The Effect of Music on Anxiety and Pain Level in Patients Who Had Coronary Artery Bypass Graft Surgery

Koroner Arter Bypass Greft Cerrahisi Uygulanan Hastalarda Müziğin Anksiyete ve Ağrı Düzeyine Etkisi

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Abstract

The study was conducted to determine the effect of music therapy applied to patients who had Coronary Artery Bypass Graft (CABG) surgery on anxiety and pain levels. The population of the study consisted of patients who had CABG surgery in a public hospital. The sample size was determined as 60 patients, 30 patients in each of the intervention and control groups. Data were collected with the "Personal Information Form", "State Anxiety Scale" and "Visual Analog Scale". Percentage, Mean (X), Standard Deviation (SD), Kolmogorov-Smirnov, Mann–Whitney U, Wilcoxon Signed-Ranks and Chi-Square (χ^2) tests were used to evaluate the data. While there was no difference in the postoperative 1st and 2nd day anxiety levels of the intervention and control groups, the anxiety level of the intervention group on the 3rd day was found to be lower than the control group ($p<0.05$). The postoperative pain intensity of the patients in the intervention and control groups was similar. It was found that the pain level of the intervention group on the 2nd and 3rd days was significantly lower than the control group ($p<0.05$). In conclusion, it can be said that music is effective in reducing anxiety and perceived pain intensity in CABG surgery.

Keywords: Anxiety, coronary artery bypass graft, music, nursing, pain

Özet

Çalışma, Koroner Arter Bypass Greft (KABG) ameliyatı olan hastalara uygulanan müzik terapisinin anksiyete ve ağrı düzeyine etkisini belirlemek amacıyla girişimsel olarak yapıldı. Araştırmanın evrenini bir kamu hastanesinde Koroner Arter Bypass Ameliyatı olan hastalar oluşturdu. Örneklem sayısı müdahale ve kontrol gruplarının her birinde 30 hasta olmak üzere 60 hasta olarak belirlendi. Veriler, "Kişisel Bilgi Formu", "Durumluk Anksiyete Ölçeği" ve "Visual Analog Skala" ile toplandı. Verilerin değerlendirilmesinde Yüzdelik, Ortalama (X), Standart Sapma (SD), Kolmogorov-Smirnov, Mann–Whitney U, Wilcoxon Signed-Ranks ve Ki Kare (χ^2) testleri kullanıldı. Müdahale ve kontrol grubunun ameliyat sonrası 1. ve 2. gün anksiyete düzeylerinde fark yok iken, 3. gün müdahale grubunun anksiyete seviyesinin kontrol grubuna göre daha düşük olduğu bulundu ($p<0.05$). Müdahale ve kontrol grubundaki hastaların ameliyat sonrası yaşadıkları ağrı şiddeti benzerdi. Müdahale grubunun 2. ve 3. gün ağrı düzeyinin kontrol grubuna göre anlamlı olarak daha düşük olduğu bulundu ($p<0.05$). Sonuç olarak KABG cerrahisinde müziğin, anksiyete ve algılanan ağrı şiddetini azaltmada etkili olduğu söylenebilir.

Anahtar Kelimeler: Ağrı, anksiyete, hemşirelik, koroner arter baypas greftleme, müzik

1. Introduction

Cardiovascular diseases are still among the diseases that cause the most mortality and morbidity worldwide. Although there are many methods such as lifestyle changes and medical treatments in the treatment of the disease, the surgical methods applied as the last resort also play an important role. As with all surgical methods, patients are at risk for many complications after cardiovascular surgery. It is stated that coronary artery bypass graft (CABG) surgery involves major metabolic, physical and psychological stress for patients (Gallagher & McKinley, 2007). It is reported that high anxiety causes high postoperative pain in patients undergoing CABG (Nelson et al., 1998). In order to control complications and ensure the comfort of patients, it is very important to apply individualized nursing care.

Nurses have a significant role in relieving patients' pain and anxiety, especially in providing hemodynamic. In addition, it is reported that the long-term psychological outcomes of patients with high post-surgical anxiety levels are worse (Gallagher & McKinley, 2007). While all surgeries have the possibility of creating a negative feeling in the patient, having this type of surgery causes the patient to experience more anxiety. While the causes of this anxiety are mostly related to death anxiety, some conditions such as pain and the healing process that may be experienced after surgery can increase anxiety.

Nurses are responsible for reducing anxiety by providing a therapeutic environment for the patient. The use of music within this therapeutic environment helps patients focus on something more pleasant and familiar than negative stimuli, allowing them to escape into their own world. This intervention can help the patient relax by focusing on music. It is also expressed that music therapy is an interdisciplinary therapeutic tool that facilitates the recovery of patients (Nilsson, 2008). Moreover, music is closely linked to emotions and arousal. Studies show that listening to music has positive effects on the cardiovascular and respiratory systems, and it regulates emotions (Bernardi et al., 2006). It has been suggested further that music has an analgesic effect and helps to cope with anxiety by diverting attention from a negative experience (Nilsson, 2008; Good et al., 2001; Nilsson, 2003). There are studies showing that music therapy applied in the postoperative period significantly reduces the level of pain and anxiety (Ajorpaz et al., 2014; Çürük et al. 2018; Sin & Chow, 2015; Tse et al., 2005; Xiao-Mei et al., 2011).

Music therapy, which is used to reduce anxiety, has an effect on the endocrine and nervous system and provides the emergence of meaningful reactions in emotions and thoughts. The most important healing effect of music is on relaxation and reducing stress. It is a known fact that music therapy, which is one of the oldest treatment methods, is used to treat patients in various cultures (Karamızrak, 2014; Schou, 2014).

In cardiac interventions, nurses have responsibilities such as preparing the patient for the procedure, determining the patient's anxiety level, questioning the causes of anxiety, and applying strategies to reduce anxiety so that the patient can recover in a shorter time (Nilsson et al., 2019; Uzun et al.,

2008; Weeks & Nilsson, 2011). It is very important to support the patient psychologically since increased anxiety level can cause many negative conditions such as prolongation of the patient's recovery period, increase in the amount of sedative drug use, and complications (Çürük et al. 2018).

In line with this information, it was decided to conduct this study in order to determine the effect of music on anxiety and pain levels in patients who underwent CABG surgery.

2. Method

This study is an interventional study with a pre-test post-test control group to determine the effect of postoperative music on pain and anxiety in patients who have undergone CABG surgery.

2.1. Purpose of the research

The aim of this study was to determine the effect of music therapy applied to patients after cardiac surgery on patients' pain and anxiety.

2.2. Research Hypotheses

H1. There is a positive difference between the state anxiety levels of the patients with CABG who listened to music after the surgery and the state anxiety levels of the group who did not listen to music.

H2. There is a positive difference between the pain levels of the patients with CABG who listened to music after the surgery and those who did not.

2.3. Population and Sample of the Research

Before the data collection phase, the required sample number for the research was determined using the G*Power3.1 program. When the effect size was taken .5, the alpha level .05, and the power 80%, the sample number was found to be 28 as a result of the power analysis: and when the power was taken as 95%, the sample number was found to be 47. Considering the data losses, the number of samples was determined as 60. The sample group of the study consisted of 60 patients, with 30 in the experimental group and 30 in the control group, who agreed to participate in the study between March 1, 2021 – June 30, 2021.

The criteria for inclusion in the research are as follows;

- Those over the age of 18
- Those who do not have a visual or hearing impairment,
- Those whose spoken language is Turkish,
- Those who will undergo CABG for the first time,
- Those who have not had complications in the hospital environment, do not have mental-psychiatric problems, do not have diseases such as Diabetes Mellitus, Chronic Obstructive Pulmonary Disease, Hypertension,
- Patients willing to participate in the study were included.

2.4. Data Collection and Data Tools

2.4.1. Personal Data Collection Form

This form, which was developed by the researcher on the basis of literature information, consists of 7 questions in total about age, gender, occupation, marital status, education level, issues that patients are worried about, and postoperative health status (Ciğeci & Özbayır, 2016; Vural & Eti Aslan, 2014). This form was filled by the researcher by asking the patient questions through a face-to-face interview method during the day the patient was in the service when they were convenient and felt ready.

2.4.2. State Anxiety Scale (SAS)

The state anxiety scale is a 20-item scale adapted to Turkish society by Oner and Le Compte in 1983. It gives information about how an individual feels under certain conditions at a certain moment. It includes marking one of the items of the scale according to the severity of the current emotions (1) never, (2) a little, (3) quite, (4) completely (Öner & LeCompte, 1983).

The scale consists of 20 items and ten items are scored in reverse. These are 1st, 2nd, 5th, 8th, 10th, 11th, 15th, 16th, 19th, and 20th items. The total weighted score of the reverse statements is subtracted from the total weighted score for the direct statements. A predetermined and unchanging value is added to this number, 50 for the State Anxiety Scale. The final score is the individual's anxiety score. The scores obtained from the scale theoretically vary between 20 and 80. A high score indicates a high level of anxiety, and a low score indicates a low level of anxiety. The average score level determined in practices in Turkey varies between 36-41. The Cronbach's alpha value of the scale is 0.921. In this study, the Cronbach Alpha reliability coefficient was found to be 0.642.

2.4.3. Visual Analogue Scale (VAS)

Visual Analogue Scale (VAS) is used to convert a number of values that cannot be measured numerically into a numerical format. 2 end definitions of the evaluated parameters are written on the 2 ends of 1 100 mm line and the patient is asked to show a line where he or she would be suitable on the said line. The distance from the part where the patient has no pain to the part marked shows the pain level of the patients.

2.5. Ethical Aspect of Research

Before starting the study, ethics committee approval numbered 2019/07-05 from Maltepe University Ethics Committee and necessary permissions to start working at Dokuz Eylül University Hospital were obtained. Patients who were scheduled for surgery were hospitalized in the cardiovascular surgery service and those who met the inclusion criteria of the study were informed by the researcher and signed an informed consent form.

2.6. Limitations of the Research

The study was carried out in the Cardiovascular Surgery Clinic of Dokuz Eylül University Practice and Research Hospital. This study is limited to the responses given by the participants to the data collection tools.

2.6.1. Application

Patients who were hospitalized in XXX University Hospital for CABG surgery were interviewed, and informed consent was obtained from the patients who met the inclusion criteria. It was planned to continue the study in two groups as the control and intervention groups. The patients in the control group were interviewed before the surgery, and the Personal Data Collection Form and SAS were applied once by the researcher. After the surgical intervention, the patients continued to receive their routine treatments on the first day of coming to the surgical service, and SAS and VAS were measured when their clinical status was appropriate, and they were open to communication. On the 2nd and 3rd days after the surgical intervention, SAS and VAS were applied once again to the patients who were open to communication and whose clinical progress was normal. After reaching 30 patients in the control group, the same initial process was repeated for the intervention group.

Before the surgical intervention, the Personal Data Collection Form and SAS were applied to the patients in the intervention group by the researcher. The patients were informed about the pain that may occur after the surgical operation, the length of stay in the ICU, the healing process and the application to be made. The choice of nature music and classical music, which are known to be effective on anxiety by calming and creating a feeling of well-being, determined by the researcher, were presented (Abrahamov et al., 2003/2006; Akkaş Gürsoy, 2001; Allerd et al., 2010; Hadj et al., 2006; Liu & Petrini, 2015; McCrone et al., 2001; Özer et al., 2013; Parent & Fortin, 2000; Rymaszewska et al., 2003; Tully et al., 2015; Wong et al., 2001; Yardakçı & Akyolcu, 2004). Nature sounds consist of sounds created by the ecosystem without human intervention. These include the singing of birds, the sound of rain, the waves of the sea or the flow of a stream. These sounds are generally calming and soothing sounds to the human mind. Mozart's works were also used as classical music pieces. The type of music that the patients wanted to listen to was recorded in their files. The patients, who were taken to the surgical service from the ICU after the operation, continued to receive their routine treatment (Paracetamol 3 times a day if necessary, Tramadol once a day if necessary). When the patients were open to communication and their clinical condition was appropriate, the type of music they had chosen before the surgery was played for 15 minutes. This application was repeated on the 2nd and 3rd days after surgery. The application of the study was carried out between March 1, 2021 – and June 30, 2021.

2.7. Data Analysis

Data collected as a result of the study were analysed in Social Sciences for Windows IBM SPSS Statistics SPSS. 23 program. Number, percentage, mean, minimum and maximum values were used to evaluate the descriptive features. The normality assumptions of the variables were examined with the Kolmogorov-Smirnov test, and the Mann–Whitney test was used to compare the non-normally distributed continuous variables between the two groups. The Friedman test was performed to compare the SAS and VAS scores of the patients on the 1st, 2nd and 3rd days, and if there was a significant difference, the Wilcoxon signed-ranks test was used for post hoc. Relationships between

categorical variables were examined with Chi-square analysis or Fisher's Exact Test. The value of p < 0.05 was accepted as the level of significance.

3. Results

A total of 60 patients, whose age range was between 48 and 80 (Mean=65.05, SD=7.70), including 30 (50%) control and 30 (50%) intervention groups, were included in the study. Of the patients participating in the study, 25 (41.7%) were female and 35 (58.3%) were male. 21 (35.0%) of them were housewives by profession, and 24 of them (40.0%) had primary school education. 51 (85.0%) of them were married and 25 (41.7%) of them stated the fear of 'pain + disability' as a source of anxiety. Table 1 shows the comparison of the sociodemographic characteristics of the control and intervention groups. There is no statistical difference between the groups (Table 1).

Table 1. Comparison of Sociodemographic Characteristics of the Intervention and Control Group

	Control		Intervention		Total		χ2	p
	n	%	n	%	n	%		
Gender*							1.714	.190
Woman	10	33.3	15	50.0	25	41.7		
Man	20	66.7	15	50.0	35	58.3		
Occupation							-	-
Housewife	8	26.7	13	43.3	21	35.0		
Worker	2	6.7	1	33.3	3	5.0		
Public employee	8	26.7	4	13.3	12	20.0		
Retired	10	33.3	8	26.7	18	30.0		
Self-employed	2	6.7	4	13.3	6	10.0		
Education								
Illiterate	1	33.3	0	0.0	1	1.7		
Primary School	10	33.3	14	46.7	24	40.0		
Elementary School	6	20.0	6	20.0	12	20.0		
High School	4	13.3	2	6.7	6	10.0		
University	9	30.0	8	26.7	17	28.3		
Marital Status**								
Married	26	86.7	25	83.3	51	85.0		
Single	4	13.3	5	16.7	9	15.0		
Anxiety sources								
Pain	3	10.0	8	26.7	11	18.3		
Risk of death	4	13.3	7	23.3	11	18.3		
Loss of working power	8	26.7	3	10.0	11	18.3		
Staying away from family	2	6.7	0	0.0	2	3.3		
Pain + Being disabled	13	43.3	12	40.0	25	41.7		

*Chi-square analysis; **Fisher's Exact Test*

The postoperative VAS 2nd day score of the intervention group (2.60 ± .62) was significantly lower than the score of the control group (3.27 ±45) and the postoperative VAS 3rd day score of the intervention group (2.30 ± .47) was significantly lower than the score of the control group (2.77 ± .43),

(p<.001). Despite these findings, there was no statistically significant difference between the postoperative VAS score (p=.516), the 3rd day score after SAS music therapy (p=.108), and the VAS 1st day postoperatively (p=1.00) variables between the control and intervention groups (Table 2).

Table 2. Comparison of VAS and SAS Scores of the Intervention and Control Group

	Control (n=30)		Intervention (n=30)		p
	Avg. ± SD.	Median (Min. -Max.)	Avg. ± SS.	Median (Min. -Max.)	
Preoperative SAS*	40.73±3.57	40.00 (35.00 - 47.00)	40.93±2.69	40.00 (37.00 - 47.00)	.710
After music therapy SAS 1st day *	38.33±2.31	38.50 (35.00 - 43.00)	38.10±1.95	38.00 (35.00 - 43.00)	.697
After music therapy SAS 2nd day *	37.93±2.74	37.00 (34.00 - 45.00)	37.03±2.09	37.00 (34.00 - 43.00)	.234
After music therapy SAS3rd day *	39.90±3.06	40.00 (34.00 -47.00)	35.40±1.77	35.00 (33.00 - 42.00)	<.001
Postoperative VAS score*	7.00 ± .95	7.00 (5.00 - 8.00)	7.20 ± .66	7.00 (6.00 - 8.00)	.516
After music therapy VAS 1st day *	3.60 ± .50	4.00 (3.00 - 4.00)	3.60 ± .50	4.00 (3.00 - 4.00)	1.00
After music therapy VAS 2nd day *	3.27 ± .45	3.00 (3.00 - 4.00)	2.60 ± .62	3.00 (2.00 - 4.00)	<.001
After music therapy VAS 3rd day*	2.77 ± .43	3.00 (2.00 - 3.00)	2.30 ± .47	2.00 (2.00 - 3.00)	<.001

Mann-Whitney U Test

A statistically significant difference was found between the preoperative SAS score and the postoperative 1st day score, the 2nd postoperative day score and the 3rd postoperative day score in the control group (p<.001). A statistically significant difference was also found between the postoperative VAS 1st day score, the 2nd postoperative day score, and the 3rd postoperative day score (p<.001) (Table 3).

Table 3. Comparison of VAS and SAS Scores in the Control Group (n=30)

	Avg. ± SD.	Median (Min. -Max.)	p
Preoperative SAS **Postoperative SAS 1st day***	40.73 ± 3.57 38.33 ± 2.31	40.00 (35.00 - 47.00) 38.50 (35.00 - 43.00)	<.001
Preoperative SAS **Postoperative SAS 2nd day***	40.73 ± 3.57 37.93 ± 2.74	40.00 (35.00 - 47.00) 37.00 (34.00 - 45.00)	<.001
Postoperative SAS 1st day **Postoperative SAS 2. Day**	38.33 ± 2.31 37.93 ± 2.74	38.50 (35.00 - 43.00) 37.00 (34.00 - 45.00)	.205
Postoperative SAS 1st day **Postoperative SAS 3rd day***	38.33 ± 2.31 39.90 ± 3.06	38.50 (35.00 - 43.00) 40.00 (34.00 - 47.00)	.069
Postoperative SAS 2nd day **Postoperative SAS 3rd day ***	37.93 ± 2.74 39.90 ± 3.06	37.00 (34.00 - 45.00) 40.00 (34.00 - 47.00)	.013

Table 3. Comparison of VAS and SAS Scores in the Control Group (n=30) (continued)

	Avg. ± SD.	Median (Min. -Max.)	p
Postoperative VAS 1ˢᵗ day **Postoperative VAS 2ⁿᵈ day ***	3.60 ± .50 3.27 ± .45	4.00 (3.00 - 4.00) 3.00 (3.00 - 4.00)	.002
Postoperative VAS 1ˢᵗ day **Postoperative VAS 3ʳᵈ day ***	3.60 ± .50 2.77 ± .43	4.00 (3.00 - 4.00) 3.00 (2.00 - 3.00)	<.001
Postoperative VAS 2ⁿᵈ day **Postoperative VAS 3ʳᵈ day ***	3.27 ± .45 2.77 ± .43	3.00 (3.00 - 4.00) 3.00 (2.00 - 3.00)	<.001

* *Wilcoxon signed-ranks test*

A statistically significant difference was found between the preoperative SAS score and the 1st day score after music therapy, the 2nd day score after music therapy and the 3rd day score after music therapy in the intervention group (p<.001). In addition, a statistically significant difference was found between the VAS 1st day score after music therapy, VAS 2nd day score after music therapy, and VAS 3ʳᵈday score after music therapy (p<.001) (Table 4).

Table 4. Comparison of VAS and SAS Scores in the Intervention Group (n=30)

	Avg. ± SD.	Median (Min. - Max.)	p
Preoperative SAS with 1ˢᵗ day after music therapy *	40.93 ± 2.69 38.10 ± 1.95	40.00 (37.00 - 47.00) 38.00 (35.00 - 43.00)	<.001
Preoperative SAS with 2ⁿᵈ day after music therapy *	40.93 ± 2.69 37.03 ± 2.09	40.00 (37.00 - 47.00) 37.00 (34.00 - 43.00)	<.001
Preoperative SAS with 3ʳᵈ day after music therapy *	40.93 ± 2.69 35.40 ± 1.77	40.00 (37.00 - 47.00) 35.00 (33.00 - 42.00	<.001
SAS 1ˢᵗ day and 2ⁿᵈ day after music therapy *	38.10 ± 1.95 37.03 ± 2.09	38.00 (35.00 - 43.00) 37.00 (34.00 - 43.00)	.001
SAS 1ˢᵗ day and 3ʳᵈ day after music therapy *	38.10 ± 1.95 35.40 ± 1.77	38.00 (35.00 - 43.00) 35.00 (33.00 - 42.00)	<.001
SAS 2ⁿᵈ day and 3ʳᵈ day after music therapy *	37.03 ± 2.09 35.40 ± 1.77	37.00 (34.00 - 43.00) 35.00 (33.00 - 42.00)	=.003
VAS 1ˢᵗ day and 2ⁿᵈ day after music therapy *	2.67 ± .55 1.93 ± .69	3.00 (2.00 - 4.00) 2.00 (1.00 - 3.00)	<.001
VAS 1st day and 3ʳᵈ day after music therapy *	2.67 ± .55 1.37 ± .49	3.00 (2.00 - 4.00) 1.00 (1.00 - 2.00)	<.001
VAS 2nd day and 3rd day after music therapy *	1.93 ± .69 1.37 ± .49	2.00 (1.00 - 3.00) 1.00 (1.00 - 2.00)	<.001

*Wilcoxon signed-ranks test

5. Discussion

The risk of anxiety and fear of death is high in patients who are scheduled for coronary artery surgery. For this reason, patient care includes determining the causes of stress and anxiety in patients and practices aimed at minimizing these factors. It is thought that determining the anxiety level of patients and planning various applications can play an important role in eliminating the presence of anxiety (Abrahamov et al., 2003/2006; Hadj et al., 2006).

It has been shown in many studies that anxiety before surgery increases in CABG patients (McCrone et al., 2001; Tully et al., 2015). Many studies in various departments of health care have shown that music has a positive effect on anxiety.

In this study, it was determined that the patients in the intervention and control groups had a moderate level of anxiety according to the results of SAS applied before the surgical intervention. In some studies conducted with CABG patients, it has been reported that patients experience moderate to high levels of anxiety before surgery (Akkaş Gürsoy, 2001; McCrone et al., 2001; Parent & Fortin, 2000; Rymaszewska et al., 2003; Vural & Eti Aslan, 2014; Wong et al., 2001; Yardakçı & Akyolcu, 2004). In the postoperative period, while the SAS scores of the patients in the first 2 days were close to each other, it was observed that the SAS scores of the patients included in the intervention group decreased significantly at the end of the 3rd day. When the VAS scores of the patients in the postoperative period were compared; while the VAS score after music therapy applied on the postoperative 1st day was equal in both groups, it was found that the VAS scores of the patients in the intervention group decreased on the 2nd and 3rd days.

According to our study results, the pain experienced by the patients on the 1st day after surgery was higher than on the 2nd and 3rd days, and it was found that the pain on the first day was close to each other in both groups. When the pain status between the groups was evaluated, the postoperative 2nd and 3rd day pain score of the intervention group was significantly lower than that of the control group. In a study conducted by Vural and Eti Aslan (2014), 35 patients included in the experimental group after CABG listened to music for 15 minutes and it was concluded that the pain intensity of these patients decreased after the 2nd postoperative day. In another study conducted by Ozer et al., it was found that after CABG, a group of patients listened to music for 30 minutes, after which the oxygen saturation of these patients increased and their pain intensity decreased significantly compared to the control group (Özer et al., 2013). In a randomized controlled study with 112 patients in China, after thoracic surgery, in addition to the standard post-surgical care, the experimental group listened to light music for half an hour every day for 3 days, and the control group was not subjected to music. Patients were compared in terms of postoperative pain and anxiety levels. It was found that the pain and anxiety levels of the patients in the experimental group decreased statistically compared to the control group (Liu & Petrini, 2015). In a study conducted on 68 patients who had undergone coronary artery surgery, it was reported that music played for 30 minutes in the postoperative period decreased the perception of pain and the amount of analgesic intake in patients (Uzun et al., 2008). In a study carried out by Ajorpaz et al. to evaluate the effect of music played to patients after open-heart surgery

on postoperative pain, it was found that the pain of patients in the experimental group decreased (Ajorpaz et al., 2014). In addition to the similarity between the results of the studies mentioned above and the results of this study, it is possible to say that music provides benefits in pain control due to its effect on well-being as well as distracting attention.

When the anxiety levels of the control group were examined, it was found that they had a moderate level of anxiety before the operation, while their anxiety levels were significantly lower on the 1st and 2nd days after the operation than before the operation but increased to a moderate level again on the 3rd day. According to the results of the study conducted with patients with CABG; it has been reported that patients with high, moderate or low anxiety levels before the surgical intervention continue to have the same level of anxiety after the surgery (Liu & Petrini, 2015; McCrone et al., 2001; Rothenhausler et al., 2005; Shuldman et al., 2002). Heart surgery can be a bit more frightening to people when compared to many other surgeries. It is thought that many reasons such as the heart being a vital organ, sternum incision, limited mobilization for a long time, relapse and fear of death may cause patients to experience high levels of anxiety. In this study, it is thought that the anxiety of the patients, which decreased due to the fact that they survived the surgery on the first and second days, started to increase again due to some limitations they experienced and the thought that their lives would not be the same as before.

When the postoperative VAS scores of the patients in the control group were compared, it was seen that the pain experienced on the 1st day after the operation was higher than on the 2nd and 3rd days. It was found that there was a statistically significant decrease in pain scores, considering the analgesic drugs taken by the patients after the surgery, the duration of sleep and the duration of mobilization.

In the study conducted by Vural and Eti Aslan (2014), when the pain scores of the patients included in the control group were examined, it was found that the pain score measured on the 3rd day was lower than the other days. In this study, according to the results of the VAS pain score measured up to the 3rd day after the surgical intervention; it was observed that the perceived pain severity score of the patients on the 1st, 2nd and 3rd days decreased day by day. Although every surgical intervention is related to the patient's perception of pain, the intensity of the pain is usually proportional to the extent of the surgery. It is known that the pain is most intense in the first 24 hours after the surgery and gradually decreases depending on the perception of the patient in the following days.

Management of postoperative pain is among the care practices of surgical nursing. According to the results of the sources obtained in the literature review; it is stated that in cases where pain management cannot be performed, acute pain after surgical intervention is moderate in most of the patients, it may cause chronic pain syndrome in 4% of the patients, may continue until the postoperative 15th day, and uncontrolled pain may continue after discharge (Seyhan Ak et al., 2017; Zubrzycki et al., 2018).

It was found that the pain levels of the patients in the intervention group after music therapy were lower than before music therapy and gradually decreased until the 3rd day. When the anxiety levels

are compared; it was concluded that the anxiety of the patients after music therapy was lower than before the surgery and decreased significantly at the end of the 3rd day.

In a study conducted by Ferrer with patients undergoing open-heart surgery; it has been reported that music used for therapeutic purposes increases endorphin secretion and positive emotions, reduces fear and anxiety, regulates heart rhythm, lowers blood pressure, decreases sweating, relaxes muscles and reduces hyperactivity (Ferrer, 2015).

In another study, the effect of music therapy applied to patients after coronary bypass surgery on anxiety was examined. According to the results of the study; it was found that music listened to after surgery reduces anxiety and there is a certain decrease in serum cortisol levels (Nilsson et al., 2009). According to another study, it was concluded that as a result of music therapy which was applied to patients who had undergone cardiac surgery, their anxiety was found to be lower than that of patients who were not (Twiss et al., 2006). In a meta-analysis study published in 2006, a total of 1867 patients received music therapy to reduce pain. According to the results of this analysis, it was reported that music therapy reduces the severity of pain and the amount of painkillers needed by the patient (Karamızrak, 2014). As a result of another study on using music for the prevention of delirium in patients after coronary artery bypass graft surgery, it was stated that nature-based music containing bird, wind and water sounds significantly prevented delirium of patients after coronary artery bypass

Esfahanian et al., 2022). In another experimental study, classical music was played to CABP patients together with pre-operative education and it was seen that it was effective in reducing the anxiety levels of the patients compared to the control group (Nargiz Koşucu & Şelimen, 2022).

According to the results of the literature; it is seen that the anxiety and pain levels of the patient groups who received music therapy were lower than the groups that did not receive music therapy (Ajorpaz et al., 2014; Ciğerci & Özbayır, 2016; Özer et al., 2013; Sin & Chow, 2015; Tse et al., 2005; Vural & Eti Aslan, 2014; Xiao-Mei et al., 2011). The results of this study show that pain and anxiety decreased in patients who were applied music therapy after open-heart surgery compared to patients who were not.

6. Conclusion

According to the results of this study; patients undergoing open-heart surgery had moderate preoperative anxiety and the anxiety levels of the intervention and control groups were similar. While there was no difference in the postoperative 1st and 2nd day anxiety levels of the group that received music therapy and the group that did not, it was found that the anxiety level of the intervention group on the 3rd day was lower than that of the control group. The postoperative pain intensities of the patients in the intervention and control groups were similar. Although the pain of the control group decreased on the 2nd and 3rd days, the pain level of the group that listened to music was found to be significantly lower on the 2nd and 3rd days compared to the control group.

Based on these results, it can be concluded that music therapy can be used as an effective method in reducing the pain and anxiety level of patients. Nurses, who are responsible for the management of

pain and anxiety and for ensuring the comfort of the patients, can apply music therapy to their patients effortlessly and without cost.

Authors Contributions

Topic selection: ŞÖ, PD; Design: ŞÖ, PD; Planning: ŞÖ, PD; Data collection: PD; Data Analysis: ŞÖ, PD; Article writing: ŞÖ, PD; Critical review: ŞÖ, PD.

Conflict of Interest

There is no financial conflict of interest with any institution, organization, person related to this study and there is no conflict of interest between the authors.

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