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COMPARISON OF ANXIETY LEVEL, BLOOD PRESSURE AND PULSE PARAMETERS OF PATIENTS WITH AND WITHOUT CORONARY ANGIOGRAPHY EXPERIENCE: A CROSS-SECTIONAL STUDY

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Contribution
YA conceived the idea and designed the study. Data collection and manuscript writing was done by YA and EDDI. All the authors contributed equally to the submitted manuscript.

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ABSTRACT

Objective: The study aimed to compare state and trait anxiety, blood pressure, and heart rate of patients with and without coronary angiography experience who undergo coronary angiography intervention.

Methodology: This study is cross-sectional comparative research. A total of 160 patients, including 80 patients undergo for the first time coronary angiography and 80 patients with at least one experience of coronary angiography were included in the sample of the study. In the study, data were collected using 'Patient Information Form' and 'State-Trait Anxiety Inventory', blood pressure measurement device, and pulse oximeter.

Results: The mean of state anxiety scores of the patients with and without CA experience were 39.35±5.31 and 39.98±4.04, respectively; (p=0.395). The mean of trait anxiety scores of the patients with and without CA experience were 44.73±6.84 and 44.51±6.05, respectively (p=0.826). There was no statistically significant difference observed in state and trait anxiety between two groups. Before the CA procedure, the systolic and diastolic blood pressure average of the patients with CA experience were statistically higher than those without CA experience (p<0.05).

Conclusion: The anxiety levels of the patients before the CA were observed to be similar and moderate, regardless of their CA experience. It was observed that patients with CA experience before CA procedure had higher systolic and diastolic blood pressures compared to the group without experience.

Keywords: Coronary angiography, patient, anxiety level, blood pressure, pulse

INTRODUCTION

Coronary artery disease (CAD) is a condition in which the heart cannot get adequate blood and unable to function as a result of stenosis or blockage of the coronary arteries that supply the heart.[1] The diagnosis of CAD is based on various tests, such as electrocardiography, echocardiography, values of cardiac enzymes in the blood, cardiac stress test, myocardial perfusion scintigraphy, computed tomography, cardiac magnetic resonance imaging, and coronary angiography (CA).[2] Among these diagnostic methods, the most accurate method of diagnosis is the CA process, which allows invasive imaging of the coronary arteries.[3] CA is the process of imaging by administering the contrast material to the femoral and radial artery to display the anatomy of the coronary arteries, determine the presence of occlusive lesions in the coronary arteries, their localization, and the degree of occlusion in the arteries, and to make evaluations for the prognosis, and treatment options. Today, CA has become an important and frequently used invasive intervention for CAD diagnosis, understanding its pathogenesis, and following the natural course of the disease.[4]

Patients are undergoing the CA process, may experience fear of death and anxiety due to reasons such as unfamiliar hospital environment, difficulty in communicating with strangers, the use of medical terminology by the health care professionals, use of unknown instruments (vital sign measuring devices, pulse oximeter, etc.), unfamiliar procedures and environment, the lack of knowledge and past CA experiences, and the applied diagnosis and treatment procedures, and the possibility of bypass surgery recommendation after the procedure.[5,6] Patients also experience anxiety due to unknowns (how the procedure will be performed, how long the surgical procedure will take, how the procedure will go, how the patient will feel during and after the procedure, etc.) before surgical procedures, the preparation process for the procedure, and the fear of complications that may develop during the procedure, inability to recover after the procedure, and fear of being dependent on someone else in care and treatment.[7,8] This anxiety reduces the patient's compliance with treatment and causes some problems to arise during and after the procedure.[9] The patient's anxiety level and ability to cope with anxiety; may affect the physiological responses of stress such as respiratory rate, heart rate, blood pressure, oxygen consumption of the myocardium, and plasma epinephrine and norepinephrine concentration, leading to complications such as arrhythmia, embolism, neurological, vascular changes and ischemia.[6]

Experiencing uncertainty against a situation and having concerns about the things that may happen is the main cause of anxiety.[10] During the CA process, some patients verbally expressed their anxiety, while others showed symptoms of anxiety such as excessive speech, decreased concentration, restless appearance, rapid breathing, and heart palpitations.[11] Providing information about the procedure to patients before the surgical procedure makes them feel spiritually well and reduces their anxiety.[12-14] It is suggested that patients who are prepared by giving combinations of procedural, sensory, and behavioral information to invasive interventions decrease anxiety levels and have positive effects on recovery.[6] Yilmaz et al. (2006) reported that the patients who underwent CA had insufficient knowledge about the CA procedure and the treatment methods.[15] Those who were knowledgeable about the process, procedure, and purpose of the CA were found to have lower anxiety.[14] Yilmaz et al. (2012) state that the patients who undergoing CA for the first time also had higher anxiety than the patients who had CA before. Although it is the responsibility of the specialist physician to provide most of this information, the role of nursing is emphasized to prepare patients for interventions.[6] Therefore in this study, it was aimed to compare the effect of information and preparation attempts made by nurses to prepare patients for the CA procedure on anxiety level, blood pressure, and pulse parameters before and after the procedure in patients with and without angiography experience. Thus, it was thought that the results obtained from this study could guide the information given by the nurses in the CA unit according to patient preferences and thus contribute to the decrease in the pre-procedure anxiety level of the patients and increase the quality of patient education and care.

METHODOLOGY

This study was a cross-sectional study conducted between February 1st to July 1st, 2019.on patients who underwent CA and were admitted to the cardiology service of a Training and Research

Hospital for examination and treatment. The studied clinic has 60 beds and consists of two main sections (Section One: Patients coming from home for the CA procedure, Section Two: Hospitalized inpatient). The CA procedure is performed in a separate corridor on the side of the operating room on the same floor. Patients are discharged 8 hours after the CA procedure or patients who underwent to be hospitalized after the procedure are followed-up in the second section of the cardiology clinic.

The study population consisted of patients who were hospitalized for underwent CA, who agreed to participate in the research, who were over 18 years of age, who did not have any psychiatric conditions, who were able to communicate, and who were not health professionals. During the data collection process, all patients who applied to the hospital for CA and met the inclusion criteria agreed to participate in the study were included in the sample. The study was completed with a total of 160 patients who met the research criteria, including 80 patients in the first group who underwent CA for the first time and 80 patients with at least one CA experience. Power analysis was used to determine the sample of the study. The sample of the study was found 80 patients each group according to 0.5 effect size, 0.05 error level, allocation ratio 1 and %88 power, totally 220 patients were screened and 160 eligible patients were included in the sample.

The study data were collected using the 'Patient Information Form', developed by the researchers to determine the sociodemographic characteristics, the 'State-Trait Anxiety Inventory', blood pressure measurement device, and pulse oximeter.

The Patient Information Form, which was developed by the researchers by reviewing the literature contains 12 items about age, gender, marital status, educational status, diagnosis, prior hospitalization status, number of previous angiography procedures, prior surgical procedure status, the status of receiving training on angiography, blood pressure, pulse parameters and post-angiography treatment decision.[5,6,9,11,14]

State-Trait Anxiety Inventory (STAI) scale was developed by Spielberger, Gorsuch, and Lushene in 1970, and adapted to Turkish by Öner and Le Compte in 1977, and its validity and reliability study was conducted in 1983.[16,17] The State Anxiety Inventory (SAI) determines how individuals feel themselves at a particular time and in certain circumstances, using one of the options of 1) not at all, 2) somewhat, 3) moderately so, and 4) very much so. The trait anxiety scale (TAI) is scored by marking one of the options, according to how the individuals feel themselves, by 1) almost never, 2) sometimes, 3) often, and 4) almost always.

STAI consists of a total of 40 items, with 20 items in each sub-scale. There are two types of items on the scales, direct items expressing negative emotions, and reversed items expressing positive emotions. The State Anxiety Inventory has 10 reverse-coded items. These are 1st, 2nd, 5th, 8th, 10th, 11th, 15th, 16th, 19th, and 20th items. The Trait Anxiety Inventory, however, has 7 reverse-coded items. These are the 21st, 26th, 27th, 30th, 33rd, 36th, and 39th items. In scoring, the total of the reverse-coded items is subtracted from the total score of the direct items. A pre-determined and unchanged value is added to this number, which is 50 for SAI and 35 for TAI. The final score gives the individual's anxiety score. The scores obtained from both scales range from 20 to 80, theoretically. A high score indicates a high level of anxiety, and a low score indicates a low level of anxiety.[17] In a meta-analyses study, Cronbach alpha value of the State and Trait Anxiety Inventory were 0.87 and 0.93, respectively.[18] In the current study, the Cronbach alpha value of the State and Trait Anxiety Inventory were 0.90 and 0.85, respectively.

In the study, the data were collected in the patient room using the face-to-face interview method by the researchers on the morning of the day of the procedure every weekday between the dates of the study. The researcher gave detailed information about herself and the study and consent was obtained from the patients to participate in the current study after applying the data collection forms and measuring vital signs. Data collection forms were applied by the researcher, without giving procedure-specific information. Before the procedure, the patient was informed about the CA procedure by the researcher at the appropriate time in the patient's room. The patient was stretchered from the cardiology clinic to the CA unit and was admitted to the clinic after the CA procedure. The patients' systolic and diastolic blood pressures and pulse parameters were measured before, immediately after, and 1 hour after the procedure, and the data collection process was completed.

The blood pressure and pulse parameters of the patients included in the study were measured approximately 30 minutes before the angiography, immediately after the procedure was completed, and 1 hour after the patient was admitted to the cardiology service. The blood pressure and pulse parameters of the patients were measured by the same nurse in the cardiology service. In the clinic, the patient's blood pressure was measured by the same brand manual blood pressure measurement device and their pulse was measured with the same brand pulse oximeter. The calibrations of the pulse oximeter and blood pressure measurement device

used in the research are performed regularly with 6 months periods.
Data analysis was performed in SPSS 21.0 statistics package program (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY, IBM Corp.). In the statistical analysis of the data, descriptive statistics, and the Independent Samples T-test, Chi-Square test, One Way ANOVA, and Tukey HSD were used.

Before the research, the ethics committee approval from the Clinical Research Ethics Committee of the Faculty of Medicine of the University (Decision No. 2018/6-14), the research permission from the Chief Physician of the Training and Research Hospital, and verbal and written consent from the patients participating in the research were obtained.

RESULTS

It was found that 60% of the patients without CA experience were female, 92.5% were married, 43.7% had 1-2 times of hospitalization experience, 57.5% had surgery experience, and 43.7% had Primary education. It was found that 66.3% of the patients with CA experience were male, 96.3% were married, 51.3% were primary school graduates, 46.2% had hospital admission experience for 1-2 times, and 61.3% had surgery experience. While 50% of patients with CA experience underwent Stents, and 42.5% underwent medical treatment, 85% of the patients with no experience underwent medical treatment. Of the patients with no CA experience before the procedure, 75% had not received information about the procedure, while 78.7% of the patients with the experience stated that they had information about the procedure (Table 1).

Table 1: Distribution of socio-demographic characteristics of patients according to CA experience

	Patients without CA experience (n=80)	Patients with CA experience (n=80)
Gender		
Female	48 (60.0)	27 (33.7)
Male	32 (40.0)	53 (66.3)
Marrital status		
Single	6 (7.5)	3 (3.7)
Married	74 (92.5)	77 (96.3)
Education status		
Illiterate	30 (37.5)	22 (27.4)
Primary education	35 (43.7)	41 (51.3)
High school and above	15 (18.8)	17 (21.3)
Diagnosis		
Chest Pain	34 (42.5)	23 (28.8)
Acute Coronary Syndrome	42 (52.5)	55 (68.6)
Palpitation	2 (2.5)	1 (1.3)
Hypertension	2 (2.5)	1 (1.3)
Treatment decision after CA		
Balloon	0	6 (7.5)
Stents	12 (15.0)	40 (50.0)
Medical Treatment	68 (85.0)	34 (42.5)
Number of hospitalizations		
0 (zero)	21 (26.3)	-
1-2 times	35 (43.7)	37 (46.2)
3-4 times	12 (15.0)	23 (28.8)
5 times and above	12 (15.0)	20 (25.0)
Number of CA		
1 times	-	38 (47.5)
2 times	-	26 (32.5)
3 times	-	10 (12.5)
4 times	-	6 (7.5)
Surgical experience before		
Yes	46 (57.5)	49 (61.3)
No	34 (42.5)	31 (38.7)
Getting information about CA		
Yes	20 (25.0)	63 (78.7)
No	60 (75.0)	17 (21.3)

A statistically significant difference was found between the gender distribution of patients with and without CA experience ($p<0.001$). It was found that there were more female patients in the group without CA experience and more male patients in the group with CA experience. A statistically significant difference was found between the distribution of patients with and without CA experience, according to their status of receiving information about the procedure ($p=0.000$). Patients in the group with CA experience were more likely to receive information about the procedure. The mean age of the patients

with CA experience was 60.68±9.94, and it was statistically significantly higher than the mean age (52.13±14.79) of the patients without CA experience (p=0.000). The mean number of hospitalizations of patients with CA experience was 1.78±0.82, and it was found to be statistically significantly higher than the mean number of hospitalizations of patients with no experience (1.18±0.98) (p=0.000). The mean of state anxiety scores of the patients with and without CA experience were 39.35±5.31 and 39.98±4.04, respectively; and there was no statistically significant difference between the two means (p=0.395). The mean of trait anxiety scores of the patients with and without CA experience were 44.73±6.84 and 44.51±6.05, respectively; and there was no statistically significant difference between the two means (p=0.826) (Table 2).

Table 2: Comparison of patients with and without coronary CA experience according gender, getting information about CA and age, number of hospitalizations, mean of state and trait anxiety scores.

	Patients without CA experience (n=80)	Patients with CA experience (n=80)	p
Gender			
Female	48 (60.0)	27 (33.8)	<0.001
Male	32 (40.0)	53 (66.3)	
Getting information about CA			
Yes	20 (25.0)	63 (78.8)	<0.001
No	60 (75.0)	17 (21.3)	
Age (Mean±SD)	52.13±14.79	60.68±9.94	<0.001
Number of hospitalizations (Mean±SD)	1.18±0.98	1.78±0.82	<0.001
State Anxiety (Mean±SD)	39.98±4.04	39.35±5.31	0.395
Trait Anxiety (Mean±SD)	44.51±6.05	44.73±6.84	0.826

A statistically significant difference was found between the mean of trait anxiety scores of male and female patients with CA experience (p=0.040). The mean of trait anxiety scores of female patients was higher than the male patients. No statistically significant difference was found between the means of state anxiety score by gender. A statistically significant difference was found between the mean of trait anxiety scores of patients with CA experience, in terms of their educational levels (p=0.027). According to Tukey HSD, there was only a statistically significant difference between the mean of trait anxiety scores of the patients who had primary school education and high school and above education (p=0.022). There was a statistically significant difference between the mean of state anxiety score of the patients with two or more CA experiences and the mean of state anxiety score of the patients with one CA experience (p=0.001). A statistically significant difference was found between the mean of trait anxiety score of the patients with two or more CA experiences and the mean of trait anxiety score of the patients with one CA experience (p=0.03). Patients with two or more CA experiences were found to have higher state and trait anxiety levels (Table 3).

The mean trait anxiety scores of female patients without CA experience was statistically significantly higher than the mean of the male patients (p=0.014). No statistically significant difference was found between the mean of state and trait anxiety scores of patients with no CA experience, according to their age, marital status, education level, information about the CA procedure and having a surgical experience (p>0.05) (Table 3).

The pulse averages of patients with and without pre-CA procedure was 76.76±11.38 and 77.50±9.50, respectively; and there was no statistically significant difference between the two averages (p>0.05). The pre-CA systolic/diastolic blood pressure averages of the patients with and without CA experience were 128.65±17.53/79.51±12.56 mm Hg and 120.12±19.96/71.62±10.36 mm Hg, respectively, and pre-CA procedure systolic/diastolic blood pressure averages of the patients with CA experience was statistically significantly higher than the group without CA experience (p<0.05). The post-CA systolic/diastolic blood pressure averages of the patients with and without CA experience were 124.20±17.56/72.76±9.51 mm Hg and 126.25±24.77/75.25±13.21 mm Hg, respectively, and there was no statistically significant difference between the post CA systolic/diastolic blood pressure averages of the patients with and without CA experience (p>0.05). It was determined that the mean of post-procedure pulse parameters of the patients without CA experience was higher (p=0.010). There was no statistically significant difference between systolic and diastolic blood pressure averages and pulse averages of the patients with and without CA experience, an hour after the CA procedure (p>0.05) (Table 4).

Table 3. Comparison of state and trait anxiety scores according to some features of patients with and without CA experience

		State Anxiety	p value	Trait Anxiety	p value
Patients with CA experience	**Age** 18-49 age 50-64 age 65 and over age	 40.14±5.52 39.80±6.22 38.37±3.20	 p=0.500	 43.71±6.26 45.78±7.41 43.22±5.79	 p=0.283
	Gender Female Male	 38.14±4.19 39.96±5.74	 p=0.150	 46.85±6.10 43.66±7.00	 **p=0.040**
	Marital status Single Married	 36.66±2.08 39.45±5.38	 p=0.376	 41.33±6.65 44.87±6.86	 p=0.383
	Education status Illiterate Primary education High school and above	 37.45±3.18 40.19±4.65 39.76±8.07	 p=0.140	 44.18±3.93 46.46±6.62 41.29±8.99	 **p=0.027**
	Getting information about the process Yes No	 39.31±5.56 39.47±4.43	 p=0.917	 44.25±6.62 46.52±7.54	 p=0.226
	Surgical experience before Yes No	 39.81±6.30 38.61±3.14	 p=0.327	 45.34±7.50 43.77±5.62	 p=0.320
	Number of CA 1 times 2 times and over	 37.28±2.81 41.21±6.31	 **p=0.001**	 42.39±5.32 46.85±7.44	 **p=0.03**
Patients without CA experience	**Age** 18-49 age 50-64 age 65 and over age	 39.46±6.34 40.53±3.85 39.98±4.04	 p=0.591	 44.28±6.34 44.30±6.27 45.27±5.37	 p=0.710
	Gender Female Male	 39.47±3.90 40.75±4.18	 p=0.170	 45.85±6.01 42.50±5.62	 **p=0.014**
	Marital status Single Married	 36.83±3.86 40.24±3.97	 p=0.085	 44.50±5.31 44.51±6.14	 t=-0.005 p=0.996
	Education status Illiterate Primary education High school and above	 39.76±3.83 40.34±4.68 39.60±2.82	 p=0.888	 44.90±0.95 44.40±7.17 44.00±4.88	 p=0.784
	Getting information about the process Yes No	 39.45±4.18 40.16±4.01	 p=0.496	 43.90±6.55 44.71±5.92	 p=0.604
	Surgical experience before Yes No	 40.13±3.56 39.79±4.66	 p=0.716	 44.19±5.38 44.94±6.61	 p=0.589

Table 4. Mean of systolic and diastolic blood pressure and pulse parameters before, after and 1 hour after CA in patients with and without CA experience

		Systolic Blood Pressure (mm Hg)	Diastolic Blood Pressure (mm Hg)	Pulse
Before CA	Patients without CA experience (n=80)	120.12±19.96	71.62±10.36	77.50±9.50
	Patients with CA experience (n=80)	128.65±17.53	79.51±12.56	76.76±11.38
	p value	**p=0.005**	**p=0.000**	p=0.657
After CA	Patients without CA experience (n=80)	126.25±24.77	75.25±13.21	76.81±12.14
	Patients with CA experience (n=80)	124.20±17.56	72.76±9.51	72.10±10.71
	p value	p=0.547	p=0.174	**p=0.010**
1 hour after CA	Patients without CA experience (n=80)	124.25±21.62	73.25±11.55	74.41±10.99
	Patients with CA experience (n=80)	121.55±18.52	72.66±10.05	71.53±9.35
	p value	p=0.398	p=0.732	p=0.077

DISCUSSION

Diagnostic or interventional invasive procedures, such as CA, cause many patients to experience stress and anxiety.[6] Higher anxiety in invasive procedures, such as CA, causes physiological complications to develop, negatively affecting the healing process.[19] In this study, which was conducted to compare anxiety level, blood pressure, and pulse parameters of the patients with and without CA experience that underwent for CA procedure, the state anxiety score means of the patients with and without CA experience were found to be 39.35±5.31 and 39.98±4.04, respectively, and means of their trait anxiety score were 44.73±6.84 and 44.51±6.05, respectively; and, patients of both groups were found to experience a moderate level of anxiety. In the study conducted by Yel, the mean of state and trait anxiety scores of the patients were reported as 42.5±6.3 and 46.3±6.0, respectively.[20] Moradi and Hajbaghery (2015) found that the state anxiety scores of their patients were 34.36±5.56 a day before the CA procedure, and 41.44 ±8.45 thirty minutes before the CA procedure.[21] There were studies[6,21] in the literature that report the anxiety level of patients before the CA procedure as moderate, as well as studies[5,11] that report a high level of anxiety. In this context, it can be stated that every patient who underwent for CA experiences moderate or high levels of anxiety and that their anxieties were at their highest level before undergoing the CA procedure.

In this study, there was no statistically significant difference between the mean state-trait anxiety scores of the patients with and without CA experience (p>0.05). However, the mean of state and trait anxiety scores of patients with two or more CA experience were statistically significantly higher than those with only one CA experience (p<0.05). Yilmaz et al. (2012) reported that state anxiety levels of patients without CA experience were higher than those with CA experience.[6] In their study conducted to determine the effect of information given before the CA procedure on patients' anxiety level, Polat and Köşgeroğlu (2018) found that there was no statistically significant difference between state anxiety levels of patients, according to CA experience, in both informed and non-informed patient groups.[22] In their study, Türker and Bedük (2015) reported that there was no difference between the patients' state anxiety levels, according to CA experience.[23] In the same study, similar to the findings in this study, the anxiety levels of patients with higher number of CA experiences were reported to be higher.

The pulse averages of patients with and without pre-CA procedure was 76.76±11.38 and 77.50±9.50, respectively; and there was no statistically significant difference between the two averages (p>0.05). The pre-CA systolic/diastolic blood pressure averages of the patients with and without CA experience were 128.65±17.53/79.51±12.56 mm Hg and 120.12±19.96/71.62±10.36 mm Hg, respectively,

and pre-CA systolic/diastolic blood pressure averages of the patients with CA experience was statistically significantly higher than the group without CA experience ($p<0.05$). In the study conducted by Çakmakçı et al. (2012) to investigate sociodemographic characteristics and risk factors in patients who underwent CA, the pre-CA systolic blood pressure average was 132.34±26.22 mm Hg, diastolic blood pressure average was 77.30±15.92 mm Hg, and the pulse average was 81.25±18.58/min.[24] In their study conducted to determine the effectiveness of pre-CA briefing on the anxiety and vital findings of the patients who underwent CA for the first time, Atakoğlu (2019) reported that the average systolic/diastolic blood pressure and pulse averages were 152.86±22.5/91.42±11.9, and 76.28±17.1, respectively, in the non-informed group. In the same study, the average state anxiety score of the non-informed patients was 44.36 ± 11.61, and it was found that they experienced a high level of anxiety.[25] The fact that the mean systolic/diastolic blood pressure of patients with and without CA experience in our study before the procedure is lower than those reported in the literature, can be explained by the moderate anxiety levels of the patients in the sample.

The post-CA systolic/diastolic blood pressure averages of the patients with and without CA experience were 124.20±17.56/72.76±9.51 mm Hg and 126.25±24.77/75.25±13.21 mm Hg, respectively, and there was no statistically significant difference between the post-CA systolic/diastolic blood pressure averages of the patients with and without CA experience ($p>0.05$). However, it was determined that the mean of post-procedure pulse parameters of the patients without CA experience was higher ($p=0.010$). There was no statistically significant difference between systolic and diastolic blood pressure averages and pulse averages of the patients with and without CA experience, within 1 hour after the procedure ($p>0.05$). Atakoğlu (2019) report that there was a statistically significant decrease in post-CA systolic/diastolic blood pressure averages of the patients after the CA, compared to before the procedure, and that there was no significant difference in pulse averages before and after CA.[25] It can be said that CA intervention has an effect on patients' blood pressure and pulse parameters.

Limitations

The results obtained cannot be generalized to society, since this study was limited to patients who applied to the Cardiology Clinic of a Training and Research Hospital.

CONCLUSION

In conclusion, every patient with and without CA experience has anxiety during the CA procedure. While the anxiety level of patients without CA is expected to be higher, this study emphasizes that as the number of CA interventions applied to patients increase, so anxiety increases. The anxiety levels of the patients before the CA were observed to be similar and moderate, regardless of their CA experience. It was observed that patients with CA experience before CA procedure had higher systolic and diastolic blood pressures compared to the group without experience. This may be related to pre-existing cardiovascular diseases and anxiety.

Nurses should establish a reassuring and effective communication with all patients who underwent CA, and assess their level of anxiety, and should implement interventions towards decreasing their anxiety by revealing the conditions that may cause anxiety, and should evaluate the outcomes. Institution-specific training forms should be developed towards the CA procedure, the patients should be given written material after verbal training, and the individuals should be allowed to ask their questions about the issues that cause anxiety, and their questions should be answered correctly. Other studies involving larger samples with multispecialty providers and more health institutions are necessary to increase understanding regarding this topic.

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