



Research Article

**EFFECTIVENESS OF AROMATHERAPY ON ANXIETY AMONG PATIENTS UNDERGOING PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY IN SELECTED HOSPITAL, BANGALORE - EXPERIMENTAL STUDY**

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**ARTICLE INFO**

**Article History:**

Received 06<sup>th</sup> January, 2020

Received in revised form 14<sup>th</sup>

February, 2020

Accepted 23<sup>rd</sup> March, 2020

Published online 28<sup>th</sup> April, 2020

**Key words:**

Anxiety, Aromatherapy, PTCA, Cardiac diseases, Inhalation, clinical variable

**ABSTRACT**

**Introduction-** Anxiety can be functionally appropriate when it prompts an individual to quickly seek treatment for acute cardiac signs and symptoms. Presently, about 3.0 million Percutaneous Transluminal Coronary Angioplasty (PTCA) procedures are performed each year worldwide even though minimally invasive, patients experience more anxiety. Research has shown that complementary therapy has the main role in the reduction of anxiety in PTCA patients.

**Methods-** A quantitative research approach with true experimental research comprising of pre-test-post-test with control group design was adopted to assess the level of anxiety and the effect of aromatherapy on anxiety. Ninety patients were selected using a simple random sampling technique in a tertiary cardiac care hospital. The tools used for the study were baseline, clinical variables, and Beck Anxiety Inventory scale.

**Results-** Analysis of the effectiveness of aromatherapy on anxiety among PTCA patients revealed that the mean pre interventional anxiety score was 32.11, whereas the mean post interventional anxiety score was 14.78. The calculated t value (t=18.22) was significant at the 0.05 level.

**Conclusion-** The aromatherapy had a positive effect on reducing anxiety, among patients undergoing PTCA, therefore, it may be used as an independent nursing intervention.

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**INTRODUCTION**

Coronary artery diseases (CAD) such as Myocardial infarction and Angina pectoris have increased recently as the population ages and as changes in eating habits and lifestyle have led to higher incidences of diabetes, high blood pressure, and hyperlipidaemia.<sup>1</sup>The prevalence of the disease had significant implications on its workforce—it was estimated that 28% among 5 million Indians died of cardiovascular disease every year, are less than the age of 65 years and almost 25% of heart attacks seemed to occur under the age of early 40's.<sup>2</sup> PTCA and stent insertion using coronary angiography are important procedures for determining the location and severity of the blocked artery, and they can play an important role in determining subsequent treatment methods.<sup>3</sup>The National Interventional Council (NIC) reported in India, during 2015, NIC performed 3.75 lakh angioplasties.<sup>4</sup>These procedures generally lead to hospitalization in an intensive care unit (ICU).

Most of these patients experience the physical effects of a heart examination as well as an unfamiliar environment, isolation from family, and stress from encountering strangers. Consequently, most patients experience a relatively severe level of psychological anxiety because of the loss of individuality due to the treatment-centric environment and a sense of crisis due to the constantly changing environment.<sup>5</sup>

Anxiety is a factor that negatively influences the recovery after cardiac events.

The prevalence of anxiety is high at approximately 70% to 80% among patients who have experienced an acute cardiac event.<sup>6</sup> Nursing interventions based on education before coronary angiography or PTCA have shown to be effective before the procedure has been implemented in the clinical setting.<sup>1</sup> Aromatherapy, which has a wide range of applications and is easy to deploy, has recently garnered much attention. The inhalation aromatherapy has positive effects on reducing anxiety in patients before the invasive procedure, also which is recommended as a new and easy alternative for nurses to reduce anxiety in the patients.<sup>7</sup>

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A study conducted among fourteen female patients with chronic renal failure were significantly decreased the mean scores of the Hamilton Rating Scale for Anxiety (HAMA) with lavender aroma.<sup>8</sup> Lavender aromatherapy was shown to reduce anxiety in patients in the coronary intensive care unit (ICU),<sup>9</sup> dental office,<sup>10</sup> after myocardial infarction<sup>11</sup> and PTCA.<sup>12</sup> A quasi-experimental study evaluated the effectiveness of aromatherapy rubbed on a handkerchief and inhaled by the patient for 20 minutes in preoperative anxiety. The mean level of anxiety in pre-intervention in the case group was 51.00 that decreased to 38.61 after intervention which showed significant reduction of anxiety.<sup>7</sup> Since very few studies were done on aromatherapy on anxious PTCA patients, the researcher was interested to assess the level of anxiety among patients undergoing PTCA, to assess the effectiveness of aromatherapy on anxiety among patients undergoing PTCA and to determine the association between the pre interventional level of anxiety with selected baseline variables.

## **MATERIALS AND METHODS**

A quantitative research approach with true experimental research comprising of pre-test-post-test with control group design was adopted for this study. The setting for this study was the tertiary cardiac care hospital, Bangalore which performs approximately 4 to 6 cases of PTCA per day. In this study, 90 patients with moderate or severe anxiety were selected using Becks Anxiety Inventory in a pre-test. Then the sample was categorized to Experimental -45 and Control-45 using simple random sampling (lottery method). The researcher has adopted the WEIDENBACH'S helping art at clinical nursing theory (1964) as a base of developing the conceptual framework. This is a prescriptive theory in nursing that had a central purpose which direct action towards an expected goal.<sup>12</sup> The tools used for the study were baseline (Age, Gender, Marital status, Education, Occupation, Habits, Place of living, Previous history of hospitalization and Previous history of surgery/Invasive procedure), clinical (Systolic blood pressure, Pulse /minute, Respiratory rate/minute) variables and Beck anxiety Inventory scale(21 components with a 4 point scale) The Beck Anxiety Inventory Scale is psychometrically sound. Internal consistency (Cronbach's alpha) ranges from 0.92 to 0.94. The CVI for baseline and clinical variables was 0.83. Ethical clearance from the Institutional Ethics Committee and written informed consent from the participants of the study were obtained. Then the data were collected with the intervention protocol (Table1).

## **RESULTS**

Data were analyzed using SPSS. The results were computed using descriptive and inferential statistics.

### ***Findings related to the frequency and percentage distribution of baseline and clinical variables***

The **table -2** depicted that the majority of the subjects were between the age group of 50-59 years in both groups. Most of them were male and married in both groups. Based on the distribution of education around 24% of subjects had a high school education in both groups. The majority of them i.e. 69% and 47% were moderate workers in both experimental and control group respectively. Almost half of the subjects in both groups had no bad habits. And most of them 60% and 67% of patients were from rural areas in the experimental and

control group respectively. Almost 62% in experimental and 58% in control had a previous history of hospitalization. Similarly, 56% in experimental and 60% in control had no history previous of surgery/invasive procedure.

**Figure 1-3** depicted the frequency and percentage distribution of clinical variables, 53% in the experimental and 60% in the control were had the systolic blood pressure of 121-140 mm of Hg. Almost half of the patients recorded the pulse rate between 71-80 beats/mt. Regarding the respiratory rate, 40% of patients were recorded between 19-20beats/mt in the experimental and 17-18beats/mt in the control group.

### ***Findings related to Assessment of the level of anxiety among the experimental and control group***

**Table-3** showed that during pre-intervention, in the experimental group 76% of subjects reported moderate anxiety, 24% of patients reported severe anxiety. Whereas in the post-intervention the anxiety came down i.e. 73% of patients reported low anxiety and remaining reported moderate anxiety. In the control group during pre-intervention, 81% reported moderate anxiety, and 19% reported severe anxiety. Whereas in the post-intervention, 93% reported moderate anxiety and 7% had severe anxiety.

**Table- 4** showed the mean (S.D) of anxiety scores. In the experimental group, the pre-interventional anxiety was 32.11(3.63) and the post-interventional score was 14.78(6.62). In the control group, the pre-interventional anxiety was 32.11(3.52) and the post-interventional score was 29.42 (3.77).

### ***Findings related to the Effectiveness of aromatherapy in anxiety among PTCA patients in the experimental group***

The **table- 5**, showed that the mean value of pre and post-intervention scores of the experimental group was 32.11 and 14.78 respectively with a t-value of 18.22. It was found to be significant at 0.05 level, thus the hypothesis H<sub>1</sub> was accepted and the null hypothesis was rejected

### ***Findings related to the Effectiveness of aromatherapy in anxiety among PTCA patients in experimental and control***

**Table: 6** showed that the mean (S.D) post-interventional score was 14.78(6.62) among the experimental group and the 29.42 (3.78) among the control group with the mean difference of 14.64. The 't'-value 12.887 was found to be significant at the 0.05 level between the experimental and control group. Hence the hypothesis H<sub>2</sub> was accepted at 0.05 level of significance and the null hypothesis rejected.

### ***Findings related to the Association between pre interventional anxiety score and selected baseline variables.***

Chi-square showed There is no statistically significant association was found between pre interventional anxiety and selected baseline variables such as age ( $\chi^2=4.194$ ,  $df=3$ ,  $p>0.05$ ), gender( $\chi^2=0.575$ ,  $df=1$ ,  $p>0.05$ ), marital status ( $\chi^2=2.960$ ,  $df=3$ ,  $p>0.05$ ), education ( $\chi^2=1.256$ ,  $df=5$ ,  $p>0.05$ ), monthly income in rupees ( $\chi^2=9.829$ ,  $df=5$ ,  $p>0.05$ ), occupation ( $\chi^2=3.233$ ,  $df=2$ ,  $p>0.05$ ) habits ( $\chi^2=0.387$ ,  $df=4$ ,  $p>0.05$ ), place of living ( $\chi^2=0.113$ ,  $df=1$ ,  $p>0.05$ ), previous history of hospitalization ( $\chi^2=0.008$ ,  $df=1$ ,  $p>0.05$ ), previous history of surgery/invasive procedure ( $\chi^2=0.278$ ,  $df=1$ ,  $p>0.05$ ). Hence H<sub>3</sub> is rejected at 0.05 level of significance and null hypothesis accepted.

**DISCUSSION**

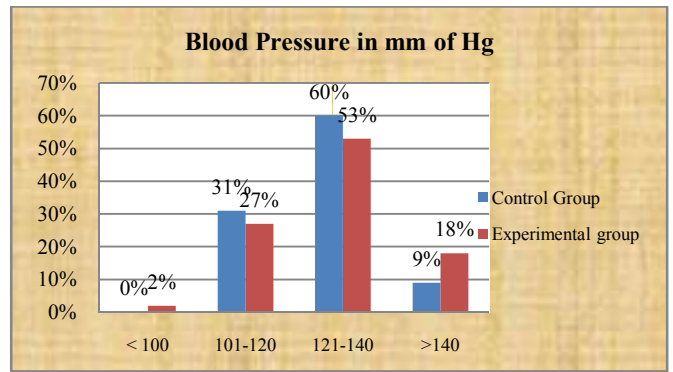
Anxiety and stress significantly affect the treatment of the CAD, which can lead to an increase in the area of infarction and even to arrhythmia.<sup>13</sup> Therefore, independent nursing interventions to decrease anxiety and stress in ICU patients with coronary artery diseases are necessary.

**Table 1** Intervention Protocol

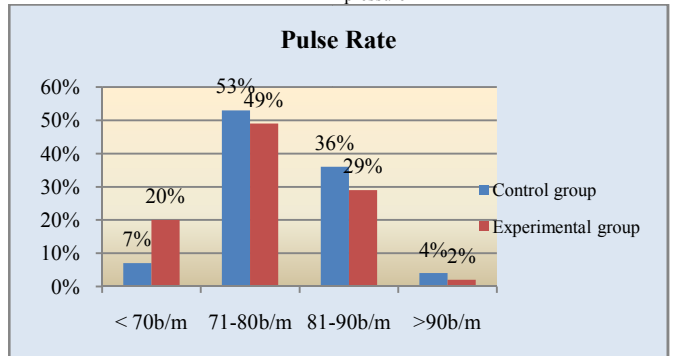
Pre test	Intervention		Post test
	Control	Experimental	
Anxiety assessment using Beck Anxiety Inventory	Video assisted teaching on Care of patients with PTCA Placebo intervention- Two drops of distilled water on handkerchief for 20 minutes 21/2 prior to PTCA procedure	Video assisted teaching on Care of patients with PTCA Aromatherapy- Two drops of lavender oil on handkerchief for 20 minutes 21/2 prior to PTCA procedure	Anxiety assessment using Beck Anxiety Inventory 30 minutes before the PTCA procedure

**Table 2** Frequency and percentage distribution of patients undergoing PTCA according to the baseline variables n1=45,n2=45

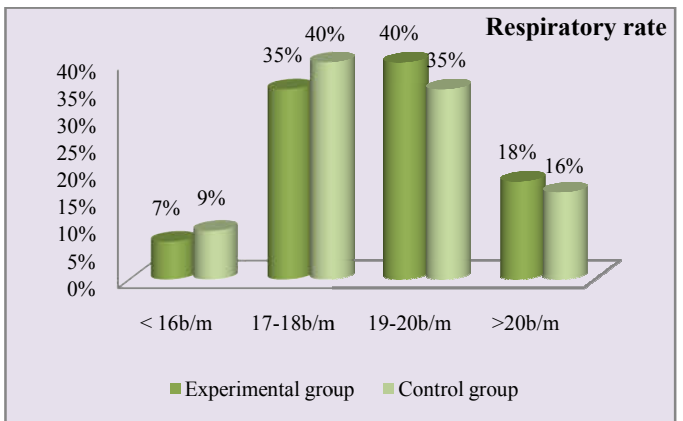
Baseline Variables	Frequency	Percentage (%)	Frequency	Percentage (%)
Age in years				
a) <39	4	9	3	7
b) 40-49	14	31	12	27
c) 50-59	14	31	20	44
d) >60	13	29	10	22
Gender				
a) Male	31	69	36	80
b) Female	14	31	9	20
Marital status				
a) Married	40	89	43	96
b) Single	1	2	1	2
c) Divorced	1	2	0	0
d) Widowed	3	7	1	2
Education				
a) Illiterate	4	9	7	16
b) Primary education	7	16	6	13
c) Middle school	7	16	10	22
d) High school	11	24	11	24
e) Higher secondary	9	20	9	20
f) Degree education and above	7	15	2	4
Occupation				
a) Sedentary worker	10	22	15	33
b) Moderate worker	31	69	21	47
c) Heavy worker	4	9	9	20
Habits				
a) Smoking	10	22	12	27
b) Alcoholism	6	13	8	18
c) Chewing tobacco or betel leaves	4	9	2	4
d) Smoking and alcoholism	3	7	3	7
e) No bad habits	22	49	20	44
Previous history of Hospitalization				
a) Yes	17	38	19	42
b) No	28	62	26	58
Previous history of surgery/invasive procedure				
a) Yes	20	44	18	40
b) No	25	56	27	60



**Fig 1** Percentage Distribution of PTCA patients according to the systolic blood pressure



**Fig 2** Percentage Distribution of PTCA patients according to the Pulse rate



**Fig 2** Percentage Distribution of PTCA patients according to the Respiratory rate

**Table 3** Frequency and percentage distribution of patients undergoing PTCA according to their level of anxiety in experimental group and control group n1=45,n2=45

Level of Anxiety	Experimental group		Control group	
	Pre test	Post test	Pre test	Post test
Very low (0-21)	f -	% -	f 33	% 73%
Moderate (22-35)	f 34	% 76%	f 12	% 27%
Severe >36	f 11	% 24%	f -	% -

**Table 4** Mean and Standard deviation of pre and post interventional anxiety scores among both experimental and control group

Group	Pre-intervention		Post intervention	
	Mean	Standard deviation	Mean	Standard deviation
Experimental	32.11	3.63	14.78	6.62
Control	32.11	3.52	29.42	3.77

**Table 5** Effectiveness of aromatherapy in anxiety among PTCA patients in experimental group n1=45

	Mean	Standard deviation	Mean difference	't' value
Pre-intervention	32.11	3.63		
Post-intervention	14.78	6.62	17.33	18.22*

\* P < 0.05 level of significance

**Table 6** Effectiveness of aromatherapy in anxiety among PTCA patients in experimental and control group n1=45 n2=45

Group	Mean	Standard deviation	Mean difference	't' value
Experimental group	14.78	6.62	14.64	12.887*
Control group	29.42	3.78		

\*p < 0.05 level of significance

The present study included only patients who had moderate to severe anxiety. In this regard, studies conducted in Iran also indicated that 74% of patients experienced anxiety before angiography.<sup>14</sup> An Indian study done among 35 patients undergoing PTCA showed that almost 26 (46.4%) patients had definite anxiety before PTCA assessed using Hospital Anxiety and Depression Scale. The findings emphasized the importance of screening patients selected for cardiac intervention for anxiety because this not only improves the quality of life but also may reduce morbidity and mortality after the intervention.<sup>15</sup> Similarly, a descriptive study among 100 convenient sample anxiety was measured using the Spielberger State Anxiety Inventory. The mean (S.D) of anxiety scores was 35.72(11.75). Symptoms of anxiety were common, particularly before PCI.<sup>16</sup>

Aromatherapy is noninvasive and can be applied continuously to patients who do not have an aversion to the odors. The present study anxiety level was significantly lower than that of the control group. It was supported by a Korean study.<sup>1</sup> A nonequivalent control group non synchronized quasi-experiment designed with 56 patients (Experimental -28, Control-28) undergoing PTCA procedure. The anxiety levels were 0.36 (SD, 0.73) in the aromatherapy group and 3.11 (SD, 2.31) in the control group ( $t = 5.99, P < .001$ ) after the aroma treatment. The changes in anxiety level were 5.10 (SD, 2.06) in the aromatherapy group and 2.07 (SD, 2.55) in the control group. There was a significant reduction in the aromatherapy group compared with the control group ( $t = -4.90, P < .001$ ). Similarly, lavender aromatherapy lowered the anxiety in cluster randomized controlled trial among 340 patients in the UK.<sup>17</sup>

In the present study, there is no statistically significant association was found between pre interventional anxiety and selected baseline. In contrast to the present study, a prospective cohort study among 2604 patients showed that female patients reported a significantly higher pre-procedure anxiety (50.4±26.5) compared to males (41.5±26.8, p=0.02). Other factors associated with higher levels of anxiety at different time points were age < 65 years and low level of education.<sup>18</sup>

Overall, the results of this study indicated that patients undergoing PTCA experience a high percentage of anxiety. Aromatherapy can be used as a complementary therapy to

reduce anxiety. Considering the advantages of this method as an easy, inexpensive, safe and noninvasive approach, application of this non-pharmacological method is recommended to reduce patients' anxiety before conducting diagnostic and invasive procedures

#### Acknowledgement

The authors thank all the patients, their caregivers, the hospital authorities and the Biostatistics department who helped to complete this study successfully.

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**How to cite this article:**

Anu Glory Abraham and Puvaneswari.K (2020) 'Effectiveness of Aromatherapy on Anxiety Among Patients Undergoing Percutaneous Transluminal Coronary Angioplasty in Selected Hospital, Bangalore - Experimental Study', *International Journal of Current Advanced Research*, 09(04), pp. 21850-21854. DOI: <http://dx.doi.org/10.24327/ijcar.2020.21854.4302>

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