

Original Article

The Comfort Level of Patients who Underwent Coronary Artery Bypass Graft Surgery

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Abstract

Purpose: The study was conducted to investigate the comfort level in patients who underwent coronary artery bypass surgery.

Methods: The study was conducted as a descriptive and cross-sectional study. The sample of the study consisted of 240 patients who underwent coronary artery bypass graft surgery in the cardiovascular surgery service of a training and research hospital in Istanbul. The inclusion criteria comprised first time CABG surgery; age of 30-75; who agreed to participate in the study; having the ability to communicate; not under treatment for severe psychological and neurological disorders. Written informed consent was obtained from each participant. Data were gathered with a questionnaire composed of questions about sociodemographic features, Perianesthesia Comfort Questionnaire, General Comfort Questionnaire, and State-Trait Anxiety Scales. For assessment of data; frequency, percentage, mean scores, Kruskal Wallis test and Mann Whitney-U test were benefited. The statistical significance was set at $p < 0.05$.

Results: The mean age of the patients was 58.58 ± 7.71 years, 71.2% were male, 79.1% were primary school graduates, 68.8% were unemployed, 57.5% had sufficient monthly income to meet their health expenditures, and 61.2% smoked. It was determined that 62.60% of the patients had double and triple vessels coronary artery bypass graft surgery. In the study, total score of Perianesthesia Comfort Questionnaire was found as 143.40 ± 22.26 ; General Comfort Questionnaire was found as 3.33 ± 0.24 . It was determined that the state anxiety level was 31.05 ± 6.80 , the mean trait anxiety level score was 41.78 ± 8.58 . A statistically significant difference was found between the general comfort level and the number of bypass graft vessels ($p < 0.05$).

Conclusion: The perianesthesia and general comfort levels among the patients were high, their state anxiety was low and their trait anxiety was moderate. It can be said that qualified nursing care given to individuals undergoing CABG increases patient comfort.

Keywords: Comfort, Coronary artery bypass graft, Postoperative care.

Introduction

Coronary artery disease (CAD) is an important health problem all over the world and is also an important cause of morbidity and mortality. The mortality rate of CAD remains high (Abbasi et al., 2014; Guzelhan et al., 2018; Schmidt-RioValle et al., 2020). According to the World Health Organization (WHO), it is estimated that there were 15.8 million individuals with CAD in 2010, and it is expected to increase to 23 million by 2030. According to the Turkish Adult Risk Factor

Study (TEKHARF) conducted in Turkey, it has been determined that among 906 people who registered in 26 years (1990-2016) and lost their lives, the reason of 42.0% of the deaths was coronary heart diseases (TEKHARF Report, 2017; TCD Report, 2020). The number of patients, who have undergone coronary artery bypass graft (CABG) surgery in the world and in Turkey, is also increasing gradually (Kuguoglu & Karabacak, 2008; WHO, 2014; Weatherby, 2018; TCD Report, 2020) CABG surgery is

the most effective treatment option when the survival rate, improvement of ventricular function, and relief from recurrent chest pain are considered. Coronary artery bypass graft surgery is a procedure used to improve blood supply and oxygenation of the myocardium, to which blood is not sufficiently supplied due to coronary atherosclerosis, by using artery and vein grafts (Abbasi et al., 2014; Weatherby, 2018; Guzelhan et al., 2018; Totur Dikmen & Yavuz van Giersbergen, 2021). With this surgical intervention, myocardial perfusion of the patient is improved, symptoms related to ischemia are relieved, the incidence of myocardial infarction and sudden death is reduced, and the daily life of the patient is ensured to continue without pain. However, the patients undergoing coronary artery bypass graft surgery may face the possibility of many complications in the post-operative period. In such patients, it has been reported that conduction defects, dysrhythmias, acute renal insufficiency, neurological complications, bleeding, mediastinitis caused by sternotomy incision, low cardiac outflow syndrome, and pain and respiratory problems due to sternotomy, thoracotomy, and chest drains have developed in the early postoperative period (Heilmann et al. 2016; Guzelhan et al., 2018; Schmidt-RioValle et al., 2020).

In coronary artery bypass graft surgery, which is a major surgical intervention, the patient undergoes a process that negatively affects both physical and psycho-social conditions due to pain and fear of death. In other words, the comfort of the patient may be affected. Provision and maintenance of comfort in the patients undergoing coronary artery bypass graft surgery should take place among the goals of care (Demir Korkmaz et al., 2015; Heilmann et al., 2016; Rodrigues et al., 2018).

Comfort, which exists as an important concept since Florence Nightingale, is an essential requirement for people. Today, it is considered as a key element of holistic care by the nurses (Kolcaba, 2003; Krinsky et al., 2014; Bice & Bramlett, 2019). According to Kolcaba, who provided the development of the theory of comfort, comfort is “an expected result with a complex structure within the physical, psychospiritual, social, and environmental integrity of helping the needs

of the individual, providing peace, and overcoming the problems” (Kolcaba, 2003; Bice & Bramlett, 2019). As a result of the analytical studies conducted regarding the use of the concept of comfort in the discipline of nursing, Kolcaba stated that comfort is a positive, holistic, multidimensional, theoretically definable, and a practical concept (Kolcaba, 2003). With a holistic approach, the concept of comfort is relieving, resting, and meeting basic human needs to overcome the problems (Kolcaba, 2003; Wilson & Kolcaba, 2004; Pinto et al., 2017; Bice & Bramlett, 2019). Comfort is accepted as an expected positive result in the patient. The patient, who underwent CABG surgery, may be exposed to problems such as pain, respiratory problems, circulatory problems, nausea and vomiting, constipation, hypothermia, fluid-electrolyte imbalance, risk of surgical site infection, and anxiety in the postoperative period, and thus, the patient comfort may be deteriorated (Wilson & Kolcaba, 2004; Rodrigues et al., 2018). The aim of the present study is to examine the comfort level and affecting factors in the patients undergoing coronary artery bypass graft surgery, to improve the quality of care for these patients, and to guide the nursing interventions and the determination of priorities to be applied to the patients.

Methods

Purpose: The study was conducted to investigate the comfort level in patients who underwent coronary artery bypass surgery.

Research Questions

- 1-What is the level of comfort among patients who had coronary artery bypass grafting?
- 2- What is the level of anxiety among patients who had coronary artery bypass grafting?
- 3-Are there significant relationship between the comfort, anxiety levels scores of patients who underwent coronary artery bypass graft surgery and their demographic and clinical characteristics?

Desing: The study was conducted as a descriptive and crosssectional study.

Setting and sampling: The sample of the study consisted of 240 patients who underwent coronary artery bypass graft surgery in the cardiovascular surgery service of a training and research hospital in Istanbul. The inclusion criteria comprised first time CABG surgery; age of 30-75; who agreed to

participate in the study; having the ability to communicate; not under treatment for severe psychological and neurological disorders. We explained the purpose of the study to patients who met the inclusion criteria and introduced the scales. Written informed consent was obtained from each participant.

Data collection and instruments: Data were gathered with a questionnaire composed of questions about sociodemographic features, Perianesthesia Comfort Questionnaire, General Comfort Questionnaire, and State-Trait Anxiety Scales.

Demographic data form: On a standardised form, we recorded age, gender, employed status, marital status, educational level, smoking status, surgical intervention time, number of bypass vessels of the patients.

Perianesthesia Comfort Questionnaire (PCQ): The PCQ was developed by Kolcaba to determine the comfort needs and to evaluate the nursing initiatives that provide comfort and the increase in comfort (Kolcaba, 2003; Wilson & Kolcaba, 2004). The questionnaire was created with the guidance of a taxonomic structure that includes three levels and four dimensions that constitute the theoretical components of comfort. PCQ identifies comfort needs and assesses whether or not the patient have reached the desired level of comfort. The adaptation of the questionnaire to Turkish was performed by Ustundag and Aslan in 2010. The questionnaire consists of 24 items about self concept which reflects the patient's general way of thinking during the perianesthesia period. The questionnaire consists of positive and negative items. The items of the questionnaire are sorted in a mixed way as positive and negative. Items are scored on a Likert type scale from 1 ("I totally disagree") to 6 ("I totally agree"). The total score ranges from 24 to 144. In the evaluation of the questionnaire, the obtained negative scores are added to the positive items by reverse coding. The mean score is calculated by dividing the total score to the number of items and the result varies from 1 to 6. Low scores indicate poor comfort levels whereas high scores indicate excellent comfort (Ustundag & Aslan, 2010). Cronbach's α of the PCQ in this study was 0.83.

General Comfort Questionnaire (GCQ): GCQ was developed by Kolcaba. GCQ was based on the taxonomical structure regarding

three levels and four dimensions of the theoretical components of comfort (Kolcaba, 2003). GCQ identifies the comfort needs and nursing interventions providing comfort and thus assesses whether or not the patient have reached the desired level of comfort. The questionnaire consists of 48 items with a 4-point Likert-type scale. The questionnaire evaluates comfort both in dimension and level. It includes physical (12 items), psychospiritual (13 items), environmental (13 items), and sociocultural (10 items) comfort dimensions. It evaluates the comfort levels as relief (16 items), ease (17 items), and transcendence (15 items). The questionnaire consists of positive and negative items. A high score (4 points) in positive items indicates high comfort, and a low score (1 point) indicates low comfort; a low score (1 point) in negative items indicates high comfort, and a high score (4 points) indicates low comfort. The mean score is calculated by dividing the obtained total score to the number of items in the questionnaire. The lowest score obtained from the questionnaire, 1 point, indicates low comfort, and the highest score obtained from the questionnaire, 4 points, indicates high comfort. The adaptation of the questionnaire to Turkish was conducted by Kuguoglu and Karabacak in 2008. The reliability and validity study by Kuguoglu and Karabacak identified that the Cronbach's alpha coefficient values was 0.85 (Kuguoglu & Karabacak, 2008). In this study, The Cronbach's α coefficient was determined as 0.82.

State-Trait Anxiety Scale (STAI): The State-Trait Anxiety Scale was developed by Spielberger et al. in order to determine the levels of state and trait anxiety. The reliability and validity study for the Turkish form of the scale was conducted by Oner and Le Compte. The scale was based on the two-factor conceptualization of anxiety and consists of two parts and 40 items in total. The first 20 items measure the level of state anxiety and items 21-40 measure the level of trait anxiety. This scores 20-39 indicate "low" levels of anxiety, 40-59 "moderate", 60-79 "severe", and 80 "panic" (Oner & Le Compte 1998). The Cronbach alpha coefficient values for subdimensions in the study were identified as follow: 0.88 for state anxiety, 0.86 for trait anxiety, 0.89 for total score.

Data collection procedures: The researchers interviewed each patient in the clinic. Data were collected by face-to-face interviews in the patient room. The researchers interviewed each patient in the cardiovascular surgery ward. Each session of data gathering took 20 minutes. Statements from the survey, which could not be understood by the patients in the data collection forms, were explained by the researchers.

Ethical considerations: The study was approved by the ethical committee of the university where the researchers worked and permission was obtained from the directorate of the hospital where the study was conducted. Informed consent was obtained from all the participants included in the study. The study conformed to the principles of the Declaration of Helsinki.

Data analysis: The data were analysed by using the SPSS 15 program (SPSS Inc., Chicago, IL, USA). Descriptive statistics such as frequency, mean, standard deviation and percentage were used to analyse all the variables under study. In the comparisons between binary groups, the Mann–Whitney U test was used, and in the comparison of groups with three or more variables, the Kruskal–Wallis variance analysis was used. Significance was accepted in a 95% confidence interval and a level of $p < 0.05$. To determine which group or groups caused the difference, Mann–Whitney U was performed. Using Bonferroni correction, the significance level was set at $p < 0.0167$ when three groups were compared and at $p < 0.0125$ when four groups were compared.

Results

The mean age of the patients was 58.58 ± 7.71 years, 71.2% were male, 79.1% were primary school graduates, 68.8% were unemployed, 57.5% had sufficient monthly income to meet

their health expenditures, and 61.2% smoked. All of the participants were married with children. When the characteristics of the surgical intervention are considered, it was found that 62.60% of all the patients underwent double or triple, 18.80% had single, 15.70% quadruple, and 2.90% quintuplet coronary artery bypass graft. Surgical intervention period of the patients was 3.11 ± 0.70 hours on average (Table 1).

In the study, total score of Perianesthesia Comfort Questionnaire was found as 143.40 ± 22.26 ; General Comfort Questionnaire was found as 3.33 ± 0.24 . It was determined that the state anxiety level was $31.05 \pm 6.80 \pm 6.80$, the mean trait anxiety level score was $41.78 \pm 8.58 \pm 8.58$ (Table 2). There was no statistically significant difference between the number of bypass vessels and the mean perioperative PCQ scores. A significant difference ($p < 0.05$) was found between the number of bypass vessels and the mean GCQ scores of the patients. In the advanced statistical analysis, it was determined that the difference was caused by the quadruple coronary artery bypass graft group, and the level of general comfort of the patients in this group was higher. No statistically significant difference was found between the number of bypass vessels and the state and trait anxiety levels of the patients.

There was no statistically significant correlation between the individual characteristics and perioperative comfort level. A statistically significant correlation was found between the gender, education level, monthly income, and the mean general comfort level of the patients. A statistically significant correlation was found between the gender, education level, monthly income, and the mean trait anxiety level of the patients (Table3).

Table 1. Demographic Characteristics of Patients (N=240)

Variables	n	%
Age (years)	(Mean±SD)	58.58 ± 7.71
35-50	119	49.6
51-69	121	50.4
Surgical intervention time (h)	(Mean±SD)	3.11 ± 0.70

Gender		
Famale	69	28.8
Male	171	71.2
Education status		
Primary	190	79.1
High school	40	16.7
University	10	4.2
Employment status		
Unemployed	165	68.8
Employed	75	31.2
Income		
Adequate	138	57.5
Inadequate	102	42.5
Smoking		
Yes	147	61.2
No	93	38.8
Number of bypass vessels		
1	45	18.80
2	75	62.60
3	75	62.60
4	38	15.70
5	7	2.90

Table 2. Mean scores of the scales

Scales	Mean±SD	Min-Max	Range
PCO	5.06±0.50	2.96-5.92	1-6
GCO	3.33±0.24	2.31-3.88	1-4
SAI	31.05±6.80	20-64	20-80
TAI	41.78±8.58	22-63	20-80

SD standard deviation, Min minimum, Max maximum, PCQ: Perianesthesia Comfort Questionnaire, GCQ: General Comfort Questionnaire, SAI: State Anxiety Scale, TAI: Trait Anxiety Scale

Table 3. The comparison of PCQ, CCQ and STAI according to sociodemographic characteristics (N=240)

Variables	PCQ Mean±SD	CCQ Mean±SD	SAI Mean±SD	TAI Mean±SD
Age(years)				
35-59	5.09±0.47	3.35±0.24	30.51±6.59	41.65±8.18
60-69	5.02±0.52	3.30±0.26	31.59±6.99	41.91±8.99
U	6779.5	6454.50	6522.00	7155.00
p	0.434	0.199	0.206	0.934
Gender				
Female	5.02±0.48	3.26±0.27	32.15±7.87	46.95±9.09
Male	5.07±0.51	3.35±0.23	30.61±6.29	39.70±7.43
U	-1.03	-2.45	-1.085	-5.606
p	0.302	0.014	0.278	0.001
Education status				
Primary	5.04±0.49	3.30±0.24	31.38±6.95	42.68±8.43
High school	5.05±0.57	3.40±0.22	30.45±6.57	39.95±7.91
University	5.37±0.39	3.50±0.18	27.30±2.58	32.10±7.38
KW	5.475b	10.901	5.408	14.812
p	0.065	0.004	0.067	0.001
Employed status				
Unemployed	5.05±0.53	3.32±0.26	31.04±6.99	41.74±9.01
Employed	5.06±0.43	3.33±0.20	31.08±6.42	41.88±7.60
U	-0.286	-0.269	-0.327	-0.376
p	0.775	0.788	0.744	0.707
Income				
Adequate	5.05±0.51	3.35±0.24	30.09±5.86	40.30±8.48
Inadequate	5.06±0.49	3.29±0.24	32.36±7.74	43.79±8.34
U	-0.061	-2.082	-2.170	-3.313
p	0.951	0.037	0.030	0.001
Number of bypass vessels				
1	4.95±0.49	3.29±0.22	30.35±5.71	42.97±8.99
2	5.03±0.58	3.30±0.28	32.37±7.72	42.41±9.13
3	5.09±0.41	3.30±0.20	30.78±6.47	42.45±8.46
4	5.11±0.50	3.43±0.24	30.47±6.77	38.68±6.59
5	5.35±0.34	3.48±0.15	27.57±5.31	37.14±7.26
KW	6.175	14.386	KW=5.326	KW=7.521
p	p=0.186	p=0.006	p=0.255	p=0.111

p< 0.05. The Mann–Whitney U test was used for binary groups and the Kruskal–Wallis test was used for three for more groups.

Discussion

Improvements in surgical sciences and medical technology have brought the developments in surgical treatment and care along. Although coronary artery bypass graft surgery is a life-saving practice, it affects the individual with all its dimensions and may cause deterioration or change in comfort (Krinsky et al., 2014; Schmidt-Rio Valle et al., 2020). In the present study, mean perioperative comfort level was found as 5.06 ± 0.50 (Range 1-6) and mean general comfort level as 3.33 ± 0.24 (Range 1-4). These data show that the comfort level of the patients is high. In the study conducted by Demir Korkmaz et al. (2015) reported that the quality of life of the patients after coronary artery bypass surgery was significantly higher. Yilmaz et al. (2018) found that total mean PCQ scores was 4.26 ± 0.58 and Seyedfatemi et al. (2014) stated that the comfort of the patient was high after the surgical intervention. It is known that when health care is provided by the health professionals, who have adopted a holistic approach, it increases the confidence of the patient and provides relief. At the same time, the fact that the structure and equipment of the hospital, where the study was conducted, are the factors facilitating the comfort and maintenance of the patients, it is considered that they also have an effect on the results obtained from the study.

No statistically significant difference was found between the age of the patients within the scope of the study and PCQ and GCQ levels. Similar to this study, it was determined that the symptoms related to the disease reduced after the coronary artery bypass surgery in the majority of the patients (Theobald et al., 2005; Tung et al., 2007; Abbasi et al., 2014; Heilmann et al., 2016; Schmidt-Rio Valle et al., 2020). It is thought to be seen in all the age groups. When the mean scores of comfort levels were observed by gender, while there was no statistical difference between them and PCQ, a statistically significant difference was found between them and GCQ. The comfort level of male patients was higher than that of female patients. Tung, et al. (2007) have suggested that physical recovery after CABG was faster in male patients than in females. The fact that male patients have higher general comfort

levels suggests that female patients with more responsibilities for their home and children may be effective.

In the study, it was found that there was a statistically significant difference between the education level and the mean score of the GCQ, and the mean score of the questionnaire increased as the education level increased. In a study Seyedfatemi et al. (2014), reported that the comfort level of postgraduate patients was higher. Increase in the educational level can lead to have more knowledge about health and disease. The information obtained leads to the reduction of anxiety and the relief of the patient. The results of the study were found to be compatible with the similar studies (Theobald et al., 2005; Seyedfatemi et al., 2014).

It is assumed that being in good economic standing or having a high purchasing power brings self-confidence and comfort together. In the current study, it was determined that there was a statistically significant difference between the mean GCQ scores of the patients with low income and low comfort levels. The results of the study were found to be compatible with the literature (Theobald et al., 2005; Tung et al., 2007).

Coronary artery disease causes pain, dyspnea, fear of myocardial infarction, and functional impairment. These troubles increase in proportion to the number of vessels affected (Rodrigues et al., 2018; Weatherby, 2018; Schmidt-Rio Valle et al., 2020; Totur Dikmen & Yavuz van Giersbergen, 2021;). It is reported in the literature that the patients feel more comfortable in multiple bypass (Weatherby, 2018; Schmidt-Rio Valle et al., 2020). In the present study, a statistically significant difference was found between the number of vessels for bypass and their comfort levels when compared to GCQ ($p < 0.05$). Comfort scores are higher in the patients with increased number of vessels replaced. In previous studies, it was stated that the rate of chest pain decreased after CABG surgery (Tung et al., 2007; Abbasi et al., 2014; Demir Korkmaz et al., 2015; Heilmann et al., 2016). After the surgical intervention, the patient calms down due to the thought that the intervention was successful, and thus, the individual relieved from the signs and symptoms caused by CAD. It can be stated

that the increase in the physical capacity of the patients, the relief of chest pain, relief of breathing, and relief after the surgical intervention due the elimination of their fear of infarction, in other words, to an increase in their comfort.

It is known that every patient, who learns that the treatment should be conducted via a surgery, will be negatively affected and got stressed by this situation (Theobald et al., 2005, Guzelhan et al., 2018). However, Kolcaba (2003) expresses that the patients will be positively affected by the comfort-providing care practices for the elimination of stress-related problems that emerge in the patient. In the present study, it was found that the average state anxiety level was 31.05 ± 6.80 , and trait anxiety was moderate (41.78 ± 8.58) in the patients undergone a major and risky surgical process such as CABG surgery. A score of 20-40 is considered as mild anxiety, and score over 40 as moderate anxiety. Okan et al. (2006) reported that the patients hospitalized for a surgical intervention had higher levels of anxiety than other patients, and that they experienced moderate anxiety leading to panic. It was seen that the occurrence of mild and moderate anxiety in the patients was consistent with the literature. The mental and physical reactions of people to existing health problems may vary according to their age, events/situations they live, their educational level, and the available opportunities. In addition, expectations from the health care professionals may differ in the comments of the level of meeting these expectations.

No statistically significant difference was found between the demographic characteristics of the patients and their mean state anxiety scores ($p > 0.05$). A statistically significant difference was found between the genders of the patients and their trait anxiety scores ($p < 0.05$). It was found that female patients had higher trait anxiety scores. Previous similar studies also show that women have lower mental health recovery scores and coping scores, higher fatigue scores, and lower quality of life scores after CABG surgery (Joseph et al., 2015). A statistically significant difference was found between the educational levels of the patients and their trait anxiety scores ($p < 0.05$). It was found that people, who graduated from

primary school, had high anxiety scores. Despite there was no statistically significant difference between them, it was observed that the state anxiety scores of the primary school graduates were also high. In the study conducted by Okan et al. (2006) reported that the patients with low level of education, who underwent surgical treatment, had higher levels of anxiety and depression. Accessing and interpreting the information obtained is closely related to the level of education. When this situation is considered, it can be specified that high anxiety levels is an expected result in the patients with low level of education. A statistically significant difference was found between the patients, whose monthly level of income is sufficient for health expenditures and whose trait anxiety scores are low. ($p < 0.05$). It was observed that the findings of the study were found consistent with the previous studies (Okanlı et al., 2006, Heilman et al., 2016; Guzelhan et al., 2018).

Conclusion: The present study has shown that the patients, who underwent CABG surgery, had high perioperative comfort and general comfort levels, mild state anxiety, and moderate trait anxiety levels. The findings will be guiding for the determination of the comfort level after the surgical intervention and the care plan. Provision of comfort in all aspects of patient care takes place among the important duties of the nurse. Nursing approaches affecting the increase in comfort are health-promoting behaviors.

Limitations of the Study: The study was conducted in a hospital and the research findings were limited to the study group, they cannot be generalized to all patients.

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