

Effects of Peer Education and Orientation Tour on Anxiety in Patient Candidates for Coronary Angiography

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Abstract

Background: Coronary angiography is a stressful procedure for most patients. The physiological responses caused by anxiety during coronary angiography increase the likelihood of dysrhythmia, coronary artery spasm, and rupture.

Objectives: This study compared the effects of peer education and an orientation tour on anxiety in patients who were candidates for coronary artery angiography.

Patients and Methods: This single blind quasi-experimental study was conducted in 2014. A total of 177 patients who were candidates for coronary artery angiography were divided into three groups: a peer education group, an orientation tour group, and a control group. The patients in the peer education group were trained by a peer educator, and the patients in the orientation tour group were trained by the researcher, who worked in the angiography unit. The DASS-21 questionnaire was used to measure the patients' anxiety levels before the intervention and two hours before undergoing the coronary angiography. The data were analyzed using a Chi-square test, analysis of variance, the Kruskal-Wallis, Wilcoxon, Mann-Whitney U tests, and an interquartile range.

Results: The three groups did not significantly differ regarding the mean anxiety scores before the intervention. However, a significant difference was observed between the mean anxiety scores of the three groups after the intervention ($P = 0.0001$). In the peer education group, the mean anxiety score was 5.34 ± 2.52 and decreased to 3.69 ± 2.87 after the intervention ($P = 0.0001$). In the orientation tour group, the mean anxiety was 5.53 ± 3.49 , which changed to 3.10 ± 2.22 ($P = 0.0001$). However, the mean anxiety score significantly increased in the control group (5.66 ± 2.94 vs. 6.53 ± 3.43 , $P = 0.017$).

Conclusions: Both methods of peer education and orientation tour decreased the anxiety levels in patients undergoing coronary artery angiography. Therefore, these approaches should be carried out according to the hospital condition and facilities.

Keywords: Angiography, Anxiety, Coronary Artery, Orientation, Peer Group, Education

1. Background

Coronary angiography (CA) is a standard method used for the anatomic evaluation of coronary artery disease (CAD) and making decisions about treatment (1, 2). Three million CA procedures were performed in the US in 2010 (3). More than 260,000 CAs are performed annually in Iran (4). Although CA is a low-risk approach used in the diagnosis and treatment of CAD (5), it creates tension in patients (6). Studies showed that patients waiting for CA are often anxious and worried (4, 7-9). The most important reasons for anxiety in these patients are hospitalization, waiting for CA, fear of complications, lack of information about the process of the CA, care before and after the surgery, and fear of the angiography unit (10-13). Some studies also showed that large pieces of equipment, the mask and gown worn by health care providers, inadequate light in the angiography unit, and the sounds of the X-ray device all increased

the patient's anxiety level (14).

Stress and anxiety influence physiological responses, such as respiratory rate, heart rate, blood pressure, myocardial oxygen consumption, and plasma concentrations of epinephrine and norepinephrine. Increasing the vascular permeability leads to tissue injury and platelet aggregation (15, 16). These physiological responses put the patient at risk for dysrhythmia, coronary artery spasm, and rupture (7). Moreover, because an anxious patient is less likely to collaborate with health care providers, technical problems might occur during the procedure (16). Some patients may also refuse the CA because of their fear and anxiety. Therefore, it is crucial for nurses to assess and alleviate patients' anxiety before the procedure (10, 11, 15).

In addition to anxiolytic medications, non-pharmacological methods, such as relaxation techniques, massage therapy, reflexology, music therapy, and listening

to the Quran (4, 17), were frequently used to decrease anxiety in patients undergoing CA. A recent study also investigated the effect of a multi-modal preparation package on anxiety in these patients (18). However, reducing stress and anxiety in patients undergoing CA remains a major challenge for nurses (2, 19).

Studies showed that providing appropriate information and making the patient aware of the process of CA could reduce anxiety and increase their self-esteem and satisfaction (10, 20). One method used to train patients is the peer education (21). Peers can have better contact with their group mates, share their experiences, and encourage them to follow healthy behaviors (22, 23). Peer education is frequently used in young people for the correction of sexual behavior, drug abuse, and smoking (24). This method was also effective in improving the knowledge, attitude, and prevention of HIV/AIDS among adolescents (25). Some studies also showed that an orientation program could decrease anxiety in patients undergoing CA (26, 27) and cancer patients (28). However, a systematic review of the effects of orientation programs for cancer patients and their family caregivers reported no positive effects on anxiety levels (29). Because of the inconsistencies in studies on the effect of orientation tours and the lack of studies comparing the effects of peer education and orientation tours in reducing anxiety, this study aims to answer the following question: Which of the two methods of peer education and orientation tour better reduces anxiety in patient candidates for coronary angiography?

2. Objectives

This study was conducted to compare the effects of peer education and an orientation tour on anxiety in patients undergoing CA.

3. Patients and Methods

3.1. Design and Sample

This single blind quasi-experimental study was conducted with patients undergoing CA. The study was carried out from March to July 2014. The study population comprised patients undergoing CA who were hospitalized one day before the procedure in the 502 hospital in Tehran, Iran. The inclusion criteria included elective CA for the first time, the ability to read and write in the Farsi language, within the age range of 25 – 65 years, no history of heart valve diseases, disabilities, depression, or anxiety diseases, no use of sedative drugs, not a health care provider, and no history of CA in close relatives. Hemodynamic instability

and refusal to participate in the research were considered exclusion criteria.

The sample size was estimated by using a previous study that investigated the effects of an orientation program in patients undergoing CA and reported that after the intervention, the mean and standard deviation of anxiety in the control and the experimental groups were 11.6 ± 4.28 and 9.60 ± 2.22 , respectively (26). Considering $\beta = 0.2$, $\alpha = 0.05$, $S_1 = 4.28$, $S_2 = 2.22$, $\mu_1 = 11.60$, and $\mu_2 = 9.60$, it was estimated that 46 subjects were needed in each group. However, we recruited 59 patients in each group to compensate for possible dropouts and increase the reliability of the results. The study flow diagram is presented in Figure 1.

3.2. Instruments

The data collection tools included an individual characteristics questionnaire (age, sex, marital status, education level, occupation, residence location, smoking, and heart disease duration) and the DASS-21 questionnaire, which consists of 21 questions about depression (7 items), anxiety (7 items), and stress (7 items). In this study, only the anxiety subscale was used. All items were designed as a four-choice Likert scale ranging from high = 3 to none = 0. Scores from 0 – 4 showed a normal state, and scores from 5 – 11 and 12 – 21 showed medium and severe anxiety, respectively. The validity and reliability of the Farsi version of the scale were confirmed previously (30, 31). The internal consistency was assessed using Cronbach's alpha, which was 0.7, 0.66, and 0.76 for depression, anxiety, and stress subscales, respectively (32).

3.3. Data Collection

The subjects were selected from hospitalized patients whom were candidates for CA. To avoid any relationship between the three groups, each group was evaluated separately and then discharged. The order of evaluating the three groups was selected randomly. Patients in another group were then recruited. Moreover, all participating patients were hospitalized in predetermined rooms to avoid relationships with those who were not in the study. No significant changes occurred in the study setting during the study period.

The sampling was performed every other day. The patients in all three groups responded to the individual characteristics questionnaire and the anxiety section of the DASS-21 on the day of hospitalization (i.e., before the intervention).

The patients in the peer education group were divided into subgroups of three to six subjects, and each subgroup was trained by a peer educator under the supervision of

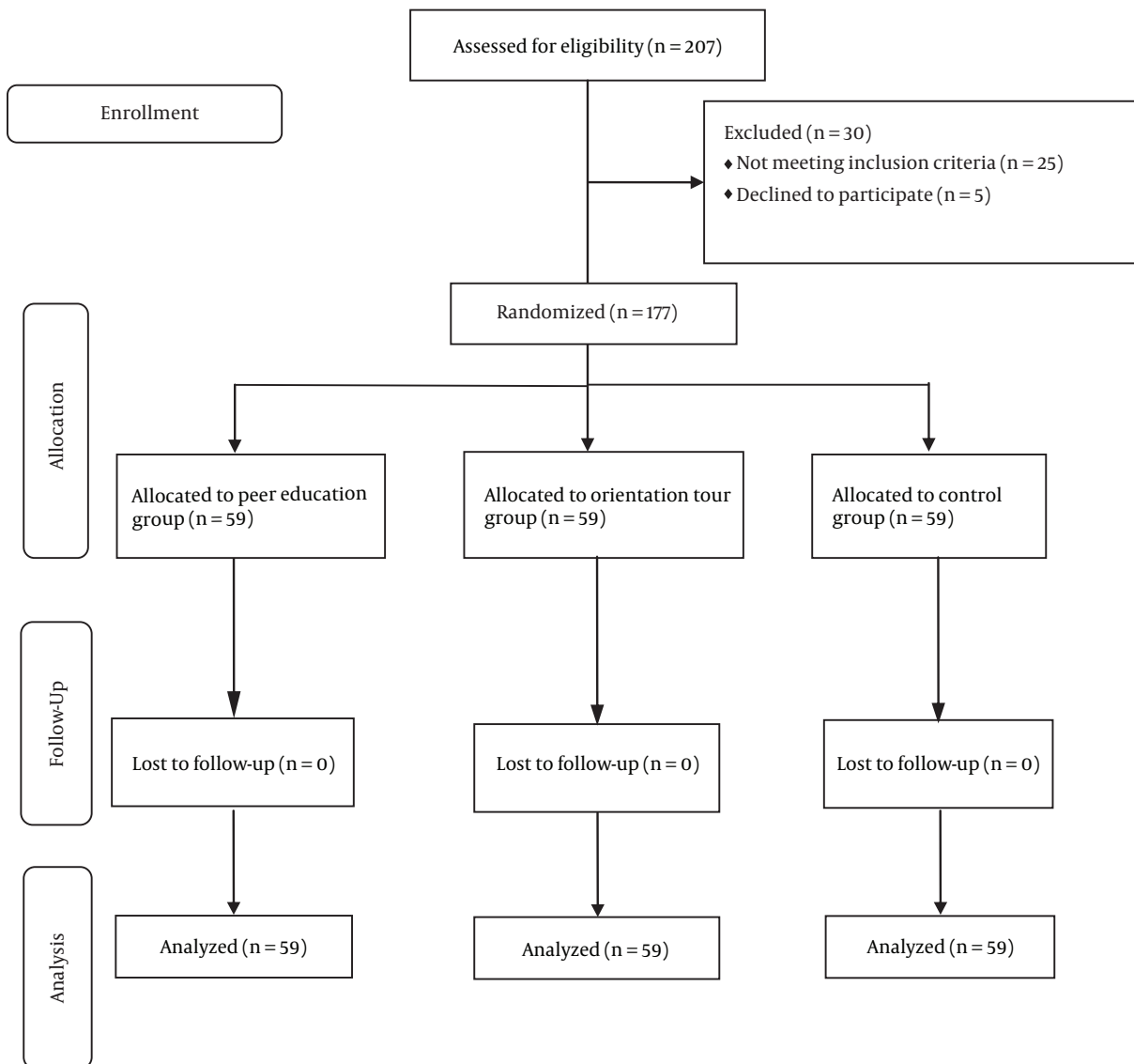


Figure 1. The Study Design

the first researcher. This training was given in a one-hour session, and it focused on the nature, signs, and symptoms of CAD, treatments, preparation measures before and after the CA, self-care at home, and treatment follow-up. The third author, who was working in the study setting, selected a peer educator. The peer educator had undergone a successful CA, had adapted well to the condition, and had been trained by the research team in two sessions of two hours each.

In the orientation tour group, the patients were divided into subgroups of three to six. They were given an orientation tour of 30 - 40 minutes in the angiography

department, where they were familiarized with the facilities and the equipment. An expert nurse answered their questions during the tour. This tour was performed after working hours when no procedure was being conducted in the angiography department. In addition, an educational booklet was given to the peer education and orientation tour groups. This booklet contained materials about the major vessels, the process of CA, preparation and care activities before, during, and after the CA, training tips on post-discharge, and indications for the need to attend the emergency department. The control group was trained according to the routine protocol. However, the educational

booklet was also given to this group after the procedure. Two hours before the CA, all three groups again answered the DASS-21 questionnaire.

It should be noted that patients who had the financial ability could purchase a book about heart disease, which was available at the hospital. However, this book is voluminous; moreover, it was prepared especially for this group of patients. Therefore, many patients were reluctant to purchase or study it. All patients had an injection (morphine + promethazine) 30 minutes before the CA. No patient had a conflict with this study.

3.4. Ethical Considerations

This study was approved by the ethics committee of the AJA University of Medical Sciences (Grant No. 9303) and was registered at Iranian registry of clinical trials (No: IRCT2014032617086N1). The researchers observed the ethical guidelines in the Helsinki declaration (33). Regarding the ethical considerations, we explained the research objectives to the participants and obtained the written informed consent from all subjects. We assured them of their right to refuse to participate or withdraw from the study at any time. We assured the participants that they would not be harmed and that their personal information would be anonymous and confidential. We answered all questions asked by the participants. In addition, the necessary permissions were sought from the hospital authorities.

3.5. Data Analysis

The data were analyzed by using SPSS software version 13. The Kolmogorov-Smirnov test was used to determine the normal distribution of the data. Descriptive statistics (mean, standard deviation, frequency, and percent) were calculated for the appropriate variables. In addition, the level of significance was set at $P < 0.05$. The Chi-square test was used to analyze the nominal and ordinal variables. A one-way analysis of variance (ANOVA) and Kruskal-Wallis tests were used to compare the mean scores of the three groups. We used the Wilcoxon test to compare the mean pre- and post-intervention anxiety scores in each group, and we used the Mann-Whitney U test for the pairwise comparisons. Moreover, the interquartile range (IQR) was calculated for the non-normal variables.

4. Results

The mean age of the subjects was 57.14 ± 7.50 years, and no significant difference was observed in the mean age of the three groups ($P = 0.978$). Moreover, no significant difference was found in the other personal characteristics of the three groups (Table 1).

Before the intervention, 77.4% of patients showed low anxiety, whereas 21.5% and 1.1% showed medium and severe anxiety, respectively. However, after the intervention (two hours before CA), the rates of low, medium, and severe anxiety in the subjects changed to 83.1%, 15.8% and 1.1%, respectively. Moreover, chi-square test showed that anxiety levels among the three groups before the intervention had no significant difference ($P = 0.283$), while the difference was significant after the intervention ($P = 0.0001$) (Table 2).

The three groups did not differ significantly regarding the mean anxiety before the intervention ($P = 0.672$). However, the post-intervention measurement showed that the mean anxiety scores were decreased in the peer education and orientation tour groups but were increased in the control group. A significant difference was observed in the mean anxiety scores of the three groups after the intervention ($P = 0.0001$) (Table 3). However, in the post-intervention phase, the Mann-Whitney U test showed no significant differences in the mean anxiety scores of the patients in the peer education group and the orientation tour group ($P = 0.454$, $Z = -0.749$).

5. Discussion

The results showed that more than two thirds of the subjects had low anxiety before the intervention. No significant difference was observed in the mean anxiety scores of the three groups at this time. However, after the intervention, significant differences were observed in the anxiety levels of the three groups. The low level of anxiety in the subjects at the start of the study was not consistent with the results of some earlier studies (9, 11), which could be attributed to the differences in the study populations.

The present study showed that anxiety levels in the peer education group were significantly decreased after the intervention. This finding showed the effectiveness of this method on anxiety in patients undergoing CA. This finding was consistent with previous studies that investigated the effects of peer education on anxiety in patients with multiple sclerosis (22), patients undergoing coronary artery bypass graft surgery (20), and patients undergoing coronary angiography (18). Our findings support the results of previous studies that showed that sharing experiences with peers is a useful anxiolytic method and can be used to decrease anxiety not only in patients undergoing CA but also in patients anticipating other procedures. Peer education can be especially effective because peers with positive experiences are a source of information, and they can communicate easily with patients, provide them with social support, and decrease their concerns about the procedure and its outcome.

Table 1. Comparison of Individual Characteristics in the Three Groups^a

Variables	Group			P Value ^b
	Peer Education	Orientation Tour	Control	
Age, y	57.03 ± 6.79	57.31 ± 7.11	57.07 ± 8.61	0.978
Duration of cardiac disease, y	2.54 ± 2.97	3.02 ± 3.10	2.51 ± 2.35	0.553
Gender				0.816
Female	30 (34.5)	27 (31.0)	30 (34.5)	
Male	29 (32.2)	32 (35.6)	29 (32.2)	
Marital status				0.674
Single	8 (40.0)	5 (25.0)	7 (35.0)	
Married	51 (32.5)	54 (34.4)	52 (33.1)	
Educational level				0.743
Diploma ≥	48 (32.2)	51 (34.2)	50 (33.6)	
Academic degree	11 (39.3)	8 (28.6)	9 (32.1)	
Employment status				0.068
Employed	38 (31.4)	47 (38.8)	36 (29.8)	
Unemployed	21 (37.5)	12 (21.4)	23 (41.1)	
Residence location				0.826
City	42 (33.6)	43 (34.4)	40 (32.0)	
Village	17 (32.7)	16 (30.8)	19 (36.5)	
Smoking				0.577
Yes	16 (34.0)	13 (27.7)	18 (38.3)	
No	43 (33.1)	46 (35.4)	41 (31.5)	

^aValues are expressed as No. (%) or mean ± SD.

^bAnalysis of variance was performed for age and duration of cardiac disease while chi-square test was performed for other variables.

Table 2. Comparison of Anxiety Levels Pre- and Post-Intervention in the Three Groups^a

Group	Low Anxiety		Medium to Severe Anxiety	
	Pre-Intervention	Post-Intervention	Pre-Intervention	Post-Intervention
Peer education	49 (35.8)	50 (34.0)	10 (25)	9 (30)
Orientation tour	45 (32.8)	57 (38.8)	14 (35)	2 (6.7)
Control	43 (31.4)	40 (27.2)	16 (40)	19 (63.3)
P value	0.553		0.018	

^aValues are expressed as No. (%).

The results showed that the orientation tour also significantly decreased the mean anxiety score before the CA. This finding is consistent with the results of Hanifi et al., who examined the effects of an orientation tour on stress, anxiety, and depression in patients undergoing CA (26). However, in a recent systematic review on the effects of orientation programs on cancer patients and their family caregivers, Chan et al. (29) reported that this method did

not significantly affect the state of anxiety in patients or in their family caregivers. Chan et al. attributed these results to a methodological problem in their study (29). However, it should be noted that cancer is considerably different from CA both in its nature and in the therapeutic procedures used to treat it. Hence, it is expected that an orientation program would be more effective in patients undergoing CA.

Table 3. Comparison of the Mean, Standard Deviation, Median, and Interquartile Range of Anxiety Scores Pre- and Post-Intervention in the Three Groups

	Pre-Intervention		Post-Intervention		Wilcoxon Test	
	Mean \pm SD	Median (IQR)	Mean \pm SD	Median (IQR)	Z	P Value
Peer education group	5.34 \pm 2.52	5 (3)	3.69 \pm 2.87	3 (3)	-4.626	0.0001
Orientation tour group	5.53 \pm 3.49	5 (3)	3.10 \pm 2.22	3 (4)	-5.926	0.0001
Control group	5.66 \pm 2.94	5 (5)	6.53 \pm 3.43	6 (4)	-2.389	0.017
Kruskal-Wallis test, P Value	0.672		0.0001			

Abbreviations: SD, standard deviation; IQR, interquartile range.

Although both intervention groups in the present study experienced less anxiety in the post-intervention measurement, the level of anxiety was significantly increased in the control group. This finding is consistent with the results of previous studies in which patients undergoing CA usually experienced higher levels of anxiety as the time of the procedure drew near (13, 18). These findings reveal the crucial importance of lowering the patient's anxiety before invasive procedures such as CA.

In this study, we recruited only patients who were hospitalized a day before CA. We did not include patients who were hospitalized on the day of the procedure. Thus, the sample might affect the generalizability of the findings. Therefore, further studies on patients who are hospitalized on the day of CA are recommended. Furthermore, we did not assess the physiologic measures of anxiety. Therefore, further multicenter studies with larger sample sizes are recommended to evaluate vital signs and hemodynamic parameters. Furthermore, although the results indicated that the two methods were useful in decreasing anxiety levels, the experience of the researchers indicated that the patients were more satisfied with the orientation tour method. However, we did not document the patients' satisfaction in the present study. Therefore, this study should be replicated to include the assessment of patient satisfaction.

In conclusion, the findings showed that both methods, peer education and the orientation tour, were effective in decreasing the patients' anxiety. Both methods are feasible, inexpensive, and non-invasive, and they present a non-pharmaceutical means of reducing anxiety reduction. Both methods, applied individually or in combination, depending on the patient's choice, could be integrated into the routine preparations before CA.

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Footnotes

Authors' Contribution: Reza Eslami contributed to the planning, data collection, and writing of the initial draft of the manuscript. Seyedeh Azam Sajadi contributed to the planning and supervision of the study. Zahra Farsi was involved in the planning, data analysis, and in submitting the manuscript and making critical revisions to it. All authors read and approved the final manuscript.

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