No smoking and alcohol	48	3	45				
9.	***Physical activity***							
a	Sedentary	5	0	55	4.120	2	0.127	NS
b	Normal activity	75	11	64				
c	Excessive	20	0	20				

Table 18. Association of sleep quality with selected sociodemographic variable.

S.N.	Sociodemographic variable	F	No sleep disturbance	Sleep disturbance	Chi-square	df	p-value	Result
1.	***Age (in years)***							
a	18–28	11	5	6	2.099[a]	4	.718	NS
b	29–38	7	2	5				
c	39–48	28	7	21				
d	49–58	28	11	17				
e	59 <	26	9	17				
2.	***Gender***							
a	Male	54	18	36	0.023[a]	1	0.879	NS
b	Female	46	16	30				
c	Other							

3.	***Marital status***							
a	Married	75	26	49	.874[a]	3	0.832	NS
b	Unmarried	14	4	10				
c	Widow	10	4	6				
d	Divorced	1	0	1				
4.	***Education***							
a	Illiterate	28	9	19	2.584[a]	3	0.460	NS
b	Primary	33	14	19				
c	Secondary	26	6	20				
d	Senior Secondary	13	5	8				
e	Graduate and above	0	0	0				
5.	***Occupation***							
a	Student	9	2	7	1.433[a]	5	0.921	NS
b	Farmer	30	11	19				
c	Businessman	2	1	1				
d	Government job	5	1	4				
e	Private job	27	9	18				
f	Housewife	27	10	17				
6.	***Economic status***							
a	10,000–20,000	45	14	31	0.553[a]	2	0.759	NS
b	20,001–30,000	51	19	32				
c	30,001–40,000	4	1	4				
d	Above 40,000	0	0	0				
7.	***Residence***							
a	Rural	68	21	47	0.920[a]	1	0.337	NS
b	Urban	32	13	19				
8.	***Religion***							
a	Hindu	65	24	41	0.875[a]	2	0.646	NS
b	Sikh		6	13				
c	Christian	19	4	12				
d	Muslim	16	0	0				

Table 19 depicts that:

1. The calculated Chi-squared value (1.877[a]) is lower than the tabulated Chi-squared value (7.82) at 3° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and diagnosis.
2. The calculated Chi-squared value (1.877[a]) is lower than the tabulated Chi-squared value (7.82) at 3° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and surgery.
3. The calculated Chi-squared value (11.430[a]) is higher than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is a significant association between fatigue and a history of childhood rheumatic diseases.
4. The calculated Chi-squared value (0.951[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and dental diseases/treatment.
5. The calculated Chi-squared value 0(.079[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and a history of heart disease.
6. The calculated Chi-squared value (0.026[a]) is lower than the tabulated Chi-squared value (3.84) at 1° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and duration of diseases.
7. The calculated Chi-squared value (9.307[a]) is higher than the tabulated chi-square value (7.82) at 3° of freedom and 0.05 level of significance. Hence, it proves that there is a significant association between fatigue and comorbid conditions.
8. The calculated Chi-squared value (5.573[a]) is lower than the tabulated Chi-squared value (9.49)

at 4° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and lifestyle.

9. The calculated Chi-squared value (4.026[a]) is lower than the tabulated Chi-squared value (5.99) at 2° of freedom and 0.05 level of significance. Hence, it proves that there is no significant association between fatigue and lifestyle.

Table 19. Association of sleep quality with the clinical profile.

S.N.	Clinical profile	F	No sleep disturbance	Sleep disturbance	Chi-square	df	p-value	Result
1.	***Diagnosis***							
a	VHDs	50	16	34	1.877[a]	3	0.598	NS
b	Coronary artery diseases	36	13	23				
c	Atrioventricular septal diseases	8	4	4				
d	Peripheral artery diseases	6	1	5				
2.	***Surgery***							
a	Valvular replacement/repairment	50	16	34	1.877[a]	3	0.598	NS
b	Coronary artery bypass grafting	36	13	23				
c	Atrioventricular septal repairment	8	4	4				
d	Peripheral artery grafting/repair	6	1	5				
3.	***History of any childhood rheumatic diseases***							
a	Yes	24	15	9	11.430[a]	1	0.001	S
b	No	76	19	57				
4.	***Dental diseases/treatment***							
a	Yes	42	12	30	.951[a]	1	.395	NS
b	No	58	22	36				
5.	***Family history of heart diseases***							
a	Yes	10	3	7	.079[a]	1	00.778	NS
b	No	95	31	59				
6.	***Duration of diseases (in years)***							
a	0–5	43	15	28	.026[a]	1	0.871	NS
b	6–10	57	19	38				
c	11–15	0	0	0				
d	Above 15	0	0	0				
7.	***Comorbid conditions***							
a	Hypertension	21	6	15	9.307[a]	3	0.025	S
b	Diabetes mellitus	17	11	6				
c	Atherosclerosis	2	0	2				
d	No comorbidity	60	17	43				
8.	***Lifestyle***							
a	Smoking	16	4	12	5.573[a]	4	0.233	NS
b	Alcohol	5	4	1				
c	Smoking/alcohol	18	6	12				
d	Obesity	13	5	8				
e	No smoking and alcohol	48	15	33				
9.	***Physical activity***							
a	Sedentary	5	0	5	4.026[a]	2	0.134	NS
b	Normal activity	75	29	46				
c	Excessive	20	5	15				

DISCUSSION

This section delves into the key discoveries of the current study, reflecting on the outcomes achieved by the researchers in similar areas. This article deals with a discussion of findings related to the study and whether the present objectives have been achieved or not. The present study aimed to assess the anxiety, fatigue, and sleep quality of patients undergoing cardiothoracic vascular surgery at a selected CTVS ward in Pandit Bhagwat Dayal Sharma University of Health Science, Rohtak.

Structured Presentation of Findings

1. Distribution of the sample according to selected sociodemographic variable.

2. Distribution of the sample according to selected clinical variable.
3. Distribution of the sample according to the assessment of anxiety level.
4. Distribution of the sample according to the assessment of fatigue level.
5. Distribution of the sample according to the assessment of sleep quality.
6. Correlation between anxiety and chosen sociodemographic variables.
7. Association of anxiety with selected clinical variable.
8. Association of fatigue with selected sociodemographic variable.
9. Association of fatigue with selected clinical variable.
10. Relationship between sleep quality and specific sociodemographic factors.
11. Association of sleep quality with selected clinical variable.

MAJOR FINDINGS OF THE STUDY

1. Among 100 patients, the majority of age wise distribution of the sample shows that 28% belong to the 39–48 years of age, and 28% belong to the 49–58 years age-group.
2. Majority (54%) of patients were male.
3. Majority (75%) of patients were married.
4. Majority (33%) of patients studied up to primary.
5. Majority (30%) of patients were farmers.
6. Majority (51%) of patients' family income is between ₹ 20,001 and 30,000.
7. Majority (68%) of patients had rural residences.
8. Majority (65%) of patients were Hindu.
9. Majority (50%) of patients had VHDs.
10. Majority (50%) of patients had undergone valvular repairment/replacement.
11. Majority (76%) of patients had no history of childhood RHD.
12. Majority (58%) of patients had no history of dental diseases/treatment.
13. Majority (90%) of patients had no family history of heart disease.
14. Majority (57%) of patients were suffering from the 6–10 years duration of diseases.
15. Majority (60%) of patients did not have any comorbidity.
16. Majority (48%) of patients were not taking alcohol and did not do smoking.
17. Majority (75%) of patients were having normal activity.
18. Majority (81%) of patients had moderate levels of anxiety.
19. Majority (89%) of patients were having fatigue.
20. Majority (61%) of patients had moderate sleep disturbance.

The results reveal no statistically significant correlation between anxiety, fatigue, sleep quality, and demographic factors. The Chi-squared value is lower than the critical threshold, and the p-value exceeds 0.05. Thus, the findings indicate that there is no statistically significant association between anxiety and fatigue with clinical variables. Their Chi-squared value is smaller than the tabulated value, and the p-value is greater than 0.05.

The result shows that there is statistically significant no association of sleep with clinical variables (diagnosis, surgery, dental diseases/treatment, family history of heart diseases, duration of diseases, lifestyle, and physical activity). Their Chi-squared value is smaller than the tabulated value, and the p-value is greater than 0.05.

The result shows that there is a statistically significant association of sleep quality with clinical variables (history of any childhood rheumatic diseases, comorbid conditions). Their Chi-squared value is greater than the tabulated value, and their p-value is less than 0.05. This article deals with the discussion of finding the term of objectives of the study, that is, to assess the level of anxiety, fatigue, and sleep quality among preoperative cardiovascular thoracic surgery and determine the association of anxiety, fatigue, and sleep quality with sociodemographic and clinical variables [16–18].

CONCLUSION

This article deals with the analysis and interpretation of findings of the data collected from the 100 patients of the CTVS ward regarding anxiety, fatigue, and sleep quality disturbance. The data has been organized and presented under various sections, such as demographic and clinical variables frequency and percentage, level of anxiety, fatigue, and sleep quality, which are minimal, mild, moderate, and severe.

The Chi-squared test was used to determine the association between demographic (age, sex, marital status, education, occupation, economic status, residence, and religion) and clinical variables (diagnosis, surgery, history of rheumatic diseases, dental diseases, family history, duration of diseases, comorbidity) with anxiety, fatigue, found nonsignificant association as calculated value is less than the tabulated value at 0.05 level of significance. Hence, the null hypothesis has been accepted, and the association of sleep quality with demographic (age, sex, marital status, education, occupation, economic status, residence, and religion) and clinical variables (diagnosis, surgery, dental diseases, family history, duration of diseases) found nonsignificant association as calculated value is less than the tabulated value at 0.05 level of significance. Hence, the null hypothesis has been accepted, and the association between the sleep quality of patients with selected clinical variables, that is, RHDs (p-value of 0.001) and comorbidity (p-value of 0.025), was found significant as the calculated value is high than the tabulated value. Hence, the research hypothesis has been accepted.

The maximum patient had a moderate level of anxiety among 81% of patients, the maximum patient had a moderate level of fatigue among (89%), and the maximum patient had a moderate level of sleep quality disturbance among (61%) patients. So, most of the patients had moderate levels of anxiety, fatigue, and sleep quality disturbance. Hence, the research hypothesis (H_1) has been accepted.

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