Original Article

The Effect of Music on Comfort, Anxiety and Pain in the Intensive Care Unit: A Case in Turkey

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Abstract

Introduction: The intensive care unit often causes major distress and anxiety in patients. Music interventions have been used to reduce anxiety and distress and improve physiological functioning in medical patients.
Aim: The aim of this study is to investigate the effect of music on pain, anxiety and comfort in patients who are in the intensive care unit (ICU) with the diagnosis of Cerebrovascular Accident (CVA).
Methodology: Target population of this experimental study is all CVA patients who were hospitalized in the ICU of a state hospital located in Adana, Turkey. The participants were 72 patients and data were collected through Patient Identification and Vital Signs Form, Visual Analogue Scale (VAS) for identifying the level of pain, Faces Anxiety Scale and State Trait Anxiety Inventory for identfying the level of anxiety, and General Comfort Questionnaire for identifying the level of comfort. The data were analysed in SPSS for Windows package programming using paired samples t-test.
Results: It was found that music increased the general comfort level and pO_2. The systolic tension arterial, VAS score, State Anxiety Level, and Faces Anxiety Scale score decreased considerably with music therapy.
Conclusions: Music is a type of therapy which contributes to the comfort of ICU patients by decreasing the pain, and anxiety.

Keywords: anxiety, comfort, intensive care, music therapy, pain

Introduction

The intensive care unit is different from other departments in hospitals in terms of the treatment methods and technical equipment used, physical appearance, and the nature of sensitive environment. When the vital functions of patients decline in a risky way, they need to receive treatment in an intensive care unit with a view to maintaining vital functions and applying special treatment methods **(**Aslan and Özer, 2010). Patients in the intensive care unit experience changes in their comfort. Some reasons include increase in the anxiety level caused by tracheostomy, intubation, and ventilation;

changes in consciousness level caused by pain and use of sedatives; and movement restriction caused by the existence of invasive and non-invasive tools (Eti Aslan and Karadağ, 2007; Tracy and Chlan, 2011).

With its multi-directional effects on people, music takes place in every aspect of our lives including the treatment purposes (Uçan and Ovayolu, 2006). Music therapy is a systematic method of treatment in which physiological and psychological effects of musical sounds and melodies are arranged according to various psychological disorders. Music therapy is a guiding communication method in identifying

psychological state of adults and children who have psychological and physical problems (Gencel, 2006).   The importance and effect of music therapy on patients' well-being was first emphasized by Florence Nightingale in early 1800s, and music therapy was defined as a nursing intervention which reduced pain and anxiety and increased patient comfort (Khorshid and Akın, 2007).

Research indicates that music creates balance between mind, body and soul, has positive effects on pain and anxiety, and increases quality of life of sick or healthy people (Uçan and Ovayolu, 2006).   Music is an important tool which distracts patients' attention and decreases their heart rate, blood pressure, body temperature, and breath rate. Brain waves can be accelerated or decelerated with music and they can create an anxiolytic impact by helping the coordination of muscle tension and movements (Uçan and Ovayolu, 2007). Music therapy is defined as "a major branch which makes use of music and musical activities to meet people's physical, psychological, social and mental needs" and accepted as a scientific treatment method compatible with traditional medicine (Erer and Atıcı, 2010).   Nowadays, music therapy as a treatment intervention that supports traditional Medicine is used as a non-invasive treatment method for patients in the ICU. However, use of music in nursing or as a nursing intervention is quite rare in our country (Ak, 2006).

The basic benefit expected from this study is to assess the effect of music on pain, anxiety and general comfort levels of ICU patients, to enhance the use of nonpharmacological methods such as music together with pharmacological methods, and to be a model for future studies in the field.

Materials and Methods

This experimental study was conducted as a self-controlled clinical study with a view to identifying the effect of music on comfort, anxiety and pain in patients with CVA in the ICU of a state hospital located in Adana, Turkey. The ICU where the study was conducted accept patients from all branches, but it was found that 31,3% of the patients were treated with CVA diagnosis between the years 2005 and 2009. Therefore, the present study involved patients with CVA. The target population of the study is all ICU patients who are taken to the ICU due to CVA diagnosis between 1st of October, 2009 and 20th of January, 2011. The participants are 72 patients who meet the following inclusion criteria:

- Volunteering to participate in the study
- Having been in the ICU for at least 48 hours,
- Being conscious enough to able to understand and respond questions regarding health status,
- Being able to speak Turkish,
- Being able to communicate, having no hearing problems,
- Not having taken any analgesic and anaesthetic Medicine within 24 hours before or during the process,
- Being 18 years old and over,
- Not having been diagnosed with a psychiatric disease before,
- Not having been drug addicted before.

The sample size was identified using Med Calc package programming; the number of patients was calculated as 72.

Data Collection Tools

The data were collected through six different data collection tools listed below:

Patient Identification Form: The form which aimed to identify the participants' descriptive characteristics (age, gender, place of living, education level, occupation, marital status, monthly income, etc) was prepared in light of the related literature.

Vital Signs Form: The form was generated by the researcher herself with a view to recording systolic and diastolic tension arterial, heart and breath rate, and pulse oximetre values by the help of a monitor.

Visual Analogue Scale: The numerical scale in which patients evaluate their pain between 1 and 10.

Faces Anxiety Scale: Faces Anxiety Scale identifies the existence and level of patient anxiety according to facial expressions in the scale. To enhance objectivity, the scale was marked by a nurse other than the researcher according to the facial expression of the patient at that moment.

STAI-1 State Anxiety/STAI-2 Trait Anxiety Inventory: The inventory which was developed by Spielberger et al. (1970) consists of two sub-scales (state and trait) each of which includes 20 questions. The questions are rated on a four-point likert scale; and the inventory can be used with individuals 14 and older. State Anxiety Inventory identifies how individuals feel at a specific moment and under specific conditions while Trait Anxiety Inventory identifies how individuals feel in general, independent from the states and conditions they are in. Turkish adaptation, reliability and validation study of the State-Trait Anxiety Inventory was performed by Öner and Le Compte (1983). Reliability coefficient was found to range between 0.83 and 0.87.

General Comfort Questionnaire: General Comfort Questionnaire was developed in light of the taxonomic structure wherein there is the three levels and four aspects constituting the theoretical components of comfort. The questionnaire is used with a view to identifying comfort needs and assessing whether these is an increase in the comfort level as a result of the comforting nursing interventions. The four-point likert questionnaire consists of 48 items and three sub-scales called relief (16 items), ease (17 items), and transcendence (15 items). Response organization of the questionnaire which involves both positive and negative items are given in mixed order.

Thus, high scores in positive items (4p) refer to high comfort level while low scores (1p) to low comfot level; low scores in negative items(1p) refer to high comfort and high scores (4p) to low comfort. In the evaluation of the questionnaite, negative scores are coded reversely and then added to the positive items. The total score to be obtained from the scale ranges from 48 to 192. The mean score is calculated by dividing the total score into the number of items in the questionnaire; and the result is indicated in a distribution ranging from 1 to 4 in which 1 refers to low comfort and 4 to high comfort. Cronbach Alpha value of the questionnaire was found 0.88.

The necessary official permissions were obtained from the ethical committe of the hospital where the study was conducted, and the patients and/or patient relatives signed the informed consent form. The participants were involved in the study on voluntary basis and the data were collected through one to one interviews conducted by the researcher. The study was piloted with 5 patients in the same unit. Because of the busy patient circulation which has the potential to distract patients' attention, the patients received music through headphones and MP3. The kind of music to be provided to patients was determined by consulting an instructor who is an expert in the field and by reviewing the related literature on the issue. For 25-30 minutes before the post test, the patients received soft instrumental music (Rast:a kind of Turkish Music mode which is effective in the afternoon and gives pleasure-joy/peace-). The data collection process was performed according to the flowchart given in Figure 1. In this regard, baseline comfort, anxiety, and pain levels of the patients were assessed at the beginning. Then, they were left to relax for 30 minutes without any intervention. The same assessments for comfort, pain, and anxiety levels were conducted again. The patients then received instrumental sufi music for 25-30 minutes; anxiety, comfort and pain levels were assessed once more.

Data analysis

Statistical analysis of the findings was performed in SPSS (Statistical Package for Social Sciences) and evaluated using descriptive statistics as well as t-test for dependent and independent samples.

Ethical consideration

Before the study was conducted, the official permissions were obtained from the hospital administrators where the study was conducted and from our Hospital Clinical Studies and Ethics Committee. The patients' verbal consent was obtained before each interview.

Results

Average age of the participants was found 64,6±12,0, and average duration spent in hospital was 4,6±4,0 days. Of all the participants, 55,6% (n=40) are male and 44,4% (n=32) are female; 91,7% (n=66) are married, 8,3% (n=6) are single, and 90,3% have children. Average duration of listening to music is 29,7±1,1 minutes, and 30 minutes for the 93,1% (n=67) of the patients. Of all the participants, 58,3% (n=42) stated that they had never used any relaxation methods before, 11,1 % (n=8) reported to listen to music as a relaxation method, and 84.7% were pleased with the music they received during the study.

The Effect of Music on Vital Signs

Mean for the participants' systolic tension arterial values in the first assessment (baseline tests) was 142 mm/Hg at the beginning, 141 mm/Hg during the half-an-hour relaxation period, and decreased to 138 mm/Hg after they received music. There was no significant relationship between the mean scores of the systolic tension and arterial value scores when there was no music (p>0,05). However, a statistically significant decrease was detected in the systolic and arterial value after listening to music (p<0,05) (see Table 1).

Diastolic tension arterial mean scores were found 78mm/Hg in the first assessment and 77mm/Hg during the half-an-hour relaxation period. The values were found to decrease to 76mm/Hg after the patients listened to music. Mean scores for the heart rate values were found 85/ms in the first assessment, 84/ms during the half an hour relaxation period, and 83/ms after listening to music. Breath rate mean scores were found 21/ms in the first assessment, 21/ms during the half-an-hour relaxation period, and 20/ms after listening to music. No significant difference was found between the first assessment and during the time they listened to music in terms of the diastolic tension arterial, heart rate and breath rate mean scores (p>0,05) (see Table 1).

Means for pO_2 was found 95,8% in the first assessment, 96% during the half-an-hour relaxation period, and 96,4 % after listening to music.

While there was no statistically significant relationship in terms of the pO_2 mean scores between the first assessment and after the half-an-hour relaxation period (p>0,05), a statistically significant increase was detected in pO_2 values after listening to music (p<0,05) (see Table 1).

The Effect of Music on Pain

VAS mean scores were found 2,3 in the first assessment and 2,0 during the half-an-hour relaxation period. The scores were found to decrease to 0,7 after listening to music. A statistically significant relationship was found among the VAS scores in the first assessment, during the half-an-hour relaxation period, and after listening to music (p<0,05) (See Table 1).

The Effect of Music on Anxiety

Faces Anxiety Scale mean scores of the patients were found 3,9 in the first assessment, 3,0 during the half-an-hour relaxation period, and decreased to 1,2 after listening to music. There was a statistically significant relationship between the Faces Anxiety Scale mean scores when the patients received music and when they did not (p<0,05)(see Table 1).

Mean scores for the state anxiety level were found 41,5 ±10,4 in the first assessment and 43,6±10,2 during the half-an-hour relaxation period; the state anxiety level was found to decrease to 34,7±8,6 after listening to music. A significant relationship was detected between the mean scores of the state anxiety level obtained in the first assessment and after listening to music (p<0,05) (see Table 1).

The Effect of Music on General Comfort Level

General comfort level of the patients was found 135,3 ±11,8 in the first assessment and it was found to decrease to 133,2±12,4 during the half-an-hour relaxation period. It was found that the general comfort level increased up to 142,7±11,0 after listening to music. There was a statistically significant relationship between the general comfort mean scores when the patients received music and when they did not (p<0,05)(See Table 1).
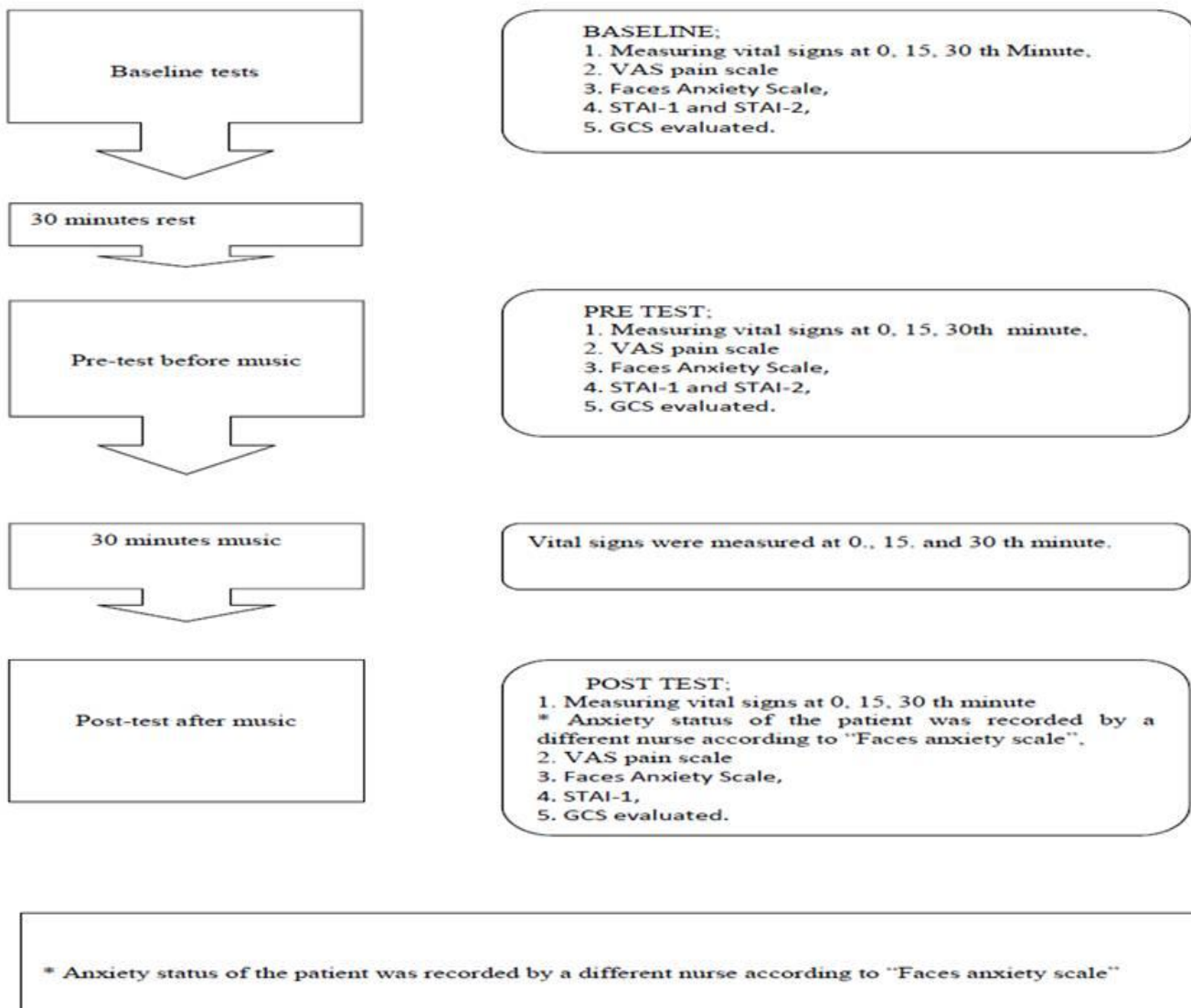
Figure 1.   The Flowchart of the Study

Baseline tests	BASELINE: 1. Measuring vital signs at 0, 15, 30 th Minute, 2. VAS pain scale 3. Faces Anxiety Scale, 4. STAI-1 and STAI-2, 5. GCS evaluated.

30 minutes rest

Pre-test before music	PRE TEST: 1. Measuring vital signs at 0, 15, 30th minute, 2. VAS pain scale 3. Faces Anxiety Scale, 4. STAI-1 and STAI-2, 5. GCS evaluated.

30 minutes music	Vital signs were measured at 0., 15, and 30 th minute.

Post-test after music	POST TEST: 1. Measuring vital signs at 0, 15, 30 th minute * Anxiety status of the patient was recorded by a different nurse according to "Faces anxiety scale", 2. VAS pain scale 3. Faces Anxiety Scale, 4. STAI-1, 5. GCS evaluated.

* Anxiety status of the patient was recorded by a different nurse according to "Faces anxiety scale"

Table 1: Mean scores of vital signs, pain, anxiety and general comfort according to listening to music (n=72)

Variables		Listening to Music		
		Baseline test(*) (†) Mean ±SD Range	Pre-test before music(*) Mean ±SD Range	Post-test after music(†) Mean ±SD Range
Vital Signs	Systolic Blood Pressure	142±24.4 (102-200) (†)	141±24.1 (97-188)	138±22.5 (91-193)(†)
	Diastolic Blood Pressure	78±13.7 (48-113)	77±14.5 (35-116)	76±13.9 (33-106)
	Pulse Rate	85±18.2 (46-148)	84±18.2 (42-149)	83±18.4 (47-155)
	Respiration Rate	21±4 (13-35)	21±4.5 (12-36)	20±3.6 (12-33)
	Pulse Oxymetry	95.8±1.9 (90-99) (†)	96±1.6 (92-98)	96.4±1.6 (93-99)(†)
Pain	Visual Analogue Score	2.3 ± 1.7 (0-8)(*)(†)	2.0 ±1.8 (0-8)(*)	0.7 ± 1.2 (0-6)(†)
Anxiety	Face Scale	3.9± 2.0 (0-8)(*)(†)	3.0 ±1.9 (0-8)(*)	1.2 ±1.5 (0-6)(†)
	State-Trait Anxiety Inventory (STAI-1)	41.5 ± 10.4 (20-66)(*)(†)	43.6 ± 10.2 (26-69)(*)	34.7 ± 8.6 (20-59)(†)
Comfort	General Comfort Scale	135.3±11.8 (110-165)(*)(†)	133.2±12.4 (106-171)(*)	142.7±11.0 (112-168)(†)

(*) Significant difference between baseline test and pre test before music values
(†) Significant difference between baseline test and post test after music values

The Effect of Music on General Comfort Level

General comfort level of the patients was found 135,3 ±11,8 in the first assessment and it was found to decrease to 133,2±12,4 during the half-an-hour relaxation period. It was found that the general comfort level increased up to 142,7±11,0 after listening to music.

There was a statistically significant relationship between the general comfort mean scores when the patients received music and when they did not (p<0,05)(See Table 1).

Discussion

The present study has revealed positive effects of music on systolic tension arterial and pulse oximeter mean scores. However, no statistically significant difference was found in terms of the diastolic tension arterial, heart rate and breath rate mean scores. Almerud and Peterson (2003) found that music therapy decreased heart and breathe rate and maintained relaxation in mechanically ventilated patients in the intensive care unit. Lindgren and Ames investigated the effect of music therapy on mechanically

ventilated patients' healing and anxiety levels and found that music decreased patients' anxiety level; thus they defined music therapy as a harmless and inexpensive intervention (Khorshid and Akın, 2007). Lee et al. (2005) found that there was a decrease in mechanically ventilated patients' anxiety, blood pressure, impulse and breath rate levels after they listened to music for 30 minutes.

The present study has explored a significant decrease in the VAS pain scores of the patients after listening to music, which indicates the positive effect of music on reducing pain. Studies conducted with different patient groups correspond to the findings in the present study. Chang and Chen (2005) investigated the effect of music on pain level and vital signs in women having caesarean section. It was found that, with the music they received, there was a decrease in women's blood pressure, impulse, breath rate, and pain level. Ebneshahidi and Mohseni (2008) investigated the effect of music that women listened for 30 minutes via headphones in post-operative period following a caesarean section.

They evaluated women's VAS and vital signs and found that the women's pain decreased statistically and they could communicate with their babies well in the early period. In their study which evaluated the effect of music on pain level of mechanically ventilated patients, Chlan et al. (2001) provided patients with relaxing music and found that music therapy reduced physiological findings and pain. Another study conducted by Chan et al. (2006) also found that music was effective in managing pain after percutaneous coronary operation.

The present study found a significant decrease in the mean scores of the face anxiety and state anxiety levels. In this regard, music seems to increase patients' relaxation by reducing their anxiety. Uçan et al. (2007) found that the music provided to patients during endoscopy significantly increased their gladness level and had positive effects on operation success. Yung et al. (2002) explored positive effect of music on anxiety in the preoperative period in Chinese men who had transurethral prostate resection. In their study conducted with mechanically ventilated

patients, Wong et al. (2001) identified music therapy as non-invasive, anxiety-reducing nursing intervention.

Bradt and Dileo (2014) indicates that in a systematic review, music listening in mechanically ventilated patients' in critical care units may have beneficial effects on state anxiety. In another systematic review Bradt and Dileo (2013) indicates that listening to music in persons with coronary heart disease may have a beneficial effect on anxiety, especially those with a myocardial infarction.

The present study found that general comfort level of the patients increased after they listened to music. There is a statistically significant relationship among the comfort levels before listening to music and after the periods with and without music. The related literature encompasses limited number of studies about the effect of music on general comfort.

However, in the study which included five mechanically ventilated patients in the ICU, Besel (2006) identified the effect of music on pain, anxiety and comfort scores and found no statistically significant relationship between them.

Studies on music therapy indicate that music, by moving patients from the intensive care unit environment that creates fear and anxiety to a familiar ground, has positive effects on reducing pain and anxiety as well as increasing comfort (Kemper and Danhaur, 2005; Briggs, 2001; Chlan, 2004; Chlan et al.. 2007).

Stress, pain, anxiety and poor comfort levels are important area for intervention in critically ill patients. Music may be a comforting, familiar intervention for patients experiencing a stressful ICU treatment.

It is recommended that organizing in-service training courses on music which is one of the independent nursing interventions known as alternative therapeutic approaches, investigating long term effects of music, conducting in-depth studies with music types chosen by patients themselves and including more participants will shed more light to the issue.

Conclusion

The present study has found that music creates significant changes in systolic tension arterial and pulse oksimeter values; significantly decreases pain, Faces Anxiety Scale, and state anxiety mean scores; and increases general comfort level. More research is needed on the effects of music offered by a trained music therapist.

Conflict of Interest

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article. This study was not funded by any organisation.

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