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Prevalence of Anxiety and Depression Among Patients with Coronary Artery Bypass Grafting (CABG) in Karnataka and Kerala

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ABSTRACT

Background: Anxiety is a shared sense of unease that many individuals go through in their lives. Pre-cardiac surgery anxiety can result in several problems, including a poor prognosis, morbidity, and a lower quality of life. Due to several variables like low economic position, fear of dying, dread of being admitted to the intensive care unit, etc., anxiety is widespread among CABG patients. One of the main concerns for patients undergoing CABG is anxiety control. Subjective assessments and clinical results are used to screen for anxiety. The care provider team will be able to find some workable strategies to lessen anxiety and assist the patient in the future with pre-operative evaluation. Globally, the anxiety in patients undergoing CABG has been determined by numerous studies. However, the available data is currently sparse.

Nevertheless, there isn't much evidence to support this claim in the Indian context. Furthermore, Data on the prevalence of anxiety is lacking in the southern region of India in the literature. Thus, the purpose of this study is to identify anxiety in patients receiving CABG in Kerala and Karnataka, South India. The objective of the study is to determine the prevalence of anxiety among CABG patients in states such as Kerala and Karnataka. Also, to find out the correlation between anxiety and depression between age, gender, and BMI among patients undergoing CABG.

Methods: Patients undergoing CABG are asked for their consent. Based on the inclusion criteria, 120 (84 males and 36 females) patients scheduled for CABG were included in the study out of the 125 patients screened. Patients provide baseline information. Patients with a history of anxiety disorders and those using anxiolytics were excluded. Individuals receiving anxiolytics may exhibit symptoms if they are not taking their prescription as prescribed, which could potentially impact the study's outcomes. Patients are, therefore, not included. The Hospital Anxiety and Depression Scale (HADS) was used to evaluate the patients' anxiety. Patients who received a score higher than eight are assigned to the anxiety group.

Results: Descriptive statistics are employed to analyze the data. The results showed that the mean anxiety score was 10.2, and the mean depression score was 6.7. A significant correlation exists between the frequency of anxiety and gender, with a p-value less than 0.05.

Conclusions: Before surgery, patients undergoing CABG experience anxiety. In these situations, prompt assessment and management are necessary.

Keywords: Anxiety, CABG, Phase I cardiac rehabilitation, India, Hospital Anxiety and Depression Scale.

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INTRODUCTION

The most recent statistics state that 190000 CABG procedures are carried out annually in India. Over ten years, the revascularization rate has also risen [1]. The worldwide prevalence of pre-operative anxiety among patients undergoing surgical procedures involving general anesthesia is high. The risk factors are yet inconclusive [2]. This could be attributed to lifestyle changes and lack of physical activity. Among these patients, the prevalence of anxiety is higher, affecting many factors such as economic status, fear of surgery, cultural variation, etc.

Additionally, anxiety occurs at higher levels among patients undergoing surgery in low- and middle-income countries [3]. Pre-operative anxiety affects surgical outcomes. Cultural variations are also seen in the case of anxiety [4]. CABG has detrimental effects and is linked to elevated stress levels. Patient's anxiety levels rise due to a variety of circumstances, including severe chest pain and its consequent incapacity, exhaustion, dread of dying, worry about the results of surgery because the heart is a vital organ, and the prospect of having to align their lifestyle while in the hospital [5]. Any surgeries create an anxiety of danger among patients. This is more common among open heart surgery patients since the heart is a vital organ, and the risk can lead to the death of the patient [6]. Components of generalized anxiety disorders, such as intrusive ideas and weak control, emotion regulation difficulties, attempts to control fearful stimuli, and continuous threat-related thoughts, are the factors that impact and lead to attenuated quality of life among patients with generalized anxiety disorders [7]. Anxiety encompasses physical, physiological, and cognitive aspects. The somatic component includes symptoms such as sweaty hands, palpitations, and finger tremors. The physiological component involves symptoms like tachycardia, hyperventilation, muscle tension, and an irritable bladder. The cognitive component primarily involves worry, characterized by excessive fear of potentially unpleasant events. The International Classification of Diseases, Tenth Edition (ICD-10), classifies depression as a condition characterized by low mood and/or anhedonia (loss of interest in previously pleasurable activities) lasting for two weeks or more, accompanied by significant functional impairment and somatic symptoms such as disturbed sleep, fatigue, body aches, digestive or sexual issues, and negative thoughts [8]. While both anxiety and depression are prevalent among the Indian population, there is a lack of sufficient evidence on their prevalence and impact.

Many studies identified the prevalence of anxiety among CABG patients (Murphy et al.) (2020) [9]. Because CABG is an open-heart surgical procedure, it can cause stress, tension, anxiety, and depression among patients. There is an increased risk of morbidity and mortality among patients with anxiety and depression. The relationship between the etiology of and its outcome on anxiety and depression is an unexplored area of research [10]. Moreover, cultural differences may impact anxiety in different ways.

Our research offers fresh insights into the subject to raise awareness of the prevalence of anxiety in CABG patients. This can support the team of experts in cardiac rehabilitation in identifying, screening, and developing efficient treatments to lessen the effects of anxiety following surgery. The purpose of this study is to determine how common anxiety and depression are in patients receiving CABG in the southern Indian states of Kerala and Karnataka. The study also intends to establish a correlation between anxiety and depression and other variables like age, gender, BMI, and exercise capacity of the patients.

METHODS

Ethical clearance and consent

The ethics committee approved the study Central Ethics Committee NITTE (Deemed to be University) - NU/CEC/2021/178. A cross-sectional technique was used for the investigation. It was a convenient sampling method. The study involved recruiting 120 patients in total (Figure 1). The patients' informed permission is acquired. Information regarding potential anxiety-related therapies is included in the consent.

Selection Criteria

The study includes patients posted for CABG, both genders, and between 30 and 80 years of age [11]. Exclusion criteria were patients who had a history of mental illness, patients who took anxiolytics (which could introduce bias), and those who declined to take part in the trial. Surgery patients received advertisements. Patients who agreed to participate in the study provided consent papers.

Procedure

Patients hospitalized at the Cardiothoracic and Vascular Surgery (CTVS) Department of a multispecialty hospital in Karnataka are given verbal advertising. The criteria for selection are used to choose the patients. Patients who agree to participate in the study are asked to sign a consent form. Noted were baseline variables like age, sex, BMI, and exercise capacity. To identify anxiety and depression, the HADS score is taken before surgery (at the latest two days prior). Patients from different parts of Kerala and Karnataka are seen at the facility.

For this reason, the study uses translated versions of the HADS questionnaire in Malayalam, Kannada, and English (India). The patients fill out the questionnaire. To assess the exercise capacity, 6 Minute Walk Test is used.

Reliability of the Outcome Measure

Hospital Anxiety and Depression Scale (HADS) is a subjective measure used to assess anxiety, and patients rate this tool. This 14-item scale has two parts: 7-item depression and 7-item anxiety sub-scales. The patients need two to five minutes to finish the form [11]. There are numerous language translations available [12]. According to studies, the Malayalam version of HADS is a relevant and dependable instrument for the CABG population [13].

Statistical Analysis

Categorical data was presented as frequencies and percentages, while quantitative data was summarized using the mean and standard deviation. The Chi-square and Fisher's exact tests compared categorical data between the groups. Quantitative data was compared using ANOVA. Karl Pearson correlation coefficient analysis was performed to ascertain the correlation between the variables. SPSS 23 software and JAMOVI were used to analyze the data. The level of significance was 5%.

RESULTS

The study recruited 120 patients (female=36 and male = 84). The mean age is 59 (range 30-80 years). The mean BMI is 23.5 (Table 1). Anxiety is more common among the male population. Depression is not prevalent among the CABG population (Table 2). Anxiety and depression are high in the female population (Table 3, 4). There is no correlation between anxiety and demographic data (Table 5, Figure 2). Anxiety is not correlated with the 6 MWT.

Figure 1: Patient recruitment flow chart

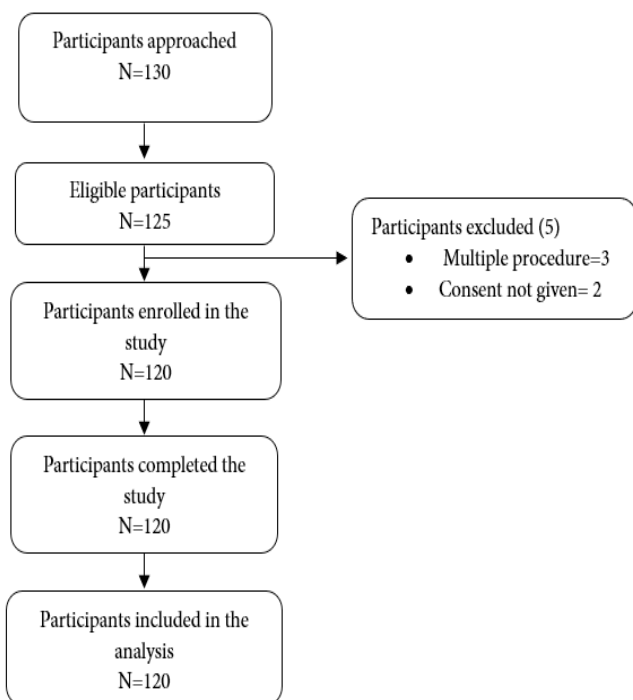


Table 1: shows the demographic data of the patients

	(n=120)	Count	Column N %
Age	40 - 50	24	20.0%
	51 - 60	44	36.7%
	61 - 70	38	31.7%
	Above 70	14	11.7%
Gender	F	36	30.0%
	M	84	70.0%
BMI	< 25	84	70.0%
	>= 25	36	30.0%

Table 2: shows the anxiety and depression among

	(n=120)	Count	Column N %
Anxiety	0-7Normal	3	2.5%
	8-10 Borderline	79	65.8%
	11-21 Abnormal	38	31.7%
	Total	120	100.0%
Depression	0-7Normal	71	59.2%
	8-10 Borderline	46	38.3%
	11-21 Abnormal	3	2.5%
	Total	120	100.0%

Table 3: Shows correlation anxiety values according to the demographic parameters

	(n=120)	0-7Normal	8-10 Borderline	11-21 Abnormal	Total	Fishers exact test p
Age	51 - 60	2 (66.7)	26 (32.9)	16 (42.1)	44 (36.7)	0.706 , NS
	40 - 50	1 (33.3)	15 (19.0)	8 (21.1)	24 (20.0)	
	61 - 70	0	28 (35.4)	10 (26.3)	38 (31.7)	
	Above 70	0	10 (12.7)	4 (10.5)	14 (11.7)	
Gender	M	3 (100.0)	63 (79.7)	18 (47.4)	84 (70.0)	0.001, HS
	F	0	16 (20.3)	20 (52.6)	36 (30.0)	
BMI	< 25	3 (100.0)	53 (67.1)	28 (73.7)	84 (70.0)	0.396 , NS
	>= 25	0	26 (32.9)	10 (26.3)	36 (30.0)	

Table 4: Shows correlation depression values according to the demographic parameter

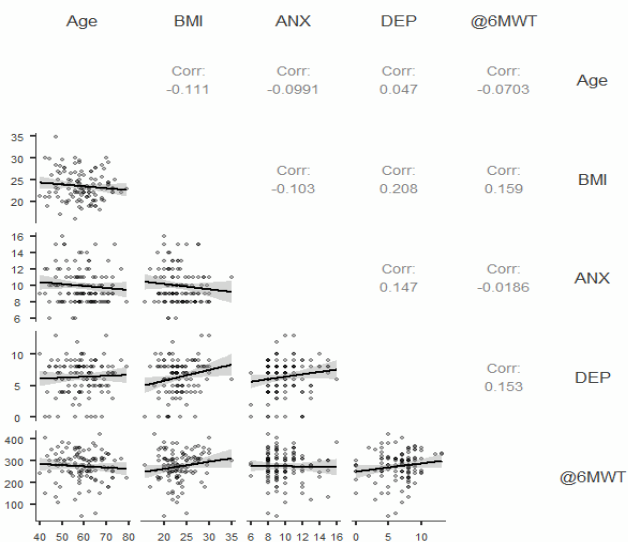
	(n=120)	0-7Normal	8-10 Borderline	11-21 Abnormal	Total	Fishers exact test p
Age	51 - 60	20 (28.2)	23 (50.0)	1 (33.3)	44 (36.7)	0.361, NS
	40 - 50	15 (21.1)	8 (17.4)	1 (33.3)	24 (20.0)	
	61 - 70	26 (36.6)	11 (23.9)	1 (33.3)	38 (31.7)	
	Above 70	10 (14.1)	4 (8.7)	0	14 (11.7)	
Gender	M	49 (69.0)	32 (69.6)	3 (100.0)	84 (70.0)	0.516 , NS
	F	22 (31.0)	14 (30.4)	0	36 (30.0)	
BMI	< 25	53 (74.6)	30 (65.2)	1 (33.3)	84 (70.0)	0.207, NS
	>= 25	18 (25.4)	16 (34.8)	2 (66.7)	36 (30.0)	
ANXI-ETY	0-7Normal	3 (4.2)	0	0	3 (2.5)	0.169 , NS
	8-10 Borderline	51 (71.8)	26 (56.5)	2 (66.7)	79 (65.8)	
	11-21 Abnormal	17 (23.9)	20 (43.5)	1 (33.3)	38 (31.7)	

Table 5: Pearson's coefficient correlation table

Correlation Matrix		Age	BMI	ANX	DEP	6 MWT
Age	Pearson's r	—				
	p-value	—				
BMI	Pearson's r	-0.111	—			
	p-value	0.226	—			
Anxiety	Pearson's r	-0.099	-0.103	—		
	p-value	0.281	0.263	—		
Depression	Pearson's r	0.047	0.208	0.147	—	
	p-value	0.610	0.023	0.109	—	
6 MWT	Pearson's r	-0.070	0.159	-0.019	0.153	—
	p-value	0.445	0.083	0.841	0.095	—

Note. * p < .05, ** p < .01, *** p < .001

Figure 2: Shows the correlation between the parameters



DISCUSSION

The prevalence of anxiety in patients undergoing CABG is a significant concern. Our data analysis shows that anxiety is more prevalent among patients who are undergoing CABG. The gender-wise distribution shows male patients have more anxiety symptoms compared to female patients. The anxiety level depends on the age of the patient. BMI is another factor that changes the level of anxiety. The anxiety is not dependent on the exercise capacity of the patients.

Shreya et al. (2024) [14] in their study, aimed to find out the prevalence of anxiety among patients undergoing cardiothoracic surgery, and their second objective was to find out the association of anxiety with post-operative pain and analgesic use. Out of 122 patients enrolled in the study, they found that about 63.9 patients suffer from pre-operative anxiety. The results of our study correlate with this study in which there is a high level of anxiety among the patients undergoing CABG, contributing to 65.8% borderline abnormal cases and 31.7% abnormal cases. In

their investigation, Goli B et al. (2021) [15] discovered that patients with CABG had a greater prevalence of anxiety. They recruited 210 patients referred for CABG surgery. The data analysis revealed that 38.6% of total patients experienced anxiety before the surgery. The anxiety level was correlated with the gender. According to our research, anxiety is quite prevalent in CABG patients and is correlated with gender. Faraz Farooqui et al.(2020) [16] gathered 121 patients for their investigation. They also contributed to the discipline by pointing out that patients who engage in little physical exercise frequently experience worry, which lowers their quality of life. Our research contradicts the previously held belief that anxiety is more common among women and has an abnormally high mean value. This association with physical activity could be the focus of future research. The trial is only open to CABG surgical patients. It is possible to conduct more studies to find out how common anxiety is in CABG patients after surgery over the long run. The study findings contradict the research conducted by C. Ramesh (2017) [17] and colleagues. They discovered in their observational study that before CABG, anxiety disorders affected women more frequently. The results of this investigation disagree with those of our investigation. The study was conducted in an Indian tertiary care referral hospital. One day before surgery, the researcher used the State Portrait Inventory (STAI) to test patients for anxiety. The majority of patients expressed severe anxiety. In light of our findings, the anxiety level was a slightly unusual case [18]. According to Yalcin et al (2018)., Women are more prone to experiencing anxiety than men [19]; this result contradicts our study results.

Additionally, our study found that male patients experience anxiety before CABG. Female patients experience depression as compared to male patients. This increase in anxiety among male patients may be attributed to financial stress and worries regarding the surgery since the heart is a vital organ. Our study results found that there is no correlation with the exercise capacity of the patients. Patients with exercise capacity are less likely to experience anxiety. Moreover, our data analysis showed that individuals following CABG do not frequently experience depression. Our research is pertinent since anxiety-related outcomes are poor in India [20]. This study also confirms that there is no depression among South Indian CABG patients receiving treatment in Kerala and Karnataka. The study reveals the frequency of anxiety among the South Indian population who is undergoing CABG. It is necessary to incorporate safe and workable therapies into standard care. The use of cost-effective treatments such as relaxation exercises, yoga therapy, music therapy, low-intensity aerobic exercises, etc., helps to relieve anxiety during the in-hospital phase.

People experience uncomfortable feelings of anxiety or depression symptoms in response to stressful situations, but this does not imply that they have clinical depression or anxiety disorders, which are medical conditions [21]. To verify that pre-operative anxiety is clinical anxiety, a follow-up study might be carried out in this regard in the

future. With these patients' follow-ups, more research may be done. This may offer the most precise understanding of the transient nature of symptoms or actual disease. Furthermore, our research showed a negative relationship between anxiety level and BMI. Studies examining the relationship between BMI and anxiety in CABG patients have not yet been conducted. This calls for a thorough assessment of anxiety before surgery.

More research can be done to determine the association between anxiety and risk factors among the CABG population. Future studies can be conducted with interventions to improve anxiety symptoms. Follow-up studies are warranted to know the extent and impact of anxiety disorder on clinical, social, and economic outcomes. This study evaluates the level of anxiety in the states of Karnataka and Kerala. There may be regional variations among the prevalence. This can be a future scope of the study. Future multicentric trials with large sample sizes are warranted. Clinical anxiety among patients undergoing CABG should be diagnosed with various clinical outcomes, which is beyond the scope of the study.

Limitations

The study has a limited sample size. In the field, large multicentric trials can be conducted in this regard. The study results reveal the status of patients in the regions Kerala and Karnataka. The outcomes can differ according to the region.

CONCLUSION

Our research indicates that anxiety is a significant problem that requires attention in individuals undergoing CABG. Additionally, a great deal of anxiety is seen in CABG patients. The people living in the regions of Kerala and Karnataka are more susceptible to anxiety, which can have an impact on their quality of life in terms of health and the prognosis of their conditions. Patients undergoing CABG experience increased levels of anxiety, which is particularly common in men. Anxiety and BMI are more correlated.

The results should be interpreted with caution due to the small sample size. The study was carried out in Kerala and Karnataka. Depending on the lifestyle, risk factors, and medical care, the regional variations may change the results. Therefore, it is essential to exercise caution when extrapolating the findings to the population of any other region. Before CABG, anxiety screening and assessment are crucial. This facilitates improved diagnostic and therapeutic decision-making for post-operative anxiety prevention strategies. The prognosis and quality of life of CABG patients can both improve with the assessment and management of anxiety. According to the study, patients with CABG should incorporate specific practices like yoga therapy and relaxation into their regular care regimen. Make sure to strengthen your physical capabilities as well since they can have a knock-on effect on your mental well-being. Before surgery, we also advise determining any possible causes of anxiousness in the patient. The anxiety among the patients undergoing CABG is not associated with age,

BMI, or previous exercise capacity. It should be concluded that the anxiety is due to fear of surgery, economic burden, fear of outcomes, etc. Pre-operative counseling education about the surgery can have a detrimental effect on Pre-operative anxiety.

Highlights

Known facts: An analysis is conducted on the frequency of anxiety and depression among individuals who have been diagnosed with coronary artery disease. The frequency of anxiety following CABG surgery has also been shown in recent research.

New information: This study determines the pre-operative prevalence of anxiety and depression in patients undergoing CABG surgery. This is the first study to determine the prevalence among people living in Kerala and Karnataka in southern India. This study is the first to find that the variables vary geographically.

Clinical application: Before CABG, screening for anxiety or depression enables the physical therapist and doctor to identify and treat symptoms early on. Controlling the symptoms becomes better after the surgery.

Ethics approval and consent to participate: The ethical clearance to conduct the study is obtained from the Central Ethics Committee NITTE (Deemed to be University)

Informed consent: Informed consent was obtained from each participant

Consent for publication: Obtained from patients

Data-Availability: The data sets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Competing interests: Nil

Authors' contributions: The first author (Abeeshna Ashok) Contributed significantly to the conception or design of the study or the acquisition, analysis, or interpretation of data. Involved in drafting the manuscript or revising it critically for intellectual content. Accepted responsibility for all aspects of the research, ensuring that any questions regarding the accuracy or integrity of the work are thoroughly investigated and resolved.

The second author (Dr. Dhanesh Kumar K U) Made substantial contributions to the conception or design of the study or the acquisition, analysis, or interpretation of data. Involved in drafting the manuscript or critically revising it for significant intellectual content.

The third author (Dr. Gopalakrishnan Mundayat) Has made substantial contributions to the conception or design of the study or the acquisition of data.

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