ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE, SCHOOL OF NURSING AND MIDWIFERY, DEPARTMENT OF NURSING

LEVEL OF ANXIETY AND ITS PREDICTORS AMONG CARDIAC PATIENTS UNDERGOING CARDIAC CATHETERIZATION AT SELECTED CARDIAC CENTER HOSPITALS, ADDIS ABABA, ETHIOPIA 2024

By; Sumeya Tofik Yassin

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RESEARCH THESIS TO BE SUBMITTED TO ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE, SCHOOL OF NURSING AND MIDWIFERY, NURSING DEPARTMENT IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER SCIENCE IN CARDIOVASCULAR NURSING.

JULY, 2024

ADDIS ABABA, ETHIOPIA

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Approval sheet

ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF NURSING AND MIDWIFERY, DEPARTMENT OF NURSING, CARDIOVASCULAR NURSING POSTGRADUATE PROGRAM

I, the undersigned MSc student, declare that I have submitted my original work on "level of anxiety and its predictors among cardiac patients undergoing cardiac catheterization at selected cardiac center hospitals, Addis Ababa, Ethiopia 2024" prepared by Sumeya Tofik satisfies the university's regulations and adheres to the accepted standards of originality and quality required for the Degree of Master of Sciences in Cardiovascular Nursing.

This thesis is submitted in partial fulfillment of the requirement for a graduate degree from the Addis Ababa University at College of Health Sciences, School of Nursing and Midwifery department of Nursing. The thesis is deposited in the Addis Ababa University Digital Library and is made available to local, national and international scientific community.

Submitted by:

Mrs. Sumeya Tofik (B.Sc.)

Name of Student	Signature	Date

This thesis work has been submitted for examination with my approval as an advisor.

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Name of Co-Advisor	Signature	Date

Approval by the board of examination

This thesis by **Mrs. Sumeya Tofik** is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of masters of Science in Cardiovascular Nursing.

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Statement of declaration

By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, data analysis and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used in this document. Every effort has been made to avoid plagiarism in the preparation of this thesis. I solemnly declare that this thesis has not been submitted to any other institution anywhere for the award of any academic degree, diploma or certificate.

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STUDENT NAME:

Mrs. Sumeya Tofik (B.Sc.)

Name of Student	Signature	Date

Acknowledgment

First and foremost, I want to express my sincere gratitude to the department of Nursing, School of Nursing and Midwifery, College of Health Science, Addis Ababa University, Ministry of Education for giving this opportunity. I would like to acknowledge my advisors, Mr. Berhanu W. (Msc, Associate professor) and Mr. Tefera M. (Msc, Assistance professor) for their helpful suggestions, priceless advice, constructive feedback and continuous support through developing this thesis. I would also like to thank cardiac center hospitals and study participants for their support throughout data collection. Finally, I want to express my gratitude to my friends and family for their support and motivation. Throughout this academic journey, their support has served as a source of inspiration.

Abbreviation & acronyms

AOR – Adjusted odds ratio

ASD – Atrial septal defect

BAI – Beck anxiety inventory

CAD - Coronary artery disease

CAG – Coronary angiography

Cath lab - Catheterization laboratory

CI – Confidence interval

COR – Crudes odds ratio

CVD –Cardiovascular disease

ETB – Ethiopian birr

PCI - Percutaneous coronary intervention

RCT - Random controlled trail

VAS – Visual analog scale

WHO - World health organization

Table of content

List of table

List of figure

Abstract

Background Globally, cardiovascular diseases (CVD) are the primary causes of morbidity and death. High level of anxiety is linked to worse clinical outcomes. It has significant effects on the cardiovascular system, including increasing blood pressure, heart rate, oxygen consumption in the heart, mortality, and the progression of coronary artery disease (CAD). Assessing level of patient anxiety undergoing cardiac catheterization is core component for improvement quality of care and to improve clinical outcome.

Objective To assess level of Anxiety and its predictors among cardiac patients undergoing cardiac catheterization at selected cardiac center hospitals, Addis Ababa, Ethiopia 2024.

Methods A facility-based cross-sectional study design was carried out among cardiac patients receiving cardiac catheterization at a selected cardiac center hospital from February 19 to March 31, 2024. Participants were chosen using a consecutive sampling technique. Data was gathered from 233 patients by in-person interviews with a standardized questionnaire and Beck Anxiety Inventory (BAI-II). Some parts of patient information were filled from patient chart. The statistical analysis of the data was conducted with SPSS version 27. Tables and chart were used to display the results of the descriptive statistics. Binary logistic regression was used to examine relationship between dependent and independent variables.

Result From 233 participant giving a response rate 98.7%, the overall prevalence of anxiety was 61.3%, and history of catheterization AOR = 0.025, CI (0.01, 0.62), previous knowledge of the procedure AOR = 0.382, CI (0.15, 0.97), preoperative nursing care AOR = 0.250, CI (0.09,0.69) , and coping techniques like prayer AOR = 0.2, CI (0.67, 0.6) and music AOR = 0.139, CI (0.54,0.36) were linked to lower levels of anxiety, and alcohol intake AOR = 2.178, CI (1.3, 2.7) was shown to be linked with increasing levels of anxiety.

Conclusion The level of anxiety among cardiac patient was found to be significantly high. The focus on preoperative anxiety reduction among cardiac patient should be one priority of health practitioners. Knowledge about procedure, pre-operative nursing care, praying and music therapy are preventive from anxiety.

Key words: Anxiety, cardiac catheterization, cardiac patients

1. Introduction

1.1 Background

Cardiac catheterization also known as cardiac cath. or heart catheterization is an invasive technique frequently used to diagnose or treat several cardiac disorders, including coronary artery disease (CAD) (1, 2). Under x-ray monitoring, flexible tubes called catheters are inserted into the heart through an artery or vein as part of the diagnostic as well as the therapeutic process known as heart catheterization. Before significant operations such as heart valve surgery, cardiac catheterization can definitively determine the presence of coronary artery narrowing and exclude the possibility of coronary artery disease (3).

Additionally, cardiac catheterization can be used in place of some heart surgeries in order to repair heart defects, open a restricted heart valve (stenosis), open blocked arteries or heart grafts, and implant permanent pacemakers (1,4). Anxiety is one of the most prevalent unpleasant emotions that cardiac patients who are having heart catheterization feel, along with fear, discomfort, and distress (5).

Anxiety is defined as a condition in which a person feels uneasy and their autonomic nervous system is triggered in reaction to an unclear and ambiguous threat (6). Numerous physiological reactions result from the sympathetic nervous system being activated by anxiety (7). This might exacerbate the patient's progression and cause symptoms like tachycardia, sweating, excessive oxygen demand, and hypertension. Furthermore, anxiety may negatively impact a patient's clinical results, including refusal of therapy and reduced ability to tolerate pain prior to, during and following the cardiac catheterization procedure. Numerous studies revealed that pre-operative anxiety is a typical response, and that patients and their families experience emotional shock when they anticipate surgical intervention (8).

Many factors, including waiting times for coronary angiography, fear of the cardiac catheterization unit, the adverse effects of angiography, and panic concerning an angiography-related problem, have been linked in studies to heightened pre-procedural anxiety among CATH patients. The most significant element influencing anxiety level is especially the waiting period (12, 21). On the other hand, misunderstanding of the angiography process is the most common source of anxiety (12).

Nurses and Doctors who provide care on pre-surgery wards have a lot of opportunities to help patients feel less anxious and have better results (9). The quality of life can be predicted by anxiety after a cardiac event so it is important for clinicians to understand how often anxiety is experienced by patients with heart problems (10). The multidisciplinary team should provide distinctive care during the pre-catheterization phase, especially nurses who will be preparing the patient and providing advice because they are more familiar with them at that time (11).

Preoperative anxiety is a serious concern, when faced with this circumstance, nurses should gather the best information that they can to be able to provide better treatment and lessen stressors, which will lessen anxiety in patients and their families (11). Pharmacological and non-pharmacological therapies both can be used to manage anxiety (12). Research has shown that providing patients with adequate preparation and knowledge prior to invasive procedures and surgery may reduce anxiety and improve their ability to tolerate pain after the treatment (19). So studying on this area will have major role in decreasing level of anxiety among cardiac patient undergoing cardiac cath. and also the burden of cardiovascular disease.

1.2 Statement of the problem

Globally, cardiovascular diseases (CVD) are the primary causes of morbidity and death (5). The World Health Organization (WHO) estimates that 17.9 million people in the nation die from cardiovascular illnesses each year, making them a major cause of morbidity and mortality (13). Coronary artery disease is the most common cardiovascular disease-related cause of death worldwide. Roughly 7 million fatalities a year are attributed to this burden, most of which is placed on low- and middle-income countries (14). The most dramatic and frightening situation in people with ischemic heart disease is acute coronary syndrome (5).

Cardiac catheterizations are regarded as a low-risk, standard diagnostic procedure in the field of cardiovascular disorders and their treatment, which is steadily increasing in today's society (15). Treatment options for ischemic heart disease include medications, surgery (myocardial revascularization if cardiac catheterization reveals substantial obstructive lesions), or vascular (angioplasty), depending on the patient's clinical status and the degree of coronary artery blockage (5). In order to treat heart defects, open a narrowed heart valve (stenosis), open blocked arteries or heart grafts, and install permanent pacemakers, cardiac catheterization can be used in place of certain heart operations (1,4)

Patients are still unaware about cardiac catheterization even though it is frequently done in specialty hospitals. Due to the unknowns, patients having cardiac catheterization may experience psychological and emotional complications such as anxiety, fear, worry, and insecurity (2). Anxiety has been demonstrated to elevate the body's physiological and psychological processes, including heart rate, blood pressure, and cardiac output, so increasing the danger to the cardiovascular system (16). Elevated anxiety is linked to worse clinical outcomes, such as heart rate impairment in cardiac patients and changes in cardiovascular function (6). It has significant effects on the cardiovascular system, including raising blood pressure, heart rate, oxygen consumption in the heart, mortality, and the progression of coronary artery disease (CAD) (2).

As cardiovascular diseases continue to pose a global health challenge, the degree of anxiety in individuals receiving catheterization for heart disease remains a critical concern (15). Heart catheterization can save lives (5), but very little study has been done to investigate the psychological effects particularly the degree of anxiety that patients who have undergone this procedure in certain Addis Ababa cardiac center hospitals. Untreated anxiety can lead to poor health outcomes; make it difficult for patients to cooperate during procedures, and compromise cardiac patients' general well-being. Thus, in order to create focused therapies that can improve patient experience and, ultimately, treatment adherence and outcomes, a detailed examination into the factors driving anxiety levels in this particular population is important.

There is a dearth of information on the anxiety levels of cardiac patients in Ethiopia having cardiac catheterization, which highlights the need for further focused research. Researchers from all over the world have looked into pre-procedural education, psychological support, and relaxation techniques as ways to help cardiac patients feel less anxious (2, 17). Comprehending the unique stressors and coping strategies that are common among Ethiopians is necessary in order to tailor these interventions to the Addis Ababa local context.

A single study done Addis Ababa, Ethiopia (18) makes a substantial contribution to our understanding of the psychological effects of this procedure in the local context, but an in-depth review identifies certain areas in which the literature could benefit from additional research. The fact that the study was limited to only two cardiac centers may limit the findings' applicability to other institutions or areas with different patient demographics, healthcare infrastructures, and cultural contexts. Because of this narrow emphasis, more research is required to verify whether

the results can be applied to a larger patient population and a variety of Ethiopian healthcare settings.

To improve the outside validity of the results, this research was taken a multicenter strategy, involving a variety of patient populations and healthcare environments throughout Addis Ababa, Ethiopia. Our study could overcome these shortcomings by offering a more thorough understanding of preoperative anxiety and directing targeted strategies for improved patient welfare. We were use a standardized approach and integrated additional cardiac centers in order to achieve this. Thus, by measuring the anxiety level of cardiac patients undergoing cardiac catheterization in many cardiac centers in Addis Ababa, Ethiopia this study might be able to close the gap.

1.3 Significance of the study

Anxiety before a procedure presents a serious problem for heart disease patients. It is predicted that individuals with heart disease undergoing cardiac catheterization will be able to heal and adhere with their prescribed course of treatment. Identifying gaps in the knowledge about anxiety and predictors among cardiac patients undergoing cardiac catheterization can help policymakers focus on this emerging problem and establish programs that are essential to reducing anxiety in cardiac patients prior to cardiac cath. procedures and controlling cardiovascular diseases.

Additionally, it will influence the effectiveness of nursing interventions targeted to address this problem, improve pre-procedural nursing care, and lessen the likelihood of anxiety-related complications in heart patients. Furthermore, this research may serve as a foundation for subsequent investigations and serve as a guide for broader research on anxiety in cardiac patients undergoing cardiac catheterization.

2. Literature review

Many emotions, like as anxiety, worry, desperation, and uncertainty, are frequently expressed during a catheterization (CATH) operation. But the primary emotion that patients feel before a CATH procedure is anxiety (14). This category will contain articles and research on the degree of anxiety experienced by cardiac catheterization patients. Eleven publications that particularly examined preoperative anxiety in patients undergoing cardiac catheterization are included below; these are the research's associated sections.

2.1 Prevalence of anxiety

Globally Anxiety among cardiac patient undergoing cardiac catheterization procedure is prevalent in different countries. Preoperative anxiety is common among cardiac patients undergoing cardiac catheterization all around the world. According to research conducted in a tertiary cardiac care facility in Amsterdam, the Netherlands, 43.9% of patients had pre-operative anxiety (6). A cross-sectional study carried out in Peshawar's two main public hospitals revealed that A significant portion of patients in both hospitals had high levels of anxiety, which were categorized as mild (20%), moderate (34%), and severe (10%) (12).

Anxiety was reported by 83.3% of patients in a cross-sectional study conducted in a tertiary care hospital in India, with 31.5% experiencing severe anxiety (16). Pre-operative anxiety ratings in another cross-sectional study carried out in North India were 8.2 severe, 26.4 moderate, and 65.5% mild (19). According to a study conducted in Jordan, 52.14% of cardiac patient had anxiety before CATH (20).

In a research done at the Punjab Institute of Cardiology in Lahore, high anxiety level were seen in men during the pre-procedure period 47.2% while female patients had even greater anxiety levels 50.4% than those of men (21). Patients in the Turkish study who had their first cardiac catheterization at Osmaniye Private New Life Hospital's cardiology clinic had an average anxiety level of 36% (22). Preoperative anxiety was seen in 70.4% of patients receiving cardiac catheterization in Ethiopia (18).

2.2 Anxiety-related factors

2.2.1 Socio-demographic factors

Most research found that women experienced higher levels of anxiety than men (12, 19, 20, 21). A tertiary cardiac care center in Amsterdam, the Netherlands conducted a study that found that women had considerably higher pre-procedure VAS anxiety scores. Prior to the procedure, anxiety levels were higher in individuals 65 years of age or older than in patients less than 65 years old (6).

Significant correlations between the patient's gender, education, and occupation were discovered in the Peshawar study. i.e. individuals who were illiterate experienced higher degrees of anxiety than individuals who were educated when it came to the patient's educational background. Similar findings were observed regarding the patients' occupations: those who were housewives or jobless reported higher levels of anxiety than those who were employed. Additionally, anxiety levels were higher in women than in men (12).

An additional cross-sectional study carried out in North India also revealed that women were more anxious than men (19). According to a Jordanian study, younger patients and female patients have higher anxiety levels related to CATH (20). According to a Lahore study, male patients scored significantly on anxiety during this period (47.2 ± 29.0 mm), but female patients had an even higher pre-procedure anxiety score (50.4 ± 26.5) than male patients ($p = 0.02$). It was observed that being older than 60 years old was an independent predictor linked to higher anxiety levels, as well as lower educational attainment (21). An Ethiopian study found that compared to workers in other sectors, the odds of private and public sector workers experiencing high-level preoperative anxiety were 3.38 and 6 times higher, respectively [AOR, 3.38 (95% CI: 1.45, 7.68)] (18).

2.2.2 Comorbid factors

Patients who have experienced cardiac procedures in the past may experience increased anxiety due to concerns about the surgery and its outcomes (23). However, previous surgical experience was associated with a lower level of anxiety as reported from previous study of Ethiopian (18). Anxiety can be worse by comorbid conditions like diabetes and high blood pressure (23).

2.2.3 Procedural factors

Insufficient knowledge, lack of understanding regarding the catheterization process may cause anxiety to increase. Anxiety may be exacerbated by perceived invasiveness, or the idea that the surgery is intrusive and uncomfortable. Anxiety can also be heightened by fear of complications, anxiety about possible problems, and unfavorable results (24). A study in Jordian was showed that Patients with primary percutaneous coronary intervention (PCI) was experienced high level of anxiety (21).

2.2.4 Psychosocial support

Lacking social support, insufficient assistance may exacerbate patients' anxiety levels. Coping methods, the effectiveness of a patient's coping strategies can have an impact on their anxiety. Additionally, previous mental health disorders like depression or anxiety disorders may make procedural anxiety worse (25). Prior research conducted in Ethiopia demonstrated a significant correlation between pre-operative anxiety and coping techniques such as seeking assistance and engaging in listening to music (18).

2.3 Summary of literature

Anxiety is the main topic of this literature review, which explores the emotional aspect of patients having cardiac catheterization. It provides details from various studies conducted in different countries. Some important details include; Preoperative anxiety is common among cardiac patients undergoing cardiac catheterization globally. Studies have shown varying percentages of patients experiencing anxiety before the procedure, ranging from 43.9% to 83.3%. Women generally experience higher levels of anxiety compared to men. Factors such as age, education, occupation, previous surgical experience, comorbid conditions, and knowledge of the catheterization process can influence anxiety levels. Insufficient social support, ineffective coping strategies and inadequate understanding can exacerbate anxiety levels.

Research linking preoperative anxiety with coping techniques indicates that psychosocial support and coping skills are essential in reducing anxiety. Previous research on cardiac catheterization-related anxiety in patients shows advantages in global representation. However, a study conducted in Addis Ababa on this topic was limited in its reach, which may limit the findings' applicability to other institutions or areas with different patient demographics, healthcare infrastructures, and cultural contexts. Further research is necessary to confirm whether the

findings can be applicable to a broader patient group. Our future study aims to address these limitations by providing a more comprehensive knowledge of preoperative anxiety and guiding specific strategies for enhanced patient well-being. To do this, we will employ a standardized methodology and include more cardiac centers.

2.3 Conceptual frame work

The theoretical structure derived from the research concerning anxiety among individuals having cardiac catheterization. According to the framework, a range of factors, including clinical factors (like the kind of procedure being done), socio-demographic factors (like age and educational level), and psycho-social factors (like social support), can have an impact on anxiety. The framework developed from a literature review on anxiety in cardiac patients identified a number of factors that have been shown to be associated with anxiety in this population, and they organized these factors into four main categories: clinical, procedural, socio-demographic, and psycho-social.

The framework shows that clinical factors can have a direct impact on anxiety. Socio-demographic factors can also have a direct impact on anxiety. For instance, Patients are less likely to experience anxiety if they are younger, more educated than older, or have less education. Anxiety may be impacted by psycho-social factors. Patients with significant social support networks are less likely to suffer from anxiety than patients without such networks. (12, 18, 19, 20, 21, 22, 24, 25)

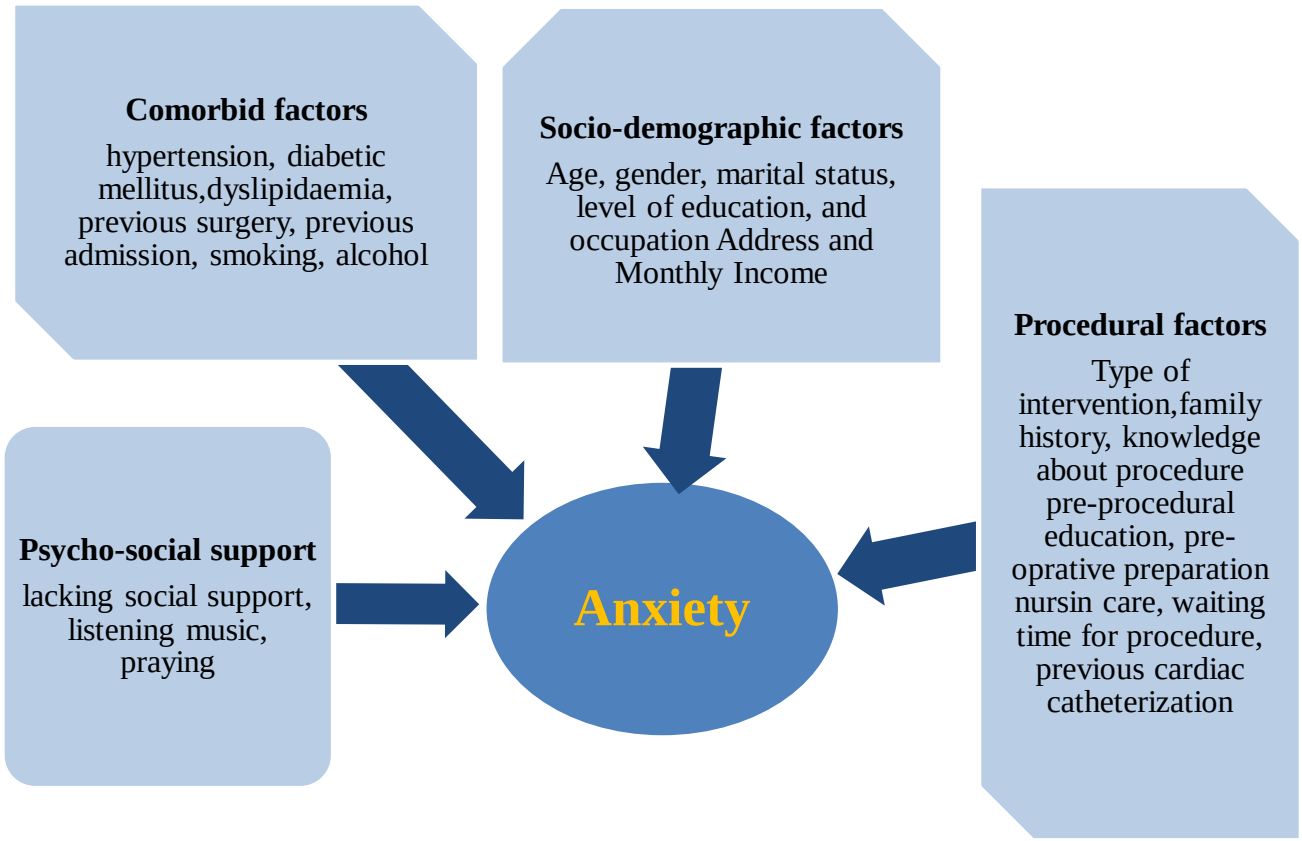

Figure 1 Conceptual frame work level of anxiety and its predictors among cardiac patients undergoing cardiac catheterization developed by principal investigator after literature review

3. Objectives

3.1 General objective

To assess level of Anxiety and its predictors among cardiac patients undergoing cardiac catheterization at selected cardiac center hospitals, Addis Ababa, Ethiopia 2024

3.2 Specific objective

To determine the level of anxiety among cardiac patients undergoing cardiac catheterization at selected cardiac center hospitals, Addis Ababa, Ethiopia 2024

To determine predictors of the anxiety level among cardiac patients undergoing cardiac catheterization at selected cardiac center hospitals, Addis Ababa, Ethiopia 2024

4. Method

4.1. Study area & period

The investigation was carried out from Feb 19 –March 31, 2024 in Addis Ababa at selected cardiac center hospitals. Addis Ababa is the capital city of Ethiopia and located in East Africa. It is also the largest city in the country by population Addis Ababa's 2024 population is now estimated at 5,703,628. This capital city holds 527 square kilometers of area in Ethiopia. The population density is estimated to be near 5,165 individuals per square kilometer available (23).

In Addis Ababa there are three public and eight private hospitals have their own cardiac center. They are Tikur Anbessa Specialized Hospital (TASH), Cardiac center Ethiopia, St'Petros specialized hospital, Gesund cardiac and medical center, Ethio tebib hospital, korean hospital, Addis cardiac hospital, Alpha cardiacc and medical center, Tazma cardiac center, Elouzeir cardiac center and International cardiovascular hospital.

4.2. Study design

The research project was used facility- based cross- sectional study design among cardiac patient undergoing cardiac catheterization.

4.3. Source and study population

4.3.1. Source population

All cardiac patients who were undergone cardiac catheterization procedure in public and private cardiac center hospitals located in Addis Ababa.

4.3.2. Study population

All cardiac patients who were undergone cardiac catheterization procedures at selected public and private cardiac center hospitals located in Addis Ababa during the study period.

4.4 Eligibility Criteria

4.4.1 Inclusion criteria

Patients over the age of 18 who were undergone cardiac catheterizations at selected cardiac centre hospitals.

4.4.2 Exclusion criteria

Cardiac patients who were critically ill and unable to communicate at the time of data collection.

4.5. Sample size and sampling procedure

4.5.1 Sample size

From the selected five cardiac centers, there were about 250 cardiac catheterization procedure schedules per 6 weeks. Level of anxiety taken from research conducted in Addis Ababa, Ethiopia, with prevalence of 70.4% ((18), 95% confidence interval, 5% margin of error and 10% for incomplete data was used as parameters.

By using single population proportion formula; $n_i = \frac{Z^2 p(1-p)}{d^2}$

There for by using the above formula = $(1.96)^2$ 0.70(1-0.70) / $(0.05)^2$ **= 323**

The final calculated result is **323** Because of the population is less than 10,000 we should use correction formula for the sample size

n=Nxn/(n+N-1) n=250x323/(323+250-1)=141

By adding 10% a non-response rate (14), the total sample size is **155.**

The above final sample size is small, so to avoid sampling error and to make the data representative we were increased the sample size using design effect (1.5).

n=155 x 1.5= **233**

4.5.2 Sampling procedure

233 participants were selected by consecutive sampling method.

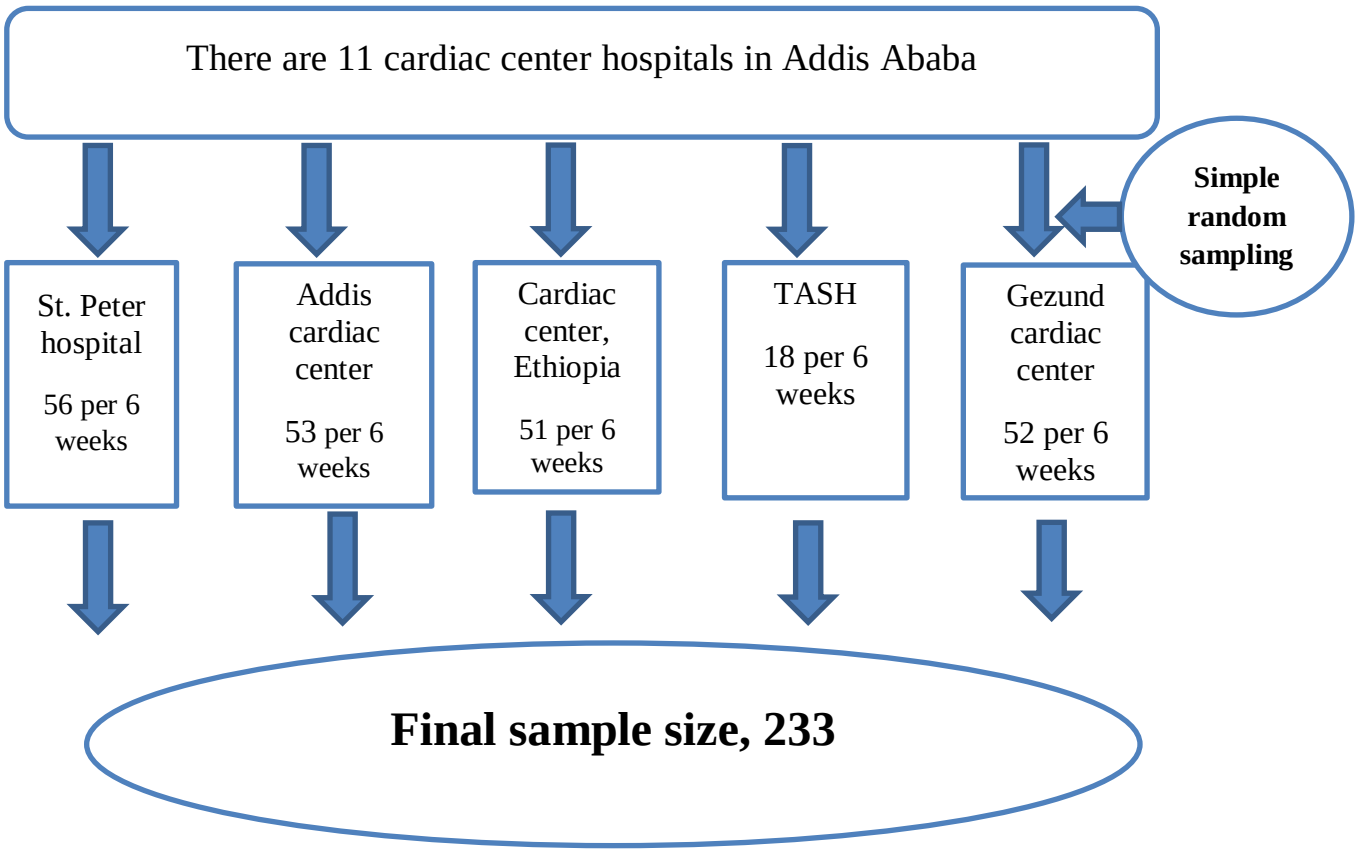

Figure 2 Schematic presentation of sampling techniques used to select study subjects from cardiac center hospitals, Addis Ababa, Ethiopia, 2024

4.6 Study variables

4.6.1 Dependent variable

Level of anxiety

4.6.2 Independent Variables

Socio- demographic factors: Age, gender, marital status, level of education, and occupation Address and Monthly Income

Comorbid factors: hypertension, diabetic mellitus, dyslipidaemia, previous surgery, previous admission, smoking and alcohol

Procedural factors: Type of intervention, family history, knowledge about procedure, pre-procedural education, pre-operative preparation nursing care, waiting time for procedure and previous cardiac catheterization

Psycho-social support related factors: lacking social support, listening music and praying

4.7. Operational definitions

Preoperative anxiety refers to the range of emotions that patients who are admitted to the hospital for surgery may experience, including anxiety, nervousness, fear, worry, and elevated autonomic activity (19). The validated tool Beck Anxiety Inventory (BAI-II) 21 items were used to assess level of anxiety (27). The cut point for individuals with anxiety problems was > 22-point score without emphasizing a mild form of anxiety because it is the usual problem without causing significant clinical distress, occupational, and functional impairment. The moderate form of anxiety with a Grand sum between 22– 35 score and the severe form of anxiety with a grand sum of > 36 scores was considered for anxiety level assessment (28). In this study a the cut point for level of anxiety was 22, so patients with a score of less than 22 were considered no anxiety, on the other hand patients with score of 22 and above were considered as anxiety.

4.8. Data collection tool and procedures

The data was gathered through in-person interviews using structured and pre-tested questionnaire and Beck Anxiety Inventory (BAI-II) at one point in time before going to cardiac catheterization laboratory. 6 BSC nurses were selected from other sector to minimize bias, 5 nurses as data collectors and the 1 nurse as supervisor. The supervisor was guided and communicated every day with data collectors throughout data collection time.

The questionnaire has four parts. Part one is general information about health institution which contains 2 questions. Part two is socio-demographic which contains seven questions tools to assess socio-demographic characteristics of patients. Part three is clinical factors which contains seven questions tools to assess clinical related factors of the patients. Part four is procedural factor which contains seven questions tools to assess procedural related factors of the patients. Part five is psycho-social support which contains three questions tools to assess psycho-social related factors of the patients. Part six is self-rating of anxiety level Beck Anxiety Inventory (BAI-II) tool to assess patient's anxiety level. Some parts of patient information, like comorbid factors: having hypertension, diabetic mellitus, dyslipidemia and procedural factor like type of intervention were filled from patient chart.

4.8.1. Data quality control

The continuous verification of the questionnaires' completion was regulated the data quality. Before the study begins, a half-day training session was held for data collectors to orient them and make sure they fully understand the study protocol, data collection instruments, and informed consent procedures. The questionnaire that the interviewer will use in English was developed first, translated into Amharic, and then translated back into English by a professional translator to ensure consistency. To increase the questionnaire's validity, it was shown to experts in the area. A pre-test of the questionnaire was carried out at Ethio Tebib Hospital prior to the actual data collection period; this test was not included in the actual data. The pre-test result was determined how the questionnaire is modified. To reduce anticipated bias, data collector nurses were chosen from other sectors.

4.9. Data processing and analysis

Initially, a desk assessment of the gathered data was conducted to ensure that all questions are complete and not misfiled. After that, the data was edited, checked for deviations, missing values, and inconsistencies, and then analyzed using the Statistical Package for Social Science (SPSS version 27). To illustrate the socio-demographic data and patterns for each independent variable, descriptive statistics were provided in the form of texts, graphs, and tables.

Binary logistic regression was used to evaluate each independent variable's relationship to each dependent variable. Those variables which were found to have an association with the outcome variable at $P<0.2$ were entered to multivariable logistic regression to test for independent association. The connection between independent variables in relation to dependent was assessed using odds ratios and 95% confidence interval (CI) and P values below 0.05 was regarded statistically significant.

4.10. Ethical consideration

The Addis Ababa University Ethical Review Committee, College of Health Science, School of Nursing and Midwifery, Department of Nursing, was offer a formal letter of ethical clearance and approval. The study was conducted at certain cardiac centers to which the official was submitted. After that, a letter of authorization from the local administration was obtained in order

to interact with the appropriate hospital entities. Permission from the cardiac centers and participants was obtained prior to data collection; then the data extraction was taken place.

To prevent patient identity, codes was used in place of their names. The patients were informed that their participation is voluntary and would not result to any harm, and that the information they provide will be kept private. Information provided by participants was not be accessible to anyone other than authorized personnel, and it was only be used for this research in order to preserve confidentiality. The interview was ended at any time during the data collection period by the participant if they were not comfortable.

4.11. Result dissemination plan

The study's findings was submitted to the Addis Ababa University, College of Health Science, School of Nursing and Midwifery, Department of Nursing, selected cardiac center hospitals, Addis Ababa Health Bureaus, other relevant organizations. The graduation defense seminar is where the final result presented. The final step will be to publish in national and international journals in order to spread information globally and to give presentations at various conferences.

5. Result

The analysis and interpretation of the findings are the primary topics of this section. The essential statistics and data were gathered from primary data via questionnaire. From expected 233 cardiac patients undergoing cardiac catheterization, 230 participants were involved in this study giving a response rate 98.7%. Accordingly, the analysis and findings of this paper are based on the response of cardiac patients undergoing cardiac catheterization in selected cardiac center hospitals Addis Ababa, Ethiopia, 2024. The first four sections were included some factors like socio demographic, clinical, procedural and social support of descriptive statistics. The fifth section and sixth section were included level of anxiety among respondent and predictors of anxiety level respectively.

5.1 Socio-demographic characteristics

From 230 respondents majority 150 (65.2%) of them were males. From total participants most 161 (66.5%) of participants were married, about 153 (66.5%) of them were from urban area and 83 (36.1%) participant of monthly income was below 5000 ETB.

Table 1: Socio demographic characteristic of study participant in selected cardiac center hospitals Addis Ababa, Ethiopia 2024 (n=230)

Variables	Category	Frequency / percentage
Age	18-30	25 (10.9%)
	31-40	41(17.8%)
	41-50	57 (24.8%)
	51-60	54 (23.5%)
	Above 60	53 (23%)
Sex	Female	80 (34.3%)
	Male	150 (65.2%)
Marital status	Married	161 (70%)
	Single	44 (17.6%)
	Divorced	12 (4.8%)
	Widowed	10 (4%)
	Separated	3 (1.2%)
Permanent residence	Urban area	153 (66.5%)
	Rural area	77 (33.5%)

Education	No formal education /can't read & write	43 (18.7%)
	No formal education but can read & write	10 (4.3%)
	Elementary school (grade 1-8)	24 (10.4%)
	Secondary school(Grade 9-10)	20 (8.7%)
	Preparatory (grade 11 -12)	51 (22.2%)
	Diploma	27 (11.7%)
	Degree	26 (11.3%)
	Above degree	29 (12.6%)
Occupation	House wife	46 (20%)
	Government employee	35 (15.2%)
	Private employee	44 (19.1%)
	Private business	82 (35.7%)
	Student	10 (4.3%)
	Retirement	13 (5.7%)
Monthly income	Less than 5000	83 (36.1%)
	5000-10,000	61(26.5%)
	10,000-15,000	25(10.9%)
	15,000-20,000	15 (6.5%)
	Above 20,000	46 (20%)

5.2 Comorbid factors

From 230 our participants 119 (51.7%) was hypertensive patients. Even though majority 146 (63.5%) of our participant had have history of hospital admission, most of our participants 190 (82.6%) did not have previous surgery.

Table 2: Clinical feature of study participant in selected cardiac center hospitals Addis Ababa, Ethiopia 2024 (n=230)

Variables	Category	Frequency / percentage
Hypertensive patient	Yes	119 (51.7%)
	No	111 (48.3%)

Diabetic mellitus patient	Yes No	74 (32.2%) 156 (67.8%)
Dyslipidaemia	Yes No	101 (43.9%) 129 (56.1%)
Previous surgery	Yes No	40 (17.4%) 190 (82.6%)
Previous hospital admission	Yes No	146 (63.5%) 84 (36.5%)
Smoking cigarette	Yes No	45 (19.6%) 185 (80.4%)
Drinking Alcohol	Yes No	92 (40%) 138 (60%)

5.3 procedural conditions

Almost all 209 (90.9%) of our respondent were undergone cardiac catheterization for the first time. Among them most 88 (38.3%) of out them were undergone percutaneous coronary intervention (PCI), followed by coronary angiography (CAG) which was 56 (24.3%), and then valvotomy, pacemaker and ASD (Atrial septal defect) closure which were 47 (18.8%), 29 (11.6) & 10 (4 %) respectively. Majority 188 (81.7%) of our study participant's family member have no any history of cardiac catheterization and also most 159 (63.6%) of participants did not have previous knowledge about the procedure. However most of them 151 (65.7) and 157 (68.3%) were received pre-procedural education about the procedure and received pre-operative preparation nursing care respectively.

Table 3: procedural conditions of study participant in selected cardiac center hospitals Addis Ababa, Ethiopia 2024 (n=230)

Variables	Category	Frequency / percentage
Type of intervention	CAG PCI Valvotomy Pacemaker implantation ASD closure	56 (24.3%) 88(38.3%) 47 (18.8%) 29 (11.6%) 10 (4%)
Family member have history of cardiac catheterization	Yes No	42 (18.3%) 188 (81.7%)
Have knowledge about the procedure before	Yes No	71 (28.4%) 159 (63.6%)

Received pre-procedural education about the procedure	Yes No	151 (65.7%) 79 (34.3%)
Received pre-operative preparation nursing care	Yes No	157 (68.3%) 73 (31.7%)
Number of days waited for procedure	3/<3 days >3 days	115 (50%) 115 (50%)
Previous cardiac catheterization	Yes No	21 (9.1%) 209 (90.9%)

5.4 Psycho-social support

Majority 167 (72.6%) of our participants have social support during procedure and 160 (69.6%) were pray to decrease their anxiety. But most 152 (66.1%) of them were not listen music to decrease their anxiety.

Table 4: Psycho social support of study participant in selected cardiac center hospitals Addis Ababa, Ethiopia 2024 (n=230)

Variables	Category	Frequency / percentage
Having social support during procedure	Yes No	167 (72.6%) 63 (27.4%)
Listening music to decrease anxiety	Yes No	78 (33.9%) 152 (66.1%)
Praying to decrease anxiety	Yes No	160 (69.6%) 70 (30.4%)

5.5 Anxiety level

The level of anxiety among 230 cardiac patients undergoing cardiac catheterization at selected cardiac center hospitals in Addis Ababa, Ethiopia was as the following, 89 (37.8%) of participants had no anxiety, and 141 (61.3%) of participants had anxiety.

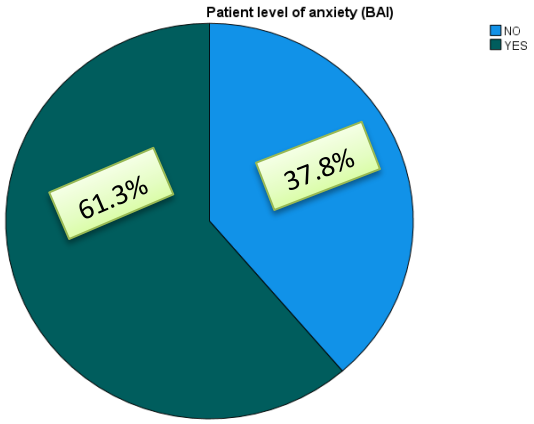

Figure 3: Level of anxiety (BAI) among cardiac patient undergoing cardiac catheterization at selected cardiac center hospitals Addis Ababa, Ethiopia 2024.

5.6 Predictors of anxiety level

The analysis for predictor of anxiety was done by using binary logistic regression. During the first step or analysis of bivariate almost all independent variables of p- value were < 0.2 except some variables like age, hypertension and dyslipidaemia. Then after entering of those associated variables in multivariable analysis six factors were showed significant association with anxiety p-value <0.05.

Numerous factors tend to have an impact on the degree of anxiety that cardiac patients feel when having catheterization. Individuals who drink alcohol are more likely to report feeling anxious (p = 0.01, AOR = 2.178, CI (1.3, 2.7) i.e. anxiety was 2 times higher among alcohol drinkers than non-alcoholic patient, whereas patients who were aware of the procedure are more likely to report feeling less anxious (p = 0.042, AOR = 0.382, CI (0.15, 0.97) which means patients who had have prior knowledge about the cardiac catheterization procedure were 61.8% preventive to experience high levels of anxiety compared to those who don't have previous knowledge.

Further evidence of the value of supportive therapies in reducing anxiety derives from the significant association between getting pre-operative in preparation nursing care and reduced levels of anxiety (p = 0.008, AOR = 0.250, CI (0.09, 0.69). it suggests that cardiac patients who receive pre-operative nursing care are 75% preventive from experience of high levels of anxiety compared to those who do not receive such care.

It is significant that patients who have undergone cardiac catheterization in the past also show reduced anxiety (p = 0.024, AOR = 0.025, CI (0.01, 0.62), patients who have previous cardiac catheterization are 97.5% preventive to experience high levels of anxiety during their next catheterization compared to patients who were undergone primary cardiac cath. suggesting that familiarity may play a part in reducing procedural anxiety. Furthermore, patients who use coping techniques like praying (p =0.005 AOR = 0.2, CI (0.67, 0.6) or listening to music (p = 0.001, AOR = 0.139, CI (0.54, 0.36) also typically report feeling less anxious, According to the data, cardiac patients who pray are 80% preventive than those who don't pray to feel extremely anxious before cardiac procedures and cardiac patients who listen to music are 86.1 % preventive to experience high levels of anxiety during cardiac catheterization compared to those who do not listen to music. which emphasizes the importance of adaptive measures in treating pre-procedural anxiety.

Table 5: Anxiety associated factors among participants at selected cardiac center hospitals, Addis Ababa Ethiopia 2024(n=230)

Variables		Anxiety		COR (CI)	P-value	AOR (95% CI)
		Yes	No			
Drinking Alcohol	Yes	68 (29.6%)	24(10.4%)	2.5 (1.4,4.5)	0.01	2.178 (1.3,2.7)
	No	73 (31.7%)	65 (28.3%)			
Knowledge about the procedure	Yes	16 (7%)	55 (23.9%)	0.79 (0.40,0.16)	0.042	0.382 (0.15, 0.97)
	No	125 (54.3%)	34 (14.8%)			
Received pre-operative preparation nursing care	Yes	75 (32.6%)	82 (35.7%)	0.97 (0.042,0.23)	0.008	0.250 (0.09,0.69)
	No	7 (3%)	66 (28.7%)			
Previous cardiac catheterization	Yes	1 (0.4%)	20 (8.7%)	0.025 (0.003,0.187)	0.024	0.025 (0.01,0.62)
	No	140 (60.9%)	69 (30%)			
Listening music to decrease anxiety	Yes	21 (9.1%)	57 (24.8%)	0.98 (0.052,0.182)	0.001	0.139 (0.54,0.36)
	No	32 (13.9%)	120 (52.2%)			
Praying to decrease anxiety	Yes	78 (33.9%)	82 (35.7%)	0.106 (0.046,0.25)	0.005	0.200 (0.67,0.6)
	No	63 (27.4%)	7 (3%)			

6. Discussion

In this study the degree of anxiety among respondent undergone cardiac catheterization was 61.3%. A similar range of anxiety levels was observed in patients, with percentages ranging from mild to severe, according to research done in Pakistan, mainly in Peshawar and Lahore These findings align with the results of our study, which showed that prior to the procedure, 61.3% of patients reported having moderate to severe anxiety (12).

Furthermore, studies conducted in India revealed that a significant portion of cardiac patients experienced high levels of anxiety, with prevalence rates identical to our study (19). This similarity suggests that a considerable proportion of cardiac catheterization patients experience significant distress and anxiety before the procedure.

A study carried out in the Netherlands in a tertiary cardiac care institution in Amsterdam found that 43.9% of patients had anxiety prior to procedure (6). An average degree of anxiety was found to be significantly lower in the study in Turkish (36%) (22). This discrepancy might be because of variance in patient demographic, educational level, living in a developed, quality of health care system and more scientific community than our study populations. Similarly when we compare this study with a study carried out in Ethiopia, which found that 70.4% (18) found that patients' anxiety levels were slightly lower than our study. Even though both studies were conducted in the same country, they are different in methods the previous study were conducted only in 2 cardiac center hospitals but our study was conducted with including of all cardiac centers in Addis Ababa, Ethiopia which might lead to the variation in reported anxiety levels.

Cardiac catheterization patients' anxiety levels are influenced by a number of variables. According to this study, drinking alcohol is associated with increased anxiety, i.e. anxiety was 2 times higher among alcohol drinkers than non-alcoholic patient, a study finding reported as alcoholics frequently experience episodes of intense depression and/or severe anxiety (24). Whereas patients who were aware of the procedure are more likely to report feeling less anxious whereas knowing about the procedure is associated with decreased anxiety. Patients who had prior knowledge about the cardiac catheterization procedure are 61.8% preventive from experience of high levels of anxiety compared to those who don't have previous knowledge.

Supportive therapies, such as pre-operative nursing care, have been demonstrated to considerably lower anxiety, in our finding cardiac patients who receive pre-operative nursing care are 75% preventive to experience high levels of anxiety compared to those who do not receive such care. Which is consistent with other studies that highlight the importance of psychosocial support in reducing anxiety (21). This is may be because of as a result of having received sufficient information on the first time. And also it tell us the role of nursing care in reducing anxiety level is has crucial effect.

In addition patients who have had cardiac catheterization previously report less anxiety, which means patients who have previous cardiac catheterization are 97.5% less likely to experience high levels of anxiety during their next catheterization compared to patients who were undergone primary cardiac cath. indicating that comfort level can reduce anxiety. This result is also in line with jordian study that patient with primary PCI more prone to develop preoperative anxiety (21). Patients who have experienced cardiac events or procedures in the past may experience increased anxiety due to concerns about the surgery and its outcomes (23). This indicates that patients who have had the procedure done previously are probably familiar with to it and know what to anticipate. Because of this familiarity, anxiety levels can be lowered by lowering the uncertainty and fear of the unknown. Patients who have had a procedure before may also feel calmer since they have a better idea of what to expect in terms of symptoms, time, and possible results.

Praying and listening to music are two coping mechanisms that are linked to decreased anxiety, cardiac patients who pray are 80% preventive than those who don't pray to feel extremely anxious before cardiac procedures and cardiac patients who listen to music are 86.1 % preventive to experience high levels of anxiety during cardiac catheterization compared to those who do not listen to music. This finding was aligned with the research done in Ethiopia (18) and supporting previous studies on the effectiveness of adaptive coping strategies (25). This result shows praying and listening to music may trigger intense feelings like comfort, hope, and peace. By participating in these activities, people can learn to control their emotions, which can offer emotional stability and support throughout cardiac catheterization.

7. Conclusion and recommendation

7.1 Conclusion

We draw the conclusion that anxiety levels during cardiac catheterization are a common problem for people with cardiac diseases. These finding showed that high prevalence of anxiety among cardiac patients undergoing cardiac catheterization in cardiac center hospitals, located in Addis Ababa, Ethiopia. Drinking alcohol, preoperative nursing care, previous experience of cardiac catheterization, having knowledge about procedure, music therapy and prayer were significantly associated with level of anxiety. Alcohol consumption exacerbates anxiety while knowledge of the procedure and supportive therapies, such as pre-operative nursing care, minimize it. Previous experience with catheterization and the use of coping mechanisms, such as music therapy and prayer, are associated with a level of anxiety.

7.2 Recommendation

As demonstrated by adjusted odds ratios (AORs) anxiety was linked to a number of variables, such as having had cardiac cauterization in the past, drinking alcohol, participating in spiritual activities like prayer, using music therapy, and receiving pre-operative nursing care. This research highlights the significance of treating anxiety in cardiac patients undergoing cardiac catheterization, for both the patients' overall health and the effectiveness of the operations. To achieve these aim different responsible bodies should be involved:

Policy makers:

- ✓ Provide standardized procedures for managing anxiety in cardiac patients undergoing catheterization and for assessing patients prior to surgery.
- ✓ Provide funding to help cardiac care facilities add psychosocial support services like music therapy.

Cardiac center hospitals:

- ✓ Provide comprehensive preoperative programs so that patients are aware of what to expect during the catheterization process and can reduce anxiety.
- ✓ Educate nurses and other health care providers on pre-operative care for patients undergoing cardiac catheterization with compassionate and supportive care.

Researchers

- ✓ To do RCT (random controlled trail) to know the effectiveness of pre-operative nursing care, knowledge, music therapy in decreasing anxiety level.

7. Reference

1. *National heart, Lung, and Blood Institute.* Catheterization, Cardiac Catheterization - What is Cardiac. s.l. : National heart, Lung, and Blood Institute, 2022, National heart, Lung, and Blood Institute.

2. *Batista LC, Melo MN, Cruz DALMD, Gengo E Silva Butcher RC.* catheterization, Characteristics of music intervention to reduce anxiety in patients undergoing cardiac. s.l. : Heliyon, 2022 Nov 25.

3. *FS., Glowny MG. & Resnic.* Catheterization, What to Expect During Cardiac. s.l. : cardiology patient page., Feb 2012.

4. *Stamato NJ, O'Toole MF, Enger EL.* room, Permanent pacemaker implantation in the cardiac catheterization laboratory versus the operating. s.l. : An analysis of hospital charges and complications., 1992 Dec;15.

5. *Ferreira NC, Ramalho ES, Lopes JL.* review, Non-pharmacological strategies to decrease anxiety in cardiac catheterization: integrative. s.l. : Rev Bras Enferm., 2015.

6. *Delewi R, Vlastra W, Rohling WJ, Wagenaar TC, Zwemstra M, Meesterman MG, Vis MM, Wykrzykowska JJ, Koch KT, de Winter RJ, Baan J Jr, Piek JJ, Sprangers MA, Henriques JP.* laboratory., Anxiety levels of patients undergoing coronary procedures in the catheterization. s.l. : Int J Cardiol, 2016 Nov 11.

7. *Player MS, Peterson LE.* Anxiety disorders, hypertension, and cardiovascular risk. s.l. : A review. Int J Psychiatry Med., 2011.

8. *Mulugeta H, Ayana M, Sintayehu M, Dessie G, Zewdu T.* hospitals, Preoperative anxiety and associated factors among adult surgical patients in Debre Markos and Felege Hiwot referral. s.l. : BMC Anesthesiol., 2018 Oct 30.

9. *Ryamukuru D, Ndateba I, Mukamana D, Mukantwari J, Adejumo O, Collins A.* Rwanda., Assessment of Anxiety in Patients Awaiting Surgery in a Referral Hospital in. Rwanda : Rwanda J Med Health Sci., 2019 May.

10. *L., Neubeck.* Nurs., Anxiety and coping in the cath lab. Br J Card. s.l. : Available from: www.cardiac-nursing.co.uk, 2017 Jul.

11. *Buzatto LL, Zanei SS.* catheterization., Patients' anxiety before cardiac. 2010 Dec.

12. *Shaheen N, Muhammad D, Habibullah G, Khattak IU.* Peshawar., Association between knowledge and anxiety level among patients undergoing coronary angiography in tertiary care hospitals of. s.l. : Crit Care Innov J., 2022.

13. *Organization., World Health.* diseases., Cardiovascular. s.l. : Organization., World Health, https://www.who.int/health-topics/cardiovascular-diseases, 2024.

14. *Ralapanawa U, Sivakanesan R.* Syndrome, Epidemiology and the Magnitude of Coronary Artery Disease and Acute Coronary. s.l. : A Narrative Review. J Epidemiol Glob Health., 2021 Jan 7.

15. *Block A, Bonaventura K, Grahn P, Bestgen F, Wippert PM.* Laboratory, Stress Management in Pre- and Postoperative Care Amongst Practitioners and Patients in Cardiac Catheterization. s.l. : A Study Protocol. Front Cardiovasc Med., 2022 Jul.

16. *Das DR, Nayak MR, Mohapatra D, Mahanta D.* Study, Association of Anxiety and Depression in Patients Undergoing Cardiac Catheterization With Number of Major Coronary Artery Stenosis:A Cross-Sectional. s.l. : Cureus., 2022 Jan 26.

17. *Hu CM, Wu ZT.* catheterization, Use of non-pharmacological intervention to reduce anxiety during cardiac. s.l. : Res Connection, World Crit Care Nurs., 2017.

18. *Afrassa N, Kassa RN, Legesse TG.* Center, Preoperative anxiety and its associated factors among patients undergoing cardiac catheterization at Saint Peter Specialized Hospital and Addis Cardiac. Addis Ababa, Ethiopia : Int J Africa Nurs Sci., 2022.

19. *Sinha kS., Jain K., Verma KA.,.* india., Assessment of level of anxiety and associated factors among heart patients waiting for cardiac procedure at a tertiary care hospitals in north. North india : JRFHHA., 2017 Jul-Dec.

20. *Ahmad M, Ayasrah SM.* measures., Periprocedural anxiety associated with cardiac catheterisation and the monitored physiological. s.l. : J Perioper Pract., 2019 Jun 27.

21. *Noreen A, Zia N, Kamran R.* angioplasty, Level of anxiety and fear in patients undergoing coronary. 9, s.l. : IAJPS, 2021, Vol. 08.

22. *Atik D et al.* pain, The effect on anxiety level of coronary angiographic result and the perception of. s.l. : International Journal of Research in Medical Sciences Int J Res Med Sci., 2015 Feb.

23. *Asadi-Lari M, Javadi H, Melville M, Samiei M.* study., Predictors of anxiety and depression in Iranian patients with myocardial infarction: A cohort. 2, s.l. : Eur J Cardiovasc Nurs., 2018, Vol. 17.

24. *Leegaard M, Fagermoen MS, Gjengedal E, Fagermoen MS.* study., Patients' experiences of anxiety in relation to coronary angiography: A qualitative. s.l. : Scand J Caring Sci., 2020.

25. *Tully PJ, Winefield HR, Baker RA, Turnbull DA.* Depression, anxiety and major adverse cardiovascular and cerebrovascular events in patients following coronary artery bypass graft surgery: A five-year longitudinal cohort study. s.l. : BioPsychoSocial Med., 2016.

26. *Ethiopian Central Statistical Agency.* Ethiopia, Central Statistical Agency Population Projections for. 2013, July.

27. Beck, A. T., Epstein, N., Brown, G., Steer, R. A. An inventory for measuring clinical anxiety: Psychometric properties. Journal of Consulting and Clinical Psychology,1988, 56, 893-897.

28. *Dirriba, A.B., 'Prevalence of anxiety disorder and associated factors among voluntary counseling and HIV testing clients at Governmental Health Centers in 2017 in Addis Ababa, Ethiopia', Iranian Journal of Psychiatry [Preprint]. 2021, doi:10.18502/ijps.v16i4.7226.*

29. *Šalkevicius J, Damaševičius R, Maskeliunas R, Laukienė I.* Signals., Anxiety Level Recognition for Virtual Reality Therapy System Using Physiological. 9, s.l. : Electronics., 2019, Vol. 8.

8. Appendix A: Questionnaire form English version

❖ **Questionnaire information sheet**

Questionnaires prepared to assess anxiety level of cardiac patients undergoing cardiac catheterization at cardiac center hospitals, Addis Ababa, Ethiopia 2024

Read for the study participants.

INTRODUCTION AND PURPOSE OF THE STUDY;

Good morning/ good afternoon!

My name is----------, we are doing a research on the level of anxiety among cardiac patients undergoing cardiac catheterization at cardiac center hospitals located in Addis Ababa, Ethiopia and now we are collecting information.

The purpose of this study is to identify the level of anxiety among cardiac patients undergoing cardiac catheterization at cardiac center hospitals located in Addis Ababa. Hoping that we will find constructive information from you I selected you to participate in this study. I will ask you some questions for not more than 10-15 minutes. Participation in the research is voluntary and you can withdraw after beginning if uncomfortable. Since this research is for advancement of knowledge only, no monetary motivation is available but the researcher greatly appreciates your participation.

You do not have to worry about the process that we are going to do. Since your name and anything about you is not mentioned in the paper the information you that you are going to give will be kept confidentially. However, the information you by benevolence will have a great role to improve the quality of care for cardiac patients for the future. The information you give today will not affect your future service utilization from this health institution so that you do not to worry.

So are you willing to participate actively and honestly?

Yes---------- No---------- Date----------

❖ **Questionnaire**

Instruction: Circle the number(s) under the answer section according to the respondents' answer or write the response on the blank space provided.

Part 1. General Information about the health institutions

Question	Response	Remark
Name of cardiac center hospital		
Type of hospital	1. Government 2. Private	

Part 2 Socio-demographic characteristics

SN	Questions	Response	Remark
1	How old are you?	1. 18-30 2. 31-40 3. 41-50 4. 51-60 5. Above 60	
2	Sex	1. Female 2. Male	
3	What is your marital status?	1. Married 2. Single 3. Divorced 4. Widowed 5. Separated	
4	Where is your permanent residence?	1. Urban area 2. Rural area	
5	What is your level of education?	1. No formal education /can't read & write 2. No formal education but can read & write	

		3. Elementary school (grade 1-8) 4. Secondary school(Grade 9-10) 5. Preparatory (grade 11 -12) 6. Diploma 7. Degree 8. Above degree	
6	What do you do for living? / What is your occupation?	1. House wife 2. Government employee 3. Private employee 4. Private business 5. Student Other (Specify_____	
7	How much do you earn monthly? (in Ethiopian birr)	1. Less than 5000 2. 5000-10,000 3. 10,000-15,000 4. 15,000-20,000 5. Above 20,000	

Part 3 Comorbid factors

SN	Questions	Response	Remark
1	Are you Hypertensive patient?	1. Yes 2. No	Please check from the chart to confirm
2	Are you Diabetic mellitus patient?	1. Yes 2. No	Please check from the chart to confirm
3	Do you have Dyslipidaemia?	1. Yes 2. No	Please check from the chart to confirm
4	Did you have Previous surgery?	1. Yes 2. No	
5	Did you have Previous admission in hospital?	1. Yes 2. No	

6	Are you cigarette Smoker?	1. Yes 2. No	
7	Do you drink Alcohol?	1. Yes 2. No	

Part 4 Procedural factors

SN	Questions	Response	Remark
1	Type of intervention	1. Angiography (CAG) 2. Percutaneous coronary intervention (PCI) 3. Valvotomy 4. Pacemaker implantation 5. ASD closure 6. Other, specify_____	Please check from the chart to confirm
2	Does your Family member have history of cardiac catheterization?	1. Yes 2. No	
3	Do you have knowledge about the procedure before?	1. Yes 2. No	
4	Did you receive pre-procedural education about the procedure?	1. Yes 2. No	
5	Did you receive pre-operative preparation nursing care?	1. Yes 2. No	
6	How many days did you waited for procedure?	1. less than 3 days 2. Above 3 days	
7	Did you have Previous cardiac catheterization?	1. Yes 2. No	

Part 5 Psycho-social support

SN	Questions	Response	Remark

1	Do you have social support during this procedure?	1. Yes 2. No	
2	Do you listen music to decrease your anxiety?	1. Yes). 2. No	
3	Do you pray to decrease your anxiety?	1. Yes 2. No	

Part 6 Anxiety

Beck Anxiety Inventory (BAI)

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom by marking in the corresponding space in the column next to each symptom.

No.	Symptoms of anxiety	Not At All	Mildly but it didn't bother me much	Moderately it wasn't pleasant at times	Severely It bothered me a lot
1	Numbness or tingling				
2	Feeling hot				
3	Wobbliness in legs				
5	Unable to relax				
5	Fear of worst happening				
6	Dizzy or lightheaded				
7	Heart pounding/racing				
8	Unsteady				
9	Terrified or afraid				
10	Nervous				
11	Feeling of choking				
12	Hands trembling				
13	Shaky / unsteady				
14	Fear of losing control				

15	Difficulty in breathing				
16	Fear of dying				
17	Scared				
18	Indigestion				
19	Faint / lightheaded				
20	Face flushed				
21	Hot/cold sweats				

Thank you very much for your participation!

Appendix B: Questionnaire form Amharic version

- **የመረጃ ቅጽ**

ይህ ቃለ መጠይቅ አዲስ አበባ በሚገኙ የልብ ማእከላት ውስጥ cardiac catheterization የሚስራላቸው ታካሚዎች የሚኖራቸውን የጭንቀት መጠን እንዲሁም ከእርሱ ጋር የተያያዙ ነገሮችን ለማጥናት የተዘጋጀ ነው።

- **ጥናቱ ላይ ለሚሳተፉ ሰዎች አንብብ/ቢ**

ደህና አደሩ? / ደህና ዋሉ?

ስሜ_____ ይባላል። እኛ አዲስ አበባ በሚገኙ የልብ ማእከላት ውስጥ ካርዲያክ ካቴተራይዜሽን የሚስራላቸው ታካሚዎች የሚኖራቸውን የጭንቀት መጠን እንዲሁም ከእርሱ ጋር የተያያዙ ነገሮችን ለማጥናት እየሰራን ነው። አሁን መረጃ በመሰብሰብ ላይ እንገኛለን።

የዚህ ጥናት አላማ ካርዲያክ ካቴተራይዜሽን የሚሰራላቸው የልብ ታካሚዎች ምን ያህል ጭንቀት እንደሚገጥማቸው እንዲሁም ከእርሱ ጋር የተያያዙ ነገሮችን ለመለየት ነው። ከእርሶ ጥሩ መረጃ እናገኛለን ብለን ተስፋ እናደርጋለን። እርሶ ጥናቱ ላይ እንዲሳተፉ መርጨዎታለሁ። ከ10-15 ደቂቃ በላይ የማይወስድ የተወሰኑ ጥያቄዎችን እጠይቅዎታለሁ።

ጥናቱ ላይ መሳተፍ በእርሶ ፍቃደኝነት ላይ የተመሰረተ ሲሆን ከጀመርን በኋላ የምንጠይቅዎት ጥያቄ መኖት የማይሰጥዎት ከሆነ በማንኛወም ሰአት ማቋረጥ ይችላሉ። ይህ ጥናት እውቀትን ከማሳደግ ወጪ ከኛ የሚያገኙት የገንዘብ ማበረታቻ ጥቅማ ጥቅም የለም። ይሁን እንጂ ጥናቱ ላይ እንዲሳተፉ በጣም እናበረታታለን።

እኛ በምንሰራው ስራ ላይ ስጋት እንዳይገባዎት የእርሶ ስምም ሆነ እርሶን የሚገልጽ ማንኛውም ነገር ወረቀቱ ላይ አይሰፍርም። ሚስጥረኛነቱም የተጠበቀ ነው ነገር ግን እርሶ በቅንነት በሚሰጡት መረጃ መሰረት ወደፊት ለልብ ታካሚዎች የሚጠው የጤና አገልግሎት መሻሻል ከፍተኛ አስተዋጽኦ ይኖረዋል። ዛሬ ለኛ የሚሰጡን መረጃ እርሶ ወደፊት ከዚህ የጤና ተቋም የሚያገኙትን የጤና አገልግሎት አይጎዳም በመሆኑም ስጋት እንዳይገባዎት።

ስለዚህ በታማኝነት ጥናቱ ላይ ለመሳተፍ ፍቃደኛ ነዎት?

አዎ_____ አይደለሁም_____

ቀን_____

- **የቃለ መጠይቅ ቅፅ**

መመሪያ- በመላሾቹ መልስ መሰረት የተሰጡትን ቁጥር ያክብቡ ወይም መልሳቸውን በተሰጠው ስፍራ ላይ ያስፍሩ ።

❖ ክፍል አንድ- ስለ ጤና ተቋም ጠቅላላ መረጃ

ተ.ቁ	ጥያቄ	መልስ	ማስታወሻ
1	የጤና ተቋም ስም	_____	
2	የጤና ተቋም አይነት	1. የመንግስት 2. የግል	

❖ ክፍል ሁለት- ማህበሩዊ እና ዲሞግራፊያዊ ሁኔታዎች

ተ.ቁ	ጥያቄዎች	መልስ	ማስታወሻ
1	እድሜዎት ስንት ነው ?	1. 18-30 2. 31-40 3. 41-50 4. 51-60 5. ከ 60 በላይ	
2	ጾታ	1. ሴት 2. ወንድ	
3	የጋብቻ ሁኔታዎ ምን ይመስላል ?	1.ያገባ 2.ያላገባ 3.የፈታ 4.በሞት የተለየ 5. የተለያየ	
4	በቋሚነት ሚኖሩት የት ነው ?	1 ከተማ 2 ገጠር	
5	የት/ት ደረጃዎ ስንት ነው ?	1. ያልተማረ ማንበብ እና መፃፍ የማይችል 2. ያልተማረ ግን መፃፍ እና ማንበብ የሚችል 3. የመጀመሪያ ደረጃ (ከ1- 8ኛክፍል) 4. 2ኛ ደረጃ (ከ9- 10) 5. መሰናዶ (ከ 11-12) 6. ዲፕሎማ 7. ዲግሪ 8. ከዲግሪ በላይ	

6	ስራዎ ምንድነው?	1.የቤት እመቤት 2.የመንግስት ሰራተኛ 3. የግል ሰራተኛ 4 የግል ስራ 5. ተማሪ ሌላ (ይገለፅ)_____	
7	በወር የሚያገኙት ገቢ ምን ያህል ነው ? (በኢትዮጵያ የብር መጠን)	1. ከ5000 በታች 2. 5000-10,000 3. 10,000-15,000 4. 1,5000-20,000 5. ከ20,000 በላይ	

❖ ክፍል የጤና ሁኔታ

ተ.ቁ	ጥያቄዎች	መልስ	ማስታወሻ
1	የደም ግፊት ሕመምተኛ ነዎት	1 አዎ 2 የለም	እባክዎ ካርዱን ይመልከቱ
2	የስኪር ሕመምተኛ ነዎት?	1 አዎ 2 የለም	እባክዎ ካርዱን ይመልከቱ
3	የኮሌስትሮል ህመም አለ?	1 አዎ 2 የለም	እባክዎ ካርዱን ይመልከቱ
4	ከዚህ በፊት ቀዶ ህክምና ተደርጎሎታል?	1 አዎ 2 የለም	
5	ከዚህ በፊት ሆስፒታል ተኝተዋል ?	1 አዎ 2 የለም	
6	ሲጋራ ያጨሳሉ?	1 አዎ 2 የለም	
7	አልኮል መጠጥ ይጠቀማሉ?	1 አዎ 2 የለም	

❖ ክፍል 4 ከፕሮሲደር ጋር የተያያዘ ጥያቄ

ተ.ቁ	ጥያቄዎች	መልስ	ማስታወሻ
1	የፕሮሲደር አይነት	1. አንጂኦግራፊ 2. ፐሲአይ 3. ቫልቮቶሚ 4. ፔስ ሜከር 5. ኤኤስዲ ክሎዠር	እባክዎ ካርዱን ይመልከቱ

		6. ሌላ, ይግለፅ _____	
2	ከእርሶ ቤተሰብ ይህን አይነት ሕክምና አሰራር (ካረዲያክ ካቴተራይዜሽን) ያከናወነ አለ?	1 አዎ 2 የለም	
3	ከዚህ በፊት ስለ አሰራሩ (ስለ ልብ ካቴቴራይዜሽን) ግንዛቤ ነበሮት?	1 አዎ 2 የለም	
4	ስለ ሕክምና አሰራሩ (ስለ ልብ ካቴቴራይዜሽን) ትምህርት ተሰትዎት ነበር?	1 አዎ 2 የለም	
5	ከሕክምና በፊት ለሕክምና አሰራሩ (ለልብ ካቴቴራይዜሽን) የነርስ ክትትል ይደረግልዎት ነበር?	1 አዎ 2 የለም	
6	ለህክምናዎ ሂደት(ለልብ ካቴቴራይዜሽን) ምን ያህል ቀናት ጠብቀዋል ?	1. ከ 3 ቀናት በታች 2.ከ 3 ቀናት በላይ	
7	ከዚህ በፊት የልብ ካቴቴራይዜሽን ነበረዎት?	1 አዎ 2 የለም	

- **ክፍል 5** ማህበራዊ ድጋፍ

ተ.ቁ	ጥያቄዎች	መልስ	ማስታወሻ
1	በዚህ ህክምና ወቅት ማህበራዊ ድጋፍ አለዎት?	1 አዎ 2 የለም	
2	ጭንቀትዎን ለመቀነስ ሙዚቃ ያዳምጣሉ ?	1 አዎ 2 የለም	
3	ጭንቀትዎን ለመቀነስ ፀሎት ያደርጋሉ ?	1 አዎ 2 የለም	

- **ክፍል 6 ጭንቀት**

ቤክ የጭንቀት መለኪያ ዝርዝር

ከታች የተዘረዘሩት የተለመዱ የጭንቀት ምልክቶች ዝርዝር ነው። እባክዎ በዝርዝሩ ወስጥ ያሉትን እያንዳንዱን ንጥል በጥንቃቄ ያንብቡ። ከእያንዳንዱ ምልክት ቀጥሎ ባለው አምድ ውስጥ በሚዛመደው ቦታ ምልክት በማድረግ በምልክቱ ም ያህል እንደተጨነቁ ያሳዩ።

No.	የጭንቀት ምልክቶች	ምንም የለም	በትንሹ ግን ብዙም አላስቸገረኝም	በመካከለኛ ሁኔታ አስጨንቆኛል	በከፍተኛ ሁኔታ አስጨንቆኛል
1	የመደንዘዝ ስሜት				
2	የሙቀት ስሜት				
3	በእግሮች ውስጥ መንቀጥቀጥ				
5	ዘና ማለት አለመቻል				
5	ለከፋ ሁኔታ ይከሰታል ብሎ መፍራት				
6	የማዞር ስሜት				
7	የልብ ምት መጨመር				
8	አለመረጋጋት				
9	ፍርሀት ወይም መደንገጥ				
10	የመረበሽ ስሜት				
11	የመታፈን ስሜት				
12	የእጅ መንቀጠቀጥ				
13	የሰውነት መንቀጠቀጥ				
14	ከቁጥጥር ውጭ መሆንን መፍራት				
15	ለመተንፈስ መቸገር				
16	እሞታለሁ በሎ መፍራት				
17	መደናገጥ				
18	የምግብ አለመፈጨት				
19	መድከም				
20	የፊት መቀያየር				
21	ሙቅ ወይም ቀዝቃዛ ላብ				

- ለተሳትፎዎ ከልብ እናመሰግናለን !!!

Appendix C: IRB