Anesth Pain Med. 2023 February; 13(1):e132943. https://doi.org/10.5812/aapm-132943.

Published online 2023 February 25. **Research Article**

The Effect of Music Therapy on the Pain and Anxiety Levels of Patients Experiencing Wound Healing by Suturing in the Emergency Wards

Javad Hedayati [1], Masoumeh Bagheri-Nesami [2, 3, *], Forouzan Elyasi [4] and Abolfazl Hosseinnataj [5]

[1] Student Research Committee, Mazandaran University of Medical Sciences, Sari, Iran
[2] Traditional and Complementary Medicine Research Center, Addiction Institute, Mazandaran University of Medical Sciences, Sari, Iran
[3] World Federation of Acupuncture-Moxibustion Societies (WFAS), Beijing, China
[4] Psychiatry and Behavioral Sciences Research Center, Sexual and Reproductive Health Research Center, Addiction Institute, Mazandaran University of Medical Sciences, Sari, Iran.
[5] Department of Biostatistics and Epidmiology, Faculty of Health, Mazandaran University of Medical Sciences, Sari, Iran

[*] *Corresponding author*: Traditional and Complementary Medicine Research Center, Addiction Institute, Mazandaran University of Medical Sciences, Sari, Iran. Email: anna3043@gmail.com

Received 2022 December 06; **Revised** 2022 December 26; **Accepted** 2022 December 27.

Abstract

Background: A patient experiences high pain and anxiety during laceration healing. One of the non-pharmacological methods of pain and anxiety relief is using music.
Objectives: This study was outlined to examine the impact of music therapy on the pain and anxiety levels of patients experiencing wound healing by suturing in the emergency wards.
Methods: The study population for this randomized controlled clinical trial was all patients aged 18 - 65 years who were referred to the Emergency Ward of Imam Khomeini and Buali Sina hospitals, Sari, Iran, to suture the hand or foot. Thirty people were included from each group in the study. In the intervention group, traditional Iranian wordless music (Peyk Sahar track) was played with headphones from when the patient was placed on the bed for suturing to the end, and the duration was recorded. In the control group, sutures were made according to the usual procedure. The pain level was measured by a visual analog scale in two stages before washing and immediately after the anesthetic injection. Moreover, the anxiety level was assessed in three steps, before washing the wound, after the end of the anesthetic injection, and immediately after suturing. Data were analyzed by the SPSS software version 22. Descriptive statistics, including mean and standard deviation, and inferential statistics, such as Exact Fisher's test, Mann-Whitney test, and Wilcoxon, were used to describe and analyze the variables.
Results: The mean pain before washing the wound (before music therapy) and after the end of the anesthetic injection was not significantly different between the intervention group (5.38 ± 1.31 and 3.71 ± 1.98, respectively) and the control group (5.31 ± 1.69 and 4.60 ± 2.31, respectively) (P = 0.27 and 0.057, respectively). The mean anxiety before washing the wound, after the end of anesthesia injection, and immediately after finishing the suture was 3.37 ± 0.89, 2.73 ± 1.23, and 1.27 ± 0.52 in the intervention group, and 3.50 ± 0.97, 3.07 ± 1.33, and 2.07 ± 1.14 in the control group, respectively. The mean anxiety at all three times was significantly different between the two groups (P < 0.001).
Conclusions: The study results indicated that music therapy lowered pain without a statistically significant difference. However, music therapy significantly reduced anxiety. Therefore, it is recommended to use music therapy to reduce pain and anxiety in patients.

Keywords: Music Therapy, Pain, Emergency Ward, Suture, Laceration Healing

1. Background

A wound is defined as a lesion and discontinuity on the skin surface caused by physical and thermal injuries requiring medical treatment (1). The laceration is an injury pattern in which the skin and underlying tissues are cut or torn (2). Skin lacerations are one of the main reasons for the referral of patients to the emergency room. In 2013, in the United States of America, almost seven million lacerations, which constituted 5.2% of all emergency room referrals, were referred to the emergency room (3). Wound healing stops bleeding, accelerates healing, prevents infection, and improves appearance (4). There are four different types of wound healing devices, including sutures, staples, adhesive tape, and tissue adhesive, in which suture is the most common wound healing method. Regardless of the shape of the wound, the suture will provide the most acceptable and stable wound healing (5). Suturing means

placing tissues naturally to cause healing (6). Suturing is associated with pain, and in a study on the impact of music on pain and anxiety during laceration healing in the emergency ward, the pain level was measured by a visual analog scale (VAS) after the intervention. The scoring rate of this scale is 0 - 10, with a higher score indicating more pain. The mean pain score was reported as 3.3 in the control group and 2.1 in the music group (7). Another research evaluated the impact of audiovisual distraction on children's pain during laceration healing according to the pain scoring scale based on the face reported by the child itself pre-intervention. The mean ± standard deviation of the pain level was 6.62 ± 3.11 in the test group and 5.48 ± 3.25 in the control group, which indicates high pain. According to the VAS score given by the child's caregiver before the intervention, the mean and standard deviation of the pain level were 63.90 ± 23.11 in the test group and 60.40 ± 26.79 in the control group. The scoring of this scale is 0 - 10 cm, with a higher score presenting more pain (8). Based on the reports of the mentioned articles, the patient experiences a high level of pain during the laceration healing. As a result, it is necessary to reduce pain (9). According to the definition of the International Society of Pain Studies, pain is an unpleasant sensory and emotional experience following actual or potential tissue damage. If pain is not controlled, there are endless complications in various body systems, including the cardiovascular, pulmonary, gastrointestinal, and endocrine systems (10). In addition, anxiety is also one of the important and influential factors in wound healing. Anxiety is a mental-emotional response to a stressor. Natural anxiety is a diffuse, unpleasant, and often vague feeling recognized with one or several physical indicators, such as the feeling of emptying the chest, chest congestion, heartbeat, sweating, headache, feeling of urination, restlessness, and the desire to move, and is a psychologically and physiologically potential factor in the wound healing phenomenon (11). It reduces patients' participation in self-care activities and prevents the effective implementation of care programs and their maximum efficiency and improvement (12). Anxiety usually increases the feeling of pain, and pain can also increase anxiety (11). In a study before music therapy, the mean anxiety of the patients measured by the Spielberger State-Trait Anxiety Inventory (STAI) was 40.2 (moderate anxiety) in the control group and 33.6 (mild anxiety) in the music group (7).

Mainly, pharmacological and non-pharmacological approaches relieve pain (13). Among the pharmacological methods are narcotic painkillers (e.g., fentanyl and oxycodone) (14) and local anesthetics (e.g., lidocaine 1% or 2%) (9). In the non-pharmacological methods, distraction techniques could be mentioned. Some examples of thought distraction activities include music therapy, making bubbles, and playing games (15). Using pharmaceutical methods in large doses to eliminate anxiety and alleviate pain can reduce blood circulation and breathing and has many side effects (11). Today, non-pharmacological approaches to pain relief have attracted the attention of nursing systems, and patients also desire these methods. Moreover, these types of interventions are effective, simple, and low-risk. In addition, as mentioned, the side effects caused by medications do not occur in non-pharmacological pain relief methods (13). One of the non-pharmacological approaches to relieving pain and anxiety is music. Since long ago, people believed in the healing power of music and considered it an excellent tool to treat diseases. Music reduces heartbeat and deepens breathing, and reduces pain with positive effects on anxiety and pain by reducing sending pain messages to the central nervous system (16). Music had a particular position in ancient Iran. Zarathustra can be called the founder of religious music due to attributing poems to songs and prayers. This kind of music was used to treat mental illnesses. According to the inscriptions in Jundishapur (1349), music science and music therapy were among the departments every medical student had to study at that time. Ibn Sina considered music a powerful pain reliever and a cause of joyfulness (17). The results of a study showed that music significantly reduced the anxiety and pain of children who went to the emergency room (18). In addition, another study that examined music in wound healing in adult patients mentioned that music relieved pain during laceration healing. Although the anxiety level decreased after laceration healing, there was no statistically significant difference with the control group (7). Furthermore, another study on the impact of music on pain and anxiety during episiotomy found that music did not have a statistically significant effect on anxiety and pain (19). Even though many studies have been published on the effect of music therapy on pain and anxiety levels, there are very few investigations on this technique during laceration healing, mainly performed on children (20). According to the literature, only one published study on adults reported the influence of music on reducing pain but not on reducing anxiety (7). The plan of music therapy and the tools used in the mentioned study differed from the present research.

2. Objectives

Considering the lack of information and published articles on the effect of music therapy on pain and anxiety levels during laceration healing in adults. The contradictory results of the previous studies (7, 19), the current study was conducted to assess the effect of music therapy on the pain and anxiety levels during laceration healing in the

emergency ward. It could be considered an easy, cheap, and safe method to reduce pain and anxiety, making the patient more cooperative.

3. Methods

This randomized controlled clinical trial of a parallel type was performed to evaluate the effect of music therapy on the pain and anxiety levels of patients undergoing wound healing by suturing in the Emergency Ward of Imam Khomeini and Buali Sina hospitals in Sari, Iran. The study population included all patients aged 18 - 65 years who were referred to the emergency room of Imam Khomeini and Buali Sina hospitals in Sari for sutures.

The inclusion criteria were: (1) Consent to participate in the study; (2) a laceration of 5 cm or less in the organs that need sutures; (3) age group of 18 - 65 years; (4) no mental disability; (5) hearing disability, speech disability, or physical disability, and paralysis; (6) not receiving anti-anxiety medications or pain killers for 12 h before the study; (7) not having lacerations involving tendons and ligaments; (8) not suffering from severe psychiatric disorders; (9) no cancer; (10) no rheumatology disease and medical treatment; (11) no lacerations due to self-inflicted injuries; (12) no multiple lacerations and simultaneous damages to other organs; and (13) no opioid addiction.

The exclusion criteria entailed not cooperating during the intervention for any reason and the impossibility of intervention in the procedure because of the patient's condition.

3.1. Sampling and Randomization

To determine the sample size, a similar article was used entitled "A Randomized Controlled Trial of the Use of Music during Laceration Repair" (7). In the mentioned study, the mean and standard deviation of pain in the intervention group was 2.1 ± 0.9, and in the control group was 3.3 ± 1.2 after music. Considering these results, the confidence level of 99%, test power of 90%, direction, and range of the test, and using the comparison formula between the two means, the sample size was 48 people in two groups of 24. Finally, taking into account the possibility of 20% dropout, 30 samples were collected for each group, making a total of 60 samples. In order to assign the subjects to two groups, a randomized block method (15 blocks of four) was used. In each block, two samples were considered for each group.

3.2. Intervention Group

The intervention began after providing sufficient explanations to the patient and obtaining written consent. First, the demographic information of the patients was filled in. In both groups, the wound length and depth were measured by a sterile ruler, that the length of the ruler was 15 cm, and lacerations of 5 cm or smaller in the organs were included in the study. The medicine attendants or residents of the emergency room physically examined the wound. If the depth was such that the nerve, artery, bone, ligament, tendon, and joint laceration were not involved, the study was started. After placing the patient on the bed, the anxiety and pain levels were measured for the music group. Then, the traditional Iranian wordless music, Peyk Sahar, composed by master Homayoun Khorram and played by Babak Shahraki, was played through headphones. The method of performing this song is a trio with a centaur, violin, and tombak, and its duration is 1 min and 54 sec. This song was recorded consecutively for 20 min so that there was no gap in its playback during wound suturing, and it continued until the healing was completed.

The relaxation mood was determined by the MT30 device at the rate of 76 beats. Considering that the beat is 60 - 80, this music was relaxing (21), and it was played with SONY brand headphones with the volume adjusted by the patient (22). The song was recorded on the memory card and placed in the headphones for playback. The duration of playing music for each patient was recorded separately. Pain and anxiety levels were measured immediately after washing the wound and injecting the anesthetic. It should be noted that the maximum safe dose of lignocaine (lidocaine) for local anesthesia in wound healing is 3 mg/kg (23), which was recorded for each patient. An intern or a nurse completed the suture, and after the suture was finished in the intervention group, music was stopped, and the anxiety level was measured again.

3.3. Control Group

In the control group, anxiety and pain levels were measured after the patient was placed on the bed. After washing the wound and the anesthetic injection, the pain and anxiety levels were immediately measured, and the amount of anesthesia injection was recorded. After finishing the sutures, the anxiety level was measured again.

3.4. Instruments

The data collection tools included the questionnaire of the demographic and medical characteristics of the patients, VAS, and the Face Anxiety Scale (FAS). The VAS included ten parts and was based on the patient's self-report. The pain level was evaluated, and a 0 - 10 was recorded. The VAS is a standard tool used in many studies to measure pain and was valid (7, 24, 25). In the study by Rezvani Amin et al., the correlation of VAS with the shortened McGill pain inventory was examined in patients with chronic back pain.

The correlation between the two tools was reported as r = 0.86, which indicates an excellent correlation between the pain measured by these two tools (26).

Face Anxiety Scale includes five faces, and the patient's anxiety was measured by the researcher based on the facial reactions. A score of zero means no anxiety, and five means severe anxiety. The validity of this tool was investigated in 2004, and structural validity with the clinical judgment method based on DSM-IV was reported as 0.64 on average. Moreover, its reliability was assessed by Mehranfard et al. in a study titled "Effect of Acupressure on the Patients' Anxiety Under Mechanical Ventilation was Reported Using the Simultaneous Observation Method". Thus, the researcher and three trained nurses each simultaneously and separately assessed the anxiety level of 30 patients under mechanical ventilation with a consciousness level of 9 and above on the Glasgow scale. The agreement coefficient between the researcher and each of the nurses was obtained at 0.8, 0.82, and 0.83. In addition, for ten conscious patients under mechanical ventilation who were able to respond, the tool was scored separately by the patient and researcher, and the agreement coefficient was 0.9 (27). In the present study, the researcher and three trained nurses each simultaneously and separately evaluated the anxiety level of 10 patients during laceration healing, and the intraclass correlation was calculated as 0.82 (P < 0.001).

3.5. Statistical Analysis

Data analysis was performed utilizing SPSS version 22. Descriptive information is reported using mean, standard deviation, frequency, and percentage indicators. To check the normality hypothesis of quantitative variables, the Shapiro-Wilk test and non-parametric tests were used because the data did not have a normal distribution. Qualitative variables were compared by Fisher's Exact test and Chi-square. Moreover, the quantitative variables were compared by the *t*-test, Mann-Whitney, Wilcoxon, and Friedman tests. A significance level of less than 5% was considered. Figure 1 shows the stages of entering the study, allocation, and data analysis.

4. Results

In the present study, 60 patients who met the inclusion criteria were selected out of 114 patients who were referred to the emergency room of Imam Khomeini and Buali Sina Sari hospitals. The mean age of the participants was 37.93 ± 12.61 years in the intervention group and 40.47 ± 15.35 years in the control group. According to the findings, the frequency of female and male subjects was 43.3% and 56.7% in the control group and 43.3% and 56.7% in the intervention group, respectively. In terms of employment status, 16.6% had governmental jobs, 46.6% non-governmental jobs, and 36.6% other jobs (retired, unemployed, and students) were reported in the intervention group. In the control group, 13.3% had governmental jobs, 50% non-governmental jobs, and 36.6% had other jobs (retired, unemployed, and students). According to Fisher's test, no significant statistical difference was observed between the two groups (P < 0.999). The comparison of educational status between the intervention and control groups revealed no statistically significant difference based on the Fisher's test (P = 0.891). The frequency of wound sites in the intervention and control groups was not significantly different (P = 0.781). The chi-square test showed that the frequency of underlying diseases in the two groups did not have a significant difference (P = 0.152). The duration of playing music in the test group was 508.23 ± 155.07 sec. Other demographic and medical information is presented in Table 1.

A comparison of the mean pain before washing the wound between the intervention and control groups by the Mann-Whitney test did not show a statistically significant difference (P = 0.270). The results of comparing the mean pain before and after the intervention in each group, as well as after washing the wound, are summarized in Table 2.

Comparing the mean anxiety before washing the wound in the two intervention and control groups by the Mann-Whitney test did not reveal a significant difference (P = 0.562). The comparison of the mean anxiety before washing the wound and immediately after anesthetic injection and suture completion is presented in Table 3.

5. Discussion

According to the results of the present study, there was no statistically significant difference between the mean pain before washing the wound in the patients of the intervention group and the control group, and both groups felt almost the same pain before washing the wound. No study examined pain before washing the wound in patients undergoing wound healing with sutures in adults. Only one study was conducted on children titled "Investigating the Effect of Distraction by Watching Cartoons on the Level of Preparation Pain on 86 Children between 3 and 12 Years Old". The results showed that before the anesthetic injection (after playing the cartoon), the mean pain assessed by the FLACC tool in the children of the control and test groups was significantly different. The comparison between the two groups demonstrated that the children of the intervention group experienced less pain before the anesthetic injection (28). The mean pain differ-

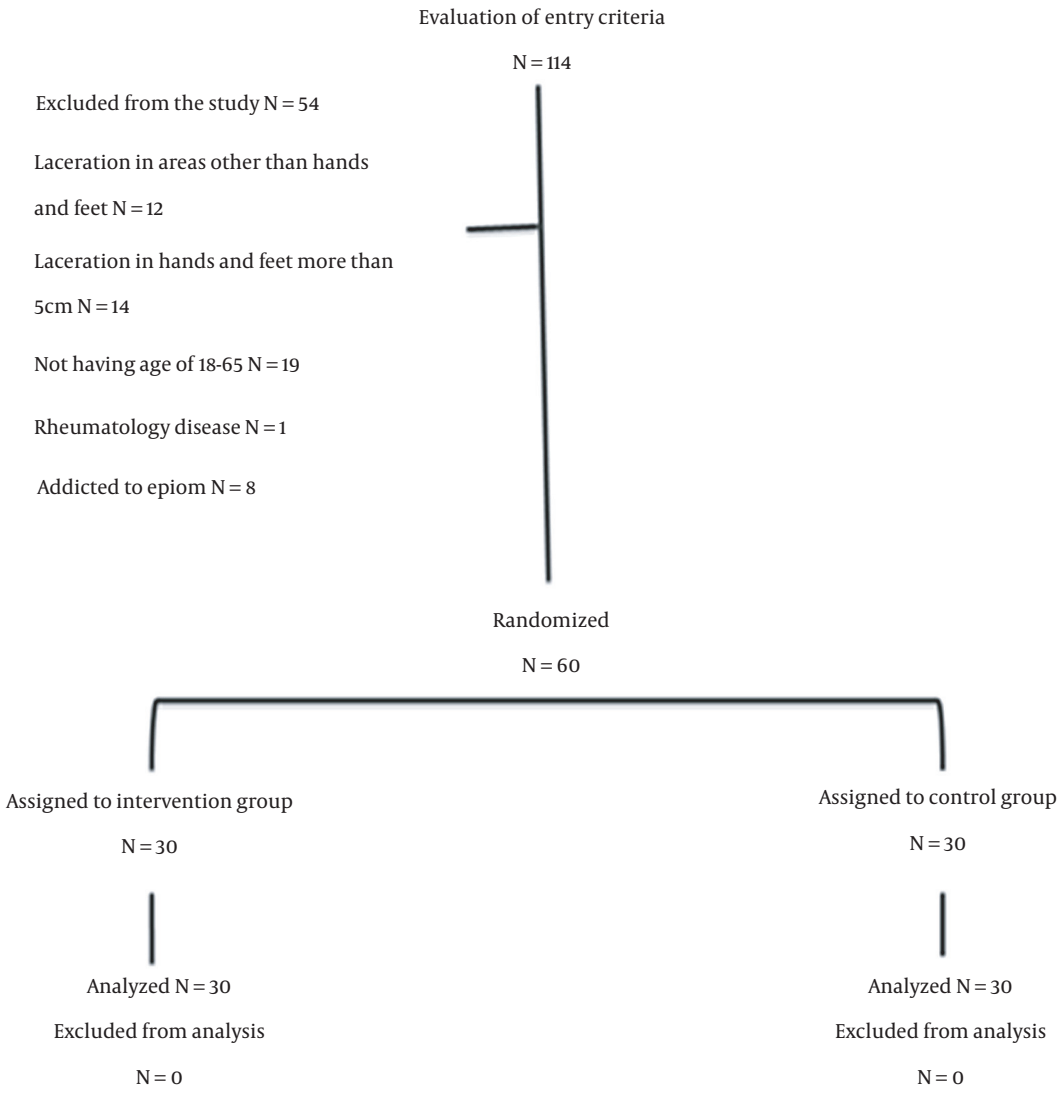

Figure 1. Stages of entering the study, allocation, and data analysis

Table 1. Comparison of Demographic and Medical Information Between the Intervention and Control Groups

Variables	Group (Mean ± SD)		*t*-Test	P-Value
	Control	Intervention		
Laceration length (mm)	37.33 ± 9.76	36.53 ± 9.17	0.327	0.745
Laceration depth (mm)	2.73 ± 0.69	2.5 ± 0.78	1.23	0.224
Amount of anesthesiaused (CC)	3.33 ± 1.06	3.37 ± 1.13	0.12	0.907
Duration of washing until the completion of sutures (minutes)	13.08 ± 4.63	13.6 ± 3.93	0.18	0.857
Number of sutures	3.77 ± 1.16	3.83 ± 1.23	0.21	0.830

Table 2. Comparison of Mean Pain Before Washing the Wound and Immediately After Anesthetic Injection Between the Intervention and Control Groups

Pain/Stage	Group (Mean ± SD)		Mann-Whitney Statistic Test	P-Value
	Control	Intervention		
Before washing the wound	5.31 ± 1.69	5.38 ± 1.31	1.10	0.270
Immediately after the anesthetic injection	4.60 ± 2.31	3.71 ± 1.98	1.91	0.057
Wilcoxon statistic test	0.59	3.70		
P-value	0.556	< 0.001		

Table 3. Comparison of the Mean Anxiety Before Washing the Wound, Immediately After Anesthetic Injection, and Immediately After Suture Completion Between the Intervention and Control Groups

Anxiety/Stage	Group (Mean ± SD)		Mann-Whitney Statistic Test	P-Value
	Control	Intervention		
Before washing the wound	3.5 ± 0.97	3.37 ± 0.89	0.58	0.562
Immediately after the anesthetic injection	3.07 ± 1.33	2.73 ± 1.23	1.09	0.275
Immediately after suturing	2.07 ± 1.14	1.27 ± 0.52	0.01	0.003
Friedmanstatistictest	32.19	43.10		
P-value	< 0.001	< 0.001		

ence before injection in the two groups of the above study was 1.28, while in our study, it was 0.07 before washing the wound. The findings of the present study are inconsistent with the mentioned research, which could be attributed to the difference in the pain measurement tool. According to the pain report, more understanding of pain has been reported in children, and the pain was measured before the anesthetic injection and at the time of playing cartoons. In contrast, in the present study, the pain was measured before playing the music. That the intervening role of playing cartoons, However, in this short period of time, can be the reason for the discrepancy in the results of these two studies. Because in the mentioned study, the pain was measured while playing the cartoons, while in the present study, the pain was measured before the music was played.

We observed no statistically significant difference between the mean pain immediately after anesthetic injection in the patients of the test and control groups. However, comparing the two groups indicated that immediately after anesthetic injection, the patients of the intervention group experienced less pain than the control group. In this regard, the results of an investigation on the effect of music on pain and anxiety during laceration healing in the emergency ward in 38 patients older than 18 years showed a statistically significant difference in the pain level after suturing, which was compared with the VAS of pain (7). In the present study, the pain was measured immediately after anesthetic injection, and it should be considered that needling itself causes much pain and can increase pain in the patients, while in the mentioned study, the pain was measured after the suture was completed, and some time has passed since the anesthetic injection, and its effect has decreased. This can be the reason for the discrepancy between the results of these two studies. It is worth mentioning that in the above study, similar to our research, a laceration below 5 cm was included in the study, and music was played from when the patient was placed on the bed until the suture was completed.

The results of the present study showed a statistically significant difference between the mean pain before washing the wound and immediately after anesthetic injection in the intervention group. On the other hand, in the control group, the comparison of mean pain before washing the wound and immediately after the anesthetic injection did not show a statistically significant difference. These findings indicated the impact of music therapy on pain reduction in patients (Table 2). No study has only compared pain before washing the wound and immediately after anesthetic injection in the control and intervention groups. A study was conducted on children, but cartoons had been played since before wound washing, while in our study, there was no intervention during pain evaluation before washing the wound.

Based on the results of the present study, there was no statistically significant difference between the mean anxiety before washing the wound in the patients of the test and control groups. So that the patients of both groups experienced almost the same anxiety; in this regard, the results of a study that investigated music's effect on pain and anxiety during laceration healing in 38 patients older

than 18 years showed no significant difference in the anxiety level before wound healing in both groups (7). However, it should be noted that the difference in the mean anxiety before washing the wound in the two groups of the present study was 0.13, while this difference was 6.6 in the above study. This difference may result from different anxiety measurement tools, FAS in our study and Spielberger in the above study. In addition, the cultural context of the two studies was different in Iran and America. The sample size in our study was 60 people, while their research was 38. Regarding the larger sample size in our study, perhaps one of the reasons is the mean difference in anxiety before washing the wound in the two studies. The age range of the patients was almost similar to our investigation.

According to the findings of the current study, no statistically significant difference was observed between the mean anxiety immediately after anesthetic injection in the patients of the intervention and control groups. However, the subjects in the intervention group experienced less anxiety immediately after the anesthetic injection compared to the control group. Furthermore, the findings of the present research showed a statistically significant difference in comparison with the mean anxiety immediately after suturing in the intervention and control groups. The comparison of the two groups demonstrated that after suture completion, the test group patients experienced much less anxiety than the control group. In this regard, the results of a study investigating the effect of music on pain and anxiety during laceration healing in the emergency ward on 38 patients older than 18 years showed no statistically significant difference in the anxiety level after wound healing reported by the patient using the Spielberger inventory (7). The difference in the mean anxiety immediately after suturing in the intervention and control groups of the current study is 0.8, while it was 4.5 in the above study 4.5. In both studies, the mean difference in anxiety decreased immediately after suturing. Therefore, it seems that music was influential. Another reason may be the difference in sample size, which was 38 people in the mentioned research (19 people in each group) and 60 in the present study (30 people in each group). The difference in the anxiety measurement tool may be the reason for the discrepancy in the results.

The findings of the current research showed a statistically significant difference in the mean anxiety of the test group before washing the wound, immediately after the end of the anesthetic injection, and immediately after the completion of the suture. Moreover, this difference was also significant in the mean anxiety before washing the wound, immediately after the anesthetic injection, and immediately after suturing in the control group. It seems that the patient had a high level of anxiety at first due to the suture procedure ahead, at the beginning of the procedure, and the injection of anesthetic, which caused a decrease in pain and, consequently, anxiety. Finally, after the suture, the level of anxiety declined in both groups. However, according to the data presented in Table 3, there was a statistically significant difference between the two groups in terms of mean anxiety immediately after suturing. Therefore, anxiety decreased to a greater extent in the intervention group, showing the positive and significant role of music therapy on the level of anxiety.

5.1. Conclusions

The present study showed that music therapy could reduce the anxiety level of patients undergoing wound healing by suturing, while it was not significantly effective on pain. It should be noted that before washing the wound and after the anesthetic injection, the patients in the test group experienced less pain than those in the control group. Patients referring to the emergency rooms experience severe pain, and the secondary consequence of pain can be anxiety. Mismanaging pain and anxiety might have side effects on health. Consequently, a nurse, as a healthcare team member, should use safe and easy methods to reduce the patient's pain and anxiety. Based on the results of this study, it is suggested that music therapy can be used to manage the pain and anxiety of patients who refer to the emergency room for wound suturing.

Among the limitations of this study were different suturing people, such as nurses, interns, or residents, which may distort the study results. Moreover, the level of interest of patients in music is different. Due to little time in the emergency ward, it was impossible to choose a piece of music among several songs for each patient in this study. In addition, pain varies in diverse organs. Therefore, only the hand and feet were considered in the current study, and it was impossible to study patients with head and neck wounds due to music playing through headphones. In the present investigations, the researchers assumed no pain due to the anesthetic injection. Therefore, the pain was not measured after suture completion. Considering that even the pressure of a suture needle can cause pain in a person, it is recommended that in future studies, pain at the end of the suture should also be measured and compared between the two groups. In this regard, the mean and standard deviation of the total time of the wound healing procedure was 13.7 ± 4.25 min, which was a short time, as well as the low mean time of washing the wound and injecting anesthetic. The difference in this short time did not show pain reduction. However, the difference in the pain level before washing the wound and after the injection of anesthesia was 1.67 units in the intervention group and 0.71 units in the control group. The pain reduction was more

in the test group. It is recommended that this method be used by nurses to reduce pain. Furthermore, a two-way relationship between pain and anxiety causes an increase in one, leading to a rise in the other and raising its adverse effects on health. As a result, it is recommended for patients hospitalized in the emergency ward to use music therapy during suturing.

Footnotes

Authors' Contribution: Study concept and design: M. B. and J. H.; analysis and interpretation of data: A. H. and M. B.; drafting of the manuscript: J. H.; critical revision of the manuscript for important intellectual content: F. E., J. H., and M. B.; statistical analysis: A. H.

Clinical Trial Registration Code: IRCT20110906007494N42

Conflict of Interests: Funding or Research support: Mazandaran University of Medical Sciences. Employment: Bagheri, Eliasi, and Netah are members of the academic faculty of the university. Hedayati is a senior student of emergency nursing. Personal financial interests: There is no personal financial interest in this study. Stocks or shares in companies: There is nothing in this regard. Patents: There is nothing personal or professional relations with organizations and individuals (parents and children, wife and husband, and family relationships): Except for Hedayati, the rest of the authors are members of the scientific faculty of Mazandaran University of Medical Sciences. Unpaid membership in a government or non-governmental organization: Bagheri is a member of the World Federation of Acupuncture-Moxibustion Societies (WFAS), Beijing, China. Are you one of the editorial board members or a reviewer of this journal? No.

Ethical Approval: This study was approved under the ethical code IR.MAZUMS.REC.1400.480.

Funding/Support: This study received a grant from Mazandaran University of Medical Sciences (webpage of the grant: http://fa.irct.ir/trial/59108).

Informed Consent: The intervention began after providing sufficient explanations to the patients and obtaining written consent.

References

1. Afshar M; Ghaderi. [Novel advancements in wound healing]. *J Birjand Univ Med Sci*. 2014;**21**(1):1–19. Persian.
2. Newman RK, Mahdy H. *Laceration*. Florida: Stat Pearls Publishing; 2022.
3. Mankowitz SL. Laceration Management. *J Emerg Med*. 2017;**53**(3):369–82. [PubMed ID: 28847677]. https://doi.org/10.1016/j.jemermed.2017.05.026.
4. Hoyt KS, Flarity K, Shea SS. Wound care and laceration repair for nurse practitioners in emergency care: part II. *Adv Emerg Nurs J*. 2011;**33**(1):84–99. [PubMed ID: 21317701]. https://doi.org/10.1097/TME.0b013e318208da72.
5. Mahshidfar B, Basir Ghafouri H, Hafizi Moghaddam P, Hosseini M, Zare M, Abbasi S, et al. *[Textbook of Wound]*. Tehran, Iran: Artin Teb; 2012. Persian.
6. Siadat SA, Mokhtari J. [A Review on Types of Sutures, Their Applications and Features]. *Basparesh*. 2013;**3**(3):4–13. Persian.
7. Menegazzi JJ, Paris PM, Kersteen CH, Flynn B, Trautman DE. A randomized, controlled trial of the use of music during laceration repair. *Ann Emerg Med*. 1991;**20**(4):348–50. [PubMed ID: 2003660]. https://doi.org/10.1016/s0196-0644(05)81652-x.
8. Ha YO, Kim HS. The effects of audiovisual distraction on children's pain during laceration repair. *Int J Nurs Pract*. 2013;**19 Suppl 3**:20–7. [PubMed ID: 24090294]. https://doi.org/10.1111/ijn.12165.
9. Lambert C, Goldman RD. Pain management for children needing laceration repair. *Can Fam Physician*. 2018;**64**(12):900–2.
10. Brand K, Al-Rais A. Pain assessment in children. *Anaesth Intensive Care Med*. 2019;**20**(6):314–7. https://doi.org/10.1016/j.mpaic.2019.03.003.
11. Salkhordeh H, Sabet B, Mahboobi M, Babajani S. [The effect of music therapy on preoperational anxiety and pain in waiting room]. *J Paramed Sci*. 2017;**12**(2):55–62. Persian.
12. Manzari ZS, Memariyan R, Vanaki Z. [Effect of therapeutic communication on pain anxiety and burn wounds healing status]. *Horiz Med Sci*. 2013;**19**(2):59–65. Persian.
13. Sadeghi T, Mohammadi N, Shamshiri M, Bagherzadeh R, Hossinkhani N. Effect of distraction on children's pain during intravenous catheter insertion. *J Spec Pediatr Nurs*. 2013;**18**(2):109–14. [PubMed ID: 23560582]. https://doi.org/10.1111/jspn.12018.
14. Inturrisi CE. Clinical pharmacology of opioids for pain. *Clin J Pain*. 2002;**18**(4 Suppl):S3–13. [PubMed ID: 12479250]. https://doi.org/10.1097/00002508-200207001-00002.
15. Kaheni S, Sadegh Rezai M, Bagheri-Nesami M, Goudarzian AH. The effect of distraction technique on the pain of dressing change among 3-6 year-old children. *Int J Pediatr*. 2016;**4**(4):1603–10.
16. Naderi F, Aghayi A, Mohammadzadeh M, Nazemi S, Salmani F, Rashvand M. [Comparing the effect of music on pain threshold, anxiety, behavioral responses to pain and the hemodynamic parameters during dressing change in burn patients]. *Horiz Med Sci*. 2014;**20**(1):63–8. Persian.
17. Hatami S, Pakbaz S, Ghaffari F. [Music therapy from ancient Iran till teymoorian age]. *Med History J*. 2015;**7**(22):107–31. Persian.
18. Hartling L, Newton AS, Liang Y, Jou H, Hewson K, Klassen TP, et al. Music to reduce pain and distress in the pediatric emergency department: a randomized clinical trial. *JAMA Pediatr*. 2013;**167**(9):826–35. [PubMed ID: 23857075]. https://doi.org/10.1001/jamapediatrics.2013.200.
19. AnĞIn AD, oruç MA, öktem A, Gursu T, Alan Y, sakin O, et al. The Effect of Music on the Pain and Anxiety in Episiotomy. *Ankara Med J*. 2020;**20**(3):541–52. https://doi.org/10.5505/amj.2020.79847.
20. Sinha M, Christopher NC, Fenn R, Reeves L. Evaluation of Nonpharmacologic Methods of Pain and Anxiety Management for Laceration Repair in the Pediatric Emergency Department. *Pediatrics*. 2006;**117**(4):1162–8. https://doi.org/10.1542/peds.2005-1100.
21. Hemmati K, Farhadi P. [Evaluating the impact of hearing wordless song on patients' vital signs undergoing spinal anesthesia admitted to Imam Khomeini and Mostafa Khomeini hospitals of Ilam city during the year 1392]. *J Anesth Pain*. 2014;**5**(1):10–9. Persian.
22. Mohseni M, Ebneshahidi A, Yazdkhasti P. [The Effect of Patient-Selected Music on Early Postoperative Pain,Anxiety, and Hemodynamic Profile in Cesarean Section Surgery]. *Anesth Pain*. 2012;**3**(1):88–94. Persian.
23. Brown A, Gadogan M. *Emergency medicine diagnosis and management*. Boca Raton: CRC; 2018.

24. Gogoularadja A, Bakshi SS. A Randomized Study on the Efficacy of Music Therapy on Pain and Anxiety in Nasal Septal Surgery. *Int Arch Otorhinolaryngol*. 2020;**24**(2):e232–6. [PubMed ID: 32296470]. [PubMed Central ID: PMC7153921]. https://doi.org/10.1055/s-0039-3402438.
25. Hekmat-Afshar M, Hojjati H, Hojjati H, Salmasi E, Arazi S. [The effect of music therapy on anxiety and pain in mothers after caesarean section surgery]. *J Health Care*. 2012;**14**(3):0. Persian.
26. Rezvani Amin M, Siratinayer M, Abadi A, Moradyan T. [Correlation of visual analogue pain scale with Mc Gill shortened pain questionnaire in patients with chronic low back pain]. *Qom Univ Med Sci J*. 2012;**6**(1):31–4. Persian.
27. Mehranfard N, Mohammad Aliha J, Navidhamidi M, Kazemnejad A, Saatchi K. [The effect of acupressure on anxiety in patients under mechanical ventilation]. *Iran J Cardiovasc Nurs*. 2014;**3**(3):48–57. Persian.
28. Arab-Larimi M, Bagheri-Nesami M, Fakhri M, Moosazadeh M. The Effect of Distraction With Watching Cartoons on the Level of Pain at Preparation Before Suturing Children in the Emergency Ward. *J Pediatr Rev*. 2023;**11**(1):91–98.