THE EFFECT OF NATURE SOUND AND CULTURAL MUSIC ON PHYSIOLOGICAL RESPONSES DURING MECHANICAL VENTILATION PERIOD IN INTENSIVE CARE UNIT PATIENTS

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KEYWORDS
Intensive Care Unit, Nature Sound, Cultural Music(Turkish Folk Music), Nursing.ces

ABSTRACT

Objective: This study was carried out to evaluate the effects of nature sound and cultural music (folk song) performed during the mechanical ventilation period of the patients hospitalized in the intensive care surgery department (surgical intensive care unit) on blood pressure, heart rate, respiration, saturation and pain scores.

Material and Method: This study was designed as a semi-experimental research with pre-test - post-test control group.Data were collected between October 1, 2019 and March 31, 2020. Three groups were made in the study. During the treatment process, 30 patients were made to listen to nature sounds, 30 to cultural music (instrumental folk songs), while 30 patients were not made to listen to anything and the treatment was applied in this way.In the study, Patient Diagnosis and Evaluation Form,Critical Care Pain Observation Tool, Evaluation Form for the Physiological Conditions of Patientswere used, and Nature Sound and Cultural Music (Turkish Folk Music) were listened in the study. Data were evaluated in SPSS (for Windows 25.0)

Results:Considering the total scores according to the Critical Care Pain Observation Tool there was no significant difference before listening to music and 1 hour after listening to music ($p>0.05$), while there was a statistical difference 2 hours after listening to music ($p <0.05$). It was determined that the difference was due to the patients listening to folk music. Considering the physiological responses of the patients, while the mean arterial pressure did not change in the group that listened to nature sound and cultural music before and 2 hours after the music, the mean arterial pressure increased in the control group.

Conclusion: As a result, it was observed that listening to nature sound and cultural music during the mechanical ventilation period of the patients hospitalized in the ICU had a positive effect on physiological responses.

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Introduction

Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. The production of afferent signals, defined as the manifestation of this damage, is nociception. Pain experienced in intensive care includes both recurrent episodes of acute or short-term pain and varying degrees of chronic or persistent pain. Acute or short-term pain is primarily an immediate experience of localized tissue damage.In intensive care, acute pain may occur as a symptom of the patient's underlying disease or as a result of therapeutic.[(1)]

A wide variety of noxious stimuli can affect critically ill patients (such as surgery, monitoring devices such as a catheter or electrophysiological apparatus, procedures, tissue inflammation, and immobility).[(2, 3,4)]For example; particularly common and painful procedures include endotracheal intubation, phlebotomy, nasogastric or orogastric tubes, vascular access devices, aspiration, and chest tubes. In addition to that rotating has been described as one of the most painful and distressing procedures in routine intensive care unit (ICU) care.[5,6]

Chronic pain develops from prolonged tissue damage or persistent pain processes that cause a vicious cycle of tissue replacement and increased subjective sensitivity.
Chronic pain is common due to both diseases and conditions prior to admission to the ICU, and acquired syndromes resulting from prolonged and recurrent painful conditions during ICU stay.[2,5,7] Understanding different types of pain is important, not only for their diagnostic capabilities to determine the root cause of the pain, but also because different therapeutic approaches are indicated depending on the pain syndrome.
Pain experience can be broadly subdivided into somatic, visceral, neuropathic, other, and mixed[1,8]
In the intensive care unit, the differentiation of pain types is sometimes limited by the ability of many patients to express symptoms. Somatic pain is the predominant experience of ICU patients due to its propensity for tissue damage. Somatic pain is usually well localized, described as dull and painful, and is particularly responsive to opioids and non-steroidal anti-inflammatory agents.
Somatik ağrı genellikle iyi lokalize olur, donuk ve ağrılı olarak tanımlanır ve özellikle opioidlere ve non-steroid anti-inflamatuar ajanlara yanıt verir.[1,4,6,]
Visceral pain is characterized by cramping and colic and responds best to anticholinergic therapy.[1,4,6,].
Neuropathic pain is usually described as burning and shooting along the radicular distributions and responds to antidepressants and anticonvulsants such as gabapentin. [1,4,6,].
Pain is potentially detrimental to the ICU patient. It produces systemic effects that can be alleviated by optimal pain management.[8,9]
Understanding the physiological effects of pain is important for diagnosis and evaluation as well as motivation for intervention.[7,8,9]
Pain experience affects all systems of the body through neurohormonal mechanisms. It results in general stress response, catecholamine release, and sympathetic expression, mydriasis, anxiety, catabolism, tachycardia, followed by water retention as a result of high myocardial oxygen demand, high intestinal motility, tachypnea, and altered pulmonary mechanics, activation of the renin-angiotensin-aldosterone axis.[8,9]
It can result in unrelieved pain, immune system dysfunction, hypercoagulation and thromboembolic disease, altered glucose control, myocardial ischemia, ventilator dyssynchrony, acute restrictive respiratory physiology, and impaired sleep quality.[8,9]
Tissue damage and inflammation cause the release of multiple cytokines such as tumor necrosis factor, interleukin-1 and interleukin-6, which may contribute to hemodynamic instability for ICU patients.[10,11]
Finally, the clinician should recognize the synergistic effects of pain on anxiety, depression, and sleep disorders.[12,13]
Each of these overlapping conditions has also been shown to interact with painful conditions and increase the experience of pain. For this reason, healthcare professionals (especially nurses) can apply many methods to patients hospitalized in intensive care units for somatic or psychological pain. They can use methods such as massage and positioning in somatic pain types related to catheters and interventions, while they can use methods such as listening to music, explaining each intervention, and meeting with the patient's relatives during visiting hours in pain caused by psychological conditions such as anxiety and depression.Healthcare workers should not forget that even if the patient is dying, he/she loses the last of his/her senses.[14]
Bernardi et al. determined heart rate, respiration, blood pressure, middle cerebral artery flow rate and skin vasomotor activity in patients listening to music.[5]
They found that vocal and orchestral music had a more positive effect on respiratory rhythm and blood pressure, in contrast to monotone music.

It was found that there was no difference between musicians and non-musicians. [15,16] It was revealed that some subjects experienced a feeling of trembling with cardiovascular changes in sudden changes in musical rhythm[16,17]
For this reason, in this study, the effects of nature sound and cultural music played during mechanical ventilation period on the physiological responses of the patients in the ICU were evaluated.

Material and Methods

Study Desing
This study was designed as a semi-experimental research with pre-test - post-test control group.
The study was conducted in the Surgical Intensive Care Unit (SICU) of a university hospital in Gaziantep, Türkiye and the data were collected between 1 October 2019 and 31 March 2020.

Sample and Context (Sample Size Calculation)
The population of the study consisted of mechanically ventilated patients hospitalized in the SICU of a university hospital. The number of traumatized tertiary care patients admitted to the SICU one year ago was 118. For this reason, it was aimed to take a total of 90 patients into the sample according to the sample selection in the groups with a certain population. Three groups were formed, one control (30) and 2 experimental (30-30) groups.

Inclusion and Exclusion Criteria
Inclusion criteria:
• Being 20-60 years of age,
• Patients whose sedation was discontinued (such as porpofol, esmeron, and dormicum),
• Patients who did not take opioid analgesics (such as dolantan, fentanlyn, and morphine),
• Patients who did not take antipsychotic, anxiolytic drugs (such as neurodol and dysemia),
• Patients with a Glasgow Coma Scale score of 9 and above,
• Extubated patients who were prepared to be treated,
• Patients without hearing problems
• Patients without neurological, psychiatric diseases and head trauma
Exclusion criteria: Age after 60 years, patients whose family members did not give permission to participate in the study

Data Collection and Instruments(Tools)
In the study, Patient Diagnosis and Evaluation Form, Critical Care Pain Observation Tool" and Evaluation Form for the Physiological Conditions of Patients were applied.
For nursing practices; To make patients listen to music mp3 and mp4 Player and Earphones. The types of music listened to were Nature sound, cultural music (Turkish Folk Music).
Hemşirelik uygulamarı için; Hastalara müzikleri dinletmek için Mp3 ve Mp4 Çalar ve Kulaklık Dinletilen müzik türleri ise Nature sound, cultural music (Turkish Folk Müzik).

Patient Diagnosis Form and Evaluation Form: It included the following 21 questions about the patients hospitalized in the surgical intensive care unit: age, gender, height, weight, Body Mass Index (BMI), educational status, marital status, occupation, employment status, income status, smoking and alcohol use, presence of additional disease, hospitalization history, medications used continuously, length of stay in the intensive care unit, social support status expressing family or living alone, analgesics used, Acute Physiology and Chronic Health Evaluation (APACHE) Score, Glasgow Coma Scale (Glasgow Coma Scale-GKS), time of sedation cessation. This information was obtained from the patient file or patient relatives.

Critical Care Pain Observation Tool: It was designed to scale the suffering of patients who cannot express themselves with objective findings. The Critical Care Pain Observation Tool (CPOT) is based on four items: patient's facial expressions, body movements, compliance with the ventilator (or use of voice for non-intubated patients), and muscle tension. Each field has a possible score between 0 and 2. The total score can range from 0 to 8. Here, 0 shows no pain behavior and patients who score above 2 show clear signs of pain behavior. An increase in the score indicates an increase in pain. The validity and reliability study of the scale was performed by Gündoğan et al. on 50 patients in 2016.[18]Kappa value was found to be 0.712-0.892. In order to use the scale, permission was obtained from the team that developed the scale.[18,19]

Evaluation Form for the Physiological Conditions of Patients: This form was prepared by the researchers to evaluate the following data of the patient: physiological conditions, blood pressure, mean arterial pressure, pulse, respiration, tidal volume, spo2, fio2, ph, co2, hco3, base curve, GCS, administered sedation amount of painkiller/anti-inflammatory given and amount of painkiller/paracetamol administered.

For nursing practices: Patients were listened to music with mp3 players (music player three) and mp4 players (music player four). The same brand of mp3 and mp4 were used for each patient, but the earphones used were individual.

The types of music (Music/Songs listened):
A selection of 126 traditional Turkish folk music pieces has been chosen for instrumental performance by the Seven Cloves Ensemble.
For example, Gesi Bağları, Eklemedir Koca Konak, Ağrı Dağı, Leylimley, Gözlerin, Gel Gör Beni Aşk Neyledi, Çökertme Sarı Gelin, Yemen Türküsü etc.
As nature sound, 'natural soothingsound of a waterfall-birdsounds' (natural soothing sound of waterfall-bird sounds) was listened.
These melodies were compiled in consultation with one of the researchers, Serkan Çelik, a music therapist and professor at the Department of Music, Faculty of Art and Design, Izmir Katip Çelebi University.
The music was listened when the patients arrived in the SICU. Music was listened to patients for approximately 45 minutes to 1 hour.
In addition, since information about the hearing status of the patients could not be obtained, the study was conducted by taking into account the statements of the patients' relatives and nurses. Therefore, based on expert opinion and literature information, music was listened to the patients with reference to the sound level (60 decibels) that the deceased person could hear.[20]
Ayrıca hastaların işitme durumları hakkında bilgi edinilemediği için hasta yakınları ve hemşirelerin beyanları dikkate alınarak çalışma yürütülmüştür. Bu nedenle uzman görüşü ve literatür bilgilerine dayanarak, vefat eden kişinin duyabileceği ses seviyesi (60 desibel) referans alınarak hastalara müzik dinletilmiştir.[20]
Music was not listened after the patients were extubated.

Variables of the Study
Dependent variables:Physiological conditions of intensive care patients. (Blood pressure, saturation)
Independent Variable: Nature sound, cultural music.
Control Variable: Age, Gender, Marital status

Data Collection Process
All data, scales and forms were administered and evaluated by a single researcher.

Respectively, the data were collected first in the control group (n: 30), then in the nature sound listening group (n: 30) and then in the Cultural Music (Turkish Folk Music) Listening group (n: 30).
When the patient is admitted to the surgical intensive care unit Their families were informed about the study.
And consent from the family for voluntary participation in the study form was signed.
After the Patient Diagnosis Formwas applied.
When the control group arrived at the SICU, their pain and physiologic symptoms were measured and documented.
The control group was not allowed to listen to music, but pain and physiologic symptoms were measured and documented again in the 1st hour and 2nd hour of the SICU (as if music was listened).
When the two experimental groups (N:30-30) arrived at the SICU, their pain and physiologic symptoms were measured and documented (just as in the control group).
Afterwards, the first 30 patients of the experimental group were listened to nature sounds and the other 30 patients were listened to cultural music (Turkish folk music/songs). Pain and physiologic symptoms were measured and documented at the 1st hour and 2nd hour after the music was listened to.

Data Analysis
The SPSS 23.0 package program was used for data analysis. Categorical measures were summarized as numbers and percentages, whereas continuous measurements were summarized as mean, deviation, and minimum-maximum. Chi-square test and Fischer's Precision Test were used to compare the categorical variables. The conformity of the variables to the normal distribution was examined using visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk Tests).
One-way Anova test was used for groups with normal distribution and for more than two variables, while the Kruskall Wallis test was used for groups that did not fit normal distribution and for more than two variables. The Bonferroni analysis was used in post-Hoc analyzes to determine the source of the difference between the groups. The Wilcoxon signed-rank test was applied because the data did not show normal distribution in the comparison of the physiological findings obtained from the patients at the beginning and two hours later. Statistical significance level was taken as 0.05 in all tests.
Ethical Issues
Ethical Permissions: Consent was obtained from the patients who voluntarily participated in the study, and permission was obtained from the Non-Invasive Clinical Studies Ethics Committee of SANKO University on September 5, 2019 (2019/11 session number and decision number 3).
n addition, permission was obtained from the hospital where the study would be conducted.
Permission was obtained from the team that performed the validity and reliability of the Critical Care Pain Observation Tool (CPOT) for Türkiye.

Findings

In the study, which was applied to 90 patients hospitalized in the surgical intensive care unit, 30 of the patients listened to nature sound, 30 of them listened to cultural music (non-verbal instrumental folk song), whereas 30 of them were treated without listening to anything. In this context, the study was examined in three groups.
As a result of the examination, the differences between the groups in terms of gender, marital status, place of residence, working status, occupational status, and smoking and alcohol use were

not found statistically significant (p>0.05). When the education levels of the patients were examined, the rate of those who received high school or higher education in the group listening to nature sound was statistically significant compared to the other groups (p<0.05). The age levels of the patients in the group listening to nature sound were found to be statistically higher than the mean age of the patients treated in the control group (p<0.05) **(Table 1).**

Table 1. Distribution of Patients by Descriptive Characteristics

Socio-demographic characteristics		Nature Sound (n: 30) n(%)		Cultural Music (n: 30) n(%)		Control (n: 30) n(%)		Total (n: 30) n(%)		P
Gender	Male	16	(53,3)	18	(60,0)	19	(63,3)	53	(58,9)	0,725
	Female	14	(46,7)	12	(40,0)	11	(36,7)	37	(41,1)	
Marital Status	Married	30	(100,0)	28	(93,3)	30	(100,0)	88	(97,8)	0,129
	Single	0	(0,0)	2	(6,7)	0	(0,0)	2	(2,2)	
Level of education	Primary school	11	(36,7)	18	(60,0)	7	(23,3)	36	(40,0)	0,040
	Secondary School	8	(26,7)	5	(16,7)	15	(50,0)	28	(31,1)	
	High School	10	(33,3)	5	(16,7)	6	(20,0)	21	(23,3)	
	University and higher	1	(3,3)	2	(6,7)	2	(6,7)	5	(5,6)	
Place of residence	Rural	4	(13,3)	7	(23,3)		9 (30,0)	20	(22,2)	0,295
	Urban	26	(86,7)	23	(76,7)	21	(70,0)	70	(77,8)	
Working status	No	17	(56,7)	13	(43,3)	16	(53,3)	46	(51,1)	0,561
	Yes	13	(43,3)	17	(56,7)	14	(46,7)	44	(48,9)	
Occupational status	Self-employed	9	(30,0)	8	(26,7)	6	(20,0)	23	(25,6)	0,095
	Worker	6	(20,0)		(20,0)	11	(36,7)	23	(25,6)	
	Civil Servant	2	(6,7)	2	(6,7)	2	(6,7)	6	(6,7)	
	Housewife	13	(43,3)	9	(30,0)	11	(36,7)	33	(36,7)	
	Other	0	(0,0)	5	(16,7)	0	(0,0)	5	(5,6)	
Income	Income less than expenses	17	(56,7)	1	(3,3)	17	(56,7)	35	(38,9)	0,000
	Income equal to expenses	13	(43,3)	29	(96,7)	13	(43,3)	55	(61,1)	
Smoking	No	14	(46,7)	11	(36,7)	17	(56,7)	42	(46,7)	0,300
	Yes	16	(53,3)	19	(63,3)	13	(43,3)	48	(53,3)	
Alcohol	No	28	(93,3)	23	(76,7)	24	(80,0)	75	(83,3)	0,186
	Yes	2	(6,7)	7	(23,3)	6	(20,0)	15	(16,7)	
Age	Means	58,60±6,73		55,73±9,90		51,83±5,08		55,38±7,93		0,001

* p<0.05, Chi-square test, x2: Kruskal Wallis test, Bonferroni test was applied by coding as Nature Sound (1), Cultural music (2), Control (3) in Post Hoc analysis.

There were no statistically significant differences between the groups in terms of the presence of chronic diseases such as hypertension, diabetes mellitus, asthma, acute kidney failure, heart failure, hospitalization history and continuous drug use of the patients included in the study (p>0.05). The social support level of the patients in the cultural music group was found to be higher than the other groups (p<0.05). The frequency of analgesic use in the patients in the nature sound group was found to be statistically significantly higher than the patients in the other groups (p<0.05).
It was determined that the GCS of the patients showed a homogeneous distribution between the groups (p>0.05). The differences between the groups in terms of intensive care duration, apache score, and duration of intubation or tracheostomy were found to be statistically significant (p<0.05).
In the post hoc analysis performed to determine the significant difference between the groups, it was found statistically significant that the length of stay in the intensive care unit and the duration of intubation or tracheostomy of the patients who were treated by listening to cultural music were lower than the rates of the patients in the nature sound (p=0.000) and control (p=0.000) groups (p<0.05). In the Apache score findings, the rates of the patients listening to cultural music were found to be higher than those of the patients in nature sound (p=0.000) and control (p=0.000) groups, which was statistically significant (p<0.05) **(Table 2).**

Table 2. Distribution of Patients by Medical Characteristics

		Nature Sound		**Cultural Music**		**Control**		**Total**		**P**
Medical characteristics		**(n: 30)**		**(n: 30)**		**(n: 30)**		**(n: 30)**		
		n(%)		**n(%)**		**n(%)**		**n(%)**		
Chronic disease	No	10	(33,3)	15	(50,0)	13	(43,3)	38	(42,2)	0,421
	Yes	20	(66,7)	15	(50,0)	17	(56,7)	52	(57,8)	
Hospitalization history	No	11	(36,7)	14	(46,7)	14	(46,7)	39	(43,3)	0,665
	Yes	19	(63,3)	16	(53,3)	16	(53,3)	51	(56,7)	
Continuous drug use	No	9	(30,0)	16	(53,3)	12	(40,0)	37	(41,1)	0,183
	Yes	21	(70,0)	14	(46,7)	18	(60,0)	53	(58,9)	
Social support	No	21	(70,0)	1	(3,3)	23	(76,7)	45	(50,0)	0,000
	Yes	9	(30,0)	29	(96,7)	7	(23,3)	45	(50,0)	
Analgesic use	No	3	(10,0)	0	(0,0)	0	(0,0)	3	(3,3)	0,045
	Yes	27	10 (33,3)	30 (100,0)		30 (100,0)		87	(96,7)	
	Nature Sound	Cultural Music		Control		Total		p		Post Hoc
	(n: 30)	(n: 30)		(n: 30)		(n: 90)				Difference
	Mean±ss	Mean±ss		Mean±ss		Mean±ss				Level
Duration of intensive care	19,73±11,16	6,10±2,57		24,03±9,42		16,62±11,43		0,000		2-1; p=0,000 2-3; p=0,000

GKS	10,20±0,61	10,43±0,72	10,56±0,56	10,40±0,64	0,061	No significant difference
Apache	23,53±4,63	30,93±3,69	24,43±5,91	26,30±5,81	0,000	2-1; p=0,000
						2-3; p=0,000
Duration of intubation or tracheostomy	16,66±9,96	5,50±2,19	20,20±8,75	14,12±9,92	0,000	2-1; p=0,000
						2-3; p=0,000

* p<0.05, Chi-square test, x2: Kruskal Wallis test, Bonferroni test was applied by coding as Nature Sound (1), Cultural music (2), Control (3) in Post Hoc analysis.

In **Table 3,** the initial physiological responses of the patients included in the study and the differences between the groups were examined.
The distribution of the frequency of administration of anti-inflammatory and paracetamol to the patients included in the study was found to be similar between the groups (p>0.05).
When the physiological findings were examined, it was observed that the distribution of the diastolic, pulse, pH and GCS scores of the patients showed homogeneity (p>0.05), while the differences observed between the groups in systolic, MAP, respiration, tidal volume, SPO2, FIO2, CO2, HCO3, and base curve were found to be statistically significant (p<0.05). As a result of the Post hoc analysis performed to determine the source of the difference between the groups, it was found that the systolic (p=0.010), MAP (p=0.003) and CO2 findings of the patients were lower than the rates of the patients in the nature sound and control groups (p<0, 0). 05).

Table 3. Investigation of Initial Physiological Responses of Patients and Differences Between Groups

		Nature Sound	**Cultural Music**	**Control**	**Total**	**P**
		(n: 30)	**(n: 30)**	**(n: 30)**	**(n: 30)**	
		n(%)	**n(%)**	**n(%)**	**n(%)**	
Anti-inflammatory	Not given	29 (96,7)	30 (100,0)	30 (100,0)	89 (98,9)	0,364
	Given	1 (3,3)	0 (0,0)	0 (0,0)	1 (1,1)	
paracetamol Systolic	Not given	27 (90,0)	30 (100,0)	29 (96,7)	86 (95,6)	0,160
	Given	3 (10,0)	0 (0,0)	1 (3,3)	4 (4,4)	
	127,7±18,9	121,8±16,2	135,6±8,0	128,4±18,5	0,023	3-2; p=0,010
Diastolic	76,2±5,3	70,9±14,7	77,5±4,1	74,9±9,6	0,180	No significant difference
MAP	93,2±7,2	87,6±14,7	96,5±6,3	92,4±10,7	0,028	3-2; p=0,003
Pulse	98,1±17,8	93,2±20,5	96,6±10,0	95,9±16,7	0,574	No significant difference
Respiration	16,9±3,6	13,2±1,7	18,2±3,6	16,1±3,7	0,000	2-1; p=0,000
						2-3; p=0,000
Tidal volume	517,7±31,2	473,3±66,6	502±30,6	497,7±49,1	0,001	2-1; p=0,001

SPO2	99,3±1,4	97,3±2,1	98,8±1,6	98,5±1,9	0,000	2-1; p=0,000
						2-3; p=0,003
FiO2	86,6±15,5	62,8±12,7	94,6±11,3	81,4±18,9	0,000	2-1; p=0,000
						2-3; p=0,000
pH	7,37±0,11	7,41±0,09	7,33±,09	7,37±0,10	0,057	No significant difference
CO2	34,4 ±7,4	35,1±2,4	31,6±8,7	33,7±6,8	0,006	2-3; p=0,037
HCO3	24,0±3,4	23,5±1,7	19,9±3,1	22,5±3,4	0,000	2-1; p=0,000
						2-3; p=0,000
Base Curve	1,37±2,82	2,29±2,01	-2,06±2,11	0,53±2,98	0,000	2-1; p=0,000
						2-3; p=0,000
GKS	10,8±1,34	10,37±0,71	10,57±0,56	10,58±0,94	0,616	No significant difference

* p<0.05, Chi-square test, x2: Kruskal Wallis test, Bonferroni test was applied by coding as Nature Sound (1), Cultural music (2), Control (3) in Post Hoc analysis

The respiration, tidal volume, SPO2, FIO2, HCO3 and base curve findings were found to be statistically significantly lower in the patients in the control group compared to the rates of the patients listening to nature sound and cultural music (p<0.05). The physiological responses of the patients one hour after listening to music and the differences between the groups are summarized in Table 4. It was determined that the frequency of administration of anti-inflammatory and paracetamol to the patients included in the study was homogeneously distributed between the groups (p>0.05).

Table 4. Examination of the Physiological Responses of the Patients One Hour After Listening to Music and the Differences Between the Groups

		Nature Sound	**Cultural Music**	**Control**	**Total**	**P**
		(n: 30)	**(n: 30)**	**(n: 30)**	**(n: 90)**	
Anti-inflammatory	Not given	30 (100,0)	30 (100,0)	30 (100,0)	90(100,0)	
	Given	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)	1,000
Paracetamol	Not Given	30 (100,0)	30 (100,0)	30 (100,0)	90 (100,0)	1,000
	Given	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)	
	Nature Sound	**Cultural Music**	**Control**	**Total**	**p**	Post Hoc Difference Level
	(n: 30)	**(n: 30)**	**(n: 30)**	**(n: 90)**		
	Mean±ss	**Mean±ss**	**Mean±ss**	**Mean±ss**		
Systolic	126,2±18	121,4±13,0	136,7±17,1	128,1±17,3	**0,004**	3-1; p=0,044
						3-2; p=0,001
Diastolic	76,3±4,5	70,7±12,3	77,3±4,53	74,7±8,4	0,059	2-1; p=0,025
						2-3; p=0,006
MAP	92,6±7,0	87,2±12,2	96,7±7,3	92,2±9,9	**0,007**	2-3; p=0,000
Pulse (F)	99,2±18,2	91,8±19,8	98,6±11,5	96,5±17,1	0,199	No significant difference
Respiration	19,9±3,6	13,1±1,5	18,2±3,6	16,0±3,7	**0,000**	2-1; p=0,000
						2-3; p=0,000

Tidal volume	517,6±31,2	473,3±66,6	502,0±30,6	497,6±49,0	**0,001**	2-1; p=0,001
SPO2	99,0±1,6	97,7±1,8	98,6±1,49	98,4±1,7	**0,001**	2-1; p=0,010
FiO2	86,6±15,5	63,1±13,0	94,6±11,3	81,5±18,9	**0,000**	2-1; p=0,000 2-3; p=0,000
pH	7,37±0,09	7,41±0,08	7,34±0,06	7,37±0,08	**0,004**	2-3; p=0,002
CO2	34,8±6,6	36,3±3,4	31,7±7,5	34,3±6,3	**0,002**	2-3; p=0,015
HCO3	24,7±2,8	24,1±2,4	21,3±3,1	23,4±3,1	**0,000**	2-1; p=0,000 2-3; p=0,001
Base Curve	1,47±3,11	2,69±2,20	-1,55±1,99	0,87±3,04	**0,000**	2-1; p=0,000 2-3; p=0,000
GKS	10,2±0,61	10,43±0,72	10,56±0,56	10,4±0,64	0,061	No significant difference

* p<0.05, Chi-square test, x2: Kruskal Wallis test, Bonferroni test was applied by coding as Nature Sound (1), Cultural music (2), Control (3) in Post Hoc analysis

It was determined that the distribution of the pulse and GCS scores of the patients included in the study obtained one hour after listening to music was similar between the groups. (p>0.05).
There were statistically significant differences between the groups in terms of systolic, diastolic, MAP, respiration, tidal volume, SPO2, FIO2, pH, CO2, HCO3, base curve and pain scores (p<0.05). Post hoc analysis was applied to determine the source of the difference between the groups.
According to the results, it was found statistically significant that the systolic blood pressure levels of the patients in the control group were higher than the rates of the patients who were treated by listening to nature sound (p=0.044) and cultural music (p=0.001) (p<0.05). It was determined that the diastolic, MAP and respiratory rates of the patients treated by listening to cultural music were statistically significantly lower than the rates of the patients treated in the nature sound and control groups (p<0.05).
The PH, CO2 and HCO3 rates were found to be lower in the control group patients compared to the rates of the patients listening to cultural music and nature sound, and it was statistically significant (p<0.05). The tidal volume and SPO2 findings of the patients listening to cultural music were found to be statistically significantly lower than the rates of patients treated by listening to nature sound (p<0.05). In Table 5, the physiological responses of the patients after listening to music after two hours and the differences between the groups are given. The distribution of the frequency of administration of anti-inflammatory and paracetamol to the patients included in the study was found to be similar between the groups (p>0.05). All patients received bronchodilator and cortisone treatment.

Table 5. Investigation of the Physiological Responses of the Patients Obtained Two Hours After Listening to Music and the Differences Between the Groups

		Nature Sound	**Cultural Music**	**Control**	**Total**	**P**
		(n: 30)	**(n: 30)**	**(n: 30)**	**(n: 30)**	
		n(%)	**n(%)**	**n(%)**	**n(%)**	
Anti-inflammatory	Not given	30 (100,0)	30 (100,0)	30 (100,0)	90(100,0)	1,000
	Given	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)	
Paracetamol	Not given	30 (100,0)	30 (100,0)	30 (100,0)	90(100,0)	1,000
	Given	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)	

	Nature Sound (n: 30) Mean±ss	Cultural Music (n: 30) Mean±ss	Control (n: 30) Mean±ss	Total (n: 30) Mean±ss	P	Post Hoc Difference Level
Systolic	127,2±18	120,9±13,2	136,9±17,2	128,3±17,6	**0,002**	2-3; p=0,001
Diastolic	75,4±10,4	69,8±12,7	81,3±5,6	75,5±10,9	**0,000**	2-3; p=0,000
MAP	92,3±10,8	86,2±12,3	99,6±8,0	92,7±11,7	**0,000**	3-1; p=0,028 3-2; p=0,000
Pulse (F)	99,1±16,3	91,7±19,2	98,9±11,9	96,6±16,3	**0,249**	No significant difference
Respiration	16,8±3,5	13,0±1,4	18,1±3,6	16,0±3,7	**0,000**	2-1; p=0,000 2-3; p=0,000
Tidal volume	517,6±31,2	473,3±66,6	502,0±30,6	497,6±49,0	**0,001**	2-1; p=0,001
SPO2	99,1±1,3	97,9±1,7	98,9±1,3	98,6±1,5	**0,001**	2-1; p=0,004 2-3; p=0,032
FİO2	86,6±15,5	63,8±2,3	94,6±11,3	81,7±18,5	**0,000**	2-1; p=0,000 2-3; p=0,000
pH	7,37±0,09	7,42±0,08	7,34±0,06	7,38±0,08	**0,001**	2-3; p=0,000
CO2	35,2±6,4	35,8±2,6	45,9±80,4	39,0±46,3	**0,001**	2-1; p=0,000 2-3; p=0,000
HCO3	24,6±2,8	24,5±2,3	21,3±2,8	23,5±3,0	**0,000**	2-1; p=0,000 2-3; p=0,000
Base Curve	1,41±3,30	2,85±2,2	-1,48±2,06	0,93±3,13	**0,000**	2-1;p=0,000 2-3;p=0,000
GKS	10,2±0,61	10,46±0,68	10,56±0,56	10,41±0,63	**0,051**	No significant difference

* p<0.05, Chi-square test, x2: Kruskal Wallis test, Bonferroni test was applied by coding as Nature Sound (1), Cultural music (2), Control (3) in Post Hoc analysis

When the physiological findings obtained after two hours were examined, it was determined that the distributions of the patients' pulse and GCS scores were similar (p>0.05). The differences between the groups in terms of systolic, diastolic, MAP, respiration, tidal volume, SPO2, FIO2, pH, CO2, HCO3, base curve and pain score were found to be statistically significant (p<0.05). According to the results of the analysis conducted to determine the source of the difference between the groups, it was found statistically significant that the respiratory, SPO2, FIO2, CO2, HCO3 and base mean scores of the patients treated by listening to cultural music were lower than the rates of the patients in the nature sound and control groups (p< 0.05).
It was found that the systolic (p=0.001), diastolic (p=0.000) and pH (p=0.000) findings of the patients in the cultural music group were lower than the rates of the patients in the control group (p<0.05). It was determined that the MAP findings of the patients were higher than the rates of the patients in the control group listening to nature sound (p=0.028) and cultural (p=0.000) music (p<0.05). The tidal volume findings were found to be statistically significantly lower in the patients in the cultural music group compared to the patients in the nature sound group (p<0.05) (Table 5).

The beginning, first hour and second hour Critical Care Pain Observation Tool scores of the patients and the differences between the groups were analyzed in **Table 6, Table 7 and Table 8.**

Table 6. Initial Distribution of Pain Observation Scores in Patient Groups

Initial findings in the Critical Care Pain Observation Tool (The Beginning)		**Nature Sound**		**Cultural Music**		**Control**		**Total**		**P**
		(n: 30)		**(n: 30)**		**(n: 30)**		**(n: 30)**		
		n (%)		**n (%)**		**n (%)**		**n (%)**		
Painful facial expression	Relaxed neutral	13	(43,3)	6	(20,0)	11	(36,7)	30	(33,3)	0,029
	Tense	9	(30,0)	20	(66,7)	17	(56,7)	46	(51,1)	
	Grimacing	8	(26,7)	4	(13,3)	2	(6,7)	14	(15,6)	
Painful body movements	No body movement or normal position	4	(13,3)	4	(13,3)	9	(30,0)	17	(18,9)	0,281
	Protection	22	(73,3)	22	(73,3)	20	(66,7)	64	(71,1)	
	restlessness agitation	4	(13,3)	4	(13,3)	1	(3,3)	9	(10,0)	
Compliance with painful intubated ventilator	Compliance with the ventilator or movements	5	(16,7)	8	(26,7)	10	(33,3)	23	(25,6)	0,476
	Coughs but tolerates	25	(83,3)	21	(70,0)	19	(63,3)	65	(72,2)	
	Fighting the ventilator	0	(0,0)	1	(3,3)	1	(3,3)	2	(2,2)	
Painful muscle tension	Relaxed	8	(26,7)	4	(13,3)	7	(23,3)	19	(21,1)	0,468
	Tense rigidity	22	(73,3)	25	(83,3)	23	(76,7)	70	(77,8)	
	Excessive tension and rigidity	0	(0,0)	1	(3,3)	0	(0,0)	1	(1,1)	

Table 7. Distribution of First Hour Findings in the Critical Care Pain Observation Tool

Initial findings in the Critical Care Pain Observation Tool (First Hour)		Nature Sound (n: 30)		Cultural Music (n: 30)		Control (n: 30)		Total (n: 90)		P
		n	(%)	n	(%)	n	(%)	n	(%)	
Painful facial expression	Relaxed neutral	11	(36,7)	8	(26,7)	9	(30,0)	28	(31,1)	0,041
	Tense	15	(50,0)	22	(73,3)	21	(70,0)	58	(64,4)	
	Grimacing	4	(13,3)	0	(0,0)	0	(0,0)	4	(4,4)	
Painful body movements	No body movement or normal position	7	(23,3)	2	(6,7)	4	(13,3)	13	(14,4)	0,291
	Protection	20	(66,7)	27	(90,0)	24	(80,0)	71	(78,9)	
	Restlessness agitation	3	(10,0)	1	(3,3)	2	(6,7)	6	(6,7)	
Compliance with painful intubated ventilator	Compliance with the ventilator or movements	5	(16,7)	8	(26,7)	10	(33,3)	23	(25,6)	0,476
	Coughs but tolerates	25	(83,3)	21	(70,0)	19	(63,3)	65	(72,2)	
	Fighting the ventilator	0	(0,0)	1	(3,3)	1	(3,3)	2	(2,2)	
Painful muscle tension	Relaxed	8	(26,7)	4	(13,4)	7	(23,3)	19	(21,1)	0,468
	Tense rigidity	22	(73,3)	25	(83,3)	23	(76,7)	70	(77,8)	
	Excessive tension and rigidity	0	(0,0)	1	(3,3)	0	(0,0)	1	(1,1)	

Table 8. Distribution of Second Hour Findings in the Critical Care Pain Observation Tool

Initial findings in the Critical Care Pain Observation Tool (Second Hour)		Nature Sound (n: 30)		Cultural Music (n: 30)		Control (n: 30)		Total (n: 90)		P
		n	(%)	n	(%)	n	(%)	n	(%)	
Painful facial expression	Relaxed neutral	12	(40,0)	12	(40,0)	10	(33,3)	34	(37,8)	0,183
	Tense	12	(40,0)	17	(56,7)	18	(60,0)	47	(52,2)	
	Grimacing	6	(20,0)	1	(3,3)	2	(6,7)	9	(10,0)	
Painful body movements	No body movement or normal position	4	(13,3)	2	(6,7)	3	(10,0)	9	(10,0)	0,131
	Protection	21	(70,0)	28	(93,3)	25	(83,3)	74	(82,2)	
	Restlessness agitation	5	(16,7)	0	(0,0)	2	(6,7)	7	(7,8)	
Compliance with painful intubated ventilator	Coughs but tolerates	3	(10,0)	15	(50,0)	4	(13,3)	22	(24,4)	0,002
	Fighting the ventilator	24	(80,0)	0	(0,0)	2	(6,7)	5	(5,6)	
Painful muscle tension	Relaxed	6 (20,0)	6 (20,0)	7	(23,3)	1	(3,3)	14	(15,6)	0,191
	Tense rigidity	23	(76,7)	23	(76,7)	28	(93,3)	74	(82,2)	
	Excessive tension and rigidity	1	(3,3)	0	(0,0)	1	(3,3)	2	(2,2)	

* $p<0.05$, Chi-square test

While the painful body movements, compliance with painful intubated ventilator and painful muscle tension findings and the differences between the groups were not statistically significant in the Critical Care Pain Observation Tool findings ($p>0.05$), it was found statistically significant that the frequency of being nervous in the painful facial expression findings of the patients in the group listening to nature sound was lower than the rates of the patients in the cultural music and control groups ($p<0.05$).

In the Critical Care Pain Observation Tool findings, the differences between the groups in terms of painful body movements, compliance with painful intubated ventilator and painful muscle tension were not statistically significant ($p>0.05$). It was statistically significant that the frequency of being nervous in the painful facial expression finding of the patients in the group listening to nature sound was lower than the rates of the patients in the cultural music and control groups ($p<0.05$).

According to the findings obtained after two hours, it was determined that the painful facial expression, painful body movements and painful muscle tension findings of the patients showed homogeneity between the groups ($p>0.05$).

In the compliance with painful intubated ventilator findings, compliance with the ventilator or movements was found to be statistically significantly higher in the group listening to cultural music compared to the patients in the nature sound and control groups ($p<0.05$) **(Table 8)**.
In Table 9, the responses in the Critical Care Pain Observation Tool were scored and the differences between the groups were examined. As a result of the examination, it was determined that the scores of the patients that they got in the beginning and one hour later in the scale did not show statistically significant differences ($p>0.05$). In the findings obtained from the patients two hours later, the rate of the patients listening to cultural music was found to be statistically significant ($p<0.05$) **(Table 9).**

Table 9. Investigation of the Initial, 1st and 2nd Hour Findings of the Intensive Care Critical Observation Tool Scores of the Patients and the Differences Between the Groups

	Nature Sound (n: 30) Meant±ss	Cultural Music (n: 30) Mean±ss	Control (n: 30) Mean±ss	Total (n: 90) Mean±ss	p	Post Hoc Difference Level
Initial Pain Tool 3,40±1,49		3,60±1,47	2,90±1,37	3,30±1,46	0,244	No significant difference
1st Hour Pain Tool	3,56±1,61	3,00±1,11	3,46±1,19	3,34±1,33	0,185	No significant difference
2nd Hour Pain Tool	3,66±1,66	2,83±1,01	3,63±1,35	3,37±1,41	**0,018**	2-3; p=0,033
						2-1; p=0,039

*p<0,05, x2: Kruskal Wallis test, Bonferroni test was applied by coding as Nature Sound (1), Cultural music (2), Control (3) in Post Hoc analysis

Table 10 summarizes the differences between the physiological responses of the three groups in the study obtained at the beginning and after two hours.

Table 10. Intra-Group Distribution of Patients' Initial and Second Hour Physiological Responses

		Nature Sound(n: 30) Mean±ss	Cultural Music(n: 30) Mean±ss	Control(n: 30) Mean±ss
Systolic	Initial	127,73±18,9	121,80±16,19	135,63±18,02
	2nd Hour	127,23±18,76	120,90±13,23	136,96±17,21
		0,820	0,470	0,089
Diastolic	Initial	76,23±5,26	70,90±14,67	77,47±4,16
	2nd Hour	75,46±10,48	69,86±12,71	81,30±5,59
		0,951	0,279	**0,002**
MAP	Initial	93,17±7,2	87,60±14,66	96,53±6,34
	2nd Hour	92,36±10,82	86,26±12,34	99,60±8,02
		0,798	0,206	**0,000**
Pulse	Initial	98,10±17,83	93,20±20,55	96,60±10,01
	2nd Hour	99,16±16,32	91,76±19,28	98,96±11,99
		0,136	0,068	**0,005**
Breathing	Initial	16,87±3,55	13,23±1,69	18,17±3,61
	2nd Hour	16,86±3,54	13,0±1,41	18,13±3,66

		1,000	0,059	0,317
Tidal volume	Initial	517,67±31,23	473,33±66,60	502,0±30,64
	2nd Hour	517,66±31,23	473,33±66,60	502,0±30,64
		1,000	1,000	1,000
SPO2	Initial	99,30±1,44	97,33±2,09	98,83±1,57
	2nd Hour	99,16±1,31	97,90±1,76	98,90±1,32
		0,372	**0,002**	0,608
FiO2	Initial	86,67±15,55	62,83±12,70	94,67±11,36
	2nd Hour	86,66±15,55	63,83±12,29	94,66±11,36
		1,000	0,380	1,000
pH	Initial	7,37±0,11	7,41±0,09	7,33±0,09
	2nd Hour	7,37±0,09	7,42±0,08	7,34±0,06
		0,267	0,195	**0,045**
CO2	Initial	34,39±7,40	35,14±2,43	31,60±8,75
	2nd Hour	35,20±6,49	35,87±2,61	45,92±80,41
		0,141	0,465	**0,003**
HCO3	Initial	24,06±3,40	23,52±1,78	19,95±3,16
	2nd Hour	24,64±2,81	24,54±2,36	21,37±2,83
		0,046	**0,000**	**0,000**
Base Curve	Initial	1,37±2,82	2,29±2,01	-2,06±2,11
	2nd Hour	1,41±3,30	2,85±2,22	-1,48±2,06
		0,416	**0,000**	**0,000**
GKS	Initial	10,80±1,34	10,37±0,71	10,57±0,56
	2nd Hour	10,20±0,61	10,46±0,68	10,56±0,56
		0,024	0,083	1,000

As a result of the examination, it was determined that the systolic, diastolic, map, pulse, respiration, tidal volume, SPO2, FIO2, pH, CO2, and base curve findings of the patients in the nature sound group did not show a statistically significant difference between the initial and two-hour later data ($p>0.05$). In the findings obtained after two hours, it was determined that the high HCO3 value and the low GCS score were statistically significant ($p<0.05$).

When the findings of the patients in the cultural music group were examined, there was no statistically significant difference between the findings of systolic, diastolic, map, pulse, respiration, tidal volume, FIO2, pH, CO2, and GCS in terms of initial and two-hour later data (p>0, 05).

Considering the SPO2, HCO3, and base curve findings, it was found that the findings obtained after two hours were higher than the initial findings, which was statistically significant ($p<0.05$).

The systolic, respiratory, tidal volume, SPO2, FIO2, and GCS findings of the patients in the control group were found to be similar in terms of initial and two-hour later data ($p>0.05$).

The diastolic, MAP, pulse, pH, CO2, HCO3 and base curve findings of the patients in the control group obtained after two hours were found to be higher than the initial rates ($p<0.05$).

Discussion

In the study, 3 homogeneous groups with similar gender, marital status, place of residence, working status, occupation and economic status, smoking, alcohol consumption, presence of chronic disease, hospitalization period, and continuous drug use were analyzed. However, there was no homogeneity between the patients' length of stay in the intensive care unit, APACHE

score, and intubation time. Anti-inflammatory paracetamol drugs given to the patients in the intensive care unit were also homogeneously distributed among the groups.

The mean arterial pressure (MAP) of the patients after listening to music was 96.7±7.3 in the control group, while it was 92.6±7.0 in those listening to nature music and 87.2±12.2 in those listening to cultural music, and there was a significant difference between them. The MAP values were closer to the normal mean in the patients who listened to cultural music.

One hour after listening to music, the pulse values of the patients were similar in all 3 groups. Although respiratory rates were lower in those listening to cultural music, they were within normal limits in all three groups. Oxygenation was highest at 99.0 ± 1.6 in those who listened to nature sound and was within the normal range in the three groups. The FiO2 value was 63 ± 13.0 in the patients listening to cultural music, 86.6±15.5 in those listening to nature music, and 94.6±11.3 in the control group. The significant difference between the FiO2 values of the patients showed better lung oxygenation in those who listened to cultural music. There was a difference between the values determining blood acidosis/alkalosis, such as CO2 and HCO3, in all three groups, and alkalosis was present in the control group.[1,6,17]

The mean arterial pressure (MAP) of the patients listening to cultural music and nature sound was closer to the normal mean compared to the control group, and the mean MAP of the patients listening to cultural music was better. The patients listening to cultural music had a better and significant statistical difference in terms of respiratory FiO2 values compared to the other groups. In particular, the blood gas values were worse in the control group than the patients who listened to nature sound and cultural music at the beginning, one hour and two hours later, and did not remain at normal blood gas values.

It is seen that the oxygenation of the vital signs of the patients listening to music in the intensive care unit was positively affected. Mangoulia and Ouzounidou in 2013 reported that the vital signs and oxygenation of patients in the ICU, who listened to nature sound, were good. In addition, it was reported that the vital signs of patients who listened to cultural ethnic music were more positively affected after the intervention and that their respiratory findings were better. It was emphasized that especially ethnic cultural music should be chosen.[21]

In the study, the painful facial expression differed statistically in all three groups before listening to music ($p<0.05$). One hour after listening to music, there was a statistically significant difference in the patients who listened to nature sound and cultural music compared to the control group. There was a statistically significant difference between these three groups two hours after listening to music ($p<0.005$).

In the study, while the compliance with painful intubated ventilator values were similar in 3 groups before listening to music, no statistical difference was found one hour after listening to music. Two hours after listening to music, a statistical difference was determined with the difference created by the group listening to cultural music. When the patients' compliance with intubation was evaluated with pain, it was determined that the group listening to cultural music was better.

According to the CPOT data, there was no statistically significant difference one hour and two hours after listening to music in three groups in terms of painful body movements and painful muscle tension items ($p>0.05$).

When the CPOT total scores were examined, there was no significant difference in 3 groups before and 1 hour after listening to music ($p>0.05$), while there was a statistical difference 2 hours after listening to music ($p<0.05$), and it was determined that the difference was due to the patients listening to cultural music.

There were similarities in the three groups regarding chronic diseases such as acute renal failure, liver failure, diabetes, and hypertension.

The scores of the Critical Care Pain Observation Tool are similar to the results of Gündoğan et al.'s research conducted with patients listening to music.[18,19]

In this study, the mean arterial pressure, FiO2 values, respiratory rate, and blood gases of the patients who listened to cultural music were determined better than the other groups before listening to music and one hour and two hours after listening to music. This is similar to the study of Nilsson et al.(2009).[22]

The blood gases and mean arterial pressure values of the control group had more negative results than the patients who listened to nature sound and cultural music. According to this result, it was revealed that the vital signs of the patients could be changed with nature sound and cultural music.[23]

Considering the physiological responses of the patients, while the mean arterial pressure before and 2 hours after listening to music did not change in the group listening to nature sound and cultural music, the MAP values increased in the control group and were found to be 99.6 0 ± 8.02 mm/Hg at the highest level of the normal limit. (MAP 70-100 mm/Hg).

This result shows that blood pressure is more controllable in groups that listen to music, and the response of patients to stress is better at blood pressure level.

Kemper et al. also showed in their research that the blood pressure of patients increased with stress and that this pressure was, however, controlled when patients listened to music.[1,6,17,24]

Strengths and Limitations

Having group characteristics similar to each other is one of the strengths of this study.

The fact that it was a semi-experimental study and that the inclusion and exclusion criteria ensured a high level of randomization in the groups increases the reliability of the results.

On the other hand; The limitations of this study include the fact that the study was conducted in an intensive care unit, only tertiary intubated patients were included in the sample, and the data were collected in a noisy environment of the intensive care unit with machine alarms such as mechanical ventilators and hemodynamic monitoring.

In addition, since information about the hearing status of the patients could not be obtained, the study was conducted by taking into account the statements of the patients' relatives and nurses. Therefore, based on expert opinion and literature information, music was listened to the patients with reference to the sound level (60 decibels) that the deceased person could hear.[20]

Conclusion

With this research, the following conclusions were reached:

- It was determined that the vital signs and oxygenation of the patients who listened to music in the intensive care unit were positively affected. Cultural music was especially seen to be effective.
- It was observed that the vital signs of the patients could change with nature sound and cultural music.
- When the patients' pain was evaluated during the intubation period, it was determined that the CPOT pain score was better in the group listening to cultural music.
- It was observed that the blood pressure was more controllable in the groups listening to music and that the response of the patients to stress was better at blood pressure level.

As a result, it was determined that nature sound and cultural music had positive effects on physiological responses during mechanical ventilation period in ICU patients.

Suggestions

- Music should be used frequently in the treatment of pain and anxiety in intensive care patients. This non-pharmacological method has been found to be inexpensive and easily accessible, and its use should be increased.
- Nurses should be educated about the positive effects of music and apply this treatment to patients.
- Especially, the selection of instrumental cultural music suitable for the values of each nation can provide positive physiological responses for patients.

Conflicts of interest statements

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

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