



THE EFFECT OF LISTENING TO MUSIC ON SURGICAL FEAR AND ANXIETY BEFORE CARDIAC SURGERY: A RANDOMIZED CLINICAL TRIAL

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Abstract

Objective: Listening to music has been used as an intervention during both the treatment and rehabilitation process. Cardiac surgery is stressful and generates fear for most patients. This study assessed the effect of listening to music on the level of surgical fear and state anxiety of the patients, who were undergoing cardiac surgery.

Methods: This randomized controlled trial consisted of 50 patients in the intervention group and 50 patients in the control group. Two days before cardiac surgery, the intervention group listened to music for about 45 minutes each day. The control group received no music intervention. Patients' state anxiety and surgical fear were measured using the State-Trait Anxiety Inventory and Surgical Fear Scale.

Results: After the music intervention, the mean surgical fear of the intervention group was 29.04 ± 10.31 , and the control group was 50.68 ± 13.65 . The state anxiety rate of the intervention group was 39.56 ± 9.37 . The state anxiety rate of the control group was found to be 56.94 ± 13.90 . The difference between the mean state anxiety and surgical fear scores before cardiac surgery were statistically significant between the intervention group and control group.

Conclusion: A music listening program may aid patients in the preoperative period to reduce stress and anxiety and is well accepted by patients. Listening to music as an intervention for patients, expecting to undergo cardiac surgery was feasible and the results suggest a high degree of effectiveness.

Keywords: Music therapy, cardiac surgery, surgical fear, anxiety, nursing care.

Introduction

Cardiac surgery is important surgical intervention that affects patients psychologically, economically, socially and physically. The changes that cardiac surgery may make to the lives of the individuals are many. However, the inability to comprehend these changes before surgery may cause anxiety, and patients may feel their health threatened and in danger, so they become anxious about not returning to their pre-hospital life.¹

The level of anxiety before surgery varies according to many factors.² Thoughts such as not being able to return to the life before the surgery, lack of information about the surgery and its aftermath, not being able to survive the surgery or being disabled may cause patients to experience anxiety and fear. Since the operation will be performed on the heart, the fear of death is understood in the patients and this increases the anxiety before the operation. The pre-operative process itself can cause anxiety and fear in many patients.³ Any negative situation that a hospitalized patient may experience for any treatment adversely affects the treatment process and the healing process. It is among the duties of the nurse to reduce the anxiety and fears that the patients may experience in this process with different interventions and to ensure their safety in every sense.³

Various additional nursing interventions can be used to relieve the fear and anxiety caused by surgery, which may positively affect the surgical treatment and the healing processes. One of these interventions is music therapy.⁴ Music therapy has been used to treat many diseases and to reduce symptoms.⁵ Music therapy has been used in different studies with intensive care patients, patients undergoing different surgical interventions and in small invasive procedures to relieve pain and anxiety. Many of these studies have found that music therapy improved results in patients.⁶⁻⁸ The 2006 Cochrane assessment of 23 clinical studies of heart disease, the utilization of some music has been found to reduce blood pressure and anxiety in patients with coronary heart disease.⁸ Music therapy is not only used as a treatment tool, it can be used as a preservative in some patients, and it is stated that music has a strong effect on accelerating the healing of the individual. Different cultures have used their own music genres for therapy and patients have been influenced by the music of their own cultures because of the strong cultural links.⁹ Although there are many national and international studies in which music therapy have been used, there is no study which investigated the effects of classical Turkish music on surgical fear of patients undergoing cardiovascular surgery. In the present study, the effects of listening to music on anxiety and surgical fear were evaluated through playing Sufi music, including the pieces Büzürk and Uşşak, before cardiac surgery.

Methods

Study Design

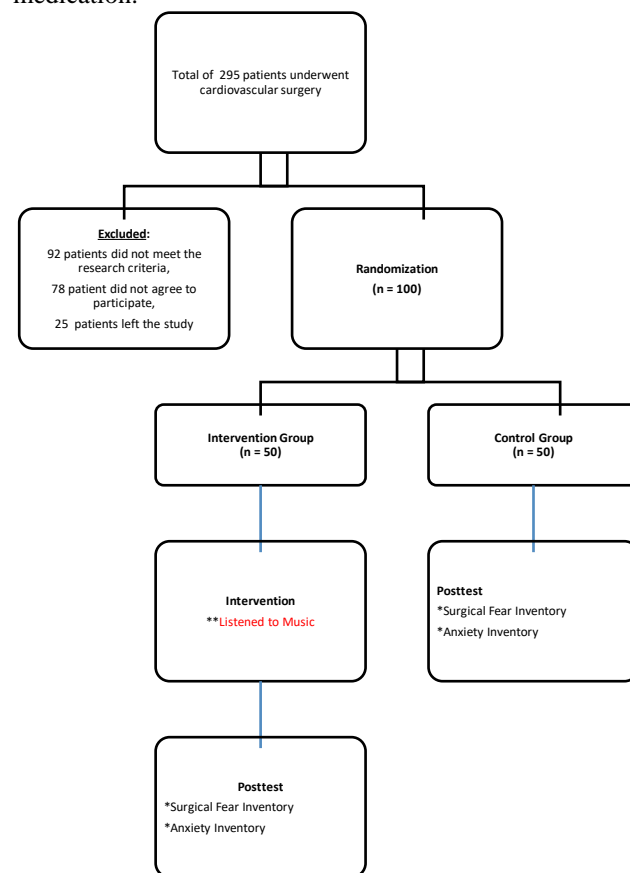
This randomized, controlled study was conducted to determine the effect of listening to music before cardiac surgery on the level of state anxiety and surgical fear. The study was undertaken in the Cardiovascular Surgery Unit of İstanbul Dr. Siyami Ersek Cardiovascular Surgery Training and Research Hospital between December 2017 and May 2018.

Ethical Considerations

This study was carried out in accordance with the principles of the Declaration of Helsinki. Before the study, written permission was obtained from the Hasan Kalyoncu University Health Science Ethics Committee (date: October 31, 2017 and number: 2017/11) and institution's directorate (date: January 04, 2018 and number: 28001928-508.01). All of the participants were informed about the purpose and the design of the research. Anonymity and confidentiality were guaranteed. It was stated that the decision of the patients, who chose not to participate in the study, would not affect the nursing interventions applied to them, and the patients could withdraw from the study at any time.

Population and Sampling

A total of 295 patients who underwent cardiac surgery during the study period and 125 patients who underwent cardiac surgery for the first time were included in the study. 25 patients did not want to continue listening to music and were excluded from the study. From the beginning of the data collection, randomization was done so that odd numbers would come to the experimental group and even numbers to the control group. This study was conducted with 100 people (50 intervention group and 50 control group). (Fig. 1.). The sample size was estimated by G-power 3.010 software with the following selection parameters: power 0.99, α 0.05, effect size 0.96; two-tailed test; estimated total sample size of 100. The inclusion criteria for the study were having no communication problem and no hearing problem, being 18 years of age and over, being able to cooperate, and agreeing to participate. The exclusion criteria for the study were previous surgery, taking anxiolytics, or using any sedative medication.



*Surgical fear and anxiety scales were administered to the control group before the operation, to the experimental group before the operation and after listening to music. **The experimental group was listened to music before the operation.

Figure 1. Follow chart of patient selection

DATA Collection Tools

The “Introductory Information Form” developed by the researchers and the “State-Trait Anxiety Inventory” and “Surgical Fear Scale” were used for data collection. The data of the study was collected by the researchers in the patient room before the surgery and collection lasted approximately 15 min.

Introductory Information Form:

The questionnaire included five close questions. This questionnaire was used to collect demographic data including age, gender, education status and marital status. The form also includes questions about whether the patients have any chronic diseases and whether they have had previous surgery.¹⁰

State-Trait Anxiety Inventory:

This scale was developed by Spielberg et al. to determine state-trait anxiety levels separately, and it has been adapted to Turkish language by Oner and Le Compte. The validity and reliability studies for the Turkish version have been carried out and the robustness has been confirmed. It comprises 40 items. Respondents were asked to mark one of the choices that suit best for each item in the scale, and these options were: “almost never,” “sometimes,” “often,” “almost always.” Higher scores on the scale indicate higher anxiety.¹¹

Surgical Fear Scale (SFS):

This scale was developed by Theunissen *et al.* to determine surgery fear, and it has been adapted to Turkish language by Bağdigen and Karaman Ozlu.^{12,13} The SFS comprises eight items, four of which measure the origin of fear, and the other four measure fear of the surgery. The participants were asked to mark one of these choices that suit best for each item in the scale from 1 to 10, with “0= I am not afraid” and “10= I am so afraid.” Once again, high scores on the scale indicate higher fear.

Interventions

After the patients were taken to the clinic, a headphone connected to an MP3 player was provided to the patient. A separate headset was used for each patient. The patients were not asked about the type of music they preferred. For music intervention, low-tempo music without strong beats and ripple rhythms was chosen. Before the operation, the intervention group listened to the sufi compositions Uşşak and Büzürk for an average of 45 minutes. The patients were listened to music once a day for 45 minutes for two days. The choice of music type may be important. This Sufi music has been previously used in heart disorders, because it gives a sense of laughter and joy, which decreases or eliminates fear. This kind of music may also inspire religious feelings and provide religious messages. In the current study, all of the musical compositions, which were utilized in music intervention, were selected with the help of a specialist lecturer in the field of music.¹⁴ All patients undergoing cardiovascular surgery during the study period were eligible to participate. Patients who did not want to participate were not asked to provide any specific reasons. After explaining the purpose of the research, patients were randomly divided into intervention and control groups. In order to avoid any effect of the intervention, the data of the control group were collected first, and then the data of the intervention group were collected. No additional intervention was performed on the individuals in the control group.

Fear of surgery and State-Trait Anxiety forms were filled in the patient's room. The researchers played instrumental music in the afternoons two days before the heart surgery. Surgery fears and State-Trait Anxiety of the patients were recorded the night before the surgery. Data were collected from the control group at the same time as the intervention group, but without music therapy. In the study, no pre-measurement was made and the data were taken with a single measurement after the music application. A statistician, blinded to group composition, evaluated the study's data.

Statistical Analysis

SPSS, version 21.0, was used for evaluation and comparison of data (IBM Inc., Armonk, NY, USA). Kolmogorov-Smirnov and Shapiro-Wilk tests were used in evaluating the normal distribution of the collected data. The descriptive characteristics are presented as mean \pm standard deviation and percentage. The Chi-square test was used to compare the demographic characteristics. The T-test was used to compare the levels of anxiety and surgical fear of the individuals in the intervention and the control group. In comparisons, $p < 0.05$ was considered statistically significant.

Results

Two-hundred and ninety five patients underwent cardiovascular surgery during the study period. Of these, 92 did not meet study criteria, 78 declined to participate and 25 left the study after agreeing to participate, so 100 patients were included in the study. The descriptive characteristics of the individuals in the study are given in Table 1. Half of the individuals in the musical intervention group were aged ≥ 59 years. Furthermore, 52% were men, 98% married and 56% illiterate. Among the individuals in the control group, 46% were in the 53-55 years old age group, 50% were women, and 96% were married.

The anxiety and surgical fear scales, subscales and total score averages of the patients in the intervention and the control groups were compared. After the music intervention, the mean surgical fear of the intervention group was 29.04 ± 10.31 , and the control group was 50.68 ± 13.65 . While the rate of short-term fear in the intervention group was 15.08 ± 5.97 , this rate was 29.24 ± 6.63 in the control group. While the long-term fear ratio was 13.96 ± 5.13 in the intervention group, the long-term fear ratio in the control group was found to be 21.44 ± 8.33 . The state anxiety rate of the intervention group was 39.56 ± 9.37 . The state anxiety rate of the control group was found to be 56.94 ± 13.90 . The difference between the groups in each subscale and total score was significant ($p < 0.001$). Moreover, total level of the surgical fear, short term fear, long term fear and anxiety rates in the intervention group were significantly lower than the control group (Table 2).

Discussion

This study was conducted to determine the effect of listening to music before cardiac surgery, and to assess any changes on the anxiety and surgery fear. Although there are many studies^{15,5,6} measuring the anxiety level of patients by applying the music postoperatively there are few studies examining this effect when used preoperatively. Both medical and nursing management of the pre-procedural anxiety and stress is important¹⁶ and providing evidence-based interventions that meet psychosocial needs is a crucial aspect of nursing care.¹⁷

Table 1. Baseline comparison of demographic and clinical characteristics between intervention and control groups

	Intervention (n=50)		Control (n=50)		X ²	p
	n	%	n	%		
Age						
53-55	8	16	23	46	1.103	0.842
56-58	17	34	14	28		
59 and above	25	50	13	26		
Gender						
Female	24	48	25	50	3.27	0.523
Male	26	52	25	50		
Education						
Illiterate	28	56	28	56	0.42	0.514
Literate – primary	19	38	18	36		
High school – university	3	6	4	8		
Any Chronic Illnesses						
Yes	33	68	35	70	0.42	0.741
No	17	32	15	30		
Previous surgery						
Yes	16	32	21	42	2.267	0.658
No	34	68	29	58		
Average of Age	56.62 ± 2.54		58.76 ± 3.14			

Table 2. Comparing the study groups in terms of the mean score of state anxiety and surgical fear

	Intervention		Control		T test score (p- value)
	Min- Max	Mean ± SD	Min- Max	Mean ± SD	
Surgical Fear	9-52	29.04±10.31	11-70	50.68±13.65	24.567 0.003
Short Term Fear	4-29	15.08 ± 5.97	7-37	29.24 ± 6.63	23.341 <0.001
Long Term Fear	5-30	13.96 ± 5.13	3-36	21.44 ± 8.33	22.566 <0.001
State Anxiety	27-61	39.56 ± 9.37	24-103	56.94±13.90	32.871 <0.001

The present study found that there was significant difference between the level of anxiety and surgical fear of the individuals in the intervention and control groups. It is generally accepted that patients who will undergo cardiac surgery understandably experience a great deal of fear and anxiety before surgery. This fear and anxiety may affect the course of the surgery, the process of healing after surgery and discharge. Therefore, it may be important to measure these negative feelings before the operation and to identify methods of reducing these negative emotions.¹⁸⁻²⁰

The anxiety levels of the patients in the intervention and control groups were compared. There was a greater and significant decrease in the anxiety scores of the patients in the intervention group than in the control group. The present study, which examined the effects of listening to music on anxiety of patients waiting for cardiac catheterization, found that the difference between the anxiety score of the patients was significant and the anxiety level of the intervention group was lower.²¹ Buffum *et al.* (2006) investigated the effects of listening to music on patients undergoing vascular angiography. The difference between the means anxiety scores of the experimental and control groups significant.²² Cooke *et al.* (2004) had their patients listen to music of their choice for a day. They also found a significant difference in measures of anxiety between the groups with the intervention group reporting lower anxiety.¹⁸ In contrast Taylor Piliae *et al.* used classical music in their study on patients who underwent cardiac catheterization in China and found no difference between the mean scores of the patients, who listened to music, and those who did not.²³ Music may have

caused the mind to be busy with other things, the relaxation of the muscles, and the reduction of anxiety and fear in the patients by creating a feeling of comfort.

Mean scores for surgical fear, short-term fear and long-term fear were compared between the two study groups. The fear level of the intervention group was significantly lower than the control group. The related surgery was associated with a vital organ, i.e., the heart, hospitalization for the treatment, waiting for the procedure, experiencing the surgery for the first time, and potential post-procedural complications, some or all of which may cause anxiety and fear in patients. Studies have found that music slows down the heart rate, reduces the frequency of breathing and creates a calming effect.^{24, 25} The literature was reviewed, and no research was found examining the effect of music on surgical fear. Therefore, literature information could not be added to this finding.

The fact that the patients were not allowed to choose the music, the pre-test was not carried out, and the vital signs related to anxiety were not included in the study may be a limitation of this study. If patients can select their own choice of music or if some types of music have greater benefit than others, this may affect study outcomes and measures.

The results of the present study showed that music can decrease the fear of the patients when undergoing planned cardiovascular intervention. Although there are a limited number of studies in this field, almost all show a positive benefit of music listening prior to surgery, including the present study.

Conclusion

This study evaluated the effects of listening to music on anxiety and surgical fear before cardiac surgery. It was found that there were significant lower levels of anxiety and surgical fear in patients in the intervention group compared to the control group. We suggest that other prospective studies be performed to confirm these findings. Subsequently, there may be a place in pre-operative therapy for music listening to improve outcomes in patients requiring these types of interventions.

Conflict of Interest

The authors have no conflicts of interest to disclose.

Compliance with Ethical Statement

This study was carried out in accordance with the principles of the Declaration of Helsinki. Before the study, written permission was obtained from the Hasan Kalyoncu University Health Science Ethics Committee (date: October 31, 2017 and number: 2017/11) and institution's directorate (date: January 04, 2018 and number: 28001928-508.01). All of the participants were informed about the purpose and the design of the research.

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Author Contributions

Study idea/Hypothesis: ÇA; Data preparation: ÇA; Analysis: ÇA; Literature review: AD, ÇA; Manuscript writing: AD, ÇA; Critical Review: AD, ÇA.

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