



Clinical trial

Effect of listening to music on anxiety and physiological parameters during coronary angiography: A randomized clinical trial

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ABSTRACT

Introduction: Listening to music has been used as an intervention during treatment, rehabilitation and also in disease prevention. Coronary angiography is an invasive procedure and is stressful for the patient. This randomized controlled trial assessed the effect of listening to music during the coronary angiography on the level of anxiety and physiological parameters.

Methods: This randomized controlled trial consisted of 91 patients in the intervention group and 80 patients in the control group. The intervention group listened to music during their angiography procedure (15–20 min on average). The control group received no music intervention.

Results: Study data was collected introductory information form, a physiological parameter evaluation form and State-Trait Anxiety Inventory. The difference between the mean state anxiety scores during the coronary angiography procedure was not statistically significant between the intervention group and the control group ($p > 0.05$). There was no difference in heart rate, respiratory rate and diastolic blood pressure between the groups ($p > 0.05$). However, there was a difference in systolic blood pressure ($p < 0.05$) and pain ($p < 0.001$) between the groups.

Conclusion: Music listening as an intervention for patients undergoing coronary angiography procedures was highly feasible. Although the intervention was not effective in reducing anxiety levels, systolic blood pressure and pain were significantly lower in patients who listened to music.

1. Introduction

Currently, cardiovascular diseases are on the rise due to various reasons, such as the increased life expectancy, inactivity and obesity [1]. This increase has made the medical and surgical treatment of cardiovascular diseases, which present with high mortality, even more important. One of the preferred methods of treating cardiovascular diseases is coronary angiography. Coronary angiography (CAG) is a cineangiographic imaging procedure performed by administering contrast material to the femoral, brachial, radial, and axillary arteries [2,3].

Although CAG is applied for diagnostic and therapeutic purposes, it can lead to anxiety and stress like all simple or serious surgical procedures [4,5]. Since CAG is an invasive procedure used in the diagnosis associated with a highly vital organ, the heart, it causes fear of death and anxiety due to the uncertainty about the process [6,7]. In addition, separation from family, lack of knowledge about diagnosis, treatment

and medical intervention, cost of the procedure, hospitalization, anesthesia, and post-procedural pain are the potential problems that trigger anxiety in individuals [8]. Individuals reportedly experience significant stress before the CAG procedure [9,10]. Constant anxiety in individuals with heart disease has both physiological and psychological negative consequences [6]. Anxiety can increase workload of the heart by activating the sympathetic nervous system. Anxiety is also associated with heart rate, blood pressure, palpitation, breathing difficulty, respiratory rate, and peripheral vasoconstriction [11,12]. High anxiety in patients can lead to both cognitive and hemodynamic changes [13]. In such cases, the impact of anxiety needs to be emphasized since it affects the CAG process to be performed and the treatment process.

Non-pharmacological approaches as well as pharmacological treatment modalities are frequently used to reduce patient anxiety [14]. Non-pharmacological approaches include music therapy [15], reflexology [16], massage [17], progressive relaxation exercises [7], and audio-visual training [18]. Music is a non-pharmacological method

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frequently used to reduce anxiety [13,19] and the level of pain [20]. Studies have found that listening to music reduced the cortisol level, anxiety, and pain [21] and reduced the systolic blood pressure and heart rate and increased SpO₂ [22]. The effect of listening to music applied Sufi musical compositions (tune Hüseyini) were played during CAG procedure on anxiety and physiological parameters was evaluated in this study.

2. Methods

2.1. Design and setting

This randomized, controlled, experimental study was conducted to determine the effect of listening to music during CAG procedure on the level of anxiety and physiological parameters. The study was conducted between September 2017 and April 2018 at the Cardiovascular Surgery Unit of the Aksaray University Training and Research Hospital.

2.2. Sample

A total of 962 patients underwent CAG procedures in the above-mentioned period. A total of 208 patients who underwent CAG for the first time were included in the study. This study was conducted with a total of 171 individuals (91 in the intervention group and 80 in the control group) (Fig. 1). The power of the study was calculated using the results of a similar study [7]. The result of the power analysis using anxiety level (State-Trait Anxiety Inventory) suggested that the study should include at least 5 patients each group at the 80% power and 5% type I error levels. Considering the losses that may arise in the research process, 171 individuals were included in the sample (91 in the intervention group, 80 in the control group).

The inclusion criteria for the study were: no previous CAG treatment, age > 18 years, conscious, able to cooperate, having no analgesic or anxiolytic medication to suppress anxiety symptoms, willingness to participate in the study and provide informed consent. The exclusion criteria were; problems with cognitive understanding that hindered communication, hearing problem, and not able to speak Turkish.

2.3. Measurement

The "Introductory Information Form" developed by the researchers and the "Physiological Parameter Evaluation Form" and "State-Trait Anxiety Inventory" were used for data collection. The study data were collected by the researchers in the preparation room before the procedure and lasted approximately 15 min.

Introductory Information Form: The questionnaire created by the researchers comprised a total of 16 closed-ended questions. This questionnaire contains items about demographic characteristics (age, gender, marital status, education status, and occupation), medical characteristics (chronic illnesses and the number of medications used), and their knowledge and thoughts about the procedure.

Physiological Parameters Assessment Form: Physiological parameters assessed via this form include heart rate, respiratory rate, systolic blood pressure, diastolic blood pressure, and pain level estimated using VAS.

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 Öner 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, of which 20 measure the state anxiety and 20 measure the trait anxiety. Respondents were asked to mark one of these choices that suit best for each item in the scale: "almost never," "sometimes," "often," "almost always." High scores on the scale indicate higher anxiety [23].

2.4. Intervention

After the patients were taken to the operating table, 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 (60–80 rhythm/min) flute music without strong beats and ripple rhythms was chosen. Sufi musical compositions (tune Hüseyini) were played during the angiography procedure (15–20 min on average) in the study intervention group. Sufi music played included both vocal and instrumental aspects and was performed using a Turkish classical instrument called "Ney" (a reed flute). It has been reported in the literature that relaxation music can lead to relaxation and calm in the individual, which can consequently reduce blood pressure, heart rate, and respiration rate [24]. Music is one of the most relaxing methods and can restore the patients' heart rate to a resting rate of 60–80 beats per minute even under stressful conditions. Relaxing music can induce relaxation by reversing the harmful effects of the stress response [24]. In this study, all musical compositions used in music intervention were selected with the help of a specialist lecturer in the field of music.

2.5. Procedure

Total of 962 patients underwent CAG procedures. A total of 171 patients (698 patients did not meet the research criteria and 93 patients did not agree to participate in the study) were included in the study. Patients who did not want to participate in the research were not asked to provide any specific reasons. After explaining the purpose of the research, patients were randomly allowed to draw lots by closed envelope method which would determine their allocation to the control or intervention group. Ten minutes before the procedure the state-trait anxiety scale and the physiological parameters assessment form were administered. Participants were asked to select an envelope. Those that selected single numbers were allocated to the control group and those with double numbers formed the intervention group. As a result of the draw, listening to music was provided to the patients in the intervention group during the procedure. No additional intervention was performed on the individuals in the control group.

Vital signs (blood pressure, heart rate, respiration rate, and pain level) of the patients in the intervention group were recorded 15 min before the procedure, and the State-Trait Anxiety Inventory was filled in. Instrumental music was played by researchers throughout the procedure. After the completion of the procedure, the patients were taken to their rooms, and their physiological parameters 15 min after the procedure were noted in the vital signs follow-up form. The State-Trait Anxiety Inventory was completed 20 min after the procedure.

Data were collected from the control group at the same intervals as the intervention group, but only the routine nursing care practices, except for listening to music, were carried out in the unit. The data of this study were collected by a person who was blinded to the allocation of patients into the groups. The study data were evaluated by a statistician who was also blinded to the same information.

2.6. 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 Aksaray University Human Research Ethics Committee (date: June 16, 2017 and number: 2017/68) and institution's directorate (date: June 20, 2017 and number: 806.02.02). All participants were informed about the purpose and design of the research. Anonymity and confidentiality were guaranteed. Participation in the study was voluntary. It was stated that the decision of the patients to not participate in the study would not affect the nursing interventions applied to them and that the patients could withdraw from the study at any time.

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