



# The effects of Turkish classical music on physiological parameters, pain and analgesic use in patients with myocardial infarction: A non-randomized controlled study

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## ARTICLE INFO

### Keywords:

Myocardial infarction  
Music listening  
Pain  
Analgesic use  
Physiological states

## ABSTRACT

**Introduction:** Cardiovascular diseases are one of the most important causes of morbidity and mortality worldwide. The purpose of the current study was to investigate the effect of listening to music on pain, analgesic use and physiological states on Turkish people with myocardial infarction.

**Methods:** This study was a non-randomized controlled clinical trial and was conducted in a coronary intensive care unit in a university hospital. The study was conducted with a total of 500 patients; 250 in the experimental group; 250 in the control group; participants were aged between 18 and 79 years; and able to speak, read and write Turkish. The control group received routine care after myocardial infarction while the experimental group listened instrumental Turkish classical music for 30 min in coronary intensive care. The choice of music was made by the researchers. The music, a classical instrumental Turkish music, (Zirgülemakami) was soft, relaxing, and included instrumental melodies of 60–80 beats per minute (bpm) and was for 30 min with a volume of 50–60 dB. Face-to-face interviews and then Personal Sociodemographic characteristics and Visual Analog Scale were used to collect data.

**Results:** After the music listening, pain, analgesic use, systolic and diastolic blood pressure, pulse averages of the patients were decreased and oxygen saturation averages between the groups were increased and differences between groups was statistically significant ( $p < 0.001$ ).

**Conclusions:** These findings support the use of music as an independent nursing intervention to manage pain, analgesic use and physiological states in patients after myocardial infarction. Listening to music during and after myocardial infarction can effectively reduce pain, analgesic use, systolic and diastolic blood pressure, pulse levels. Thus listening music may be a useful tool for coronary intensive care nursing.

## 1. Introduction

Cardiovascular diseases (CVD) are one of the most important causes of morbidity and mortality worldwide. According to the World Health Organisation, 17.3 million people died in 2016 due to cardiovascular diseases, and this corresponds to 30% of all global deaths. When effective precautions are not taken, it is expected that in 2030, about 23.6 million people will die of cardiovascular diseases, especially acute myocardial infarction (AMI) [1–3]. The results of the study Heart Disease and Risk Factors in Turkish Adults (TEKHARF) by the Turkish Cardiology Association revealed that 3.1 million people at the age of 35

or older have CVD, and the incidence of the disease has increased by 6.4% annually since 1990. The coronary mortality rate that was calculated as 5.7 per thousand each year is very high in comparison to those in European countries [4].

Pain is the most common symptom in MI [5]. Pharmacological and non-pharmacological agents are widely used in treating pain. Music is a non-pharmacological treatment method for pain that is effective, inexpensive and reliable [5,6].

During music listening, the individual's cognitive analgesic mechanism is activating by distracting their attention towards somewhere else, the pain is alleviated with the relaxation as a result, and anxiety is

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<https://doi.org/10.1016/j.eujim.2018.08.001>

Received 23 May 2018; Received in revised form 30 July 2018; Accepted 1 August 2018

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reduced by developing positive emotions [7,8]. Lui and Petrini stated that 68.1% of the group that listened to music had reduced pain and 76.6% had reduced anxiety [9]. Various studies have demonstrated that music can alter physiological responses which can in turn affect specific hormone secretion [7,10–14].

This study was conducted to determine the effect of music on pain, analgesic usage numbers and physiological parameters in patients with myocardial infarction

## 2. Hypothesis

**H1.** In patients who are given music to listen to, analgesics usage, pulse, systolic-diastolic blood pressure values are low, and oxygen saturations will be high.

## 3. Methods

### 3.1. Study design

This non-randomized controlled clinical trial was conducted in the coronary intensive care unit of a university hospital.

### 3.2. The study population

The study was conducted in the coronary intensive care unit (CICU) of a university hospital located in the eastern Turkey between May 2015–May 2016. The study population consisted of 650 patients over the age of 18 years who were hospitalized with the diagnosis of MI at the CICU. Patients were included into the study if they had no visual-auditory impairment, were able to read and write in Turkish, had 24 h of hospitalization at the CICU, and would stay in hospital for at least one more day.

Patients with severe hypotension, atrioventricular block, not want to listen to music or not finish listening to music, and cardiogenic shock were excluded from the study. Patients who came in the first six months were assigned to the experimental group, and those who came in the next six months were assigned to the control group. The study was completed with 500 MI patients (250 experiments and 250 control groups).

### 3.3. Data collection

The data were collected by a patient information form that was created by the researcher, life signs before and after the intervention, and a pain and analgesics usage record form. The researcher was at the CICU seven days a week, monitored each patient who met the inclusion criteria between May 2015 and May 2016 and collected the data by face-to-face interviews with the patients.

For the patients in the experimental group, on their second day of hospitalization at the CICU, vital signs (pulse, systolic-diastolic blood pressure, oxygen saturation values), analgesic usage number, and pain levels evaluated with Visual Analogue Scales (VAS) was recorded in the pre-registration form. After the pre-test, the patient listened to music for 30 min. After listening to the music, vital signs (pulse, systolic-diastolic blood pressure, oxygen saturation values), analgesics usage and pain levels (evaluated with a VAS) were recorded in the post-test recording form. No music intervention was conducted with the control group patients, and on their second day of hospitalization at the CICU, vital signs (pulse, systolic-diastolic blood pressure, oxygen saturation values), analgesic usage and pain levels were recorded in the pre-test record form, and these were recorded again in the post-test record form after 30 min.

In the coronary intensive care unit only medical treatment is routinely given. Providing music for patients with myocardial infarction to listen to is not part of routine care in the coronary intensive care unit. In

the coronary intensive care unit is non-pharmacological methods are not used.

There is no specific protocol for providing analgesia for those who have had a myocardial infarction. If the patient has pain, analgesic (morphine HCl) is available after the ECG and an evaluation by a cardiologist.

### 3.4. Patient information form

The patient information form was prepared to determine the descriptive characteristics of the patients who were included in the study at the CICU. This form contains a total of four questions (age, gender, marital status, education level).

#### 3.4.1. Pre-post test record form

These form were prepared to record vital signs (pulse, systolic-diastolic blood pressure, oxygen saturation), and the number of analgesics used by patients before and after the music listening.

#### 3.4.2. Visual Analogue Scales (VAS)

VAS was used to record pain level of patients before and after the music listening. The VAS scale has predefined values. The scale is marked with numbers from 0 to 10. The point of 10 on the scale corresponds to a pain never before experienced by the patient. The severity of pain is estimated by asking the patient at what point on the scale to place the suffering difficulty experienced at the moment [15].

### 3.5. Intervention

The patients in the experimental group were informed about music listening, the aim and method of the study were explained, and their approvals were received. On their second day of hospitalization at the CICU, vital signs (pulse, systolic-diastolic blood pressure, oxygen saturation values), the number of analgesics used by patients, and pain levels levels evaluated with VAS was recorded in the pretest record form. Music was provided and the experimental group patients were able to listen after the pretest. Music was listened for the experimental group patients after the pretest. The choice of music was made by the researchers. Music selection was supported by an instructor at the department of music at the faculty of fine arts. The patients listened to classical instrumental Turkish music (Zirgüle makamı) for 30 min with MP3 headphones in their beds. The meaning of the makam in classical instrumental Turkish music is that the used sound sequences are used within the framework of certain rules. The music, a classical instrumental Turkish music, (Zirgüle makamı) was soft, relaxing, and included instrumental melodies of 60–80 beats per minute (bpm) and was for 30 min with a volume of 50–60 dB. The Zirgüle makamı is effective in patients with cardiovascular disease [16]. All patients also received oxygen support. At between 2–3 pm in the afternoon (the hours where treatment is less intensive), the research nurses assisted the participants to lie down in the bed and turn over to a relaxing position on their back, supine position, with the bed head at 30–45°. During the rest, for all participants, the environment was enhanced to reduce stimuli and facilitate rest by closing the door and posting a sign to prevent being disturbed by visitors and health care personnel. However, no changes of the environmental light were made. After the music, vital signs (pulse, systolic-diastolic blood pressure, oxygen saturation values), analgesic usage numbers and pain levels of the patients were recorded in the post-test form.

### 3.6. Research variables

Independent Variables: Music Intervention

Dependent Variable: vital signs (pulse, systolic-diastolic blood pressure, oxygen saturation values), analgesic usage numbers and pain levels.

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