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# Effects on Anxiety and Vital Signs of the Emotional Freedom Technique and Music Before Surgery for Lumbar Disc Hernia

Remziye Cici, PhD; Meral Özkan, PhD

## ABSTRACT

**Context** • Patients hospitalized for surgical treatment for lumbar disc herniation (LDH) are adversely affected psychologically, with fury, anger, helplessness, anxiety, and depression being observed in patients. Anxiety in particular is a common problem, with an incidence of around 90%.

**Objective** • This study intended to determine the effects on patients' anxiety and vital signs of the emotional freedom technique (EFT) and music before LDH surgery.

**Design** • The research team designed a quasi-experimental study.

**Setting** • The research was carried out in the neurosurgery clinic of a university hospital in Turkey.

**Participants** • Participants were 162 adult patients at the clinic who had LDH surgery between February 2018 and September 2019.

**Intervention** • Using the nonprobability sampling method, participants were allocated to one of three groups: (1) 54 to the music group, an intervention group; (2) 54 patients to the EFT group, an intervention group; and (3) 54 to the control group.

**Outcome Measures** • The Patient Information Form, the Life Findings Form, the Subjective Units of the Distress Scale (SUDS), and the State-Trait Anxiety Inventory-State Anxiety (STAI-S), were used to collect data. In the data analysis, the numbers, percentages, means, standard deviations, and chi-square values were found, and the t test and an analysis of variance (ANOVA) were used in the dependent and independent groups, respectively. The Tukey test was used for further analysis.

**Results** • EFT and music were determined to significantly reduce participants' state anxiety and subjective discomfort ( $P < .001$ ). EFT significantly reduced the pulse and respiratory rates and the systolic blood pressure, and music significantly lowered the diastolic and systolic blood pressures ( $P < .05$ ). Further analyses showed that EFT was more effective on state anxiety and reducing the respiratory rate than music.

**Conclusions** • Both music and EFT before LDH surgery reduced anxiety and regulated vital signs, and EFT was found to be more effective than music in regulating anxiety and respiratory rate. (*Altern Ther Health Med.* 2022;28(5):20-27)

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Lumbar disc herniation (LDH) indicates a hernia of the nucleus pulposus as a result of the degeneration of the lumbar vertebrae, which causes pain.<sup>1,2</sup> LDH,<sup>3</sup> which is seen in 15-56% of the world's population, has many symptoms, such as low back and leg pain, loss of muscle strength, and bladder, intestinal, and sexual dysfunction.<sup>1,4</sup> These symptoms

cause stress, limiting patients' daily activities, impairing their quality of life, and causing medical and socioeconomic problems.<sup>1</sup> Stress is defined as the body's behavior to adapt to threats and its nonspecific response to various stimuli.<sup>5</sup> When stress can't be dealt with effectively, many physical, behavioral, and spiritual problems arise.<sup>5,6</sup>

LDH patients are treated in two ways: (1) conservative treatment with medical therapy, physical therapy, exercise, rest, and training and (2) surgical treatment.<sup>1,2</sup> Surgical treatment is applied when conservative treatment isn't effective, cauda equina syndrome develops, or pain intensifies.<sup>1,4</sup>

Patients hospitalized for surgical treatment are adversely affected psychologically due to being in a different environment, lacking knowledge about the procedure, feeling a loss of control, being subjected to various medical practices,

facing the possibility that complications may develop, and fearing death.<sup>3,7</sup> As a result, fury, anger, helplessness, anxiety, and depression can be observed in patients.<sup>1,3,8</sup>

Anxiety in particular is a common problem for these patients, and its incidence has been reported to be around 90%.<sup>3</sup> The studies of Arslan et al<sup>9</sup> and Güz et al<sup>10</sup> found that participants experienced moderate state anxiety before LDH surgery. The literature has indicated that LDH patients planning to undergo surgery experience anxiety due to the need for surgery and to the disease's signs and symptoms.<sup>3,11</sup> Lee et al found that 87% of patients having spinal surgery experienced preoperative anxiety, and the cause of anxiety in 74% of the participants was the spinal surgery itself.<sup>12</sup>

Anxiety negatively affects patients' adaptation to the disease's symptoms, the healing process after surgery, and the changes in quality of life. It may also cause patients to experience additional disease, prolong the treatment period, and increase health costs.<sup>7</sup>

LDH surgery is perceived by patients as a threat to the body. In addition to its general effects, a high level of anxiety can affect vital signs by causing an increase in respiratory rate and depth, heart rate, and blood pressure.<sup>7,8</sup> The threat perception can lead to an increase in endogenous catecholamines and cortisol and lymphocyte levels.<sup>13,14</sup>

Surgical nurses have a key role in preventing preoperative problems. They are responsible for implementing the necessary interventions to assess and reduce patients' anxiety levels.<sup>15</sup> Complementary medical practices are among these interventions.

Many complementary methods are used to reduce anxiety before surgery. One of these is the use of music.<sup>16,17</sup> According to Brancatisano et al's Therapeutic Music Capacities Model,<sup>18</sup> music provides cognitive, psychosocial, behavioral, and motor benefits with its 7 therapeutic properties—attracting attention, affecting emotions, stimulating physical movement, providing synchronization of movement and speech, personal bonding and association, providing social interaction, and persuasive to be optimistic about treatment and care outcomes. Because music affects emotions, one of the therapeutic effects, Brancatisano et al indicate it may alleviate anxiety. The researchers indicated that music-based therapies can be applied therapeutically in passive—listening—or active—singing, drumming, clapping, and dancing—forms.

Some studies indicate that music can have an effect on anxiety<sup>19-22</sup> and can reduce preoperative anxiety level.<sup>17,22</sup> Ni et al conducted a study with 174 general surgery patients and found that music reduced preoperative state anxiety.<sup>8</sup> Only a limited number of studies exist in the literature that examine the effects of music on anxiety before spinal surgery.<sup>23,24</sup> One study stated that music had positive effects on anxiety before spinal surgery, but no numerical data for the state anxiety level was given in the study's results section.<sup>23</sup> Another study found that music had a positive effect on anxiety in adolescents who were going to have spinal surgery.<sup>24</sup> Although many studies in the literature have

examined the effects of music on anxiety, no studies have yet examined its effect of anxiety before LDH surgery.

Music can affect the endocrinal and nervous system and reduce the release of stress hormones.<sup>19,22</sup> Some studies have shown that music can increase the release of dopamine, adrenaline, serotonin, and endogenous opioids, activating the reward mechanism by affecting neurotransmission in the brain's reward pathways and can create an anxiolytic effect by lowering the level of cortisol.<sup>19,20,22,25,26</sup> A recent study supports that information, reporting that music increased the blood supply of the regions of the brain that are related to reward and reinforcement and decreases the activity of the amygdala, which increases when negative emotions and fear are experienced.<sup>26</sup> Some studies also have indicated that music reduces the release of stress hormones by causing a decrease in the Interleukin-6 level and exerts an anxiolytic effect by coordinating brain waves and muscle tension.<sup>20,22</sup>

In addition to its beneficial effects on anxiety, music can have a positive effect on vital signs, which is due to the effects of music on hormones such as serotonin, dopamine, and adrenaline.<sup>16,19,25,27</sup> A meta-analysis found that music can have positive effects on systolic and diastolic blood pressure and pulse rate and can cause a decrease in those parameters.<sup>28</sup> Another study found that music can reduce heart rate.<sup>29</sup> Other studies found that music's ability to lower cortisol level and increase the levels of serotonin, endorphins, and enkephalin can have a positive effect on the electrical activity of the heart.<sup>19,30,31</sup> A study conducted by Wu et al revealed that music had a positive effect on heart rate, respiratory rate, and blood pressure.<sup>16</sup>

Other studies have reported on the ability of another complementary medical practice to have positive effects on anxiety, the emotional freedom technique (EFT).<sup>32,33</sup> The technique reveals a defect in the energy meridians and balances the body as a whole, regardless of whether the source of the trouble in the body is physical or psychological. EFT costs very little and is easy to apply.

EFT can have positive effects on the stress response.<sup>34,35</sup> Through EFT, the body's stress response can be improved, and an individual can learn to respond to the triggers that cause discomfort.<sup>34</sup> Sezgin's study revealed that the EFT reduced state anxiety significantly,<sup>32</sup> as did Benor et al<sup>36</sup> and Bach et al.<sup>37</sup> Although the literature indicates that EFT can reduce anxiety,<sup>32-34,36</sup> no studies have yet investigated the effects of EFT on preoperative anxiety.

Bach et al<sup>37</sup> and Babamahmoodil et al<sup>33</sup> found that EFT can have positive effects on vital signs. Bach et al found that EFT can reduce systolic blood pressure, diastolic blood pressure, and pulse rate.<sup>37</sup> Babamahmoodil et al<sup>33</sup> found that EFT can significantly reduce the frequency and severity of respiratory symptoms in soldiers with pulmonary trauma. Other studies have found that a decrease in anxiety level was due to the fact that the EFT regulates the stress response in the brain and reduces amygdala activity and cortisol level, suggesting that the technique may also have positive effects on vital signs.<sup>34,35,38,39</sup>

The current study intended to determine the effects on patients' anxiety and vital signs of EFT and music before LDH surgery. The current research team hypothesizes that eliminating the anxiety of LDH patients before surgery may decrease the problems caused by anxiety, help patients cope better with surgical trauma, and heal in a shorter time.

## METHODS

### Participants

The research team performed quasi-experimental research that was carried out in a neurosurgery clinic of a university hospital in Turkey between February 2018 and September 2019. In this clinic, 240 LDH operations are performed annually on average. Potential participants were adult patients in the clinic, who had had LDH surgery in the year prior to the study.

Potential participants were included in the study if they had: (1) an anxiety score of one or more according to the subjective units of the distress scale (SUDS), (2) the ability to communicate with the research team, (3) had no psychiatric diagnosis, and (4) had no procedure or treatment that had affected their vital signs. Potential participants were excluded from the study if they didn't agree to participate in the study.

During the study, 190 patients had applied to the clinic to have LDH surgery, but 28 were excluded from the study, 18 because they didn't meet the inclusion criteria, 3 because they didn't agree to participate in the study, and 7 because the baseline meeting could not be provided.

Before the study, permission was obtained from Hitit University Non-Interventional Research Ethics Committee (24.01.2018 / No: 2018-05) and the Provincial Health Directorate (23418205). To protect the rights of patients in the study, oral and written permission was obtained from them following the principle of informed consent before the data collection phase. Also, the research was conducted in accordance with the principles of the Declaration of Helsinki.

### Procedures

**Group assignment.** Patients who met the research criteria were assigned to a group using the nonprobability sampling method. The assignment to the 2 intervention groups—music and EFT—and the control group was done through the drawing method. In this method, 54 pieces of M (Music), 54 pieces of E (EFT) and 54 pieces of C (Control) papers were placed in a jar. Determined the group of papers the patient chose from the jar.

**Sample size.** The sample size was determined through power analysis. According to the calculations, with an effect size of 0.4,<sup>40</sup> an error margin of 0.05, a confidence interval of 0.95, and a population representation power of 0.95, the study needed 162 participants: 54 for a music intervention, 54 for an EFT intervention, and 54 for the control group.

**Data collection.** Between February and November 2018, the data were collected in the neurosurgery clinic every day during the week of operations, but because the time of surgery wasn't set exactly, the data collection could occur at

any time on the day of the operation. It occurred in the patients' rooms and face to face with the researcher.

**Outcome Measures.** Prior to the start of the study, participants completed the Patient Information Form, which provided each participant's sociodemographic characteristics, such as age, gender, and marital status, and medical characteristics, such as the presence of chronic disease and the duration of the disc disease.

At baseline and postintervention, participants completed the SUDS and the (STAI-S), and their vital signs were measured. A digital blood-pressure device was used to measure arterial blood pressure and pulse. Respiratory measurement was made by a member of the research team by counting for one minute.

Testing postintervention occurred: (1) for the control group—at 30 minutes after the baseline testing; (2) for the music group—after listening to music for 30 minutes, the time indicated by prior studies as being the required length of music application<sup>41,42</sup>; (3) for the EFT group—after completing the 30-minute EFT session.

### Intervention

**Control group.** The control group received no intervention other than the clinical protocol (information about surgery, follow-up of vital sign, treatment and care applications)

**Music group.** The passive listening method was used to prevent an effects on other participants from the sound and to avoid disruption of clinical routines because of the absence of a specific clinic for music therapy in the hospital. The patients in the music group listened to a CD with fluent and anti-anxiety music created by a musical expert. The selected music and the modes included Buselik, Büzürk, Hüseyini, Saba, Neva, and Rast. A CD player was used to prevent external sounds. The level of sound was kept at 60 decibels, and each patient used a different headphone.

**EFT group.** EFT was applied a member of the research team who had training in the technique, in a quiet and calm environment, in a comfortable position for the participant, and in accordance with the basic principles of EFT. At baseline at the start of the EFT, the participant was asked to focus on his or her anxiety, to be aware of the discomfort he or she felt, and to indicate the problem verbally, such as "Surgery worries me" or "I am very anxious about having a surgery." Then the participant was asked to evaluate his or her anxiety with the SUDS and to give a score for the level of distress, which is the first stage of the EFT.

After the evaluation, the participant was told to say a specified sentence three times: "Although I am anxious, restless, and worried, I accept myself completely and as I am," while the EFT therapist rubbed the sensitive points continuously. These points have a diameter of 6 cm and are 7-8 cm below the sternum's upper end and 7-8 cm to the right and 7-8 cm to the left of the midline. These points are where the participant feels a slight pain when the therapist rubs them with a fingertip or pats the karate point, which is the

outer side of the left or right hand from the tip of the little finger to the beginning of wrist.

Then the therapist pats the acupuncture points, 5-10 strokes with fingertips on each acupuncture point. At this stage, the participant must repeat a specified brief sentence—"this anxiety, this worry, this unrest, this fear"—constantly. This sentence is called the reminder sentence.

The therapist starts the strokes from either the right or left side of the participant. Strokes are made: (1) first to the eyebrow's inside tip; (2) then to the side of the eye; (3) under the eye; (4) under the nose; (5) to the chin; (6) to the CB point, the point 2.5-3 cm below and 2.5-3 cm to the right or left where the sternum and the clavicle meet; (7) to the armpit point, which is the point at the level of the nipple in men and in the middle of the section under the arm of the brassiere in women; (8) to the thumb, (9) to the index finger, (10) to the middle finger, and (11) to the little finger. On all the fingers, the stroke points are on the side of hand with the fingernails when the palm is held down.

The therapist starts a gamut procedure with nine phases after completing the first series of strokes as above. This procedure is the EFT stage in which strokes are made to the gamut point, which is approximately 1.5 cm behind the middle point between the ring finger on the back of the hand and the joint between the base of the little finger. The nine gamut stages were started with the participant's head upright.

The participant was told in the first stage to close and open (second stage) his or her eyes and to later look down to the right first and then to the left (third and fourth stage). The procedure then continued with the other stages, in which the participant was asked to think of his nose as if it were the midpoint of a clock and to draw an imaginary circle, trying to see all the numbers with his or her eyes clockwise without moving the head, starting from point 12 (fifth stage). Then the participant was asked to draw an imaginary circle in the same way but in the opposite direction (sixth stage). In the seventh gamut stage, the participant was asked to hum a melody for two seconds, usually a birthday song but another favorite melody if the participant had unpleasant memories of birthdays. In the eighth stage, the participant was asked to count from one to five and hum the melody for two seconds again. Then, the gamut procedure was terminated by allowing the participant to take a deep breath, the ninth stage.

A second EFT stage followed the gamut procedure, in which the therapist made a series of strokes on the acupuncture points on the other side of the participant's body. The participant was first asked to repeat a specified sentence three times by adding the word past, "Despite my past worry and anxiety, I accept myself as I am completely and deeply," and then the stroke phase started. In this stroke phase, the participant was asked to repeat the reminder sentence continuously. The procedures in the first EFT and 9 gamut stage were repeated, and finally, the participant was told to take a deep breath, finishing the EFT session, and then completed the postintervention testing

## Outcome Measures

**SUDS.** The scale is used in energy therapies. In this scale, developed by Wolpe, the individual evaluates his or her own distress.<sup>43</sup> The level of distress is scored between 0 and 10, with 0=no distress and 10=unbearable distress.<sup>32,44</sup> This score serves as a concrete and basic starting point for an evaluation of an individual's condition at baseline and the repetition of the test postintervention reflects the change that has occurred.<sup>32</sup>

**STAI-S.** This scale was developed by Spielberg et al in 1964, and its reliability has been found to be between 0.83 and 0.92. The scale requires the individual to indicate how he or she is feeling at a specific time and to mark one of the options, depending on the severity of his or her anxiety, which are: 1 = none, 2 = a little, 3 = a lot, and 4 = completely.

The state anxiety scale includes 20 items and two types of expressions: 1=direct statements / negative emotions and 2=reversed statements / positive emotions. The reversed statements include questions 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20. Scoring is done by calculating the statements' weight value, direct statements from 1 to 4 (1 = not at all, 2 = a little, 3 = lot, and 4 = completely) and reversed statements from 4 to 1. The reversed statements are evaluated as 4 = not at all, 3 = a little, 2 = lot, and 1 = completely.

The total weighted score of the reversed statements is subtracted from the total weighted score of the direct statements, and 50 is added to that score. The total score obtained from the scale varies between 20 and 80: 20-39 = mild anxiety, 40-59 = moderate anxiety, 60-79 = high anxiety, and 80 = panic anxiety).<sup>8,45</sup> Internal consistency and homogeneity coefficients were found to be between 0.94 and 0.96 in the validity and reliability study of the scale in Turkey.<sup>45</sup> In the current study, the Cronbach's alpha coefficient of the STAI-S was determined to be 0.769.

## Statistical Analysis

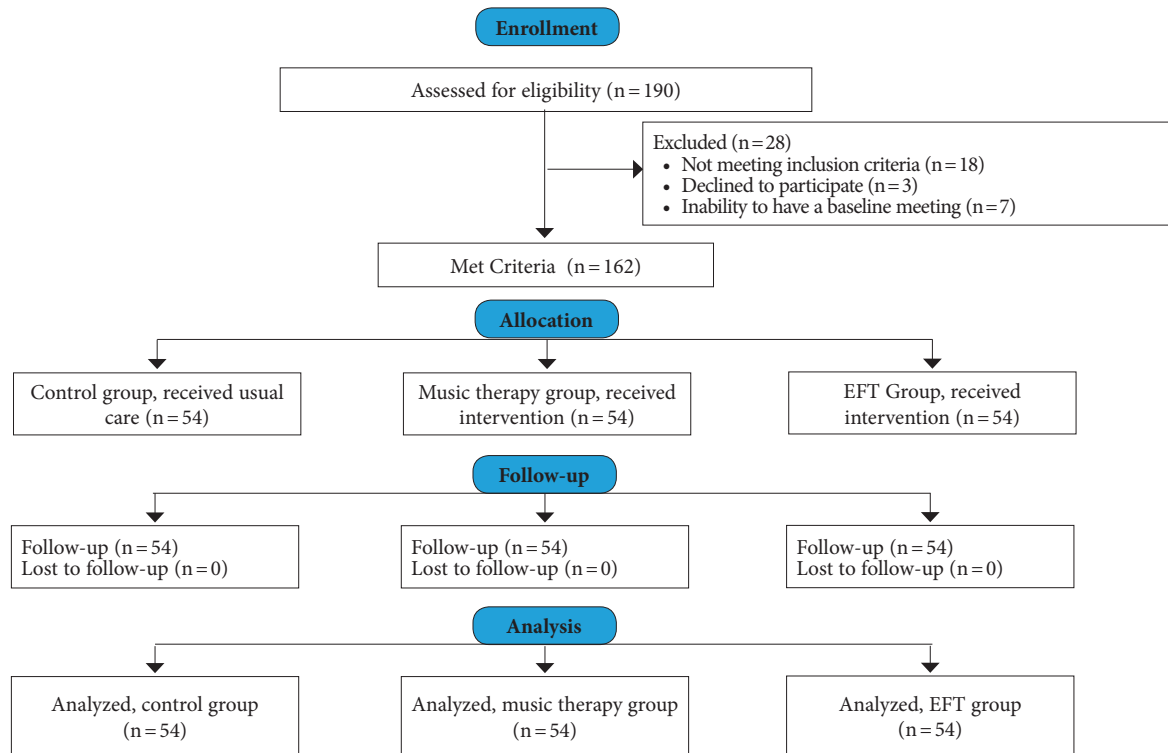
To evaluate the findings, the Statistical Package for Social Sciences (SPSS), version 22 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp) was used. The conformity of the data to normal distribution was tested with the Shapiro Wilk test. Cronbach's alpha coefficients were calculated to test validity and reliability. In the analysis of the data, number, percentage, mean, standard deviation, and chi-square values were calculated. Furthermore, the t test was used for dependent groups, and the t test and an analysis of variance (ANOVA) were used for independent groups. A post hoc test was used for further analysis. The Tukey test was used because the variances were homogeneous in the Levene test. The results were evaluated at a 95% confidence interval and a  $P < .05$  significance level.

## RESULTS

### Participants

Figure 1 shows the participants' flow diagram. No statistically significant difference existed (Table 1) between

**Figure 1.** Participants' Flow Diagram



**Abbreviations:** EFT, emotional freedom technique.

the groups in terms of age, gender, marital status, education level, employment status, income level, length of hospital stay, time since disc hernia diagnosis, past surgical experience, presence of chronic disease, and methods of coping with stress ( $P > .05$ ).

### Stress Coping Method

Participants' use of a stress coping method and the methods that they used (Table 2) didn't differ across the groups ( $p > 0.05$ ). To cope with stress, 7.4% of the control group preferred to walk and pray, while 14.8% of the music group preferred to walk and 7.4% the EFT group preferred to pray.

### Anxiety

Table 3 shows that EFT and music significantly reduced participants' state anxiety and subjective distress ( $P < .001$ ). No significant change was observed in the state anxiety and subjective distress of the control group. Further analysis showed that the practice of EFT was more effective than music on state anxiety.

### Vital Signs

Table 4 shows that EFT had a significant effect on decreasing pulse rate, respiratory rate, and systolic blood pressure, and music was effective in reducing diastolic and systolic blood pressure ( $P < .05$ ). Further analysis revealed that the practice of EFT was more effective than music. in reducing respiratory rate.

## DISCUSSION

The intense anxiety experienced by LDH patients before surgery may adversely affect their vital signs and may prolong the recovery period and hospital stay.<sup>1,3,7,8</sup> Therefore, it's important to reduce anxiety levels before surgery.<sup>15</sup>

Prior to the start of the current study, the majority of participants didn't use any method to deal with stress, which suggests that when patients encounter a situation causing intense anxiety such as surgery, they won't be able to cope with stress effectively, and thus can experience many problems. The state anxiety scores of all participants in the study show that they had moderate anxiety at baseline. Similarly to the studies of Arslan et al<sup>9</sup> and Güz et al,<sup>10</sup> the participants in the current study had anxiety about the LDH surgery.

Similarly to the studies of Benor et al,<sup>36</sup> Bach et al,<sup>37</sup> and Sezgin,<sup>32</sup> EFT in the current study reduced participants' state anxiety and subjective distress. The findings of Church et al<sup>38</sup> and Stapleton et al<sup>39</sup> that EFT regulates the stress response in the brain and reduces amygdala activity and cortisol level may provide the reason for the decrease in the level of anxiety in the current study.

Similarly to other studies on the benefits of music in reducing anxiety,<sup>19-24</sup> the current study revealed that state anxiety level and subjective distress of the participants who listened to music decreased significantly, although it found that EFT was more effective in reducing anxiety than music. This may be attributed to the fact that participants in the EFT concentrated on their anxiety and the self-acceptance factor

**Table 1.** Distribution of Control and Intervention Groups According to Descriptive and Medical Characteristics. Chi-square test was applied.

Characteristics		Control Group (N=54) N (%)	Music Group (N=54) N (%)	EFT Group (N=54) N (%)	Test and Significance
<b>Age Range</b>	22-40	9 (16.7)	12 (22.2)	15 (27.8)	$\chi^2 = 9.26$ $P = .055$
	41-60	19 (35.2)	28 (51.9)	26 (48.1)	
	61-80	26 (48.1)	14 (25.9)	13 (24.1)	
<b>Age, Mean ± SD</b>		56.67 ± 13.82	50.87 ± 12.14	51.11 ± 15.12	
<b>Gender</b>	Female	27 (50.0)	31 (57.4)	33 (61.1)	$\chi^2 = 1.404$ $P = .496$
	Male	27 (50.0)	23 (42.6)	21 (38.9)	
<b>Marital Status</b>	Married	51 (94.4)	53 (98.1)	50 (92.6)	$\chi^2 = 1.841$ $P = .398$
	Single	3 (5.6)	1 (1.9)	4 (7.4)	
<b>Education Level</b>	Illiterate	12 (22.2)	5 (9.3)	9 (16.7)	$\chi^2 = 12.68$ $P = .123$
	Literate	6 (11.1)	5 (9.3)	6 (11.1)	
	Primary School	29 (53.7)	33 (61.1)	23 (42.6)	
	High School	4 (7.4)	11 (20.4)	12 (22.2)	
	University	3 (5.6)	0 (0.0)	4 (7.4)	
<b>Working Status</b>	Working	14 (25.9)	19 (35.2)	17 (31.5)	$\chi^2 = 1.099$ $P = .577$
	Not working	40 (74.1)	35 (64.8)	37 (68.5)	
<b>Income level</b>	Income less than expenses	31 (57.4)	24 (44.4)	29 (53.7)	$\chi^2 = 3.889$ $P = .421$
	Income equal to expenses	23 (42.6)	29 (53.7)	23 (42.6)	
	Income more than expenses	0 (0.0)	1 (1.9)	2 (3.7)	
<b>Length of Hospital Stay</b>	1-7 days	50 (92.6)	50 (92.6)	48 (88.9)	$\chi^2 = 0.625$ $P = .731$
	8 days and more	4 (7.4)	4 (7.4)	6 (11.1)	
<b>Time Since Disc Hernia Diagnosis</b>	0-12 mos	27 (50.0)	28 (51.9)	24 (44.4)	$\chi^2 = 1.165$ $P = .884$
	13 mos-5 yrs	13 (24.1)	15 (27.8)	15 (27.8)	
	6 yrs and more	14 (25.9)	11 (20.4)	15 (27.8)	
<b>Surgical Experience</b>	Yes	45 (83.3)	37 (68.5)	37 (68.5)	$\chi^2 = 4.052$ $P = .132$
	No	9 (16.7)	17 (31.5)	17 (31.5)	
<b>Presence of Chronic Disease</b>	Yes	26 (48.1)	31 (57.4)	28 (51.9)	$\chi^2 = 0.941$ $P = .625$
	No	28 (51.9)	23 (42.6)	26 (48.1)	
<b>Method of coping with stress</b>	Using	15 (27.8)	16 (29.6)	13 (24.1)	$\chi^2 = 0.437$ $P = .804$
	Not using	39 (72.2)	38 (70.4)	41 (75.9)	

**Abbreviations:** EFT, emotional freedom technique.

**Table 2.** Methods of Coping with Stress in Daily Life in the Control and Intervention Groups and the Distribution of These Methods Across Groups (n = 162). Chi-square test was applied.

Method of Coping with Stress		Control Group (N=54) N (%)	Music Group (N=54) N (%)	EFT  Group (N=54) N (%)	Test and Significance
Method of Coping with Stress	Using	15 (27.8)	16 (29.6)	13 (24.1)	$\chi^2 = 0.437$ $P = .804$
	Not using	39 (72.2)	38 (70.4)	41 (75.9)	
Walking	Yes	4 (7.4)	8 (14.8)	2 (3.7)	$\chi^2 = 4.378$ $P = .112$
	No	50 (92.6)	46 (85.2)	5 (96.3)	
Praying	Yes	4 (7.4)	2 (3.7)	4 (7.4)	$\chi^2 = 0.853$ $P = .653$
	No	50 (92.6)	52 (96.3)	50 (92.6)	
Music	Yes	1 (1.9)	1 (1.9)	1 (1.9)	$\chi^2 = 0.00$ $P = 1.000$
	No	53 (98.1)	53 (98.1)	53 (98.1)	
Other, such as TV, handicraft, chatting with friends	Yes	6 (11.1)	5 (9.3)	6 (11.1)	$\chi^2 = 0.131$ $P = .936$
	No	48 (88.9)	49 (90.7)	48 (88.9)	

**Abbreviations:** EFT, emotional freedom technique.

**Table 3.** Intragroup and Intergroup Comparison of Changes in the Anxiety Scores of the Control and Intervention Groups Between Baseline and Postintervention

Anxiety Scales	Time of Measurement	Control Group (N = 54) Mean ± SD	Music Group (N = 54) Mean ± SD	EFT Group (N = 54) Mean ± SD	Intergroup Comparisons Test <sup>a</sup>
STAI-S	Baseline	40.9 ± 7.7	43.1 ± 7.6	44.3 ± 7.3	F = 2.766, 0.066
	Postintervention	40.8 ± 8.0	39.0 ± 8.0	36.9 ± 7.7	F = 3.247, 0.04 <sup>c</sup>
	Test <sup>b</sup>	<i>t</i> = 0.105, 0.917	<i>t</i> = 6.432, 0.000 <sup>c</sup>	<i>t</i> = 7.562, 0.000 <sup>c</sup>	
SUDS	Baseline	4.2 ± 2.0	4.0 ± 1.7	5.2 ± 1.2	F = 6.671, 0.002 <sup>c</sup>
	Postintervention	4.2 ± 2.1	3.4 ± 1.8	4.1 ± 2.2	F = 2.625, 0.076
	Test <sup>b</sup>	<i>t</i> = 0.000, 1.000	<i>t</i> = 5.356, 0.000 <sup>c</sup>	<i>t</i> = 6.025, 0.000 <sup>a</sup>	

<sup>a</sup>ANOVA test

<sup>b</sup>Paired *t* test

<sup>c</sup>*P* < .05

**Abbreviations:** EFT, emotional freedom technique; ANOVA, analysis of variance.

**Table 4.** Intragroup and Intergroup Comparison of Changes in Vital Signs in the Control and Intervention Groups Between Baseline and Postintervention

Vital Signs	Time of Measurement	Control Group (N=54) Mean ± SD	Music Group (N=54) Mean ± SD	EFT Group (N=54) Mean ± SD	Intergroup Comparison Test <sup>a</sup>
Pulse rate / minutes	Baseline	75.5 ± 12.6	74.0 ± 2.8	77.6 ± 3.1	F = 1.375, 0.256
	Postintervention	73.7 ± 12.3	73.2 ± 11.7	75.5 ± 10.5	F = 0.569, 0.567
	Test <sup>b</sup>	<i>t</i> = 2.041, 0.046 <sup>c</sup>	<i>t</i> = 0.702, 0.486	<i>t</i> = 2.932, 0.005 <sup>c</sup>	
Respiratory rate / minutes	Baseline	19.7 ± 3.0	19.0 ± 2.8	20.0 ± 3.1	F = 1.431, 0.242
	Postintervention	19.8 ± 3.2	18.8 ± 2.3	18.5 ± 2.9	F = 3.196, 0.044 <sup>c</sup>
	Test <sup>b</sup>	<i>t</i> = -0.230, 0.819	<i>t</i> = 1.224, 0.226	<i>t</i> = 5.320, 0.000 <sup>c</sup>	
Systolic Blood Pressure, mmHg	Baseline	130.9 ± 21.3	135.0 ± 20.3	130.8 ± 19.1	F = 0.730, 0.484
	Postintervention	128.3 ± 19.9	129.3 ± 19.8	128.1 ± 15.5	F = 0.936, 0.066
	Test <sup>b</sup>	<i>t</i> = 1.645, 0.106	<i>t</i> = 4.150, 0.000 <sup>c</sup>	<i>t</i> = 2.018, 0.049 <sup>c</sup>	
Diastolic Blood Pressure, mmHg	Baseline	80.6 ± 13.6	84.6 ± 11.6	81.6 ± 11.6	F = 1.538, 0.218
	Postintervention	78.8 ± 11.3	81.7 ± 12.1	80.5 ± 9.6	F = 0.926, 0.398
	Test <sup>b</sup>	<i>t</i> = 1.302, 0.198	<i>t</i> = 2.849, 0.006 <sup>c</sup>	<i>t</i> = 0.995, 0.324	

<sup>a</sup>ANOVA test

<sup>b</sup>Paired *t* test

<sup>c</sup>*P* < .05

**Abbreviations:** EFT, emotional freedom technique; ANOVA, analysis of variance.

was promoted in performing the EFT. Factors such as the therapist's touching of participants and constant communication during the intervention may explain EFT's effectiveness. The use of the passive listening method led to the inability to communicate with and touch participants during the music intervention.

Similarly to Bach et al.,<sup>37</sup> a statistically significant decrease was observed in participants' pulse rates, respiratory rates, and systolic blood pressures, indicating that EFT has positive effects on vital signs in the current study. Similarly to other studies indicating that music has a positive effect on vital signs,<sup>16,19,25,27-29</sup> in the current study music positively affected vital signs.

When the postintervention comparison between the groups of the changes in vital signs was made, only the

difference in respiratory rate was found to be significant. The gamut procedure in EFT in which participants breathed deeply may have led to this result.

This study has potential limitations because only inpatients participated in the study due to their need for LDH surgery and because the kind of music was not left to the participant's choice.

## CONCLUSIONS

Both the EFT and music reduced anxiety before LDH surgery, but the EFT was more effective than music. Both interventions also had positive effects on vital signs, yet EFT was more effective in reducing respiratory rate. These findings suggest that nurses should include EFT and music in



preoperative nursing care to reduce anxiety and regulate vital signs. In the future, researchers should conduct studies with different populations to evaluate the effects of EFT and music on preoperative anxiety and vital signs.

#### CONFLICTS OF INTEREST

The authors have no competing financial interests.

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