

## Anxiety Level for Patients Undergoing Cardiac Catheterization: A Pre-Experimental Design

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### Abstract

*A major factor in lowering patients' symptoms of worry and panic is educating them prior to coronary angiography. The way that patients express their fear and anxiety depends on their gender. Nurses are thought to play a vital and essential role in patient education. A pre-experimental design (one group pretest-post test design). The study was conducted using a purposive sample of 51 adult patients of both sexes who were admitted to the cardiac catheterization unit at the Critical Care Unit of the Imam Hassan Al-Mujtaba Teaching Hospital. sections: two instruments have been used. Section I: The demographic data form for the patient includes seven items: age, gender, educational level, marital status, residence, occupational level, and smoking history. Section II: The 20 components that make up the State-Trait Anxiety Inventory (STAI). The study results indicate that the patients exhibited severe levels of anxiety with a mean (2.51) before the application of the program. While the patients exhibit moderate levels of anxiety with a mean (1.69) after the application of the program. Additionally, the study sample's overall responses during the pre-test and post-test periods differed in a highly statistically significant way, with a p-value of 0.000. The study shows that there is a positive effect of instructional Programs on Anxiety levels for patients undergoing cardiac catheterization where decreased levels of anxiety from severe to moderate, where the p-value for the two measurement periods was 0.000 HS.*

**Keywords:** Anxiety, Cardiac Catheterization, Patients.

### Introduction

Coronary angiography is commonly used to assess and treat coronary artery disease, one of the leading causes of death worldwide [1]. For both men and women, coronary artery disease (CAD) is thought to be the leading cause of death. Plaque accumulation in the heart's arteries, which supply blood to the heart muscle, is the primary cause of CAD. A lack of blood flow to the heart muscle can result from plaque-induced artery tightening, which can cause irreparable damage. The World Health Organization estimates that around 18 million fatalities in 2008 were attributable to

cardiovascular disease, and by 2030, that number is expected to rise to 23 million [2]. Patients' symptoms of worry and panic can be significantly reduced by educating them prior to coronary angiography. The way that a patient expresses their fear and anxiety depends on their gender. It is believed that nurses play an essential and crucial role in patient education [3]. Over 82% of individuals who had coronary artery angiography experienced anxiety prior to the procedure. Prior to angiography, patients with coronary artery disease have a much greater incidence rate of worry than people without the

condition. Ever since the initial studies on patients with irritable heart conditions, there has been an understanding of the connection between anxiety and the cardiovascular system (CVS). Palpitations and tachycardia brought on by extreme anxiety and panic [4]. Since a cardiac catheterization is both a native and an alien operation for the patient, it is perhaps one of the most diagnostic and interventional tools accessible to cardiologists today. However, most cardiac nurses have adopted many of these diagnostic and treatment methods [5]. According to Wilcoxson (2012), the majority of patients who were waiting for cardiac catheterization were concerned and worried since they did not have enough knowledge regarding the operation. In addition to hospitalization, waiting, fear of problems, ignorance of the treatment, care before and after surgery, and fear of the angiography unit, waiting for the procedure can be a major source of stress and anxiety [6, 7]. The invasive nature of the surgery and the uncertainty surrounding the diagnosis are the primary causes of these emotions. Given that the patient is conscious throughout the procedure, [8] notes that anxiety from talking about possible complications such as cardiac arrest, cardiac dysrhythmias, myocardial infarction, cerebrovascular accident, and hemorrhage, as well as awareness of the equipment and the remarks and actions of staff, can cause tension. One advantage of nurse-led interventions for patients undergoing cardiac catheterization is that they reduce fatigue and anxiety. In order to provide patients having cardiac catheterization with optimal nursing interventions, nurses are qualified to do so [9]. For a number of reasons, it is important to evaluate and treat anxiety in patients receiving CATH. Increased anxiety due to CATH may have detrimental effects on a person's physical and mental health, which could also impair the operation and accompanying cardiac function [10]. Catecholamines like epinephrine and

norepinephrine may be released as a result of CATH, which can exacerbate endothelial damage and platelet aggregation. Another significant worry during CATH is the development of thrombosis and atherosclerosis, which can result from this. Long-term results for cardiac patients undergoing CATH may potentially be impacted by anxiety. Anxiety on following occasions and an impairment in the physical role of future functioning one year later are predicted by preprocedural anxiety associated with CATH, regardless of the severity of CAD [11]. The appropriate risk-benefit ratio is utilized to determine whether cardiac catheterization is advised. Diagnostic cardiac catheterization is generally recommended when it is clinically required to ascertain the presence or degree of a suspected heart lesion that cannot be adequately evaluated using noninvasive techniques [12]. The majority of cardiac catheterization patients were nervous and concerned because they did not have enough knowledge regarding the procedure [13]. Therefore, assessing the impact of early nurse preparation on anxiety in patients undergoing cardiac catheterization was the goal of the current study.

## **Material and Methods**

### **Study Design and Setting**

One group pretest-posttest design has been used as the pre-experimental design. The study period began on February 1st, 2024, and ended on March 4th, 2024. The study has been carried out at Critical Care Unit in Al- Imam Hassan Al-Mujtaba Teaching Hospital. To get reliable and representative data, a non-probability (purposive) sample of 51 patients was diagnosed with ischemic heart disease and scheduled for cardiac catheterization.

### **Study Participants and Sampling**

The study population consisted of 51 patients diagnosed with ischemic heart disease

(ICD) and scheduled for cardiac catheterization.

### **Criteria for Inclusion in the Study**

Patients between the ages of 18 and 80; adults who are conscious; and those having operations performed for the first time.

### **Criteria for Exclusion from the Study**

Deprived of any mental illnesses and any heart disease complications that could affect the patient's mental health. And a prior cardiac catheterization.

### **Data Collection Tools and Technique**

The researcher constructs a questionnaire format in order to achieve the objectives of the study, and it consists of two parts, which include the following:

**Part One:** Age, gender, marital status, occupational level, residence, educational level, and smoking history are the seven items on the patient's demographic data form.

**Part Two:** There are twenty items on the State-Trait Anxiety Inventory (STAI) (27), after the questionnaire was presented to eight specialists who evaluated its validity. The experts rated the questionnaire highly, and their approved revisions and recommendations were taken into consideration. Prior to data collection, a pilot research was carried out on five patients to evaluate the instruments' objectivity, clarity, relevance, feasibility, and application. The pilot study's sample is not included in the main research. A pilot study was then conducted among five patients four weeks before the sample collection process to assess the questionnaire's reliability and ensure that the sample's questions were understandable. According to the results of the pilot study, answering the questions took 10-15 minutes, and the study's dependability (Crombach's alpha) was 0.77, an acceptable proportion. To get their permission to participate in the study and to explain the study questionnaire, the researchers met with the patients at the Critical Care Unit of the

Imam Hassan Al-Mujtaba Teaching Hospital. The program was implemented by evaluating the study participants who were scheduled to undergo cardiac catheterization, instructional program was applied after first assessment and then were re-evaluated half an hour before the time of the catheterization procedure. The researcher provided the study participants with important information about cardiac catheterization by reading and explaining the booklet (brochure information). The booklet contains a lot of information, including the purpose of the catheterization, how it is performed, whether it requires general, partial, or local anesthesia, as well as how the patient is prepared for cardiac catheterization, the sensation that may be experienced during the procedure, such as feeling hot during the injection of the dye, the length of time the person spends in the hospital after the cardiac catheterization, and what instructions must be followed after leaving the hospital. The data gathering process began on February 1st, 2024, and ended on March 4th, 2024, in order to meet the study's goals.

### **Ethics Consideration**

With approval number (Nursing/5656 in - 2025-02-2), the University of Al Qadisiyah's Institutional Review Board (IRB) granted ethical approval. Prior to their participation, all participants were informed about the study's objectives and procedures. A consent form confirming their voluntary and informed participation had to be signed by each participant.

### **Statistical Analysis**

Data gathering methods included conducting interviews and using the Arabic version questionnaire. The study's data was analyzed using (SPSS) version 26.

### **Results**

Table (1) shows that the age range at the time of study was between 30 and 80 years, with the highest percentage of 47.1% in the

age group (43-55) years and the lowest percentage of 7.8% in the age group (69–80) years. As for gender (52.9%), males, (41.2%) of the sample were jobless, and (27.5%) of the sample were within primary education. The table shows that the (82.4%) were urban area residents, (84.3%) of the sample were married, and (51.0%) of the study sample were smoking. Table (2) shows that the patients are exhibit sever level of anxiety with mean (2.51) before the application of the program. While the patients are exhibit moderate level of

anxiety with mean (1.69) after the application of the program. Table(3) the study sample's total responses during the pre-test and post-test periods differed in a highly statistically significant way. Table (4) Demonstrated that there were extremely significant associations and differences between anxiety and residency (p-value of.007), gender (p-value of.028), and age (p-value of.05. The anxiety levels of the patients and the other demographic information, however, do not significantly correlate.

**Table 1.** Study Sample Distribution Based on Demographic Data

| <b>Demographic Data</b>    | <b>Rating and intervals</b> | <b>Frequency</b> | <b>Percent</b> |
|----------------------------|-----------------------------|------------------|----------------|
| <b>Age / Years</b>         | 30-42                       | 8                | 15.7           |
|                            | 43-55                       | 24               | 47.1           |
|                            | 56-68                       | 15               | 29.4           |
|                            | 69-80                       | 4                | 7.8            |
|                            | Total                       | 51               | 100.0          |
| <b>Gender</b>              | Male                        | 27               | 52.9           |
|                            | Female                      | 24               | 47.1           |
|                            | Total                       | 51               | 100            |
| <b>Occupational status</b> | Employer                    | 11               | 21.6           |
|                            | Jobless                     | 21               | 41.2           |
|                            | Retired                     | 4                | 7.8            |
|                            | Housewife                   | 15               | 29.4           |
|                            | Total                       | 51               | 100.0          |
| <b>Education level</b>     | Does not read and write     | 10               | 19.6           |
|                            | Primary                     | 14               | 27.5           |
|                            | Secondary                   | 9                | 17.6           |
|                            | Bachelor's                  | 10               | 19.6           |
|                            | Postgraduate certificates   | 8                | 15.7           |
|                            | Total                       | 51               | 100.0          |
| <b>Residency</b>           | Urban                       | 42               | 82.4           |
|                            | Rural                       | 9                | 17.6           |
|                            | Total                       | 51               | 100.0          |
| <b>Marital status</b>      | Single                      | 2                | 3.9            |
|                            | Married                     | 43               | 84.3           |
|                            | Widower                     | 6                | 11.8           |
|                            | Total                       | 51               | 100.0          |
| <b>Smoking</b>             | Yes                         | 26               | 51.0           |
|                            | No                          | 25               | 49.0           |
|                            | Total                       | 51               | 100.0          |

**Table 2.** Assessment of the Study Sample's Patients' Anxiety Levels Both Before and After the Program's Implementation

| Periods of Measurement | Anxiety Levels | Frequency | Percentage | Mean | Overall Assessment |
|------------------------|----------------|-----------|------------|------|--------------------|
| <b>Pre-test</b>        | Mild           | 5         | 9.8        | 2.51 | sever              |
|                        | Moderate       | 15        | 29.4       |      |                    |
|                        | Sever          | 31        | 60.8       |      |                    |
|                        | Total          | 51        | 100.0      |      |                    |
| <b>Post-test</b>       | Mild           | 19        | 37.3       | 1.69 | moderate           |
|                        | Moderate       | 29        | 56.9       |      |                    |
|                        | Sever          | 3         | 5.9        |      |                    |
|                        | Total          | 51        | 100.0      |      |                    |

*\*mild ( 1-1.66) , moderate (1.67-2.33), sever (2.34 - 3)*

**Table 3.** Mean Difference (Paired T-test) between the Patients' Anxiety Levels Before and After the Application of The Program

| Main domain              | Measurement intervals | Mean        | N         | Standard Deviation | t-value | d.f. | p-value    |
|--------------------------|-----------------------|-------------|-----------|--------------------|---------|------|------------|
| <b>Patients' anxiety</b> | Pre_test              | <b>2.51</b> | <b>51</b> | .34329             | 13.400  | 50   | .000<br>HS |
|                          | Post_test             | <b>1.69</b> | <b>51</b> | .34570             |         |      |            |

*Moderate (1.67-2.33), severe (2.34-3), and mild (1-1.66). P-value is the probability value, df is the degree of freedom, and HS is the highly significant value (p-value  $\leq 0.05$ ).*

**Table 4.** Relation between the Post-Test Anxiety Levels of Patients and their Demographic Data

| Demographic Data       | Rating And Intervals    | Anxiety Levels |          |       | Total | Sig                                             |
|------------------------|-------------------------|----------------|----------|-------|-------|-------------------------------------------------|
|                        |                         | Mild           | Moderate | Sever |       |                                                 |
| <b>Age/years</b>       | 30-42                   | 4              | 4        | 0     | 8     | X <sup>2</sup> (12.551)<br>p-value (.05)<br>sig |
|                        | 43-55                   | 10             | 14       | 0     | 24    |                                                 |
|                        | 56-68                   | 2              | 10       | 3     | 15    |                                                 |
|                        | 69-80                   | 3              | 1        | 0     | 4     |                                                 |
|                        | Total                   | 19             | 29       | 3     | 51    |                                                 |
| <b>Gender</b>          | Male                    | 6              | 18       | 3     | 27    | X <sup>2</sup> (7.117)<br>p-value (.028)        |
|                        | Female                  | 13             | 11       | 0     | 24    |                                                 |
|                        | Total                   | 19             | 29       | 3     | 51    |                                                 |
| <b>Residency</b>       | Urban                   | 19             | 22       | 1     | 42    | X <sup>2</sup> (9.872)<br>p-value (.007)        |
|                        | Rural                   | 0              | 7        | 2     | 9     |                                                 |
|                        | Total                   | 19             | 29       | 3     | 51    |                                                 |
| <b>Education level</b> | Does not read and write | 4              | 5        | 1     | 10    | X <sup>2</sup> (3.658)<br>p-value(.887)         |
|                        | Primary                 | 6              | 7        | 1     | 14    |                                                 |
|                        | Secondary               | 3              | 6        | 0     | 9     |                                                 |
|                        | Bachelor's              | 2              | 7        | 1     | 10    |                                                 |

|                            |                          |    |    |   |    |                                            |
|----------------------------|--------------------------|----|----|---|----|--------------------------------------------|
|                            | Postgraduate certificate | 4  | 4  | 0 | 8  |                                            |
|                            | Total                    | 19 | 29 | 3 | 51 |                                            |
| <b>Occupational status</b> | Employer                 | 4  | 7  | 0 | 11 | X <sup>2</sup> (7.012 )<br>p-value( .320 ) |
|                            | Jobless                  | 5  | 13 | 3 | 21 |                                            |
|                            | Retired                  | 2  | 2  | 0 | 4  |                                            |
|                            | Housewife                | 8  | 7  | 0 | 15 |                                            |
|                            | Total                    | 19 | 29 | 3 | 51 |                                            |
| <b>Marital status</b>      | Single                   | 2  | 0  | 0 | 2  | X <sup>2</sup> (5.462)<br>p-value(.243)    |
|                            | Married                  | 16 | 25 | 2 | 43 |                                            |
|                            | Widower                  | 1  | 4  | 1 | 6  |                                            |
|                            | Total                    | 19 | 29 | 3 | 51 |                                            |
| <b>Smoking</b>             | Yes                      | 7  | 16 | 3 | 26 | X <sup>2</sup> (4.608)<br>p-value(.1)      |
|                            | No                       | 12 | 13 | 0 | 25 |                                            |
|                            | Total                    | 19 | 29 | 3 | 51 |                                            |

## Discussion

A Discussion of Demographic Characteristics of patient undergoing cardiac catheterization as Shown in Table (1).

Regarding age of patient, current study reveals that the highest percentage of participants (47,1%) between (43-55) years. This study supported by [14] in Iraq who reveals that the highest percentage were (72%) between (40-60), However this result disagree with [15], they studied The average age of outpatients in the broader study was sixty-three years, they discovered. Upon statistical analysis of the study's findings, it was discovered that there were more male participants than female participants, with the male participation rate being 52.9 and the female participation rate being 47.1. This finding was supported by [16] in Canada, who found in their study that 55% of participants were males. Concerning levels of education, the study results indicate that the fourth percentage had primary education, and they accounted for 27.5% of the sample. This result agrees with the study conducted by [17] in Egypt. In addition, regarding occupational statistics, 41.2% of the patients were jobless, and the rest were employed or retired. This result disagreed with [18] who found that in their study, 32% of the sample were employed

and the rest were retired and unemployed.

Regarding residency, the highest percentage of participants (82.4%) were in urban areas. This result agrees with [19] in Babylon, who found that in their study, a total of 100% were in urban areas. Concerning the martial statues, the majority of the sample were married (84.3%). The study was supported by [20] in Al-Nasiriya. Regarding smoking, this study indicates that half of the sample were smoking (51.0%). This result disagrees with [21] in Jordan, who found in their study that most of the patients (56%) were non-smokers. A Discussion of Anxiety levels for the Study Sample before and after the Applications of the Program as Shown in Tables (2) and (3). According to the results of the study, the degree of anxiety prior to the program's implementation was severe, with a statistical mean of 2.51 as indicated in table (3.2). This result is consistent with the study conducted by [22], which showed that shows that the (62.1%) of the patients are exhibit high level of anxiety before the application of the program. In another study done by [23] , They discovered that patients' anxiety levels before to invasive treatments were comparatively high. After implementing the instruction program, level of anxiety was moderate with a statistical mean equal to (1.69) as shown in

table (3, 2) This study agree with a study done by [24], showed that (69.7%) of the patients are exhibit non or mild level of anxiety after the application of the program. On the same line, The majority of patients waiting for angiography allegedly lack sufficient knowledge regarding this medical procedure, and [25] reported a considerable reduction in patients' anxiety following the presentation of the training videos. These results are supported by [26] . With a p-value of 0.000 for both the pre-test and post-test measurement periods, the study demonstrates that the teaching program had a favorable impact on anxiety levels. These findings are consistent with the research conducted by [27] that demonstrated that the education program had a favorable impact on the anxiety levels of patients having cardiac catheterization, with a p-value of (0.0001) in two measurement periods. Additionally, other research conducted by [28], with a p-value smaller than (0.01), shows that there are significant variations between the patients' anxiety levels before and after the program was implemented.

**A Discussion of the Association between the Post-Test Anxiety Levels of Patients and Their Demographic Data as Displayed in Table 4.** Concerning the association between patients age and anxiety levels, the study shows found significant relationship where (p-value = .05). This result agreed with a study Carried out by [29] shows that there is statistical significant association between patient's age and instruction program where (p value > 0.05). Additionally, this study contradicts a study conducted by [22]. Regarding the association between patients' gender and anxiety levels, the study shows found significant relationship where (p-value = 0.28). This result disagreed with a study Carried out by [16]. Also this result disagreed with a study Carried out by [30-33] Regarding the association between residency and anxiety levels, the study shows found significant relationship where (p-value = .007). This result disagreed with a study Carried out by [34]

Regarding the association between the level of education, and anxiety levels, the study shows no significant relationship where (p-value = .887). This result disagreed with a study Carried out by [35] About Occupational status, Marital status and Smoking the result of the study shows no significant difference with anxiety level.

## **Limitations and Recommendations**

One of the limitations faced by the researchers was the small sample size, which was expected due to the small number of patients undergoing cardiac catheterization during the study sample collection period. Therefore, the study recommends that the nursing staff in the work rooms should be directed to provide psychological support to the patient and a detailed explanation of the entire disease in the cardiac catheterization room in order to reduce anxiety before starting the practical procedures.

## **Conclusions**

The study shows that there is a positive effect of instructional Programs on Anxiety levels for patients undergoing cardiac catheterization where decreased levels of anxiety from severe to moderate, where the p-value for the pre-test and post-test measurement periods was 0.000 HS. There is significant relationship between anxiety level and demographic characteristic of gender, age, residency. However, there is no discernible correlation between anxiety levels and level of education, Occupational status, Marital status and Smoking.

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## Conflicts of Interest

There are no conflicts of interest.

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