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The Impact of Peer Education on Stress Level in Patients Undergoing Coronary Artery Bypass Grafting

H. Nematian Jelodar (BSc)[1], Y. Jannati (PhD)[2], R. Ghafari (MD)[3], J. Yazdani Charati (PhD)[4], M. Gholami Gorzini (BSc)[5], R. Esmaeili (PhD)*[6]

1.Student Research Committee, Faculty of Nursing and Midwifery, Mazandaran University of Medical Sciences, Sari, I.R.Iran
2.Department of Psychonursing, Faculty of Nasibeh Nursing and Midwifery, Mazandaran University of Medical Sciences, Sari, I.R.Iran
3.Department of Surgery, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, I.R.Iran
4.Health Sciences Research Center, Mazandaran University of Medical Science, Sari, I.R.Iran
5.Heart Center, Mazandaran University of Medical Science, Sari, I.R.Iran
6.Orthopedic Research Center, Mazandaran University of Medical Science, Sari, I.R.Iran

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ABSTRACT

BACKGROUND AND OBJECTIVE: Coronary artery bypass grafting (CABG) is one of the most effective methods in the treatment of cardiovascular diseases. CABG can be a source of stress in candidate patients. Training and education can reduce the induced stress and its devastating physical and psychological side-effects. Therefore, this study was conducted to evaluate the impact of peer education on stress management in CABG candidates.

METHODS: In this clinical trial, 100 CABG candidates, admitted to Mazandaran Cardiac Center, were selected and randomly divided into intervention and control groups. The control group was routinely trained, while peer education, in addition to routine training, was applied in the intervention group in a one-hour meeting the day before the surgery. In order to record patients' personal and medical information, a researcher-made checklist was used. Also, for stress evaluation, DASS-21 questionnaire was applied the day before and one hour before the surgery (IRCT: 2014102619677N1).

FINDINGS: In terms of stress score, no significant difference was observed between the intervention (8.48±1.11) and control (8.86±1.29) groups before the intervention. However, after the intervention (one hour before the surgery), the mean stress score in the intervention group (4.70±0.93) was lower than the control group (9.92±1.88) ($p<0.001$).

CONCLUSION: Based on the findings, peer education could reduce the level of stress in CABG candidates. Therefore, this method is recommended for reducing stress in these patients.

KEY WORDS: Education, Peer Group, Stress, Coronary Artery Bypass Grafting, Clinical Trial.

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Introduction

Currently, cardiovascular disease (CVD) is the leading cause of death, worldwide (1). According to the American Heart Association, one-third of deaths in the United States are caused by CVD (2). In China, India, Pakistan and Middle Eastern countries, the prevalence of CVD is rapidly

***Corresponding Author: R. Esmaeili (PhD)**
Address: Faculty of Nasibeh Nursing & Midwifery, Vesal Ave, Sari, I.R.Iran
Tel: +98 11 33367341
Email: r.esmaeili90@gmail.com

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rising, accounting for 40% of all cases of death (1). According to a recent report by World Health Organization, CVD is the first cause of mortality in Iran, and more than 45% of deaths are caused by coronary artery disease (3). Although medicinal treatments and invasive interventions have greatly reduced the need for surgery in CVD patients, still coronary artery bypass grafting (CABG) is regarded as the first and best option for treatment (4). One common problem of patients before surgery is stress. In fact, stress is intensified in these patients, considering the risks, complications and patient prognosis in this surgery (5). In a study by Lopez et al., unfamiliar environment, fear of surgery, lack of awareness and information about the surgery and its consequences and risk of death were introduced as the main causes of stress and anxiety before surgery in CABG candidates (6). Low stress induces better emotional responses and more appropriate coping behaviors in patients (7), while high levels of stress stimulate the sympathetic nervous system, resulting in increased heart rate and blood pressure, cardiac irritability, cardiac dysrhythmia, increased myocardial oxygen demand (8), changes in immune responses, increased risk of infection, electrolyte imbalance (9), changes in sleep patterns (9), delayed hospital discharge and reduced patient satisfaction with treatment and nursing care (10).

Strategies for the management of pre-operational stress are divided into medicinal and non-medicinal methods. Non-medicinal methods play a significant role in stress reduction of patients, since they are not associated with medical complications, and their implementation is simpler, more effective, less risky, non-invasive and economically affordable for the patients (11).A non-medicinal method for reducing stress in patients before surgery is adequate training and providing patients with information regarding disease management, prevention and follow-up care programs by informed and experienced individuals, also known as peer groups. In this method, considering the mutual characteristics and experiences of group members, an intimate learning environment is created and patients share their experiences and feelings with those who have been affected by the same disease.

Consequently, patients are able to use their peers' useful experiences as a model to improve their condition and reduce its symptoms (12). Peer group members are able to establish an effective and supportive relationship with their teammates and encourage them to have healthy behaviors, since they share their weaknesses, strengths and experiences (13). It seems that peer groups with similar experiences can significantly reduce stress in other participants by sharing their previous successful experiences of surgery. In this regard, Sharif et al. evaluated the effect of peer education on the quality of life in patients undergoing mastectomy.

A significant improvement was observed in the performance aspect of quality of life and patient symptoms in the experimental group (14). Moreover, Dehghani et al. by evaluating the impact of peer education on stress level in patients with multiple sclerosis indicated reduced stress levels in these patients (15).

However, Mohr et al. showed that peer education was not effective in increasing physical health in patients (16). Considering the contradictory results regarding the impact of peer education, high levels of stress in CABG candidates (compared to other surgeries) (17) and scarcity of data on this subject, we aimed to evaluate the impact of peer education on stress in CABG candidates.

Methods

This clinical trial (IRCT: 2014102619677N1) was performed on CABG candidates, referring to Mazandaran Cardiac Center during November–February, 2014. The subjects were selected via accessible sampling and divided into intervention and control groups by blocking method. The blocks were selected on a weekly basis. The control and intervention groups were randomly evaluated during the first and second weeks, respectively. This process continued until data saturation was achieved.

To prevent information interference and bias, sampling was performed every week, in case all subjects were discharged from the hospital within the previous week. If even a single patient was not discharged, the sampling was delayed until hospital discharge (18). The sample size was determined to be 47 cases per group with a statistical power of 95% and power of 80%, based on a similar

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previous study (19). Considering the possible dropout of patients, 50 cases were enrolled in each group. The inclusion criteria were as follows: 1)first-time CABG candidates; 2)minimum age of 18 years; 3)full consciousness and awareness of time, place and people; 4)lack of physical or cognitive disorders; 5)lack of medical education; 6)no previous history of anxiety or depression; 7)non-use of sedatives, antidepressants and anxiety-inducing medicines one month before the study; and 8)no prior history of addiction For data collection, a demographic and medical checklist and Depression, Anxiety and Stress Scale-21 (DASS-21) were used. Face validity was applied to confirm the validity of the demographic and medical checklist.

For this purpose, the checklist was distributed among 10 faculty members of Mazandaran University of Medical Sciences. The required revisions were made, based on expert opinion.The stress scale of DASS-21 (7 items) was used to measure the level of stress in patients. The scoring was based on a Likert scale, consisting of four options: "at all" (score 0), "low" (score 1), "moderate" (score 2) and "severe" (score 3). The minimum and maximum scores for each individual were 0 and 21, respectively. The validity and reliability of this questionnaire have been confirmed in several domestic and international studies (20, 21). Moreover, in the present study, the reliability of the scale was confirmed in a pre-test (Cronbach's alpha= 0.8).

The intervention was based on peer education. In order to select the peers, a list of patients who had undergone CABG over the past two years was reviewed. The inclusion criteria for the peer group were as follows: 1) successful experience of CABG after at least one year; 2) high-school diploma (minimum educational level); and 3) ability to establish proper social interactions (22).In this study, the peer group members were university graduates. To match the intervention groups in terms of age and gender, a 50-year-old man and a 45-year-old woman were selected to train male and female patients, respectively.

The peers were trained by the researcher in three one-hour sessions, based on literature review and in accordance with the educational needs of patients undergoing CABG.In the first session, the patients were trained on the concepts, significance and benefits of peer education and strategies (e.g., deep breathing, music, Quran recitation and prayers) for stress management. The second session included instructions on post-CABG care, physical activity, diet, normal activity level and treatment follow-up for the patients.

In the third session, other needs of candidates such as wound care, use of medications and nutrition were discussed and the peers shared their experiences in this area (22). The peers also received presents after the end of meetings. The ethical considerations were respected throughout the study and informed consent forms were obtained from all patients. In the afternoon before the surgery, the demographic and medical checklist and the stress scale of DASS-21 (7 items) were completed for the patients of both groups. The control group only received routine training, which includes training by a physician, nurse or an educational pamphlet.

The peer group, in addition to the usual training, was instructed by peers for an hour at the presence of the researcher about the importance and benefits of peer education, stress management strategies and care before and after CABG in the afternoon before the operation. Then, the stress level in both groups was measured one hour before the surgery. Data were analyzed using descriptive statistics, Chi-square, analysis of covariance, t-test and Fisher's exact test. $p<0.05$ was considered statistically significant.

Results

Based on the results of this study, the mean age of subjects in the intervention and control groups was 63.84±9.50 and 61.40±7.92 years, respectively. The majority of patients in both groups were male, married and self-employed. Moreover, the educational level of the majority of subjects was less than high-school diploma, and most of the participants lived in rural areas. No significant difference was observed between the two groups in terms of sex, marital status, education, occupational status, age or place of residence. In fact, the two groups were matched in terms of demographic characteristics (table 1).

The results showed that the mean stress score in the control and intervention groups was 8.86±1.29 and 8.48±1.11 the day before surgery,

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respectively, which was not significantly different between the groups. However, the intervention group experienced a significant decrease in stress level after the intervention (4.70±0.93), compared to the control group (9.92±1.88) (one hour before surgery) (p<0.001). (fig 1). Also, based on the analysis of covariance, the mean stress level in the intervention group was 4.4 lower than the control group (by controlling the intervening effect of primary stress).

Table 1. Demographic and medical information of CABG candidates in the intervention and control groups

Variables	Groups	Intervention N(%)	Control N(%)	p-value
Age (year)	40-55	13(26)	12(24)	0.16
	56-70	26(52)	31(62)	
	71-80	11(22)	7(14)	
Gender	Male	32(64)	28(56)	0.414
	Female	18(36)	22(44)	
Marital status	Married	43(86)	42(840	0.341
	Single	7(14)	8(16)	
Educational level	Under diploma	40(80)	44(88)	0.572
	Diploma and higher	10(20)	6(12)	
Occupational status	Employee	2(4)	2(4)	0.449
	Self-employed	20(40)	22(44)	
	Retired	13(26)	6(12)	
	Housekeeper	14(28)	19(38)	
	Unemployed	1(2)	1(2)	
Place of residence	City	18(36)	19(38)	0.836
	Village	32(64)	31(62)	
History of surgery	Yes	31(62)	27(54)	0.418
	No	19(38)	23(46)	
History of hospital admission	Yes	44(88)	37(74)	0.074
	No	6(12)	13(26)	

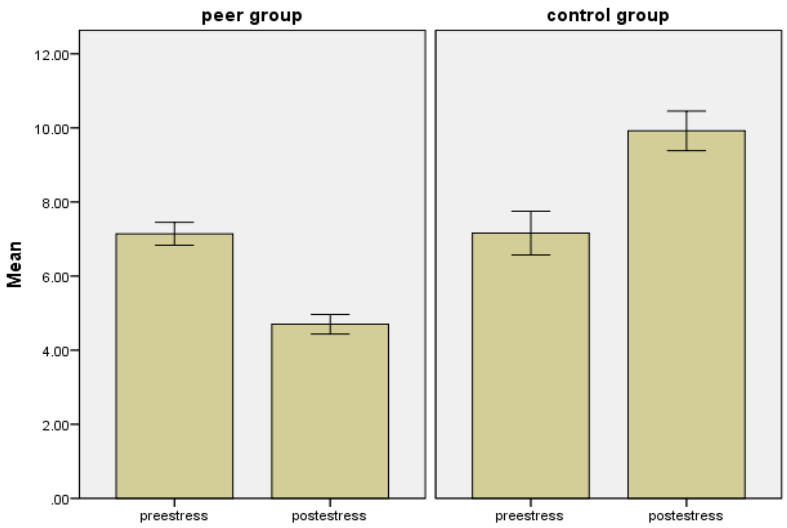

Figure 1. Comparing of stress peer and control groups in pre- and post intervention

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Discussion

The findings of the present study indicated that peer education could reduce stress in CABG candidates. Based on the results, the mean stress score was not significantly different between the intervention and control groups before the intervention; hence, the two groups were homogeneous. Similarly, in a study by Dehghani and colleagues, the mean stress level was not significantly different between the intervention and control groups before the intervention (15). These findings were consistent with the results reported by Hanifi et al., Shafiei et al. and Lianne et al. (23-25). The obtained results showed that the use of peer education could reduce the level of stress in CABG candidates, compared to the control group, which received no interventions. Since stress score was not significantly different between the two groups before the intervention, the observed difference after the intervention is due to the influence of peer education.

Similarly, Dehghani and colleagues in their study on patients with multiple sclerosis found that peer education has a significant impact on reducing patient stress (15). Consistent with the findings of the present research, Kumakech et al. found that peer support reduced psychosocial distress, especially depression, stress, anxiety and anger in the experimental group after the intervention, while the aforementioned symptoms did not alter in the control group before and after treatment. This study suggested the use of peer education for the alleviation of mental and physical symptoms of other diseases (19).

Additionally, Tam and colleagues showed an increase in the quality of life of AIDS patients after 12 months of peer education and support (26). On the contrary, Mohr and colleagues showed that physical health of patients with multiple sclerosis was not affected by peer education (16). This discrepancy could be due to differences in the characteristics of subjects in these two studies. Based on the findings, we can conclude that non-medicinal methods such as peer education could be useful in stress management before surgery. The majority of studies, which used peer training as an educational approach, particularly for the alleviation of mental symptoms, have confirmed the positive impact of this educational method. The positive effect of peer education may be related to the fact that candidates trusted other patients who had controlled their disease symptoms and had enough experience and information regarding their situation. These patients tried to apply strategies, which other patients with similar health conditions had benefited from.In the present study, since the peer group was meticulously selected, they had useful experiences and information about the patients' condition; therefore, they were able to share their experiences with their counterparts in a simple and effective manner.

Adequate sample size, random selection of participants, matching of intervention group and peers, preparation of the peer group and good patient cooperation were among the advantages of this research, compared to other studies in this area. One of the limitations of this study was the individual differences and variations in the psychological status of patients while answering the questions, which could have affected their responses to the items.

Moreover, family, social and economic problems of study units were completely out of the researcher's control.The findings of this study indicated that peer education could reduce the stress level in CABG candidates. Therefore, peer education is recommended to be integrated in patient care programs, aimed at reducing patients' psychological symptoms and improving their living conditions. Moreover, use of peer group as an effective, simple, safe and cost-effective method, which does not require any special facilities, is recommended for preparing patients.

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