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The effect of preoperative training provided to patients undergoing coronary artery bypass graft surgery on postoperative comfort

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Ethics Committee Approval
The study was approved by the Kırklareli University Health Sciences Institute Scientific Research Ethics Committee (November 8, 2019 and 69456409-199-E.19577).
All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

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Abstract

Background/Aim: The most popular surgical procedure for treating coronary artery diseases is coronary artery bypass graft surgery. However, the comfort that patients experience after coronary artery bypass graft surgery varies considerably. The purpose of this study is to ascertain the impact of preoperative training on postoperative comfort in patients undergoing coronary artery bypass graft surgery.
Methods: This study was conducted as a quasi-experimental research investigation the cardiovascular surgery clinic of Edirne Sultan Murat I State Hospital from December 2019 through December 2020. It included 46 patients aged 18–65 who were undergoing their first coronary artery bypass graft surgery and volunteered to participate. The patients in the experimental group (23 individuals), were provided preoperative training; no interventions were made with the patients in the control group. The General Comfort Questionnaire was administered to all of the patients prior to discharge. The necessary ethical and institutional approvals were obtained before the study. Transparent Reporting of Evaluations with Non-randomized Designs was used as the research reporting guideline.
Results: The postoperative General Comfort Questionnaire total score (P<0.001), mean scores of all sub-dimensions (P<0.001) and comfort levels of the experimental group were higher than those of the control group (P<0.001). Preoperative training therefore had a positive impact on postoperative comfort level.
Conclusion: Preoperative training provided to patients improved their postoperative comfort. It is recommended that surgical nurses increase patient comfort by providing patient training before coronary artery bypass graft surgery and that nurses should be supported in administering patient training.

Keywords: cardiac surgery, education, patients, nurses

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Introduction

Coronary artery diseases, which are among the causes of cardiovascular disease, account for 17.9 million deaths annually worldwide [1-3]. The most popular surgical procedure for treating coronary artery diseases, known as coronary artery bypass graft (CABG), restores circulation to the coronary arteries and increases blood flow to the heart muscle layer [4]. The perception of the heart as a functional organ that controls life and death results in cardiac surgery patients facing more intense emotional and psychological reactions to surgery than patients undergoing other surgeries [5]. These issues can negatively affect patient comfort during the perioperative period [6].

Comfort, which is a basic requirement of patients, affects vital signs, recovery time, and daily life activities of patients after surgery [7,8]. Patients who have high comfort levels adapt to treatment more readily, cope better with the stress of a disease, and experience shorter lengths of stay in the hospital [7-11].

The training provided by nurses to patients before surgery is an important stage of surgical preparation, and it is an indispensable part of nursing care [11]. It has been reported in the literature that risk factors for cardiovascular diseases decrease with patient training, patience compliance to treatment increases, anxiety and depression symptoms decrease, and patients undergo positive behavioral changes [12-14]. In CABG surgery, patient training includes information about the hospitalization, preoperative, intraoperative and postoperative periods [15,16]. Preoperative training provided by nurses before CABG surgery reduces patient anxiety and fear, ensures that a patient is supported and strengthened for his/her participation in the care process, eliminates uncomfortable situations and increases comfort level [11].

The study was conducted to determine the effects that preoperative training had on the postoperative comfort of patients undergoing CABG surgery.

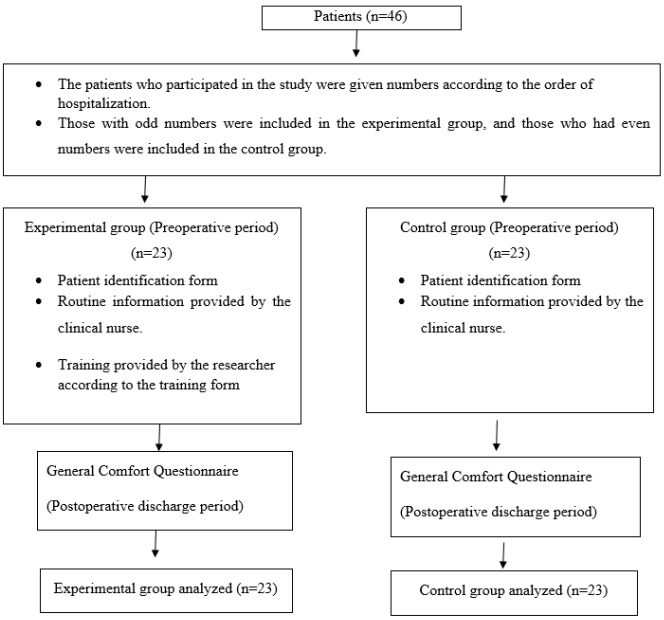
Materials and methods

Study design and sample

This quasi-experimental study was conducted with 46 patients at the cardiovascular surgery clinic of Edirne Sultan Murat I State Hospital between December 2019 and December 2020. The patient cohort included individuals undergoing CABG surgery. The hospital had 22 beds and 9 nurses in its cardiovascular surgery clinic; three nurses work the day shift each day, and two nurses work the night shift. Both elective and urgent surgical procedures are conducted, and the mean number of operations per week is three.

The effect size (d) was found to be 0.999 when calculating an average power of 90.0% at an α=0.05 level of 3.53 (0.24) for the control group and 3.73 (0.15) for the experimental group. When the Type I error rate was set at 0.05 and the power of the test was 0.80 (α=0.05, 1-β=0.80), the minimal sampling size was calculated to be 46 subjects [17]. A simple randomization approach was used to assign numbers to the 46 study participants in the order of their hospitalization; odd-numbered individuals were placed in the experimental group, and even-numbered individuals were placed in the control group. All 46 patients participated in the trial to the end (Figure 1).

Figure 1: Diagram of the study



Every patient had been admitted to the cardiovascular surgery clinic to undergo CABG surgery for the first time; everyone in the cohort volunteered to participate in the study., The patients were all between the ages of 18 and 65, were open to communication and cooperation, were in good mental health, and did not have any vision, hearing, or speech problems. Furthermore, none of the patients had more than two chronic diseases beyond hypertension and diabetes.

The following patients were excluded from the study: individuals who had undergone CABG surgery before, individuals who did not volunteer to participate in the study, individuals who had more than two chronic diseases other than hypertension and/or diabetes, individuals who were not between the ages of 18 and 65, individuals who were not open to communication and cooperation, individuals who were not mentally healthy, and individuals who had vision, hearing, or speech problems.

Ethical considerations

The study adhered to the tenets of the Declaration of Helsinki and the Good Clinical Practice Guidelines. The Kırklareli University Health Sciences Institute Ethics Committee approved the study (November 8, 2019 and 69456409-199-E.19577). Prior to the start of the study, patients were made aware of the investigation and their written, informed consent was obtained.

Data-collection tools

Patient Identification Form

The Patient Identification form, which we prepared based on information from the literature [18,19], was designed to determine the introductory characteristics of the patients who participated in the study. It consisted of 12 demographic questions (age, gender, Body Mass Index (BMI), place of residence, marital status, education level, employment status, health insurance status, chronic disease status, tobacco use, alcohol use, presence of companions), two questions about lengths of stay in the hospital and intensive care unit, and one question about satisfaction with the patient-admission process.

General Comfort Scale

The General Comfort Scale (GCS) was developed by Kolcaba in 1992 [20], and the validity and reliability study of this scale in a Turkish setting was investigated by Kuğuoğlu and

Karabacak [21]. The GCS consists of three levels and four dimensions that constitute the theoretical components of comfort; it is used to determine comfort needs and evaluate expected increases in comfort based on nursing interventions. The scale comprises 48 items and a 4-point Likert design; "1" corresponds to low comfort, and "4" indicates good comfort [20,21]. The scale's sub-dimensions pertain to relief (16 items), relaxation (17 items), and problem-solving (15 items) [20,21]. The scale has a maximum possible total score of 192 and a minimum possible total score of 48. The outcome is parameterized as a mean score between 1 and 4 calculated by dividing the total score by the number of scale items (i.e., 48). Cronbach's α of the scale was determined to be 0.85 [21]. Cronbach's α was calculated to be 0.93 for this study.

Training form

We also prepared a training form based on information from the literature aimed at standardizing the training provided to patients [15,22]. The form included information about coronary artery disease, CABG surgery, the preoperative period (i.e., hospitalization procedures, blood tests necessary for the surgery, anesthesia, what to do the night before the surgery, preparations for the morning of the surgery, transfer conditions to the surgery room), the postoperative intensive care period, procedures to be performed, starting oral intake after surgery, mobilization, admission to the post-intensive care service, and activities to be carried out in the ward, deep breathing and coughing exercises, and exercise with a breathing exercise device (i.e., a spirometer) [15,17].

Control group

Patients in the control group were given the Patient Identification Form to fill out prior to surgery. No further interventions was conducted other than providing routine information (e.g., about checking into the clinic, the doctor's visiting hours, meal hours, the rules of the clinic, medications to be used after the surgery). The GCS was given to patients who were scheduled to be discharged during the postoperative period. For the purpose of the study, patients in the experimental and control groups were kept in separate rooms to prevent them from interacting with one another.

Experimental group

Patients in the experimental group were given the Patient Identification Form to fill out prior to surgery. During the preoperative period, the patients received not only the routine information noted above but also training according to the training form. Training took an average of 30–40 minutes for each patient. The GCS was then given to patients who were scheduled to be discharged during the postoperative period.

Statistical analysis

We used SPSS version 20.0 (IBM, New York, USA) to analyze the data. We assessed the reliability (internal consistency) of the GCS using Cronbach's α. We used the Single Sample Kolmogorov-Smirnov test to evaluate the normality of the data. The study's socio-demographic data were analyzed using numbers, percentages, means, standard deviations, the Student's t-test, the Mann-Whitney U test, Yates chi-squared test, Pearson's chi-squared test and Fisher's exact test. The Mann-Whitney U test was used to determine the total and sub-dimension mean scores and comfort levels of the GCS. The Mann-Whitney U test was used to compare the mean GCS total and sub-dimension scores and comfort levels of the experimental and control groups. A *P*-value of 0.05 was adopted as indicating statistical significance.

Blinding

The researcher was aware of the patients who was provided training. The researcher and the patients who were provided training prior the surgery could not be blinded due to the nature of the study.

Results

The average ages and BMIs of the patients in the experimental and control groups were statistically similar: 57.9 [6.8] years vs. 57.6 [7.1] years; 29.7 [6.2] kg m^{-2} vs. 29.3 [4.1] kg m^{-2}. Furthermore, no significant differences persisted between the groups in terms of hospitalization duration—16.7 [1.9] days vs. 17.5 [1.7] days (*P*=0.177)—or intensive care unit stay duration—2.5 [0.6] days vs. 2.7 [0.6] days (*P*=0.401) (Table 1).

Table 1: Quantitative socio-demographic data of the patients (n=46)

	Experimental (n=23) Mean (SD)	Control (n=23) Mean (SD)	*P*-value
Age	57.9 (6.8)	57.6 (7.1)	0.900[a]
BMI	29.7 (6.2)	29.3 (4.1)	0.791[a]
The length of stay in hospital	16.7 (1.9)	17.5 (1.7)	0.177[b]
The length of stay in intensive care unit	2.5 (0.6)	2.7 (0.6)	0.401[b]

n: Number of patients, SD: standard deviation, [a] Student t Test, [b] Mann Whitney U Test, BMI: Body Mass Index

There were no statistically significant differences in gender (*P*=0.231), place of residence (*P*=1.000), marital status (*P*=1.000), education level (*P*=1.000), employment status (*P*=0.225), health insurance status (*P*=1.000), chronic disease status (*P*=0.757), tobacco use (*P*=0.167), or satisfaction with the patient-admission process (*P*=0.233) between the experimental and control groups. On the other hand, significant differences were detected between the experimental and control groups in terms of alcohol use (*P*=0.038) (Table 2).

Table 2: Categorical socio-demographic data of the patients (n=46)

		Experimental (n=23)		Control (n=23)		*P*-value
		n	%	n	%	
Gender	Woman	12	52.20	7	30.40	0.231[c]
	Man	11	47.80	16	69.60	
Place of residence	Town center	18	78.3	17	73.9	1.000[c]
	Town/village	5	21.7	6	26.1	
Marital status	Married	22	95.70	22	95.70	1.000[d]
	Single	1	4.30	1	4.30	
Education	Elementary and below	20	87.0	20	87.0	1.000[d]
	High school and above	3	13.0	3	13.0	
Employment status	Not working	8	34.8	3	13.0	0.225[e]
	Working	6	26.1	8	34.8	
	Retired	9	39.1	12	52.2	
Health insurance	Yes	22	95.70	22	95.70	1.000[d]
	No	1	4.30	1	4.30	
Chronic disease	Yes	9	39.1	7	30.4	0.757[d]
	No	14	60.9	16	69.6	
Cigarette	No	20	87.0	15	65.2	0.167[d]
	Yes	3	13.0	8	34.8	
Alcohol	No	21	91.3	14	60.9	0.038[d]
	Yes	2	8.7	9	39.1	
Presence of companions	Yes	23	100.00	23	100.00	-
	No	0	0.00	0	0.00	
Satisfaction with the admissions process	Yes	23	100.00	20	87.00	0.233[d]
	No	0	0.00	3	13.00	

n: Number of patients, [c] Yates ki-kare Test, [d] Fisher exact Test, [e] Pearson ki-kare Test

We also found that the total score of the GCS (*P*<0.001), the physical sub-dimension score (*P*<0.001), the psychospiritual sub-dimension score (*P*<0.001), the environmental sub-dimension score (*P*<0.001), and the socio-cultural sub-dimension score were

significantly higher for individuals in the experimental group (P<0.001). The mean scores in terms of the relief, relaxation, and superiority comfort levels of the experimental group were additionally significantly higher than those of the control group (P<0.001) (Table 3).

Table 3: General comfort questionnaire scores and comfort levels of the patients

	Experimental (n=23) Mean (SD)	Control (n=23) Mean (SD)	*P*-value [b]
General Comfort Questionnaire total	3.29 (0.16)	2.65 (0.17)	<0.001
Physically	3.20 (0.26)	2.20 (0.17)	<0.001
Psychospiritual	3.70 (0.21)	2.93 (0.29)	<0.001
Environmental	3.14 (0.20)	2.72 (0.15)	<0.001
Socio-cultural	3.05 (0.23)	2.72 (0.21)	<0.001
Comfort levels			
Refreshment	3.09 (0.20)	2.51 (0.22)	<0.001
Relaxation	3.39 (0.19)	2.68 (0.21)	<0.001
Superiority	3.38 (0.20)	2.76 (0.21)	<0.001

[b] Mann Whitney U Test, SD: standard deviation

Discussion

Patients in the experimental group patients had higher mean scores for all sub-dimensions of the postoperative GCS and higher comfort levels compared with the patients in the control group. Another recent study also found that providing preoperative training to patients undergoing CABG surgery boosted their comfort scores [18]. In their randomized controlled studies, Pazar and Iyigün [22] and Güner and Karakoç Kumsar [19] determined in their study that the comfort level of patients who received training in the preoperative period was higher. Other researchers have determined that providing training to patients scheduled for hip replacement surgery increased their level of postoperative comfort [17]. In a study conducted with patients undergoing day case surgery, researchers found that preoperative training had positive effects on patient comfort levels [23]. Kızıl Toğaç and Yılmaz [24] in their study with laparoscopic cholecystectomy patients and Oshvandi et al. [25] stated in their study with transradial coronary angiography patients that the training provided increased the patients' comfort scores. Yu et al. [26] reported that nursing training provided to cancer patients increased their comfort levels, and Kacaroğlu [27] found that training increased the comfort level of hemodialysis patients.

Limitations

This study had some limitations. First off, our findings cannot be generalized because they are based on data from a single center. In addition, the anxiety level of the patients was not determined—anxiety could have affected the patients' comfort levels. Multicenter studies in which patients' anxiety levels are determined and studies evaluating the effect of preoperative training on postoperative comfort level will be important.

Conclusion

We determined that training administered to patients before CABG surgery positively affected their postoperative comfort. It is critical that surgical nurses effectively use their role as patient educators to boost patient quality of care and facilitate the recovery process. We recommend that research on patient comfort be conducted with larger numbers of patients who are undergoing different surgical interventions; the educational role of surgical nurses should also be supported.

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