Original Article

THE EFFECT OF EDUCATION ON THE STRESS LEVELS IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFT SURGERY

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ABSTRACT

Objectives: To investigate the effect of education on the stress levels associated with Coronary Artery Bypass Graft (CABG) surgery in the week after CABG surgery.

Methodology: The study used a quasi-experimental design. Patients were selected through convenience sampling at a university hospital in Turkey. There were 60 patients in the study; 30 in the experimental group and another 30 in the control group. Data were collected using the Stressors Scale associated with CABG on the third day of the post-operative period.

Results: Cronbach's alpha of the scale was 0.89. Alpha coefficients ranged from 0.82 to 0.79.The difference between the score averages of the experimental and control group was p= 0.002 for the illness-related subscale, p=0.031 for the hospital-related subscale, and p= 0.006 in total.

Conclusion: Education was effective for reduction of stress associated with CABG surgery.

KEY WORDS: CABG Surgery, Stress, Nursing, Education.

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INTRODUCTION

Coronary artery bypass graft (CABG) surgery is physically and psychologically stressful. Patients perceive the surgery as a life-threatening event, have problems adapting to the hospital routines, feel distress and lack of control, and find that hospitalization separates them from their family, friends and everyday life context.[1]

Stress leads to feelings of loss of control of one's life thereby enhancing sensitivity to pain and causing feelings of weakness for those who have undergone CABG surgery. The apparent loss of control prevents the patient who has undergone CABG surgery from maximizing self-care, renders nursing care more difficult and possibly prolongs the recovery process.[2]

There are a number of concerns known about CABG and each of these concerns is known as stressor.[3-5] Patient concerns related to CABG include worry about: chances of operative success, length of the waiting period prior to surgery, fear of death, prior negative hospital experiences, fear regarding the recovery process, fear of peri-operative pain or discomfort, and concern about loss of appetite, fatigue, sleep interruptions, resumption of normal lifestyle,

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post-operative activity, cardiac monitoring, drug addiction, length of hospital stay and hospital expenses.[3-7]

There is little documentation of stress level determination regarding CABG surgery.[3,8-11] Carr and Powers[8] used the Stressor Scale, an instrument with likert scale responses they developed, to examine concerns related to CABG in patients (n = 30) and nurses (n = 18) during the week after surgery. Nurses and patients ratings differed, with nurses rating certain items more stressful for patients than the patients themselves rating those items the week after the surgery. A similar study was conducted to compare the perceptions of 33 patients and their nurses of the stressors involved in the CABG surgery.[9]

Knapp-Spooner and Yarcheski[10] examined the self-reported sleep patterns of patients undergoing CABG surgery and the relationship between their perceived illness-related stress and sleep disturbances. The analysis indicated that hospital and illness-related stress, duration of cardiopulmonary bypass, anesthesia time, and sleep medication were related to patients' sleep disturbance, effectiveness, or supplementation in different ways and at different times during the study periods.

Yarcheski and Knapp-Spooner[11] conducted a replication study with 24 patients and 24 nurses, collecting data about patients on the third day of post-operative period. Results indicated that nurses rated both hospital-related and illness-related stressors as statistically significantly more stressful for CABG patients than did the patients themselves. Patients ranked being away from home or business most stressful, whereas nurses ranked dying due to illness or surgery as most stressful.

The study results of Yarcheski and Knapp-Spooner[11] and Best[9] demonstrated that there were differences in the nurses and patients' perception of stress. Indeed, Gallagher and Mc Kinley[3] stated that if nurses' perceptions of patients' stressors are inaccurate, then nurses must modify their perceptions and guard against transferring their perception of the severity of stressors to their patients. Therefore it is important to accurately determine the stress level of the patients as well as to examine patients' concerns related to CABG. Nurses might not be objective when they evaluate the stress situation of patients in their own way, which might have a negative effect on the quality of patient care.

Patient education is vital in the nursing of surgical patients. In the literature it is explained that education given to patients improves their postoperative well-being. Patients who receive education have a reduced stress level, and shorter length of stay.[12]

To our knowledge, there has been no-known study in Turkey investigating stress level determination regarding CABG surgery .The purpose of this study was to investigate the effect of education on the stress levels associated with CABG surgery in the week after CABG surgery.

METHODOLOGY

Study Design: A quasi-experimental study was conducted in the Cardiovascular Surgery Clinic (CSC) and Intensive Care Unit (ICU) of a university hospital in Erzurum between March 2003 and September 2004.

Criteria for inclusion in the convenience sample were age 18 years or over; the ability to understand, speak and read Turkish; no previous open heart surgery; no known neurological problems; no other known complication; transfer from ICU to the CSC on the second day of the post-operative period. The sample size for this study was 60. Sumbuloglu and Sumbuloglu[13] considered that at least 30 subjects for each group are sufficient for experimental studies and parametric tests. Power analysis was based on a 2- sided alpha of 0.05 with a power of 0.79 when calculated at the conclusion of our study. According to the result of the power analysis, it can be said that the sample's representation level of the population is fine. As one part of the study was carried out in ICU, sometimes we interviewed more than one patient in the same environment. Therefore the participants in this study were not randomly selected as the patients in the ICU were staying in the same room and could be influenced from

each other. All participants gave informed consent to participate and the Ethical Committee of the Institution approved the study protocol.

Data were collected by a form about the sample characteristics and the CABG Stressor Scale developed by Carr and Powers.[8] The CABG Stressor Scale was used by developing 30 items from the literature on stressors commonly experienced by medical-surgical, intensive care, and cardiac / CABG patients.[11] Out of the 30 items in the scale, 18 are hospital-related and 12 are illness-related stressors. The scale employs a 5-point scale (0–4), with higher scores indicating higher levels of stress. Items inquired included "not affected, occasionally affected, sometimes affected, often affected or always affected". Total scores can range from 0 to 120 for the total stressor scale (0 to 72 for the hospital stressor subscale, and 0 to 48 for the illness stressor subscale). The CABG Stressor Scale measures fears and concerns related to hospital such as absence from home/business, following a hospital schedule and related to illness such as resuming lifestyle, progress in recovery.

The patients in the control group followed the routine hospital protocol in which no planned preoperative and postoperative information related to CABG stressors was provided. However the information was provided to the patients in the experimental group about all surgical procedures prior to the surgery and answered their questions using face-to-face interviews and explanations at a private room in the CSC one day before the patient's scheduled operation. Subjects for whom the date of surgery was confirmed were informed about the stressors of CABG surgery and also about methods for handling such stressors as suggested in published literature.

The education lasted for approximately 45 minutes. During this session, study participants and their relatives were informed about the function of coronary arteries, the definition of CABG surgery, preparation for surgery, technological atmosphere of the ICU, timing of resumption of activities post-operatively, post-operative active-passive exercises, visitation rules for the ICU and CSC, available pain relief options, the recovery process, nutrition, potential sleep problems, potential mood changes due to surgery, potential changes in lifestyle and what to expect after discharge from the hospital; subjects' questions were answered and every effort was made to put participants and their families at ease. A pamphlet entitled "What You Need to Know about Heart Surgery" (prepared by the researchers in accordance with current literature and including the above-mentioned issues) was handed out after completion of the pre-operative education. Study subjects were instructed that they would perform respiratory, cough and passive exercises starting on the first post-operative day in ICU and that their questions, if any, would continue to be answered in order to minimize or eliminate any of their concerns.

Each patient in the experimental group was visited by the researcher for approximately one hour in the ICU on the 1st and 2nd day of postoperative period and their questions, if any, broadly covering the items in CABG Stressor Scale (e.g. having cardiac surgery pain/discomfort, sleep interruptions, monitors /other equipment, restricted visiting hours, sharing room with, problems of other patients) were answered. Experimental group patients who were transferred from ICU to the CSC on the second post-operative day were visited by the researchers on both the second and third day of the post-operative period. They were also informed especially about lifestyle, change in eating habits, medications, and exercises, methods of coping with sleeplessness and possible psychological problems.

Since previous study utilized the CABG stressor scale on the third day of the post-operative period,[17] data were gathered by researchers, through face-to-face interviews with all the participants on the third day of the post-operative period after transfer from ICU to CSC. Thus, the researchers gathered the data, they knew which patients were in the control and experimental group. In other words, the groups were not blinded. Data collection took about 15-20 minutes for each patient.

Statistical Analysis: Descriptive statistics were used to describe the sample. Demographic characteristics of individuals in groups were compared using chi-square. Independent- sample t test was used for comparison of the average scores of the experimental and control groups. Internal consistency of the scale was tested using Cronbach's alpha reliability coefficients.

RESULTS

Demographic data are shown in Table-I. There were not statistically significant differences between two groups in relation to their demographic characteristics. This finding shows that the patients in both groups have similar characteristics.

Cronbach's alpha of the CABG Stressor Scale was 0.75 for the illness- related subscale, 0.81 for the hospital-related subscale and 0.87 in total (Table-II).

When compared with the experimental group, the Stressor Scale score averages of the control group were high in the illness-related subscale and total score, and the difference between these groups was statistically significant. (p= 0.002 for the illness-related subscale; p=0.017 in total). There was no statistically significant difference between the score averages of both groups in the hospital-related subscale (p= 0.091 for the hospital-related subscale) However, the score average of the control group was higher than the experimental group (control group = 30.50 ± 12.18, experimental group =25.10 ± 12.15) (Table-III).

DISCUSSION

This study has indicated that the Cronbach alpha Coefficient of the CABG Stressor Scale was 0.75 for the illness-related subscale, 0.81 for the hospital-related subscale and 0.87 in total.

Table-I: Characteristics of the sample

Variables	*Control group*		*Experimental group*		*P-value*
	n=30 (%)		*n=30 (%)*		
Sex					0. 260
Female	11	36.7	7	23.3	
Male	19	63.3	23	76.7	
Marital Status					0. 278
Married	24	80	27	90	
Single	6	20	3	10	
Working Status					1. 689
Housewife	11	36.7	7	23.3	
Public Official	11	36.7	11	36.7	
Self-employed	8	26.6	12	60	
Education					0. 666
Literate	3	10	6	20	
Primary	16	53.3	13	43.3	
Education Completed					
At Least	8	26.7	9	30	
Some Secondary Education Completed					
Graduate	3	10	2	6.7	
ICU experience					
Yes	14	46.7	9	30	0.184
No	16	53.3	21	70	
Age	X ±SD = 56.53± 10.23		X ±SD = 55.53 ± 11.64		0.353

In the study of Carr and Powers[8], coefficient alphas were 0.88 for the illness-related subscale, 0.87 for the hospital-related subscale and 0.92 for the total scale. In the study of Yarcheski and Knapp-Spooner[11], alpha coefficients were 0.72 for the illness-related subscale, 0.74 for the hospital-related subscale and 0.83 for the total scale. Gallagher and McKinley[3] found that internal consistency of the overall scale was 0.92. Our data were compatible with findings of the above studies.

Meta-analyses of the research on preoperative education in patients having a range of CABG surgery have demonstrated a positive impact on outcomes.[14] Stress management strat-

Table-II: Item-Total Subscale Correlation Reliability Coefficients and Mean Score

Scales	*Item-Total SubscaleCorrelation*	*Cronbach* α	*Item*	*Minimum*	*Maximum*	*Items means*	*Mean±SD*
Illness- related	0.25-0.66	0.75	12	0	48	1.77	21.15±8.6
Hospital-related	0.24-0.66	0.81	18	0	72	1.54	27.80±12.3
Total	0.24-0.66	0.87	30	0	120	1.63	48.95±19.72

Table-III: Mean Stressor Scores for the two Study Groups

Groups	Illness- related		Hospital-related		Total	
	Mean	SD	Mean	SD	Mean	SD
Control (n=30)	24.43	8.58	30.50	12.18	54.93	19.28
Experimental (n=30)	17.86	7.38	25.10	12.15	42.96	18.58
P-value	t=3.175 p=.002		t=1.719 p=.091		t=2.447 p=.017	

egies and support for similar patient populations have been previously investigated and the importance of educating these patients has been emphasized in many studies.[5-7,15] In our study, the illness-related sub-score average of the patients in the experimental group was 17.86±7.38; 24.43 ± 8.58 of the control group and there was statistically a significant difference between the score averages of the scale (p= 0.002). In the study, we demonstrated that education was effective in reducing the CABG surgery stressors.

Although this is a special scale which was developed to aim at determining the stress levels related with CABG surgery, the studies which were carried out by using this scale are few or none.[3,8-11] and there is no experimental study, either. Hence, the results of this study which intends to test an education intervention to reduce stress for CABG patients could be discussed with experimental anxiety studies. Our results were partly strengthened by Ku, Ku and Ma,[16] Hartford et al.[17] and Fitzsimonset al.[18] In the quasi-experimental studies of Ku, et al.[16] the mean anxiety averages of the patients on the day before the CABG surgery and on the day of discharge were lower in the experimental group than the control group; there were statistical differences, with a P < .05 level of significance between these 2 groups. In the study by Hartford et al[17], anxiety levels of patients undergoing CABG surgery and receiving education were also found to be lower than those who did not receive education. Fitzsimons et al.[18] found that one of the most predominant feelings expressed by patients awaiting CABG surgery was anxiety.

The study found that there was no difference between hospital-related sub-score averages of the experimental group and those of the control group. The hospital related items are the situations that cannot be easily controlled by the researcher. So some explanations were made to the patients in the experimental group related to hospital stressors such as accepting to be away from home and work, reasons for interval before surgery, restricted visiting hours, hospital procedures, monitors / other equipment and sharing room with others. Despite this, it is impossible for the researcher to fully control the stressors which stem from the environmental and economic factors. So, having no statistical difference between the hospital related stressor score averages was an expected result. However, the score averages of the experimental group were found to be lower, which made us think that the education was effective.

McCormick et al.[5] say that the collective experience of distress symptoms has a greater effect on psychosocial and physical capabilities of CABG patients rather than one individual symptom overpowering the others. In our study, the total stressor score averages of the patients in the experimental group who received education on coping with either illness-related or hospital related stressors prior to surgery were significantly lower than those of the patients who did not receive any planned training.

In this study, ratio of women in the experimental group was 23.3% (n=7), that of men was 76.7% (n=23). Therefore there arises the question of whether the lower detection of mean stressor scores in the experimental group was the result of the education offered or of the low ratio of women. But the ratio of men in the experimental group was 13.4% higher than that of those in the control group. According to this explanation, difference of female gender of 13.4 % between the control and the experimental group does not cause any difference resulting

from gender among the mean stressor scores. However, with so few female subjects in this study, more studies with larger sample sizes are needed.

The number of patients without any ICU experience within the experimental group was higher in proportion to the control group. It sould be thought that the education offered to the experimental group led to the lower detection of their mean stressor scores since there were so many factors the patients in the experimental group do not know about ICU as a result of no previous ICU experience. But, most of the Illness and Hospital-related stressors associated with CABG surgery are independent from ICU stressors.

Limitations of the study: The sample was small which reflects only one area of Turkey. The numbers of female patients in the experimental group were smaller than that of male and the numbers of patients with ICU experience were smaller than that of those with no ICU experience. Therefore the findings must be interpreted cautiously.

CONCLUSION

This study provides valuable preliminary evidence that education can be effective in decreasing CABG patients' stress levels. Nurses can design and test patient-centered interventions that address CABG patient's specific stressors. However, while investigating the effect of education on the stress levels associated with CABG surgery in the week after CABG surgery, it would be useful to look at outcome after few months.

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