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Original Article

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Pre Operative Stress and Anxiety in Patients Undergoing Cardiac Surgery Counselled with Structured Versus Traditional Programme

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Abstract

Background: Cardiovascular disease is one of the major public health problems that causes restricted quality of life, disability, and mortality, with high costs for the healthcare system. Cardiac surgery is a stressful life event for many patients. Failure to adapt to such a procedure leads to increased physical and psychological impairment such as anxiety, fear, depression, and pain. The aim of this study is to compare pre-operative stress and anxiety in patients undergoing cardiac surgery, counselled with structured vs traditional teaching programme. ***Methods:*** This is a quasi-experimental, single blinded two group pre and post-test design study done in the Department of Cardiothoracic and vascular surgery, Government Medical College, Kottayam. 120 patients (60 in each group) admitted in the wards in Government Medical College, Kottayam with CABG and valve disease were included in the study. The data was collected by a structured proforma and frequency, mean, median and standard deviation are used to assess the socio demographic variables and preoperative stress and anxiety among control and experimental groups. Comparison of two groups performed by t test and χ^2 test Population. ***Results:*** In the present study it was found that structured teaching programme was effective in significant decrease of pre-operative stress and anxiety among patients undergoing cardiac surgery in the experimental group. Statistically significant reduction in anxiety and depression after preoperative structured teaching was found. ***Conclusion:*** We require more studies that are necessary to assess which mode of intervention is beneficial for patients and at what conditions. It is important to treat mind along with heart to get better outcomes after cardiac surgery.

Keywords: ***Cardiovascular disease, Anxiety, Depression, Preoperative care, Quality of life.***

Background

Cardiovascular disease is one of the major public health problems that causes restricted quality of life, disability, and mortality, with high costs for the healthcare system [1,2]. Cardiac surgeries aim to reduce disability, physical symptoms, and morbidity and improve quality of life [3]. Cardiac surgery is a stressful life event for many patients. Failure to adapt to such a procedure leads to an increased physical and psychological impairment, fear, depression, and pain in almost 25 % of patients [4]. This creates a need for evaluating the patient's perception of the procedure and understanding the effects of this perception during the process of recovery and wellbeing of the patient.

Also, the risk of postoperative psychological dysfunction increases with age [5-17]. Psychiatric disorders independently increase the risk of cardiovascular disease and worsen the prognosis in patients with established cardiovascular lesions [18].

The aim of preoperative care is to reduce perioperative and post-operative risks by optimizing conditions under which physiological homeostasis might be achieved and thereby improving the patient's ability to react to and counteract the derangements caused by operative trauma, related stress and infection. Preoperative teaching and psychological support are integral components of preoperative care. Every patient facing cardiothoracic surgery experiences some fear and anxiety. During preoperative teaching the patient is instructed regarding the planned operative procedures and the projected post-operative course.

Several well-documented psychosocial risk factors for cardiovascular disease [19,20,21] are also predictors for outcomes after cardiac surgery. These factors include the demographic variables (e.g., age and/or gender), [22,23] depressive symptoms,[24-27] anxiety,[28-30] chronic (work and/or family) stress,[31] socioeconomic status,[32] social support, health behaviors,[33-35] marital status, and preoperative expectations [36-38] and illness beliefs [39]. Unfortunately, sufficient use of this knowledge in the current guidelines and in the daily routine of cardiac surgery is a matter of concern [40].

Rehabilitation aims to improve the postoperative outcomes while the preoperative psychological preparation can be considered "prehabilitation," a term that capture the approaches to optimize

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surgical outcomes by means of preoperative [35]. With respect to cardiac surgeries, however, there is a lack of evidence-based interventions for psychological preparation before undergoing surgery. A variety of mechanisms may explain why psychological preparation could influence the process of surgical recovery: Cognitions and emotions influence behavior and may thus be relevant for rehabilitation.

Emotions such as anger or sadness can increase pain sensations [41]. Perceived stress is associated with psychoneuroimmunological mechanisms which may delay wound healing and increase sickness behavior. Psychological interventions which influence these psychological factors may thus improve postoperative outcomes. This study is conducted to study preoperative psychological preparation for patients undergoing cardiac surgery could improve postoperative outcomes and establish the differences in two groups.

Methodology

Study design: A quasi experimental, single blinded two group pre and post-test design

Study setting: Department of Cardiothoracic and vascular surgery, Government Medical College, Kottayam

Study period: 12 months

Study population: Patients admitted in the wards in Government Medical College, Kottayam with CABG and valve disease and who meet the inclusion criteria.

Sample size: Sample size, $n = 2(z_\alpha + z_1 - \beta)^2 \sigma^2 / \delta^2$

Sample size =120 (60 in each group).

(Sample size is calculated from the similar study," A preoperative education intervention to reduce anxiety and improve recovery among cardiac patients: a randomised controlled trial" conducted by Ping Guo.4)

Sampling technique: Random sampling would be followed.

Study tool: Structured Proforma

Inclusion criteria

- Patients in the age group of 18-70 who are awaiting major cardiac surgery in the department of Cardiothoracic and vascular surgery, Government Medical College Hospital, Kottayam.

Exclusion criteria

- Unconscious and mentally unstable patients
- Emergency cardiac surgery

Study procedure

All cases fulfilling the inclusion criteria during the study period were included after SRC and IRB approvals. Informed consent was taken from the patient. In this prospective study, all consecutive patients were selected and randomly allotted to either of the arms. The First group comprising of usual care and second group comprising of information leaflet and supportive psychotherapy. The investigator assessed preoperative stress and anxiety among experimental and control groups three days before the surgery using Hospital Anxiety and Depression Scale (HADS). Then structured teaching programme was given to the experimental group for 45 minutes regarding preoperative preparations for cardiac surgery aimed at reducing stress and anxiety, which was administered using flip charts and flash cards, supportive psychotherapy also will be administered. The other group was as per hospital routines. One day prior to discharge investigator reassessed stress and anxiety among both groups. Hospital Anxiety and Depression Scale. (HADS), The length of Intensive Care Unit stay, postoperative hospital stay and heart rate variability, will be the other variables studied.

Data collection was done on printed case record forms recording clinical and investigational information at initial assessment, during hospitalization, at subsequent outpatient visits, and at end of study period.These data forms will be securely stored in the office of the principal investigator and the information transferred to SPSS statistical package worksheet (SPSS for Windows, version 21.0. Chicago: SPSS Inc.) on a password-protected computer.

Plan for data analysis

The data collected were analysed using following methods,

A. Frequency, mean, median and standard deviation are used to assess the socio demographic variables and preoperative stress and anxiety among control and experimental groups.
B. Comparison of two groups performed by t test and $\chi 2$ test Population

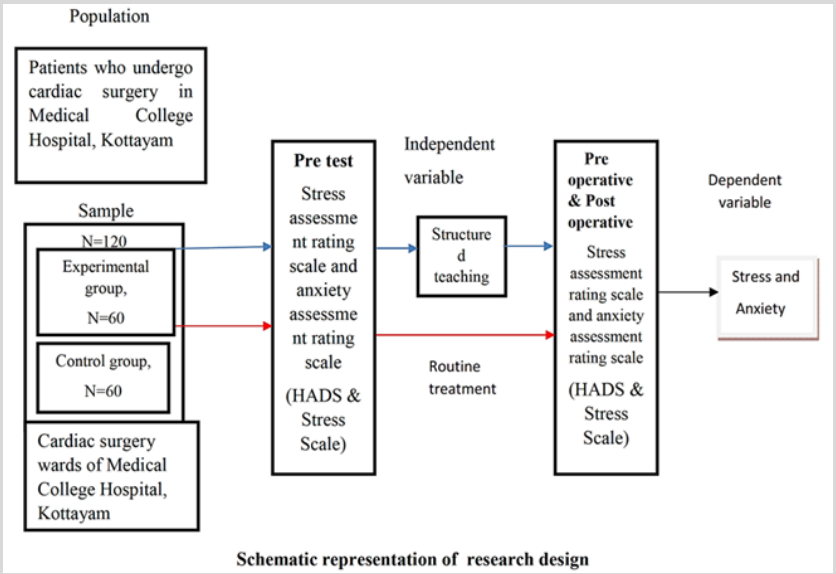

Figure 1: Structured teaching included providing an information leaflet in the local language and supportive psychotherapy.

Data management and statistical analysis

Data will be coded and entered in Microsoft Excel and analyzed using IBM SPSS software Version 22, significance being established at a two-tailed p-value of less than 0.10.

Results

There were significantly more males (84.2%) than females (15.8%) among the 120 participants (**Table 1**). The majority of the 120 participants are unemployed (40%) followed by unskilled (29.2%), skilled (23.3%), professional (5%), and semi-professional (2.5%) categories (**Figure 2,3**). There are more participants in the BPL category (61.7%) compared to the APL category (34.2%). Most participants were married (95.8%) while a small portion was unmarried (4.2%). Most participants reside in rural areas (69.2%) with fewer in urban (18.3%) and semi-urban areas (12.5%). Among total participants, 5% of participants had psychiatric relevance, while the rest did not. The distribution of diagnosis is presented in Table 2. Nearly half of the participants (50.8%) smoke, with the remaining 49.2% abstaining.

Table No 1: Distribution of Gender

Gender	Frequency (n=120)	Percentage
Male	101	84.2
Female	19	15.8

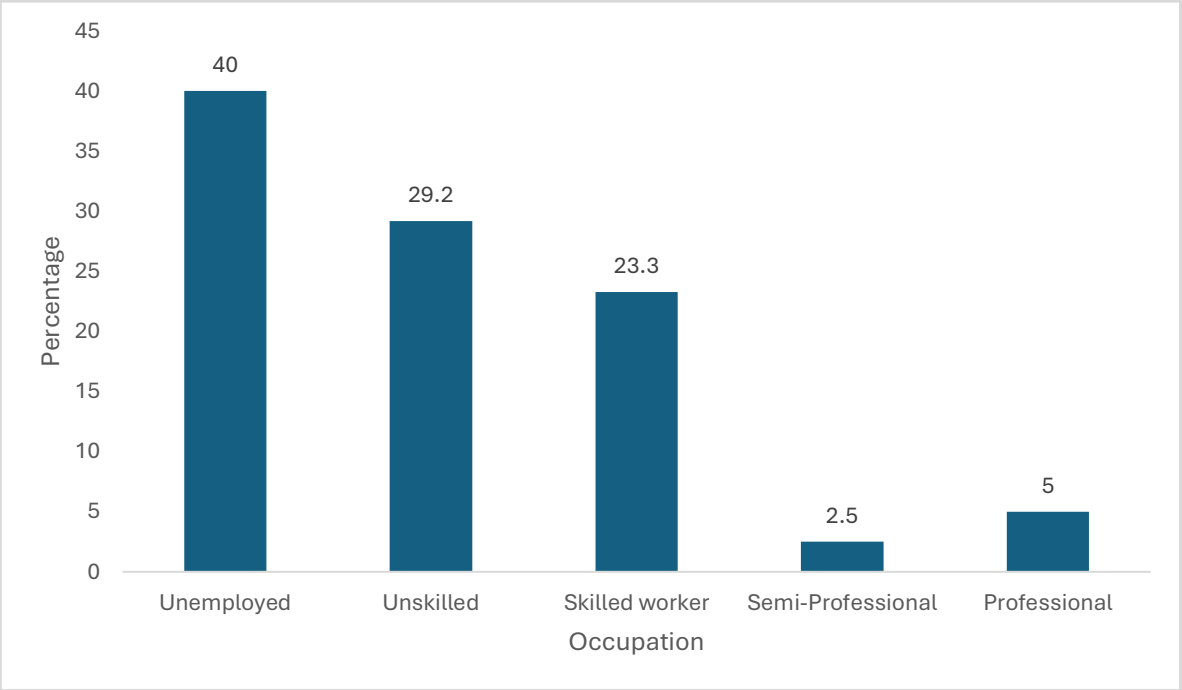

Figure 2: Distribution of Occupation

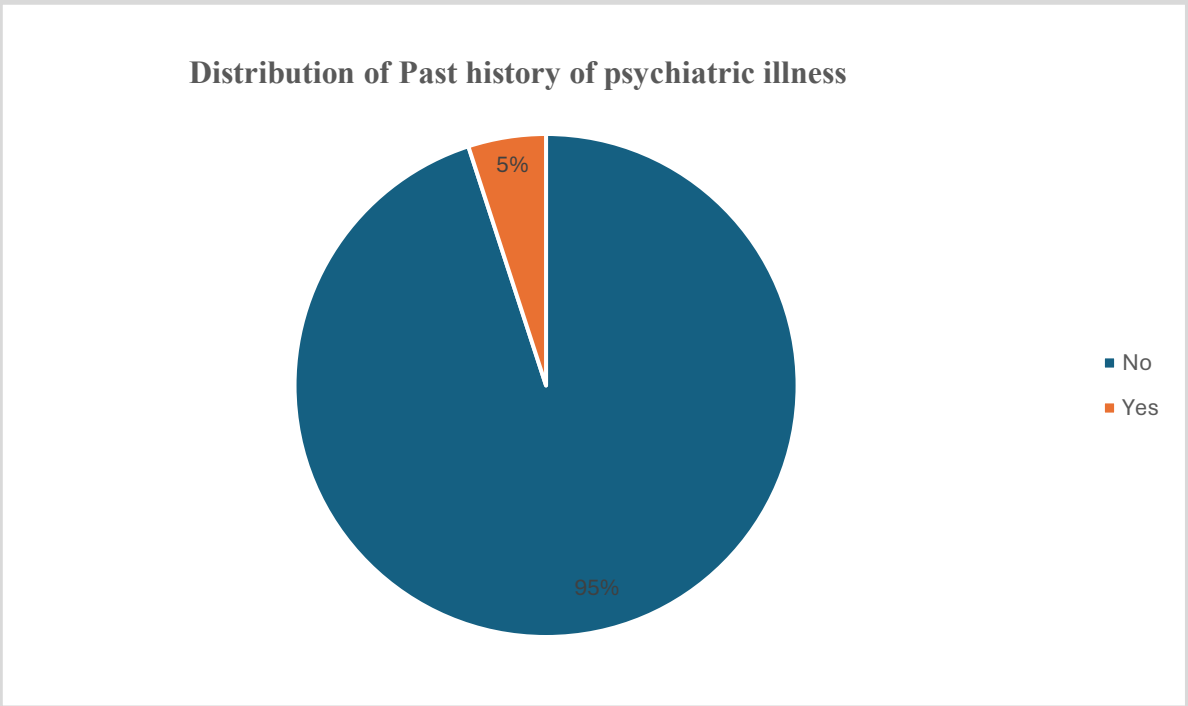

Figure 3: Distribution of past history of psychiatric illness

Table 2: Distribution of Diagnosis

Diagnosis	Frequency (n=120)	Percentage
ASD	1	0.8
CAD	79	65.8
CAD + VHD	1	0.8
CAD / VHD	1	0.8
CAD + POVD	2	1.7
CAD + Anterior Mediastinal Mass	1	0.8
CAD + IRAAA	2	1.7
CAD + POVD	2	1.7
CAD + Rt Eventration of Diaphragm	1	0.8
CAD + Rt LL Lung Cyst	1	0.8
Mitral Valve Stenosis	1	0.8
Tubercular Pericarditis	1	0.8
VHD	21	17.5
VHD / CAD	3	2.5
VHD + CAD	1	0.8
VHD + Dilated Aorta	1	0.8
VSD	1	0.8

The mean age in cases were 57.58±10.484 and in controls were 56.58±9.902. The comparison of mean age between the groups was not found to be significant (**Figure 4**). Out of 60 subjects with cases 57 (95.0%) were married and three (5.0%) were unmarried. In 60 controls 58 (96.7%) were married and two (3.3%) were unmarried. Association of marital status between groups was found to be statistically not significant with p value 1.000 (**Table 3**). Out of 60 cases, 4 (6.7%) patients had psychiatric relevance while in controls only 2 (3.3%) patients had psychiatric relevance. The association of psychiatric relevance between the groups was found to be statistically not significant with p value 0.679 (**Table 4**). In the association of Alcohol consumption between groups, out of 60 cases, 28 (46.7%) patients didn't have alcohol consumption, and 32 (53.3%) patients are consuming alcohol. Out of 60 controls, 39 (65.0%) patients didn't have alcohol consumption, and 21 (35.0%) patients are consuming alcohol. Association of alcohol consumption between the cases and controls was found to be statistically significant with p value 0.043 (**Figure 5**).

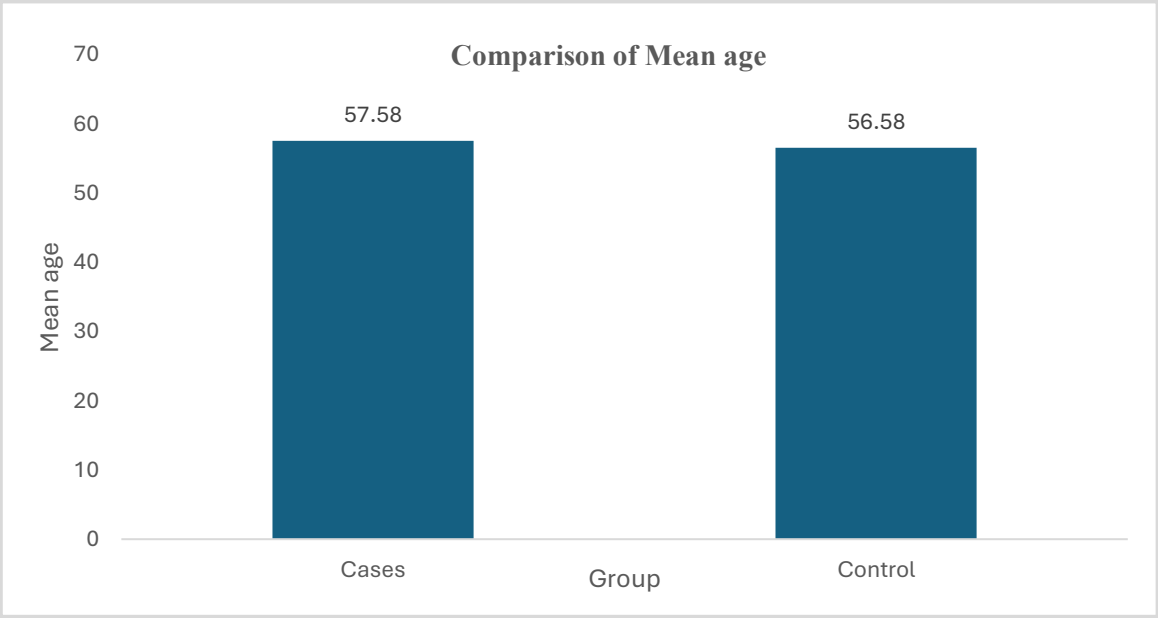

Figure 4: Comparison of Mean age between groups

Table 3: Association of marital status in the two study groups

Marital Status	Group		p value
	Cases (n=60)	Control (n=60)	
Married	57 (95.0%)	58 (96.7%)	**1.000**
Unmarried	3 (5.0%)	2 (3.3%)	

Table 4: Association of history of psychiatric illness between groups

Psychiatric Relevance	Group		p value
	Cases (n=60)	Control (n=60)	
No	56 (93.3%)	58 (96.7%)	**0.679**
Yes	4 (6.7%)	2 (3.3%)	

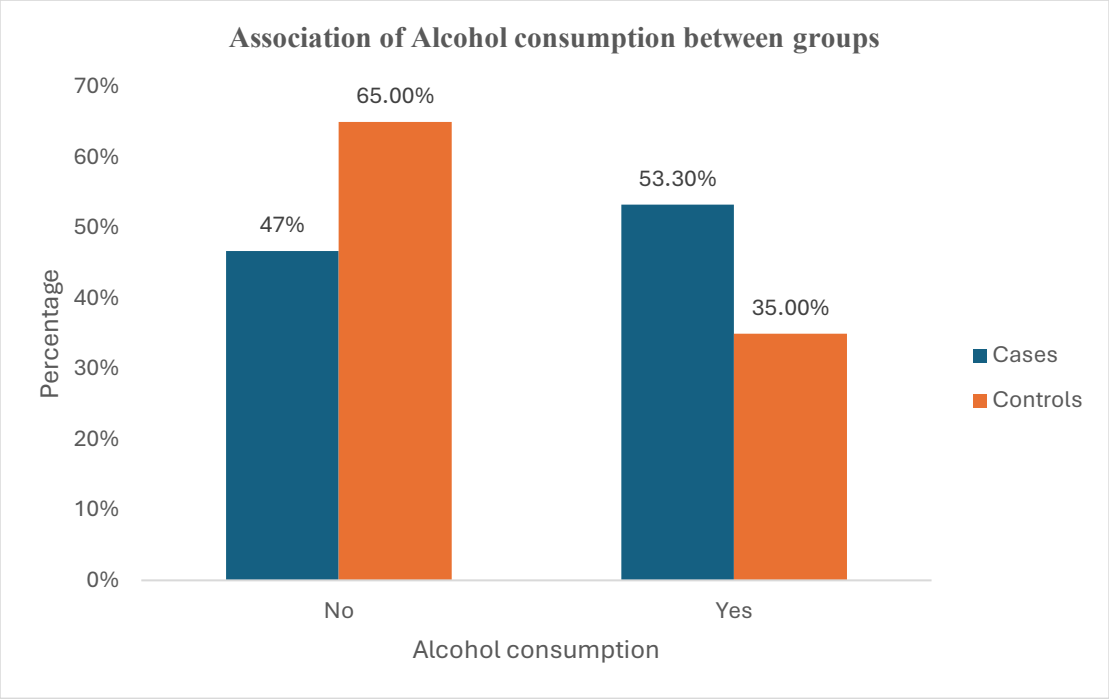

Figure 5: Association of Alcohol consumption between groups

The mean days in Hospital stay in cases was 4.63±2.699 and in controls was 5.10±3.686. And the mean pain rating scale in cases was 2.07±1.645 and in control group was 1.87±1.157. The mean comparison of days in Hospital stay and Pain Rating Scale between the groups was found to be not statistically significant (**Table 5**).

Table 5: Comparison of parameters between groups

	Cases (n=60)		Control(n=60)		
	Mean	**SD**	**Mean**	**SD**	**p value**
Days in Hospital	4.63	2.699	5.10	3.686	0.430
Pain Rating Scale	2.07	1.645	1.87	1.157	0.443

The mean pre-op anxiety in cases was 6.32±3.539 and in controls was 6.15±2.654. And the post op anxiety score in cases was 5.28±3.513 and in control group was 7.37±3.37. The mean comparison of pre-op anxiety between the groups was found to be not statistically significant while in post-op anxiety between the groups was found to be statistically significant with p value 0.001 (**Figure 6**).

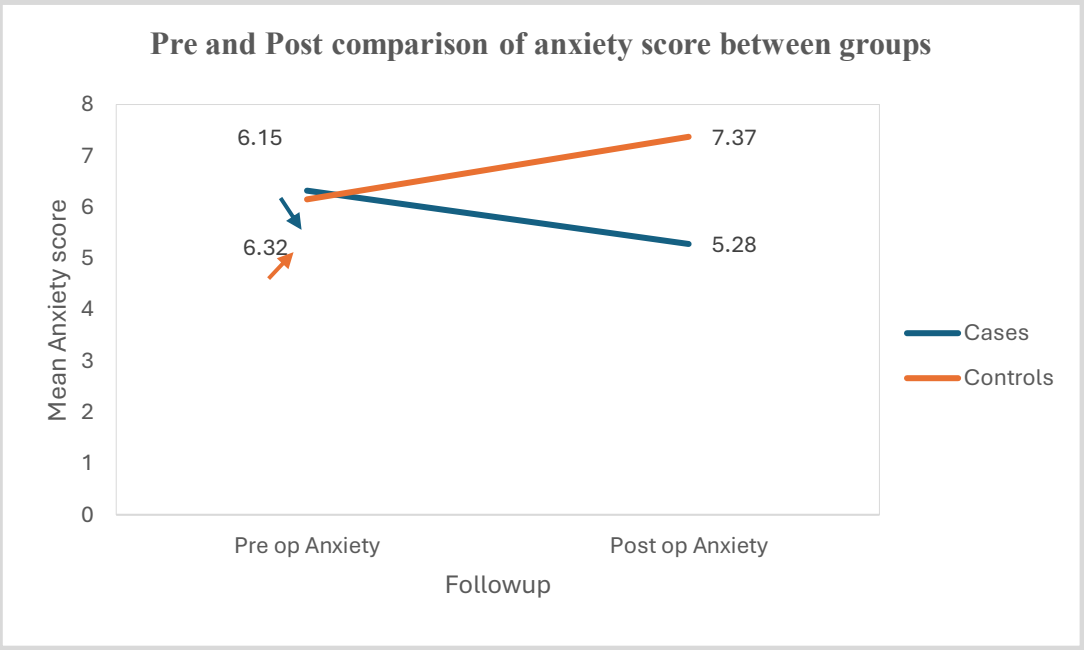

Figure 6: Pre-op and Post-op comparison of anxiety score between groups

The mean pre-op depression in cases was 2.60±2.366 and in controls was 6.07±3.394. And the post-op depression score in cases was 3.53±2.446 and in control group was 5.22±2.744. The mean comparison of pre and post op depression between the groups was found to be statistically significant with p value <0.001 (**Figure 7**).

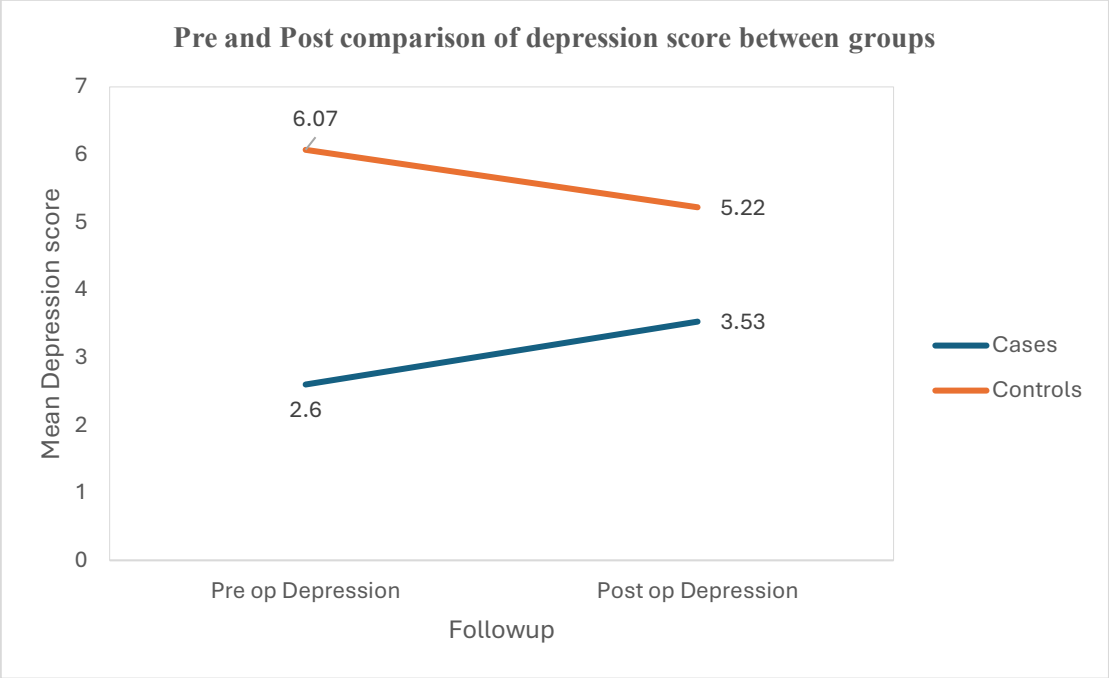

Figure 7: Pre-op and Post-op comparison of depression score between groups

Discussion

The present study was an attempt to identify the effectiveness of structured teaching programme on pre-operative stress and anxiety among patients undergoing cardiac surgery in Medical College Hospital, Kottayam.

Cardiothoracic surgery may be a crisis or threatening event for patients and their families. Post cardiothoracic surgical intensive care is one of the most challenging areas which requires adequate expertise to manage the expected and unexpected complications. Hence, the responsibility lies with the cardiac surgical team in preparing the patients and their families for the surgery. Pre-operative care of patients undergoing cardiac surgery is as important as post-operative care.

Distribution of patients based on sociodemographic and clinical data

In the present study, there are significantly more males (84.2%) than females (15.8%) among the 120 participants, similar to study conducted by Bening *et al*.,2013,[68] Lotte Kok *et al*.,2016 [49] and Bouchoucha *et al*.,2013[69] mentioned that the gender differences are not that uncommon in anxiety and other mood disorders.

This study showed that the majority of participants are married (95.8%) while a small portion is unmarried (4.2%). A study conducted on effect of patient education on patient anxiety level in open heart surgery by Malak *et al*., 93% were married [70].

In our study, the association of occupation between groups was not significant statistically. Among the unemployed, 22 (36.7%) were cases and 26 (43.3%) were controls. Almost similar to the study on the effect of cardiac rehabilitation on anxiety and depression in patients undergoing cardiac bypass graft surgery (Sharif.F *et al*.,) [71] showed that 30% of the participants in both experimental and control group were employed. There was no statistically significant association between the cases and controls in terms of smoking. However, the alcohol consumption between the cases and controls was found to be statistically significant with p value 0.043. In the present study, there was no statistically significant association between the groups in terms of past history of psychiatric illness and the ventilator support. However, among the cases 18 (30%) patients had ventilator support and among the controls 21 (35.0%) patients had ventilator support.

The present study findings showed that majority of the patients (78.2%) of patients in both the groups) were posted for coronary artery bypass graft. A study conducted on efficacy of certain structured pre-operative instructional materials in improving the level of compliance during post operative period among patients undergoing cardiothoracic surgery by Joseph *et al*., showed that among the 300 open heart surgery patients 250 patients underwent CABG [72].

The impact of a structured teaching program on stress and anxiety in patients undergoing cardiac surgery

In the present study it was found that structured teaching programme was effective in significant decrease of pre-operative stress and anxiety among patients undergoing cardiac surgery in the experimental group.

Among the cases, the mean pre-op anxiety score was 6.32±3.539 and the mean post op anxiety score was 5.28±3.513. The mean pre and post op anxiety score was statistically significant in terms of anxiety with a p value of <0.001 following a structured teaching programme.

Among the controls, the mean pre-op anxiety score was 6.15±2.654 and the post op anxiety score was 6.07±3.394 which was not statistically significant. In the study by Malak *et al*.,[70] on the effect of patient education on patient anxiety level in open heart surgery showed that there was a statistically significant reduction in anxiety after education (t= 2.003; p= 0.050).

In the study by Krannich *et al*., in 2007 [48] found that there was decreased anxiety and depression scores among the pre and post CABG surgery in terms of psychological stress related to the surgery.

A study on the teaching programme before surgery to decrease anxiety and make recovery better by Guo *et al*.,[60] showed that the participants who received preoperative education experienced a decrease in their anxiety score (P < 0.001).

In the study conducted by Kok *et al*., in 2016[49] the outcome measurements gave an indication of the presence of depressive symptoms in contrary to our study where both groups (cases and

control) had significant decrease in depression. In our study, the mean pre-op depression in cases was 2.60±2.366 and in controls was 6.07±3.394. The post-op depression score in cases was 3.53±2.446 and in control group was 5.22±2.744. The mean comparison of pre and post op depression between the groups was found to be statistically significant with p value <0.001.

Limitations of the study

The study is limited to only the patients undergoing cardiac and cardiac associated vascular and thoracic surgeries.

Recommendations

- It is possible to carry out more research to determine the impact of a structured teaching program on preoperative anxiety and tension.
- Prospective design studies with equal male / female distribution maybe done.
- Focus group discussion and interview sessions can be conducted with patients.

Conclusion

This study showed that the structured teaching programme was effective in reducing the pre-operative stress and anxiety. The preoperative preparation included the information regarding the physical, physiological, psychological and legal aspects in addition to the instruction while transferring patient to OT, and the post-operative management. However, we require more studies that are necessary to assess which mode of intervention is beneficial for patients and at what conditions. It is important to treat mind along with heart to get better outcomes after cardiac surgery.

Declarations

Ethical Clearance

The study was approved by the Ethical Committee.

Data Availability

All data available upon responsible request.

Funding source

None

Conflict of interest

None

Acknowledgment

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