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Effects of an orientation tour on preoperative anxiety in candidates for coronary artery bypass grafting: A randomized clinical trial

Reyhaneh Niknejad[(1)], Mohsen Mirmohammad-Sadeghi[(2)], Mohammad Akbari[(3)], Ahmad Ghadami[(4)]

Original Article

Abstract

BACKGROUND: Candidates for cardiac surgery usually suffer from preoperative anxiety. Although there are various anxiety reduction techniques, it is unclear which one is the most effective. Therefore, the present study was conducted to explore the effects of an orientation tour on preoperative anxiety in candidates for coronary artery bypass grafting (CABG).

METHODS: In this randomized clinical trial study, 70 patients who were candidate for CABG were recruited from February 2016 to May 2017. They were randomly assigned to two groups of 35. The intervention group members were taken on an orientation tour and the control group received routine care. Data were collected using the State-Trait Anxiety Inventory (STAI).

RESULTS: The statistical tests revealed that there was no significant difference between the intervention group (42.43 ± 13.24) and the control group (45.11 ± 10.19) with respect to the pre-intervention state anxiety level (P = 0.340); however, before surgery, the state anxiety level was significantly lower in the intervention group (34.83 ± 11.15) than in the control group (47.69 ± 11.30) (P < 0.001). Moreover, the independent t-test showed that there was no significant difference between the intervention (43.71 ± 12.04) and control (45.03 ± 8.76) groups with respect to the pre-intervention trait anxiety level (P = 0.600). Nevertheless, before surgery, the trait anxiety level was significantly lower in the intervention group (35.40 ± 10.24) than in the control group (46.91 ± 9.51) (P < 0.001).

CONCLUSION: The preoperative orientation tour had a positive impact on the anxiety level in the candidates for CABG. Hence, the tour can be used as a remarkably effective technique for reducing anxiety.

Keywords: Anxiety, Coronary Artery Bypass Grafting, Orientation

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Introduction

Cardiovascular disease (CVD) is viewed as the most important cause of mortality and disability worldwide.[1,2] In 2013, it accounted for 17.3 million out of 54 million deaths globally; in other words, 31.5% of deaths were due to CVD.[3] According to the American Heart Association (AHA), CVD causes one out of three deaths in the United States (US) and an average of 2150 Americans die of CVD per day, which roughly equates to one death every 40 seconds.[4]

Coronary artery disease (CAD) is common in Iran and the age of developing it has reduced. The disease is one of the leading causes of mortality and disability in this country and the risk of developing it has increased.[5,6] The incidence rates of CVD events are 1168 and 1436 per 100000 person in year in Iranian women and men, respectively.[7] When patients with an ischemic stroke fail to respond to medical treatment, the coronary artery bypass grafting (CABG) is the only effective option for them.[8]

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1- MSc Student, Student Research Committee, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran
2- Associate Professor, Isfahan Cardiovascular Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran
3- Cardiac Rehabilitation Research Center, Cardiovascular Research Institute AND Nursing and Midwifery Care Research Center, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran
4- Assistant Professor, Nursing and Midwifery Care Research Center AND Department of Operating Room, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran
Correspondence to: Ahmad Ghadami, Email: ghadami@nm.mui.ac.ir

CABG is common in developed countries. Over 5155000 and 17000 patients have undergone it in the US and Australia, respectively.[9,10] In Iran, 60% of heart operations are CABG. One of the problems that candidates for cardiac surgery face is preoperative anxiety.[11] Among the most common anxiety-provoking factors are awaiting surgery, hospitalization, a disturbing memory of a patient who had died of the same disease, and fears of death and unexpected outcomes.[11,12] Anxiety leads to an increase in levels of catecholamines, adrenocortical hormones, prolactin, cortisol, and prostaglandin. Increased anxiety levels affect the cardiac output, blood pressure, heart and respiratory rates, myocardial oxygen consumption, and plasma concentrations of adrenaline and noradrenaline, thereby carrying a health risk.[2,13] Anxiety could be not only preoperative but also postoperative.[14,15] High anxiety levels in patients undergoing CABG can have serious consequences for them.[16]

Pre-CABG anxiety has negative effects on the physical and mental well-being of patients and influences the outcome of their medical treatment.[11,17] According to a study by Tully et al., pre-CABG anxiety increases the risk of death. Preoperative anxiety is seemingly at the highest level in CABG patients and this is when symptoms of angina worsen.[18] This is consistent with the results of a study by Krannich et al. It showed that 34.0% and 24.7% of CABG patients had experienced preoperative and postoperative anxiety, respectively.[19] In general, it could be argued that most CABG patients suffer from different anxiety levels.[20,21]

Hence, since anxiety affects surgical outcomes and the recovery process and causes postoperative complications, it is essential to examine the anxiety level in patients. In fact, they should be under both physical and psychiatric examination. Furthermore, examining the postoperative anxiety process helps detect patients at risk of postoperative anxiety.[17] Fears, uncertainties, potential complications, and unexpected outcomes are sources of anxiety and stress in patients.[11,22] Uncertainties resulting from lack of knowledge can cause anxiety.[23]

Medical team members can reduce injuries caused by surgery and maintain the health of patients. Surgical technologists can prevent complications and risks such as the increased heart rate, myocardial infarction (MI), and adverse outcomes by knowing the anxiety level and type and applying suitable interventions, thereby helping patients recover quickly.[24] Studies show that educational interventions play an important role in reducing anxiety in candidates. Different methods are used for training researchers and each has its own impact. Hence, experienced operating-room nurses can help reduce this stress and anxiety using modern educational methods. The intra-unit training is a common method for reducing anxiety in patients. They can watch instructional videos and receive peer education. It should be noted that despite these trainings, patients may still experience anxiety.[17,25,26]

According to many studies, in order to desensitize people to stress and reduce their anxiety using mental health strategies, they should rehearse stressful situations.[27] Hence, the current study was carried out to explore the effects of an orientation tour on preoperative anxiety in CABG candidates. In fact, the study attempts to show whether the anxiety level in patients rises or decreases after they visit operating rooms and units and speak with inpatients.

Materials and Methods

This randomized clinical trial study was performed on 70 CABG candidates who had attended in Shahid Chamran Hospital in Isfahan, Iran (a large educational hospital in center of Iran) from December 2016 to May 2017. The inclusion criteria were as follows: being over 40 years old, giving full consent for participating in the study, undergoing CABG for the first time, being ready for surgery, having no acute or chronic physical and mental disorders, having basic literacy skills, being no emergency case, and having no medical education. Exclusion criteria were as follows: indicating a reluctance to participate in the study, wishing to be hospitalized somewhere else, and receiving good or bad news during the study.

The necessary sample size was calculated as a minimum of 23 participants per group at a confidence interval (CI) and test power of 95%.[28] Accounting for potential participant loss, 35 patients per group were subsequently recruited for a total of 70 patients. In this parallel-group trial, the subjects were randomly assigned to two groups, namely control (n = 35) and intervention (n = 35) by the flip of a coin.

Patients were randomly allocated to a group by a person uninvolved in the sampling and data collection process. Group allocations were performed using random sequencing. The participants and care providers were aware of the group allocation, but those who assessed outcomes were blinded. The process of selecting study

samples was repeated until the required sample size was obtained. It took about 6 months continuously and we did not have any problem and stopping.

The data were collected using the State-Trait Anxiety Inventory (STAI) both before the tour and before surgery. The data collection questionnaire had three sections, namely demographic characteristics, state anxiety, and trait anxiety. The validity and reliability of the questionnaire had been confirmed in a study by Dehghan-Nayeri and Adib-Hajbaghery in Iran (α = 0.94).[29] The patients completed the questionnaires about half an hour prior to the intervention at 4:00 p.m. and half an hour before surgery at 6:00 a.m.

There were 20 items for assessing trait anxiety and 20 for state anxiety. Each item was rated on a four-point scale. For state anxiety, the four-point scale was as follows: 1) very low, 2) low, 3) high, and 4) very high. The scale for trait anxiety was as follows: 1) almost never, 2) sometimes, 3) often, and 4) almost always. The minimum score was 20 and the maximum score was 80. The state-anxiety inventory scoring was interpreted as follows: 20-31 as mild anxiety, 32-42 as lower than moderate anxiety, 43-53 as higher than moderate anxiety, 54-64 as relatively severe anxiety, 65-75 as severe anxiety, and 76 or higher as very severe anxiety. The trait-anxiety inventory scoring was interpreted as follows: 20-31 as mild anxiety, 32-42 as lower than moderate anxiety, 43-52 as higher than moderate anxiety, 53-62 as relatively severe anxiety, 63-72 as severe anxiety, and 73 or higher as very severe anxiety.[28]

The control group patients were individually informed by a nurse or a trainer about the routine surgical procedure in the unit the day before surgery. On an orientation tour, the intervention group patients were also informed about the procedure individually the day before surgery from 4 p.m. to 6 p.m. An anesthesia technician, a nurse, and one of the researchers led the tour, which lasted 40 minutes: 10 minutes for visiting an unoccupied operating room during an evening shift, 5 minutes for visiting the intensive care unit (ICU), 10 minutes for vising the surgical unit, getting acquainted with personnel and patients there, and answering questions about CABG, and 15 minutes for speaking with inpatients. None of the participants during the intervention were excluded.

There were two types of variables, namely independent (orientation through the tour) and dependent (anxiety) variables. Demographic variables included age, gender, marital status, and disease duration.

Ethical considerations were taken into account in the present study. Authorities were briefed about the research objectives and granted the researchers a permit. The subjects were not charged for participating in the study. They were assured that their personal and private information would remain confidential. The study results were reported to authorities in the School of Nursing and Midwifery in Isfahan University of Medical Sciences and Shahid Chamran Hospital. This clinical trial was approved by the Research Ethics Committee in the university (code: 396704) and Iranian Registry of Clinical Trials (IRCT) (code: IRCT20180601039934N1).

In order to analyze the data, the independent t-test was used to compare the two groups with respect to the continuous quantitative variables, i.e., age, weight, height, and disease duration. Normality of distribution of the data was tested by Kolmogorov-Smirnov test (K-S test); a P-value greater than 0.05 indicated that the observed distribution of a variable was not statistically different from the normal distribution. The Mann-Whitney U test was applied to compare the two groups with respect to the demographic variables, namely the education level and the economic status. A comparison was made within the groups before and after the intervention using the paired t-test. Data analysis was performed using the SPSS software (version 22, IBM Corporation, Armonk, NY, USA). A P-value below 0.050 was considered statistically significant.

Results

The independent t-test showed that there was no significant difference between the two groups with respect to the mean age, weight, height, and disease duration; accordingly, the two groups were considered homogenous ($P > 0.050$) (Table 1). The Mann-Whitney U test revealed no significant difference between the groups with respect to the education level and the economic status ($P > 0.050$) (Table 2). According to the paired t-test, the mean scores of state anxiety and trait anxiety in the intervention group were significantly lower before surgery (34.83 ± 11.15, 35.40 ± 10.24, respectively) than before the intervention (42.43 ± 13.24, 43.71 ± 12.04, respectively) ($P < 0.001$); however, there was no significant difference between the mean scores of state and trait anxiety before surgery (47.69 ± 11.30, 46.91 ± 9.51) and the mean scores of state and trait anxiety before intervention (45.11 ± 10.19, 45.03 ± 8.76) in the control group ($P > 0.050$) (Table 3).

Table 1. The mean age, weight, height, and disease duration in the two groups

Variable	Intervention group (n = 35)	Control group (n = 35)	Test
	Mean ± SD	Mean ± SD	P*
Age (year)	60.15 ± 11.29	60.71 ± 8.22	0.810
Weight (kg)	71.31 ± 10.25	72.93 ± 13.58	0.620
Height (cm)	163.21 ± 17.91	166.78 ± 10.80	0.370
Disease duration (month)	40.63 ± 9.47	32.13 ± 8.42	0.510

* P-values refer to comparisons of mean age, weight, height, and disease duration between intervention and control groups (independent t-test)
SD: Standard deviation

Discussion

The aim of the present study was to determine the effects of a preoperative orientation tour on the anxiety level in CABG candidates who had attended Shahid Chamran Hospital in Isfahan. The intervention group members were in the age range of 40-81 years and the control group members were in the 48-75 age range. Moreover, 23 patients (65.7%) were men and 12 patients (34.3%) were women. In old age, the risk of CAD is higher, which emphasizes the need for diagnostic tests. Furthermore, aging is one of the major risk factors for atherosclerosis and CAD, which is reported in men over 55 and in women over 45 years of age.[30] In pre-menopausal women, female hormones reduce the risk of CAD significantly.[31,32]

In the intervention group, 91.4% of the patients were married and 91.4% of them were employed. In the control group, 82.9% of the patients were married and 82.9% of them were employed. The majority of patients in the intervention group (71.4%) and in the control group (82.9%) were nongraduate high-schoolers. The reduction of the CVD burden depends on many factors, one of which is the education level. According to Martin et al.[33] and Berkman et al.,[34] there is a significant relationship between the education level of women and cardiovascular risk factors. Gonzalez-Chica et al. reported that patients with poor literacy skills had low self-efficacy, did not follow their diet, and had lower overall quality of life.[35]

The results of the present study revealed that, after the intervention, the patients in the intervention group had significantly lower state and trait anxiety levels than the patients in the other group. In 2014, Kaur et al. investigated the effects of an orientation program on the anxiety level of patients with cancer undergoing radiotherapy for the first time. Their recommendation was that patients should be oriented regarding treatment facilities and what they might expect during the first visit.[36] In 2015, Dehghani et al. examined the impact of a preoperative orientation program on the anxiety level in patients undergoing cardiac surgery and reported that the anxiety level in the intervention group patients had decreased significantly.[37] In the present study, the anxiety level in the patients was assessed before and after the intervention. It decreased but became higher as the surgery hour got closer. The exact preoperative anxiety level was not recorded.

In the present study, the anxiety level in patients was measured before the tour and before surgery in the operating room. It was revealed that the tour had reduced the preoperative anxiety level.

Table 2. The frequency distribution of the economic status and the education level in the two groups

Variable		Intervention group (n = 35)	Control group (n = 35)	Test
		[n (%)]	[n (%)]	P*
Education	Elementary school	9 (25.7)	12 (34.3)	0.250
	Middle school	12 (34.3)	15 (42.9)	
	High school	9 (25.7)	2 (5.7)	
	University	5 (14.3)	6 (17.1)	
Economic status**	Rich	1 (2.9)	3 (8.6)	0.210
	Middle	26 (74.3)	17 (48.6)	
	Poor	8 (22.9)	15 (42.8)	

* P-values refer to comparisons of the economic status and the education level in the two groups (Mann-Whitney U test)
** The economic situation has been reported according to the views of each of the samples in the three categories of rich, middle, and poor

Table 3. The mean scores of pre-intervention and pre-operation state anxiety and trait anxiety in the two groups

Variable	Time point	Intervention group (n = 35)	Control group (n = 35)	Test
		Mean ± SD	Mean ± SD	P
State anxiety	Pre-intervention	42.43 ± 13.24	45.11 ± 10.19	0.340***
	Pre-operation	34.83 ± 11.15	47.69 ± 11.30	< 0.001***
		P ≤ 0.001*	P = 0.070**	
Trait anxiety	Pre-intervention	43.71 ± 12.04	45.03 ± 8.76	0.600£
	Pre-operation	35.40 ± 10.24	46.91 ± 9.51	< 0.001£
		P ≤ 0.001*	P = 0.140**	

* P-values refer to comparison of the mean scores of pre-intervention and pre-operation anxiety in intervention group (paired t-test)
** P-values refer to comparison of the mean scores of pre-intervention and pre-operation anxiety in control group (paired t-test)
*** P-values refer to comparisons of mean scores of state anxiety between intervention and control groups (independent t-test)
£ P-values refer to comparisons of mean scores of trait anxiety between intervention and control groups (independent t-test)
SD: Standard deviation

The reason is that the patients who participated in the tour became familiar with the operating room and special care units, which helped them adapt to the new environment and feel secure. In 2013, Varaei et al. studied the impact of an orientation tour on anxiety and satisfaction levels in candidates for coronary angiography. They reported that the mean score of anxiety was significantly lower in intervention group than in the other group after the tour. During their discharge from the hospital, the mean score was still significantly lower in the intervention group. In addition, there was a significant difference between the two groups with respect to the mean score of satisfaction during their discharge from the hospital.[38] The results of this study are consistent with the results of the present study. Nevertheless, the difference between the two studies is that, although both of them used the same questionnaire for measuring the anxiety level, the mean score of anxiety in candidates for open-heart surgery was higher than that in candidates for cardiac angiography. In fact, the orientation tour could reduce the anxiety level in patients undergoing angiography further, which must have been due to the type of surgery.

It should be mentioned that the intervention group in the present study conversed with inpatients in the surgical unit. This companionship had a very positive and soothing effect on the patients, so that even some of them expressed their satisfaction with the tour and this companionship explicitly. Results of a study by Shamsizadeh et al. are in line with this. They studied effects of peer education on anxiety in CABG candidates and reported that peer education was more effective than direct instruction.[39]

One of the limitations of the present study was that anxiety levels were not compared at different time points, for example, the day after surgery and on the discharge day. Other variables could affect the anxiety level in the patients but the researchers of the current study focused on preoperative anxiety more. It is recommended that future studies consider this comparison.

Conclusion

The results of the current study showed that the preoperative orientation tour had positive effects on anxiety in CABG candidates. Therefore, an orientation tour can be used as a highly effective technique for relieving anxiety and accelerating recovery. It can also help minimize treatment costs associated with a long-term recovery. Definitely, candidates for any other surgery can also benefit from an orientation tour.

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Conflict of Interests

Authors have no conflict of interests.

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