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The Effect of an intervention on State and Trait Anxiety Levels of Patients before and after Cardiac Catheterization

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ABSTRACT

Background: Studies have shown that patients awaiting angiography are often anxious. Due to different effects of training on patients and limited studies on patients undergoing coronary angiography, the aim of the present study was to evaluate the impact of implementing an intervention on anxiety of patients undergoing coronary angiography. **Objective:** This is a clinical trial carried out on 100 patients undergoing angiography. Patients were randomly divided into control and intervention groups. A demographic questionnaire and Spielberger State and Trait Anxiety Inventory were used to collect data. The anxiety was assessed on angiography morning. Then a multidimensional program was individually performed for each patient. Then, anxiety was re-assessed half an hour before and after angiography. Mann-Whitney test was used for data analysis. **Results:** Population consisted of 100 patients undergoing coronary angiography. Among them, 60% were male and 40% were female, and all were married. Mann-Whitney test showed that state anxiety before (p=0.001) and after (p=0.029) angiography in trained patients was significantly lower than control group. Although trait anxiety before and after angiography was lower in intervention group compared to control group, the difference was not significant. Considering**. Conclusion:** the impact of training package on reducing anxiety in patients undergoing angiography, the same technique can be recommended to increase knowledge and awareness of patients to reduce anxiety.

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INTRODUCTION

Cardiovascular diseases, especially coronary artery diseases are the main cause of death and hospitalization (Wynne and Heather, 2004). In 2005, 41.3% of all deaths in Iran were caused by cardiovascular disease which is expected to reach about 50% by 2020 (Seyam *et al*., 2011). Angiography is one of the standard methods for diagnosis of coronary artery diseases (Khayyam *et al*., 2011). In 2004, over a million cases of angiography were performed in United States (Shaw, 2008). It is predicted that over three million catheterization and angiography cases would be performed in USA by 2010 (Parsa-Yekta *et al*., 2003).

Like other invasive procedures, coronary angiography can be stressful for patients (Bally *et al*., 2003). A study on anxiety of patients before angiography showed that more than 82% of patients undergoing angiography experience preoperative fear and anxiety (Jamshidi *et al*., 2010). Increased anxiety can lead to physical and psychological stress with adverse effects on organs, especially heart. Following increased anxiety, blood pressure and heart rate and breathing rate increase. All this puts pressure on patient's cardiovascular system (Khayyam Nekouei *et al*., 2011; Bally *et al*., 2003).

Increased anxiety may increase medication therapy, hospitalization duration and postoperative complications (Jawai *et al*., 2007; Buffum *et al*., 2006; Guo *et al*., 2012). Anxiety in patients undergoing angiography may associate with dysrhythmia, heart spasms, cardiovascular complications and even death (Khayyam *et al*., 2011). Therefore, the nurse as one of the foremost member of a medical team should assess anxiety and take measures to control anxiety (Wynne and Heather, 2004).

There are several methods to reduce anxiety in patients. According to Moline, preoperative preparation and training has beneficial effects on anxiety reduction (Moline, 2000). Patient education affects behavior, knowledge, attitude and skills as well as maintaining and promoting health. Patients with higher levels of knowledge will experience lower anxiety and stress levels (Taylor-Piliae and Chair, 2002; Kruzik, 2009). Ganji

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studied the impact of education on knowledge and anxiety of patients underwent cardiac catheterization. The results showed that training increases knowledge and awareness of patients and thus reduces anxiety (Ganji *et al*., 2004)

Chan and Harkness emphasized on the role of preoperative education in reduction of anxiety in patients (Chan and Cheung, 2003; Harkness *et al*., 2003). However, different results have been reported in other studies. In a study entitled "the impact of education on anxiety in patients undergoing heart surgery", Asilioglu found no statistically significant differences between anxiety levels in trained and control groups (Asilioglu and Celik, 2004). Jamshidi found that training patients before angiography had no effect on angiographic complications (Jamshidi *et al*., 2011).

In an article entitled "the impacts of instructional booklet on anxiety of patients undergoing coronary artery bypass grafting", Momeni found no statistically significant difference between trained and control groups (Moemeni *et al*., 2007). In addition to different results concerning the impact of education on anxiety, there are few studies on anxiety of patients undergoing angiography. Most studies only measured anxiety in patients undergoing coronary angiography using descriptive methods without any intervention (Wynne and Heather, 2004; Kayyam Nekouei *et al*., 2011; Shaw *et al*., 2008; Jamshidi *et al*., 2011; Gallagher *et al*., 2010; Uzun *et al*., 2008) In interventional studies, other methods have been used to reduce (Bally *et al*., 2003; Buffum *et al*., 2006; Philippe *et al*., 2006). In some studies, one or two educational methods have been used to train patients (Chan and Cheung, 2003; Bassampour, 2004).

Given observed differences in various studies and limited number of studies on the effect of training on anxiety of patients undergoing angiography, the researcher decided to examine the impact of a multidimensional educational program on State and Trait anxiety of patients before and after angiography. It is hoped that the results of the present study help relevant authorities to improve quality of care and education of patient undergoing angiography.

MATERIALS AND METHODS

This is a clinical trial conducted on both intervention and control groups. Population consisted of patients referred to Shahid Beheshti Hospital in Kashan. The sample was selected among them. According to previous studies and sample size formula, the number of subjects in each group was assessed to be 50 patients (Jamshidi *et al*, 2011)

A two-part instrument was used to determine the impact of implementation of training package on state and trait anxiety of patients undergoing angiography. The first part includes demographic data (age, gender, marital status, residence, education and occupation). The second part of the instrument includes Spielberger Anxiety Scale. This questionnaire includes 20 items related to state anxiety and 20 questions related to trait anxiety. Responses are scored from 1 to 4 based on a 4-degree Likert scale. In the case of state anxiety, responses are considered as very low to very high. In the case of trait anxiety, responses are considered as almost never to almost always.

State and trait anxiety scores range from 20 to 80. Patients who acquire a score in the range of 0-20 will experience no anxiety. A score in the range of 21 to 40 was considered as low anxiety, 41 to 60: moderate anxiety and 61 to 80: severe anxiety. The reliability and validity of the questionnaire were examined in numerous studies. A reliability of 0.92 was calculated by Buffum using Cronbach's alpha method (Buffum *et al*., 2006) The questionnaire has been translated into Persian and validated with a Cronbach's alpha of 0.94 (Majidi, 2004).

The inclusion criteria were candidates for coronary angiography: aged between 30 to 70 years, literate with adequate physical fitness to answer questions, underwent angiography for the first time, with no known mental disorder. Exclusion criteria include active bleeding from the catheter during or after angiography and the need for cardio-pulmonary resuscitation during the procedure.

Sampling was continually done so that the researcher referred to angiography ward and selected subjects who met inclusion criteria. To prevent contact between two groups of patients, assignment of subjects to intervention and control groups was done in a weekly manner. Patients underwent angiography within the first week randomly were assigned to the control group. In the next week, all patients were assigned to the intervention group. Sampling continued until the desired sample size. Patients in both groups were matched in terms of demographic variables.

Anxiety was measured on three occasions: on angiography morning (before multi-dimensional training program), 30 min before and 30 min after angiography.

Researcher referred to patient bed on angiography morning (2 hours before angiography) and measured anxiety. A 30-min multidimensional training program was implemented for each patient in intervention group. In this program, information about actions before, during and after angiography was provided and patient's questions were answered. An educational pamphlet was also provided for further study. Then a 10-min video containing information on angiographic procedure, necessary actions before, during and after angiography and

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angiography environment was shown for each patient in presence of the researcher The content validity of the video and the educational pamphlet were confirmed by 4 faculty members of nursing school, 2 cardiologists and one specialist nurse in the Kashan University of Medical Sciences.

The patient's anxiety was assessed 30-min before angiography and 30-min after angiography. The control group received routine training. In this case, the anxiety was controlled with a pattern similar to intervention group. Data analysis was performed using SPSS. Mann-Whitney test was used to assess anxiety levels in both groups before and also after angiography.

Ethical considerations:

This study was approved by the Research Committee and the Research Ethics Committee at Kashan University of Medical Sciences and registered in Clinical Trials Registry Center. All participants signed a written informed consent form and ensured confidentiality of personal information and were not forced to participate in the study. Data were collected after coordination with nursing department head and related authorities. The aim of the study was explained to all research units.

Results:

In this study, 100 patients underwent angiography divided into two groups consisted of 50 patients. Most patients aged 51-70 years old. Among them, 60% were male and 40% were female, and all were married. 70% of patients had primary education, 54% were from urban areas and 46 % from rural areas, 34% were employed, 27% retired and 39% were housewives. Patients in both groups were matched in terms of gender, age, marital status, educational level, place of residence and occupation, thus there was no significant difference.

The mean anxiety on angiography morning in both groups was not statistically significant (p=0.09). State anxiety on angiography morning in the intervention group was 38.94. After a 30-min multi-dimensional training program, the anxiety level reduced about 4.92. After angiography, the mean anxiety score in intervention group reduced by 7.50 and reached 31.44. In the control group, anxiety level on angiography morning was 38.14 and increased to 41.44 approaching the time of angiography. After the procedure, anxiety level reached to 33.24 (Table 1).

Table 1: Mean and standard deviation of state anxiety in both groups

Group		Intervention	Control		Mann-Whitney U
State Anxiety		Mean ±SD	Mean SD	P value	
Before intervention	2 h before angiography	38.94±5.36	38.14±7.36	P = 0.09	m =1010.5,Z= -1.65
After intervention	30 min before angiography	34.02±2.32	41.44±8.45	P= 0.0001	m =488, Z= -5.27
	30 min after angiography	31.44±1.65	33.24±3.49	P= 0.029	m =940, Z= -2.18

The mean trait anxiety on angiography morning in both groups was not statistically significant (p=0.56). The mean trait anxiety level in the intervention group on angiography morning, 30-min after the training program and 30-min after angiography was 35.96, 35.70 and 34.64, respectively. In the control group, mean trait anxiety level on angiography was 36.46 and increased to 37.84 approaching the time of angiography. The mean anxiety level reached to 36.70 after angiography (Table 2).

Table 2: Mean and standard deviation of trait anxiety in both groups

Group		Intervention	Control		Mann-Whitney U
Trait Anxiety		Mean ±SD	Mean SD	P value	
Before intervention	2 h before angiography	35.96±4.16	36.46±7.24	P = 0.56	m =1166,Z=- 0.58
After intervention	30 min before angiography	35.70±4.08	37.84±6.88	P= 0.21	m =1070, Z= -1.24
	30 min after angiography	34.64±4.30	36.70±6.32	P= 0.14	m =1037, Z= -1.47

Discussion:

The results showed that the training program for patients awaiting angiography reduced anxiety before and after angiography compared to the control group. In an article entitled "the impact of early educational intervention on preoperative anxiety in patients undergoing cardiac catheterization", Harkness found a significant difference between intervention and control groups in terms of preoperative anxiety (Harkness *et al*., 2003). Momeni and Bassampour found lower mean State anxiety levels in trained group than control group before cardiac surgery (Moemeni *et al*., 2009; Bassampour, 2004).

Asilioglu examined the impact of preoperative education on postoperative anxiety of patients underwent cardiac surgery. The results showed that training reduces anxiety after cardiac surgery, although this reduction

was not statistically significant (Asilioglu and Celik, 2004). Tsai found that lower anxiety levels in trained patients than control group after coronary artery intervention (Tsai and Chou, 2012). Surgical stress is due to fear of unknown locations and lack of control on environment or fear of death. Therefore, anxiety before and after invasive procedures can be reduced through providing correct information, answering patients' questions and familiarizing them with medical environment and generally good training (Bally *et al*., 2003; Jawai *et al*., 2007; Harkness *et al*., 2003).

The present study showed that the training package reduced pre and postoperative anxiety of patients awaiting coronary angiography. However, this reduction was not statistically significant. The results were consistent with the results of Dioz-Alvare (Diez-Alvarez *et al*., 2012). In an article entitled "the impact of preoperative education on postoperative anxiety in cardiac surgical patients", Asilioglu found that training reduces anxiety in patients after cardiac surgery, although this reduction was not statistically significant (Asilioglu and Celik, 2004). The reason for the lack of significant findings in the present study and other similar studies is that trait anxiety mainly depends on personal traits and is less affected by environmental factors (Uzun *et al*., 2008).

According to Jawaid, correct information and answering patients' questions are very effective in reducing anxiety. Most patients expressed that if surgery is explained with details, their anxiety will reduce. On the other hand, patients who have previous experience with invasive procedures will experience less anxiety (Jawai *et al*., 2007). Other studies have also shown that training affects behavior, attitude and skill, maintaining and promoting health and reduces anxiety (Uzun *et al*., 2008; Bassampour, 2004; Diez-Alvarez *et al*., 2012). Therefore, educational videos from angiography environment and proper training will familiarize patients with therapeutic environment and surgery details and thus will reduce anxiety.

Conclusions:

The present study examined the impact of a multi-dimensional training program on anxiety of patients underwent angiography. The results showed that the training program can reduce state and trait anxiety. Given the beneficial impact of the training program on reducing anxiety, similar training programs are recommended to reduce anxiety in patients awaiting angiography. Of limitations of the present study is that Spielberger Anxiety Scale was used. This is why Spielberger is a self-reporting instrument and may inculcate responses to the patient. This study was conducted on patients awaiting angiography. It is recommended that similar studies are performed on patients awaiting other diagnostic invasive therapeutic tests.

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