

EFFECTS OF MUSIC LISTENING DURING CHEMOTHERAPY ON VITAL SIGNS AND ANXIETY LEVELS: A RANDOMIZED CONTROLLED TRIAL

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Abstract

Purpose: This study aims to investigate the effects of music listening during chemotherapy on cancer patients' vital signs and anxiety levels.

Method: The population of the study consisted of the patients receiving chemotherapy in the chemotherapy unit of a public university hospital. The power analysis revealed that a sample size of 80 was required to achieve a power of 80%. The patients were assigned into two study groups as the group listening to music (music group) and the group not listening to music (non-music group) during chemotherapy. During chemotherapy sessions, two genres of music were played for 45 minutes at a level of 60 decibels: Turkish maqams and classical music.

Result: The mean state-trait anxiety levels after the second music listening were 26.95 ± 5.983 in the music group and 30.30 ± 8.42 in the non-music group, and the difference was statistically significant. When the diastolic blood pressure values of the music group were examined, the change in these values after the second music listening was statistically significant.

Suggestion: These results suggest that music listening has a positive effect on the vital signs and state-trait anxiety levels of patients receiving chemotherapy.

Keywords: Anxiety, Nursing, Chemotherapy, Music listening, Vital signs

Introduction:

Cancer patients seek complementary therapies to cope with cancer, enhance physical and psychological well-being, strengthen the immune system, and prevent recurrence.^{1,2,3,4} With its effects on the autonomic nervous system, music creates a balance between human physiology and psychology. The effects of music on hormones, neurotransmitters, cytokines, lymphocytes, vital signs and immunoglobulins have been extensively investigated in the last 20-25 years. Especially in the last decade, the number of studies investigating the psychological and neurological effects of music and the health benefits of music has increased. It has been found that music therapy leads to a decrease in adrenaline level and neuromuscular activity, slows respiration and pulse rate, and lowers blood pressure.⁵ Music can accelerate and slow down brain waves, and can help coordinate muscle tension and movements, creating an anxiolytic effect.⁶ Many studies have shown that sounds and music cause positive changes in anxiety and pain.⁷

In a study in which patients on mechanical ventilation in an intensive care unit were divided into experimental and control groups, Almerud and Petersson (2003) applied 60-minute music therapy to the experimental group and recorded their pulse values during this period. The authors demonstrated a significant decrease in the pulse rates of the experimental group.⁵ In a study conducted with intensive care and surgical patients undergoing coronary artery surgery, Cigerci and Özbakır (2016) found lower anxiety levels in the music group.⁸

Music therapy is used as a non-pharmacological nursing listening that reduces

anxiety, provides relaxation and has positive effects on vital signs. In order to reduce the physical, emotional and mental symptoms of the patients and to provide the energy they need during the treatment process, music therapy should be included in nursing practice.^{9,10}

Material and Method:

This randomized controlled trial was conducted between 20.06.2018 and 20.04.2019 with patients treated in the Oncology Day Treatment Unit of a public university hospital. The power analysis revealed that a sample size of 80 was required to achieve a power of 80% ($\alpha = 0.05$). Therefore, the sample group consisted of 80 patients who agreed to participate in the study and met the inclusion criteria. The patients were assigned into two study groups as the music group and the non-music group. Random assignment technique (flipping a coin) was used to assign the patients into the groups (heads - non-music group, tails - music group).

Inclusion criteria were determined as follows:

- Being 18 years or older,
- Not having been diagnosed with head and neck cancer,
- Not having been diagnosed with a psychiatric illness before,
- Not having any hearing problems,
- Not having been diagnosed with substance abuse before,
- Being treated in the Oncology Day Treatment Unit.

Data Collection Forms

Data were collected by the researcher by

face to face interview method using "Patient Identification Form" and "Measurement Form of Vital Signs Before and After Music Listening," which had been designed by the researcher, and the "State-Trait Anxiety Inventory."

Following the literature review, two genres of music were decided to be played for 45 minutes at a level of 60 decibels: Turkish maqams (Nihavend, Nihavend Taksim with the Qanun) and classical music (Bach, Beethoven, Chopin).

15 minutes after the vascular access and premedication (Metoclopramide HCl, Pheniramine) were performed, the patients in the music group were asked to adopt a half-lying position in their chemotherapy seats before the music listening. They were also told that if they wanted, they could turn the volume up or down, pause, or continue to listen to the music. They were also asked to mute their phones and were advised to close their eyes and take deep breaths when they became distracted. Subsequently, the pre-selected music was played through a headset that covered the ear during the chemotherapy session. The objective of using headphones was to prevent any sound that would otherwise have distracted the patients. The headphones (Philips SHP 1900 brand) were disinfected with 70% alcohol cotton before being used by another patient.

Once the chemotherapy sessions were over, necessary forms were filled out and next appointments were arranged. The same treatment

procedure and the same music were also used during the other appointments.

The same forms were applied to the non-music group. Also, they were interviewed and the data collection forms were applied during their second chemotherapy assignments, as well.

Data Analysis

Data were analyzed by the SPSS program. Kolmogorov-Smirnov test was used to test whether the data were normally distributed. The Independent t-test was used to compare suitability for normal distribution. Mann Whitney U test was used for the data that did not show a normal distribution. Measurements made at different times were analyzed by repeated variance analysis and the Friedman test. The chi-square test was performed to examine the categorical data according to the groups. As a result of the analysis, the data showing normal distribution were expressed as mean \pm standard deviation and the data not showing normal distribution were expressed as mean (minimum-maximum). Categorical data were expressed as frequency (percentage). The level of significance was set at $p < 0.05$.

Ethical Considerations

Permission was obtained from the Non-Interventional Clinical Research Ethics Board (numbered 104 and dated 18.06.2018). The patients in the study were informed about the study and written consent forms were obtained from them.

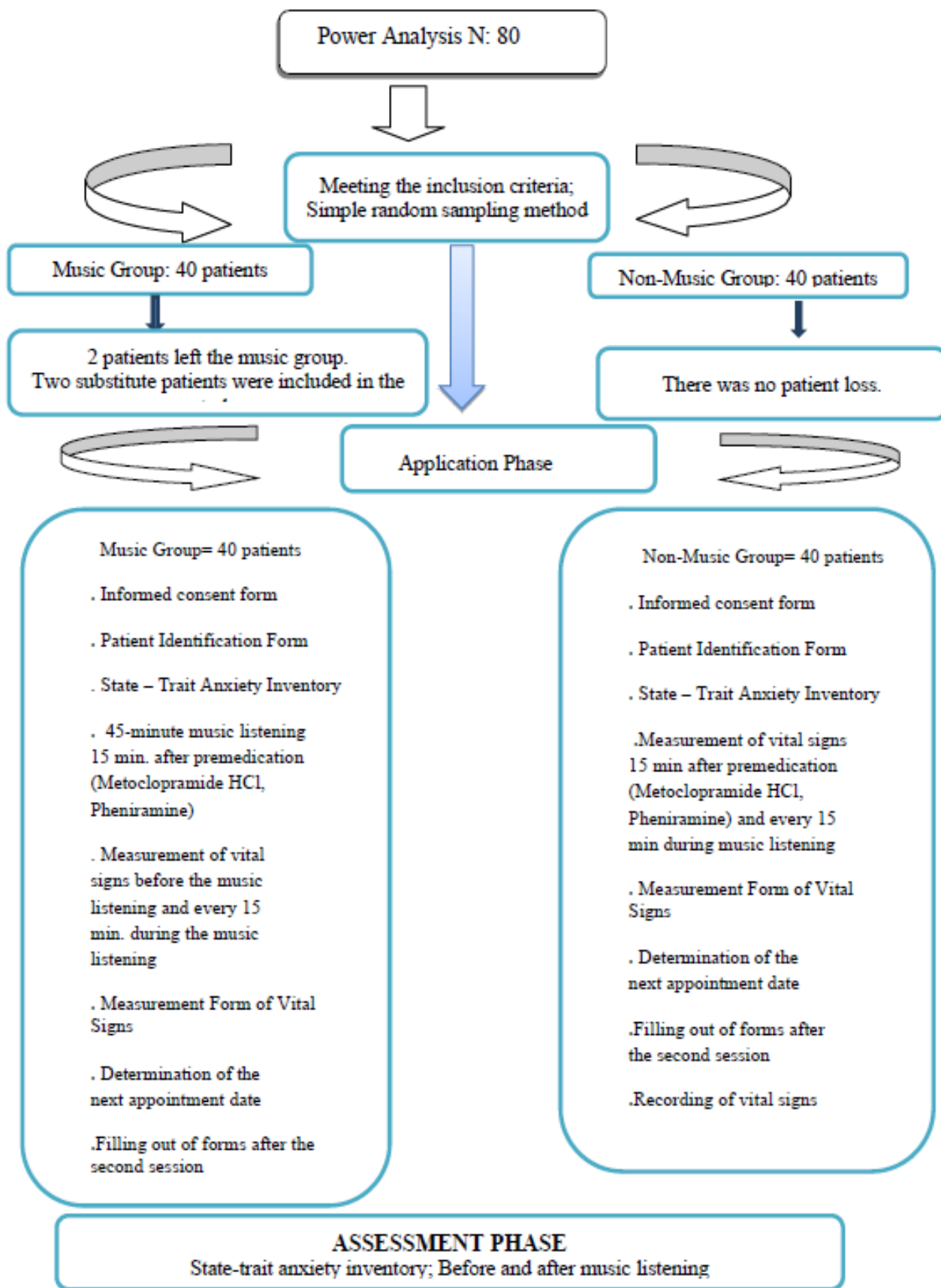


Figure 1. Study Sample Flow Chart

Limitations of the Study

The limitations of the present study are as follows: some of the patients did not show up for the next appointment due to changes in their laboratory findings and overall situations; some were not fond of the music played; some asked to quit the study; some lost their lives, and some continued their treatment in another hospital.

Findings

Table 1. Descriptive Characteristics of The Groups

	Music Group n:40	Non-Music Group n:40	Total N:80	Chi-square Test Statistics	P
Sex					
Female	15 (37.5)	20 (50)	35 (43.8)	$\chi^2 = 0.813$	0.367
Male	25 (62.5)	20 (50)	45 (56.3)		
Age	54.38 ± 13.93	56.08 ± 10.50		t = -0.619	0.538
Marital status					
Married	34 (85)	35 (87.5)	69 (86.3)	$\chi^2 = 0.105$	0.745
Single	6 (15)	5 (12.5)	11 (13.8)		
Do you have any children?					
No	5 (12.5)	3 (7.5)	8 (10)	$\chi^2 = 0.556$	0.456
Yes	35 (87.5)	37 (92.5)	72 (90)		
Longest place of residence					
Countryside	7 (17.5)	9 (22.5)	16 (20)	$\chi^2 = 0.330$	0.848
Town/District	9 (22.5)	8 (20)	17 (21.3)		
City/Metropolis	24 (60)	23 (57.5)	47 (58.8)		
Current place of residence					
Countryside	5 (12.5)	7 (17.5)	12 (15)	$\chi^2 = 0.399$	0.819
Town/District	12 (30)	11 (27.5)	23 (28.8)		
City/Metropolis	23 (57.5)	22 (55)	45 (56.3)		
Educational level					
Not literate	1 (2.5)	1 (2.5)	2 (2.5)	$\chi^2 = 4.054$	0.399
Primary School	17 (42.5)	23 (57.5)	40 (50)		
Secondary school	6 (15)	7 (17.5)	13 (16.3)		
High school	7 (17.5)	6 (15)	13 (16.3)		
Community College/Faculty	9 (22.5)	3 (7.5)	12 (15)		

Occupation	Music Group	Non-Music Group	Total	Chi-square Test Statistics	p
Worker	6 (15)	6 (15)	12 (15)	$\chi^2 = 0.164$	0.997
Civil Servant	5 (12.5)	4 (10)	9 (11.3)		
Self-employed	5 (12.5)	5 (12.5)	10 (12.5)		
Retired	15 (37.5)	15 (37.5)	30 (37.5)		
Housewife	9 (22.5)	10 (25)	19 (23.8)		
Income status					
Income less than expenditures	9 (22.5)	10 (25)	19 (23.8)	$\chi^2 = 0.740$	0.691
Income equal to expenditures	22 (55)	24 (60)	46 (57.5)		
Income more than expenditures	9 (22.5)	6 (15)	15 (18.8)		
Social security					
No	0 (0)	2 (5)	2 (2.5)	$\chi^2 = 2.051$	0.152
Yes	40 (100)	38 (95)	78 (97.5)		
Smoking Status					
Yes	31 (77.5)	32 (80)	63 (78.8)	$\chi^2 = 0.075$	0.785
No	9 (22.5)	8 (20)	17 (21.3)		
Have you ever used alcohol?					
Yes	14 (35)	10 (25)	24 (30)	$\chi^2 = 0.952$	0.329
No	26 (65)	30 (75)	56 (70)		
The Importance of Music in Your Life					
Not important at all	7(17.5)	8(20)	15(18.8)	$\chi^2 = 0.258$	0.879
A bit important	20(50)	21(52.5)	41(52.2)		
Very important	13(32.5)	11(27.5)	24(30)		
Have you taken up a new hobby after the illness?					
Yes	19 (47.5)	17 (42.5)	36 (45)	$\chi^2 = 0.051$	0.822
No	21 (52.5)	23 (57.5)	44 (55)		

Table 1. (continuation) Descriptive Characteristics of The Groups

There is no difference between the music group and the non-music group in terms of average age values. The use of alcohol and thoughts about music did not lead to any differences between the groups.

Also, sex, marital status, having children,

occupation, income status, social security, or smoking status did not lead to any differences between the groups ($p > 0.05$).

The diagnoses of the patients were breast cancer (21.3%), lung cancer (20%), and colon cancer (18.8%).

Table 2. Comparison of state-trait anxiety scores by groups

	Music Group	Non-Music Group	Test Statistics	P
State Anxiety 0	30.63 ± 8.04	29.5 ± 9.73	t= 0.564	0.575
Trait Anxiety 0	42.18 ± 9.49	43.13 ± 10.2	t= -0.431	0.668
State Anxiety 1	26.48 ± 4.94	30.3 ± 8.42	t= -2.479	0.085
State Anxiety 2	26.95±5.983	30.30±8.416	t=2.052	0.044

t =: Independent samples t-test

The "State anxiety and trait anxiety 0" in the table indicates the data obtained before the first music listening, the "State anxiety and trait anxiety 1" indicates the data obtained after the second music listening, and the "State anxiety 2" indicates the data obtained after the second music listening.

The mean values of the State anxiety 1 were obtained as 26.48 ± 4.94 in the music group and as 30.3 ± 8.42 in the non-music group, and there was no difference between the groups (p=0.085).

The mean values of the State anxiety 2 were obtained as 26.95 ± 5.983 in the music group and 30.30 ± 8.416 in the non-music group, and the difference was statistically significant (p=0.044).

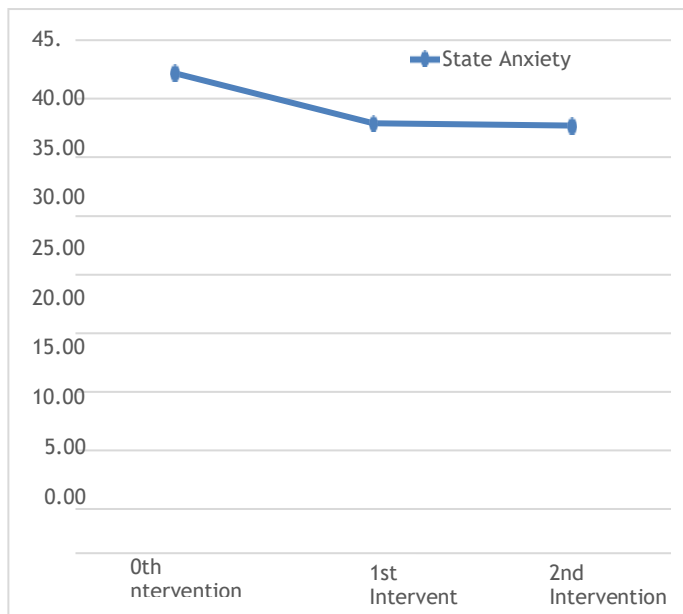


Figure 2. Variation of State Anxiety Mean Values by Groups

Table 3. Comparison of the Music Group and the Non-Music Group

	Music Group	Non-Music Group	t-test	P
State anxiety 2	26.95 ± 5.98	30.3 ± 8.42	-2.052	0.044

t: Independent samples t-test

The mean values of the State anxiety 2 differed between the music group and the non-music group (p=0.044). The mean value was found to be higher in the non-music group.

Table 4. Comparison of the Vital Signs of the Groups

Value	Measurement	Time	Music Group	Non-Music Group	Mann-Whitney U Test	P
Systolic	1st Listening Measurement	0th min.	120.5 (84 - 171)	121 (90 - 161)	U= 749.5	0.627
		15th min.	117 (14 - 181)	120.5 (99 - 174)	U= 696	0.317
		30th min.	120 (85 - 179)	121 (100 - 176)	U= 712.5	0.399
		45th min.	116.5 (73 - 174)	124 (14 - 164)	U= 716	0.419
	2nd Listening Measurement	0th min.	126 (73 - 153)	125 (84 - 169)	U= 774.5	0.806
		15th min.	121.5 (86 - 152)	123 (85 - 163)	U= 797.5	0.981
		30th min.	114.5 (90 - 156)	123.5 (85 - 186)	U= 652	0.154
		45th min.	124 (83 - 169)	122 (89 - 149)	U= 751.5	0.640
Diastolic	1st Listening Measurement	0th min.	73 (56 - 128)	75 (60 - 102)	U= 716	0.419
		15th min.	71 (56 - 118)	76.5 (59 - 107)	U= 642	0.128
		30th min.	73 (53 - 105)	76.5 (60 - 106)	U= 598	0.052
		45th min.	72 (55 - 98)	76 (54 - 114)	U= 703	0.350
	2nd Listening Measurement	0th min.	76 (46 - 111)	74 (56 - 107)	U= 791	0.931
		15th min.	74.5 (50 - 101)	75.5 (60 - 102)	U= 714	0.407
		30th min.	72 (46 - 101)	75 (8 - 102)	U= 638.5	0.120
		45th min.	72 (45 - 98)	74 (58 - 97)	U= 586.5	0.039
Pulse	1st Listening Measurement	0th min.	81 (9 - 116)	85 (55 - 116)	U= 695.5	0.314
		15th min.	80 (56 - 108)	82 (54 - 113)	U= 751	0.637
		30th min.	77 (9 - 105)	79.5 (56 - 113)	U= 716	0.418
		45th min.	77 (56 - 107)	80 (54 - 116)	U= 714	0.407
	2nd Listening Measurement	0th min.	84 (60 - 116)	92 (53 - 137)	U= 585	0.038
		15th min.	83 (65 - 989)	89 (54 - 139)	U= 658.5	0.173
		30th min.	82 (61 - 106)	86.5 (54 - 130)	U= 602.5	0.057
		45th min.	78 (61 - 107)	85.5 (52 - 132)	U= 631.5	0.104
SPO2	1st Listening Measurement	0th min.	98 (93 - 100)	97 (92 - 98)	U= 744	0.565
		15th min.	98 (93 - 99)	98 (91 - 99)	U= 779	0.828
		30th min.	96.5 (93 - 99)	98 (92 - 100)	U= 651.5	0.137
		45th min.	97.5 (93 - 956)	98 (91 - 99)	U= 741.5	0.552
	2nd Listening Measurement	0th min.	98 (92 - 99)	97.5 (91 - 98)	U= 656	0.122
		15th min.	98 (93 - 99)	98 (91 - 99)	U= 719.5	0.392
		30th min.	98 (92 - 100)	98 (90 - 99)	U= 686	0.240
		45th min.	98 (94 - 100)	97.5 (88 - 99)	U= 721	0.426
Respiration	1st Listening Measurement	0th min.	20 (20 - 26)	20 (18 - 26)	U= 777	0.809
		15th min.	22 (2 - 24)	22 (18 - 28)	U= 696	0.302
		30th min.	21.5 (16 - 24)	21.5 (18 - 28)	U= 747.5	0.602
		45th min.	20 (16 - 24)	21.5 (18 - 28)	U= 658.5	0.150
	2nd Listening Measurement	0th min.	21 (18 - 26)	20 (20 - 28)	U= 768.5	0.739
		15th min.	20 (18 - 24)	22 (2 - 26)	U= 700.5	0.310
		30th min.	21 (18 - 24)	22 (18 - 26)	U= 610	0.058
		45th min.	21 (18 - 24)	22 (18 - 28)	U= 671	0.187

U: Mann-Whitney U Test

The mean values of the diastolic measurement at the 45th min. of the second listening showed a significant difference between the groups (**p=0.039**). The mean value was found to be 72mmHg in the music group while it was found to be 74mmHg in the non-music group.

Table 5. Temporal Variations of the Parameters

Parameter	Measurement	Music Group		Non-Music Group	
		Statistics	P	Statistics χ^2	P
Systolic	1st Listening Measurement	$\chi^2 = 4.462$	0.216	$\chi^2 = 0.077$	0.994
	2 nd Listening Measurement	$\chi^2 = 5.614$	0.132	$\chi^2 = 2.041$	0.564
Diastolic	1st Listening Measurement	$\chi^2 = 2.561$	0.464	$\chi^2 = 3.357$	0.340
	2 nd Listening Measurement	$\chi^2 = 8.348$	0.039	$\chi^2 = 0.070$	0.995
Pulse	1st Listening Measurement	$\chi^2 = 8.812$	0.032	$\chi^2 = 11.232$	0.011
	2 nd Listening Measurement	$\chi^2 = 18.807$	<0.001	$\chi^2 = 19.192$	<0.001
SPO2	1st Listening Measurement	$\chi^2 = 1.292$	0.731	$\chi^2 = 5.864$	0.118
	2 nd Listening Measurement	$\chi^2 = 2.231$	0.526	$\chi^2 = 2.020$	0.568
Respiration	1st Listening Measurement	$\chi = 2.582$	0.461	$\chi^2 = 8.394$	0.050
	2 nd Listening Measurement	$\chi^2 = 1.287$	0.732	$\chi^2 = 1.997$	0.573

χ^2 =: Friedman test statistics

The "1st Listening Measurement" in the table indicates the mean values obtained after the first music listening while the "2nd Listening Measurement" indicates the mean values obtained after the second music listening.

The measurement of diastolic blood pressure values of the music group revealed that temporal variations obtained during the second listening were statistically significant (**p=0.039**).

The mean pulse values of the music group obtained during the first listening show variations over time (**p=0.032**). The values obtained at the 0th min. differed from those obtained at the 45th min. but they did not differ from the values obtained at the 15th and 30th-minute measurements. The mean pulse values of the music group obtained during the second

The mean values of the pulse measurement at the 0th min. of the second listening showed a difference between the groups (**p=0.038**). The mean value was found to be 84/min in the music group while it was found to be 92/min in the non-music group.

listening show variations over time (**p<0.001**). The values obtained at the 0th min., which were higher than the other values, differed both from those obtained at the 30th min and at the 45th min.

The mean pulse values of the non-music group obtained at the first measurement show variations over time (**p=0.011**). The values obtained at the 0th min. differed from those obtained at the 45th min. but they did not differ from the values obtained at the 15th and 30th-minute measurements. The mean pulse values of the non-music group obtained at the second measurement show variations over time (**p<0.001**). The values obtained at the 0th min., which were higher than the other values, differed both from those obtained at the 30th min and at

the 45th min.

Discussion:

There was no difference between the groups in terms of age, sex, marital status, educational level, occupation, and income levels. Similar studies also reported no significant difference between the experimental and control groups in terms of these parameters.^{11,12,13,14,28} The diagnoses of the patients were breast cancer (21.3%), lung cancer (20%), colon cancer (18.8%). A thorough search of the relevant literature showed that breast cancer was present in 46.7% of the patients in the study by Yildirim (2007), in more than half of the patients in the study by Burns et al. (2001), and in 50% of the patients in the study by Waldon (2001).^{11,12,13,28} Examination of the smoking status of the patients demonstrated that 63 (78.8%) smoked while 17 (21.3%) did not smoke; there was no statistical difference between them. Yildirim (2007) reported the rate of smoking patients as 43.3% while it was found as 78.8% in our study.¹¹

Examination of the state anxiety scores of the groups yielded the following findings: the mean values of the "State anxiety 2" were calculated as 26.95 ± 5.98 in the experimental group and as 30.30 ± 8.416 in the control group, which shows that the difference was statistically significant. The mean state anxiety and trait anxiety values showed variations in the experimental group over time. On the other hand, the mean state anxiety values of the control group showed variations over time. In his study exploring the effects of music listening on the side effects of chemotherapy and state-trait anxiety levels, Yildirim (2007) found no significant association between the side effects of chemotherapy and music listening. On the other

hand, the author found a significant association between state-trait anxiety levels and music listening.¹¹ In their study examining the effects of music therapy and guided imagery on anxiety levels and nausea and vomiting caused by chemotherapy, Karagözoglu et al (2012) found that the state-trait anxiety levels of the participants decreased significantly.¹⁵

In their study examining the effects of music listening on the side effects of chemotherapy and anxiety levels of the patients, Sabo and Michael (1996) found a significant difference between pre-and post- listening scores from the state anxiety scale. Besides, anxiety levels of the control group remained the same over time.¹⁴ In a study investigating the effect of music therapy on anxiety levels and sleep quality of elderly cancer patients, Gökalp (2015) found that the difference between state anxiety levels of the experimental and control groups was statistically significant.¹⁶ Horne-Thompson Grocke (2008) conducted a randomized controlled trial to investigate the effect of music therapy on anxiety in terminal patients and reported a significant decrease in the anxiety levels of the experimental group.¹⁷ Li et al. (2012) conducted a randomized controlled trial with breast cancer patients and found that music therapy had a positive effect on anxiety levels.¹⁸ In a study conducted with 101 psychiatric patients, Arlı (2015) used music therapy as an alternative and complementary therapy for stress and anxiety and found that state-trait anxiety levels of the patients after the listening were lower than the baseline levels.¹⁹ The results of the related studies in the literature are consistent

with our findings on anxiety levels of patients.

Systolic blood pressure values obtained at the 15th-, 30th- and 45th-minute measurements did not show any difference between the groups. Also, there was no difference between the experimental and control groups in terms of pulse, respiration, and SPO2 mean values obtained at the 15th-, 30th- and 45th-minute measurements. In a study examining the effects of music therapy on the vital signs of surgical intensive care patients, Araç (2012) found no statistically significant difference between the experimental and control groups in terms of 0th-minute measurement and post-music listening measurement.²⁰

A significant difference was found in the music group's diastolic blood pressure values obtained during the second listening. The values obtained at the 0th min. differed from those obtained at the 45th min. but they did not differ from the values obtained at the 15th and 30th-minute measurements.

The mean pulse values of the experimental group obtained at the first measurement show variations over time. The values obtained at the 0th min. differed from those obtained at the 45th min. but they did not differ from the values obtained at the 15th and 30th-minute measurements. The mean pulse values of the experimental group obtained at the second measurement show variations over time. The values obtained at the 0th min., which were higher than the other values, differed both from those obtained at the 30th min and at the 45th min. The mean pulse values of the control group obtained at the first measurement show variations over time. The values obtained at the 0th min. differed from those obtained at the 45th

min. but they did not differ from the values obtained at the 15th and 30th-minute measurements. When the results are evaluated, the mean pulse values of the control group obtained at the first measurement differed significantly at the 45th-min. measurement. It is thought that the chemotherapy medications taken by the patients might have affected their vital signs.

In a study examining the effects of music therapy on the vital signs of surgical intensive care patients, Araç (2012) found a decrease in the pulse, systolic, and diastolic blood pressure and an increase in the oxygen saturation levels of the patients after the music listening. In the study, it was found that music listening provided a decrease in the mean pulse values of the patients, which was found to be high at the baseline measurement. Also, the difference was found to be statistically significant.²⁰ In a study conducted with intensive care patients to examine the effects of music listening on the physiological responses and anxiety levels of patients on mechanical ventilation, Lee et al. (2005) found no significant difference between the physiological values of the experimental and control groups before the music listening.²¹ In a study conducted with intensive care patients, Shartini (2008) found that music therapy reduces systolic and diastolic blood pressure, pulse and respiratory rate.²² In a study examining the effects of music therapy on the vital signs and anxiety levels of patients undergoing ERCP, Çoban (2014) reported no significant difference between the experimental and control groups in terms of diastolic and systolic blood pressure values.²³ In a study conducted to find out what chemotherapy patients mostly do to comfort themselves, Çokmert (2011) found that 56% of the patients

preferred to listen to music.²⁴ In a study examining the effects of music listening during upper gastrointestinal endoscopy procedure on patients' pulse rate, blood pressure, and oxygen saturation, Uçan et al. (2006) conducted music listening through a central music system in a hospital for 15-30 mins and measured the vital signs of the patients before and after the listening. The authors found that while music listening did not affect the pulse rate, blood pressure, and oxygen saturation values of the patients, the systolic blood pressure values of the patients in the experimental group were lower than those of the control group. They also reported that music listening significantly increased the satisfaction level of the patients and positively affected the success of the procedure.²⁵

In a study conducted with patients on mechanical ventilation in an intensive care unit, Almerud and Petersson (2003) applied music therapy to the experimental group for 60 minutes and recorded their pulse values during this time. The authors reported a significant decrease in the pulse rate values of the experimental group.⁵ In a study examining the effects of music listening on the physiological findings and anxiety levels of patients scheduled for cesarean section, Chang et al. (2005) found a decrease in the pulse rate values of the experimental group patients. On the other hand, the authors found no statistically significant difference between the experimental and control groups in terms of pulse rate values but stated that music listening reduced the anxiety levels of the patients.²⁶

When the respiratory rate and SPO₂ mean values of the patients included in the study were compared, no statistically significant difference was found between the control and experimental

groups.

In a study examining the effects of music therapy on the vital signs and anxiety levels of patients undergoing ERCP, Çoban (2014) reported no statistically significant difference between the control and experimental groups in terms of mean respiratory rates and SPO₂ values.²³

In another study examining the intraoperative and postoperative effects of music therapy in patients under general anesthesia, Yaşar (2010) found that music therapy provided a significant decrease in mean blood pressure in the intraoperative and early postoperative period, but did not provide a difference in SPO₂ levels.²⁷

Conclusion and Recommendations:

This randomized controlled study conducted to investigate the effects of music listening during chemotherapy on cancer patients' vital signs and anxiety levels found that music listening positively affected the anxiety levels of the patients. The state anxiety values of the music group patients decreased with time. On the other hand, the state-trait anxiety mean values of the non-music group did not differ over time.

The mean diastolic values of the music group obtained at the 45th-min measurement of the second listening showed a variation compared to the other measurements. The mean pulse values of the music group obtained during the first listening showed variations over time. It was seen that music listening had a positive effect on the pulse rates of the patients. The difference between the mean pulse values obtained at the 0th and 45th min. measurements during the first and second listening might also

be attributed to the effects of chemotherapy medications.

Therefore, further studies are needed to examine the long-term effects of music listening on chemotherapy patients. To ensure a calm, relaxed hospital atmosphere for cancer patients, music listening to help them comfort themselves can be applied during their treatments. Also, future studies can focus on the effects of music chosen according to patients' tastes on their vital signs, pain levels, sleep quality, and anxiety levels.

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