Original Research

The Effect Of Familiar Voice On Pain And Anxiety Of Children After Hernia Surgery

Hossein Motahari Niya[1], Fatemeh Ranjbar Noei[2*], Somaye Moayedi[3], Kowsar Fahimi[4], Farhadi Sakineh[5]

1. Master of Pediatric Nursing. Taleghani Hospital, Golestan University of Medical Sciences, Gorgan, Iran. Orcid: 0000-0001-7687-0430

2. MSc of Medical – Surgical Nursing, 5 Azar Hospital, Golestan University of Medical Sciences, Gorgan, Iran. Orcid: 0000-0002-2098-8234

3. Department of Nursing and Midwifery, School of Nursing, Bam University of Medical Sciences, Bam, Iran. Orcid: 0000-0003-0479-105X

4. Msc Critical Care Nursing, Shahid Sayyad Shirazi Hospital, Golestan University of Medical Sciences, Gorgan, Iran. Orcid: 0009-0003-0572-1392

5. PhD of Nursing, Aliabad Katoul Branch, Islamic Azad University, Aliabad Katoul, Iran.

Corresponding Author: Fatemeh Ranjbar Noei. MSc of Medical – Surgical Nursing, 5 Azar Hospital, Golestan University of Medical Sciences, Gorgan, Iran. **Email:** f.rnjbr.n@gmail.com

Abstract

Background: Surgery is considered a stressful event in children. The mother's voice as a familiar voice is considered to calm and reduce anxiety in children. Therefore, this study was conducted with the aim of examining the effect of familiar voice on pain and anxiety of children after hernia surgery.
Method: This experimental study was conducted on 60 children undergoing hernia surgery. The children were selected by simple random method before being divided in two intervention and control groups. The data collection tools included the Osher's pain and Spence's anxiety questionnaires for children. In the intervention group, the recorded voice of mother before, during, and after surgery was played for the child through a radio. Data were analyzed by paired and independent t-tests.
Results: Independent t-test showed a significant difference in the score of pain ($P < 0.01$) and anxiety ($P < 0.01$) between the intervention and control groups after the intervention. Also, the paired t-test showed a significant difference between the level of pain and anxiety in the intervention group before and after the intervention ($P < 0.01$).
Conclusion: The results showed that the familiar voice of mother reduced pain and anxiety of the child after hernia surgery. Therefore, this non-pharmacological care method can be used as a low-cost, effective and complication-free pain management technique in these children.
Keywords: Familiar voice, Pain, anxiety, Child, Surgery, Hernia

Submitted: 16 Oct 2023, Revised: 7 Nov 2023, Accepted: 18 Nov 2023

Introduction

Pediatric surgery is considered a common treatment method all over the world (1). On average, about 3.3 million children in the United States are hospitalized for surgery every year (2). On the other hand, this intervention is considered a stressful event for children and their families (3). It also leads to psychological problems such as anxiety, fear, restlessness and pain (4, 5). Sometimes the presence of unfamiliar noises and lack of physical space before surgery affect the anxiety and stress of children and their caregivers (6, 7). Therefore, most children experience anxiety during surgery (8). The children's anxiety starts in the recovery room where they are prepared for the operation and when they return from the operating room, it becomes even worse (9). Hospitalization for surgery is considered a crisis in childhood (10), in the meantime, prolonged recovery time and long duration of anesthesia cause many complications in patients (11). Anxiety before surgery stimulates the sympathetic, parasympathetic and endocrine systems, which increase the heart rate, blood pressure and cardiac excitability that cause arrhythmia (12). The medicinal methods of pain relief often have numerous side effects such as nausea and vomiting (13), and patients often require higher dose of anti-anxiety and pain-relief drugs, which can reduce blood circulation and breathing (12). The use of non-pharmacological methods such as music therapy or distraction plays an important role in reducing postoperative anxiety (14). Reports indicate that sound stimulation has analgesic, sedative and anti-anxiety effects (2). Music therapy has an effective role in reducing heart rate, regulating breathing, and controlling blood pressure, which create positive changes in the behavioral and physiological indicators (14). Therefore, the sense of hearing is the last sense that disappears in anesthesia and is the first sense that returns after anesthesia (2). Pain management is one of the duties of nurses (15). Mother's presence during hospitalization has a great role in reducing the anxiety of hospitalized children (16). Based on this, the physical presence of mother during the induction of anesthesia and regain of consciousness plays an effective role in controlling the child's anxiety level (10). The mother's voice is considered as the first and most important audible sound frequency that the child feel from the third day of birth (17). This familiar voice has a positive effect on the behavioral and physiological responses of children (2). The mother's recorded voice plays an effective role in reducing the child's anxiety (18), because hearing the mother's voice by the child activates brain receptors (2). Supportive care and rehabilitation is one of the standards of nursing care that is effective in reducing the psychological problems of patients (19, 20). The use of pain management techniques, in addition to reducing pain, reduces the costs and complications of surgery (15). Various studies have confirmed the effect of mother's voice on the child's relaxation, while emphasizing on the positive emotional connection between the mother and child, as well as the role of nurses in reducing children's anxiety. Thus, this study was conducted to investigate the effect of familiar voice on the pain and anxiety of children after hernia surgery.

Method

This classical experimental study was conducted on 60 children who had been divided in two intervention and control groups. The environment of this research was the operating room of Taleghani Children's Hospital. The conditions for entering this study included; being a 5-10 years old child diagnosed with abdominal hernia, being aware of time and place, and not having cognitive or psychological problems. Exclusion criteria also included requiring an emergency surgery and having a history of surgery in the past year. The sample size of this research was calculated to be 60 people based on the study of Avijgan (2023) with an effect size of 0.76, a test power of 90%, a significance level of 0.05 and a confidence interval of 95%. The samples of this study were selected by simple random method, before being

divided into two intervention and control groups by simple random allocation method. Data collection tools included a demographic information form (age, sex, mother's education, birth rank, duration of hospitalization, mother's age), Ocher's pain scale for children and Spence Children Anxiety Scale (SCAS).

The Ocher's scale is the most famous and widely used tools for measuring pain in children aged 3-12 years. The lowest pain score in this scale is 1 and the most severe pain is 6 (21). The ACAS scale, which has been designed in Australia in 1997, is based on a 4-option Likert scale, ranging from never (score 0), sometimes (score 1), often (score 2), to always (score 3). A higher score in this scale indicates higher anxiety (22).

The validity of both above-mentioned scales has been confirmed in national and international studies. Also, 10 faculty members of the university confirmed their validities in this study. Zhang (2023) has also confirmed the anxiety scale with Cronbach's alpha correlation coefficient of 0.87 (22).

In the control group, routine surgical interventions were performed, but in the intervention group, the mother's voice was recorded (calling the child's name for 1-2 minutes and giving her/his affection). The mother's recorded voice was played for the children in the recovery room before and after the surgery by a pocket player. Also, the child's level of anxiety and pain were evaluated before and after the intervention in both groups. The data was analyzed by SPSS-21 statistical software, using paired t-test and independent t-test at a significance level of 0.05.

Results

The independent t-test did not show a significant difference between the two groups in terms of the child's age (P=0.28), mother's age (P=0.62) and duration of hospitalization (P=0.42). Fisher's exact test did not show a significant difference between the two groups in terms of mother's education (P=0.32) P=0) and mother's occupation (P=0.51), and Chi-square test did not show a significant difference between the two groups in terms of the child's gender (P=0.61).

The mean score of pain before the intervention was 4.56 + 0.85 in the intervention group and 4.94 + 0.72 in the control group, and also independent t-test did not show a significant difference between the two groups in this regard (P=0.08). The mean score of pain after the intervention was 3 + 1.95 in the intervention group and 3.97 + 1.97 in the control group, and independent t-test showed a significant difference between the two groups in this regard (P < 0.01). However, paired t-test did not show a significant difference between the scores of pain and anxiety in the control group before and after the intervention (Table 1).

The mean score of anxiety in the intervention group before the intervention was 2.2 + 0.71 and in the control group was 2.26 + 0.8, and independent t-test did not show a significant difference between the two groups in this regard (P = 0.4). Meanwhile after the intervention, the mean score of anxiety in the intervention group was 1.26 + 0.82 and in the control group was 2.99 + 0.6, and independent t-test showed a significant difference between the two groups in this regard (P=0.001).

The paired t-test showed a significant difference between the mean scores of anxiety before and after the intervention in the intervention group, but it did not show a significant difference between these scores in the control group (Table 2).

Discussion

The results showed that a familiar voice reduces pain and anxiety in children. Babaei et al. (2015) showed that mother's voice during and after surgery plays a major role in reducing pain after tonsillectomy surgery (17), Hekmat Afshar et al. (2012) revealed that music therapy reduces anxiety (14). Oyzhgan (2022) in a study showed that the mother's recorded voice reduces anxiety in children undergoing surgery (2). Diva (2023) indicated that distraction techniques before and after surgery reduces anxiety in children (8). Jerjin (2023) revealed that playing the recorded voice of

mother causes a sense of relaxation and reduces the need for sedatives in hospitalized children (18). Salkhorde et al. (2017) in a study showed that music therapy reduces post-operative anxiety (12). Byun (2018) compared the voice of a mother and a stranger after general anesthesia and showed that, the mother's voice reduced the scores of delusions in pediatric patients (23). Taibi (2008) stated that listening to a familiar voice during and after surgery reduces the anxiety of patients (24). Rafian et al. (2009) argued that music therapy in surgery stabilizes blood pressure and controls anxiety (25). Zahadatpour (2018) in a study revealed that the mother's familiar voice plays an important role in calming the child and regulating his/her heart rate (26). The child recognizes the mother's voice from the fetal period, considering it a soothing noise (18). Kim (2010) showed that the recorded voice of mother during hospitalization reduces anxiety and creates calmness in children (27) Listening to music or any kind of familiar sound causes a calmness in the hospitalized children and regulates blood pressure and breathing in them (27). The mother's voice, as a soothing voice, plays an effective role in managing the pain and anxiety of hospitalized children (23). Playing the mother's voice during the child's hospitalization as a distraction technique can reduce pain and anxiety of hospitalized children (17). The mother's voice as a familiar and soothing sound is effective in relaxing the hospitalized children, because this voice is familiar and inspiring to the children even from the fetal period (28). The mother's voice is considered a familiar voice even when the child is asleep and anesthetized, and creates a sense of security in the child (29). Since pain management is considered one of the duties of nurses, by using non-pharmacological methods such diversion, nurses can calm children, reduce their anxiety and relieve their pain (17). The presence of mothers increases the self-efficacy and empowerment of children, and also improves the quality of nursing care (30). One of the limitations of this study was the short presence of the researcher in the study setting and also the short duration of the mother's voice. Also, due to the Covid-19 pandemic, the researcher had many limitations in choosing the research units. For this reason, the implementation of this study was prolonged

Conclusion:

The results showed that listening to the mother's voice is effective in reducing pain and anxiety of children before and after the surgery. Nurses as a member of health care team have a long and close contact with the children, so they can benefit from the sound stimuli such as mother's voice as a non-medicinal, inexpensive and acceptable treatment method to manage their pediatric patients. However, it is suggested to provide a safe environment for children in the recovery of operating room, so that they can benefit from such interventions. It seems that visual and sound stimulations can have a better effect on anxiety and pain of pediatric patients. This method can be used as complementary, efficient and low-cost intervention in rehabilitation care of hospitalized children.

Acknowledgments

This project was approved by the student research committee of Chalous Islamic Azad University and a code of ethics was obtained from the bioethics committee of the university. In conclusion, the researchers consider it necessary to express their gratitude to all the parents who helped us in this research.

Funding

None

Conflicts of interests

No conflict of interest was observed during this study.

Ethical considerations:

None

Author contribution:

All authors met the four criteria for authorship contribution based on recommendations of the International Committee of Medical Journal Editors

References:

1. Motahari niya H, Hojjati H. The influence of

education on anxiety in mothers of children with surgery. jpenir. 2019;5(4):49-55.
2. Avijgan f, Jalalodini A, Ghaljaei F. The effectiveness of mother's recorded voice on the anxiety in pediatric undergoing surgery. jpenir. 2022;9(2):46-53.
3. Bekmaz K, Hojjati H, Akhoundzadeh G. Relationship Between Mothers' Concerns and Nursing Support of Children Admitted to Baqiyatallah Al-Azam Hospital of Ali Abad Katoul, Golestan Province, Iran, in 2018. Mod Care J. 2019;16(4):e92471.
4. Hashemzadeh S, Khanjarian F, Bagheri N, Nouri MA. The Effect Of Spiritual Self-Care Training On The Anxiety Of Infants Hospitalized In The Respiratory NICU. intjmi. 2023;12(3):0-.
5. Motahari Niya H, Hojjati H. The impact of General Psychological Training on the self-efficacy of Mothers whose Children Undergoing Surgery in Taleghani Pediatrics Hospital in Gorgan, Iran. nmj. 2019;16(1):43-50.
6. Semnani N, Hojjati H, Akhoundzadeh G. The Effect of Yakson Touch on Pain Control Due to Nasogastric Intubation in Premature Infants Admitted to the Neonatal Intensive Care Unit of Taleghani Gonbad Hospital in 2019. arumshcj. 2020;22(2):93-101.
7. Hanieh Sajadi GAHH. The Effect of Empowerment Program on Participation of Mothers with Premature Infants Hospitalized in Neonatal Intensive Care Unit of Sayyed Shirazi Hospital in Gorgan, in 2018. Indian Journal of Forensic Medicine & Toxicology. 2020;14(2):1269-76.
8. Devi EA, Nagaprasad YR, Shiva PV, Nirmalan P. Incidence and risk factors for emergence delirium in children undergoing surgery under general anaesthesia - A prospective, observational study. Indian J Anaesth. 2023;67(8):725-9.
9. Bennett JT, Chung H, Artz N, Abraham VM, Andrews A, Wells D, Jr., et al. Does a Preoperative Mental Health Diagnosis Affect Pain Management in Patients with Adolescent Idiopathic Scoliosis Undergoing Surgery? J Pediatr Orthop. 2023.
10. Rasti R, Jahanpour F, Motamed N, Kiani J. Effects of parental presence during induction of anesthesia in children undergoing surgery on anxiety of parents. Avicenna-J-Nurs-Midwifery-Care. 2014;22(1):52-9.
11. H H, A A, Dehghani A, S A, B H, S P. The effect of music therapy on hemodynamic in patients undergoing caesarean section in Hakim Jorjani Hospital in Gorgan. Medical - Surgical Nursing Journal. 2013.
12. Salkhordeh H, Sabet B, mahboobi M, Babajani S. The Effect of Music Therapy on Preoperational Anxiety and Pain in Waiting Room. ajaums-jps. 2017;12(2):55-62.
13. Hojjati H, Aghamolai M, Asadinejad H, Dehghan BH, Afra A, Kamalgharibi N. Hemodynamic Changes in Two Methods of Patient Controled Analgesia and Intramuscular Injection after Abdominal Surgery. arumshcj. 2012;14(3):0-.
14. Hekmat-Afshar M, Hojjati H, Sharif nia SH, Hojjati H, Salmasi E, Arazi S. The Effect of Music Therapy on Anxiety and Pain in Mothers after Caesarean Section Surgery. arumshcj. 2012;14(3):0-.
15. Hojjati H, Aghamollayi M, Fayaz S, Eslami Akbar r, Musavi SM, Hekmati pour N. Comparison of patientsâ€ ™ satisfaction of intramuscular injection via two methods of self-control and muscular injection: attending to ethical criteria in patient care. Education and Ethics In Nursing. 2022;2(1).
16. Efe YS, Erdem E, Doğan M, Bağcı K, Öztürk S, Öztürk MA. Anxiety and healthcare satisfaction of mothers with children hospitalized in the pediatric emergency service. Arch Pediatr. 2022;29(3):207-12.
17. Babaei k, Alhani F, Khaleghipour M.

Effect of Mother's Voice on Postoperative Pain Pediatric in Tonsillectomy Surgery. jpenir. 2016;3(2):51-6.
18. Gergin Ö, Pehlivan SS, Erkan İ, Bayram A, Aksu R, Görkem SB, et al. The effect of playing music and mother's voice to children on sedation level and requirement during pediatric magnetic resonance imaging. Explore (NY). 2023;19(4):600-6.
19. Kabusi M, Golfiroozi S, Rajabloo M, Yahyanezhad M, Hojjati H. The Effect Of Neonatal Cardiopulmonary Resuscitation Training On The Knowledge Of Neonatal Ward Nurses. intjmi. 2023;12(3):189-95.
20. Mazroei R, Monemi Gohari E, Ghadermazi M, Latifi N, Hojjati H, Hekmati Pour N. The Effect of Home-Based Pulmonary Rehabilitation on Asthmatic Pediatric Quality of Life. J Health Rep Technol. 2023;9(3):e137577.
21. Vosoghi N, Chehrzad M, Abotalebi GH, Atrkar Roshan Z. Effects of Distraction on Physiologic Indices and Pain Intensity in children aged 3-6 Undergoing IV Injection. Hayat. 2011;16(3):39-47.
22. Zhang H, Yang Y, Zhao X, Hu H, Liu J, Zhan X, et al. Effects of psychosocial function in pediatric-onset inflammatory bowel disease during the coronavirus disease 2019 pandemic. Front Pediatr. 2023;11:955293.
23. Byun S, Song S, Kim JH, Ryu T, Jeong MY, Kim E. Mother's recorded voice on emergence can decrease postoperative emergence delirium from general anaesthesia in paediatric patients: a prospective randomised controlled trial. Br J Anaesth. 2018;121(2):483-9.
24. Tayebi V. FAMILIAR MUSIC, THE OTHER KIND OF TREATMENT FOR ANXIETY BEFORE SURGERY (REVIEW ARTICLE). UNMF. 2009;7(1):28-35.
25. Rafieeyan Z, Azarbarzin M, Safaryfard S. The effect of music therapy on anxiety, pain, nausea and vital signs of caesarean section clients in Dr. Shariatee hospital of Esfahan in 2006. iau-tmuj. 2009;19(1):25-30.
26. zahadatpour z, edraki m, razavinejad ardekani sm. Impact of Lullabies on Changes in Heart Rate during Tubal Tracheal Suction in Premature Infants. jpenir. 2018;5(1):11-20.
27. Rabiee M, Kazemi Malek Mahmodi S, Kazemi Malek Mahmodi S. The effect of music on the rate of anxiety among hospitalized children. J-Gorgan-Univ-Med-Sci. 2007;9(3):59-64.
28. Cevasco AM. The effects of mothers' singing on full-term and preterm infants and maternal emotional responses. J Music Ther. 2008;45(3):273-306.
29. Taylor G, Slade P, Herbert JS. Infant face interest is associated with voice information and maternal psychological health. Infant Behav Dev. 2014;37(4):597-605.
30. Hatami F, Hojjati H. Effect of Roy's Adaptation Model on the Care Burden of Mothers of Children Under Chemotherapy (A Quasi-Experimental Study). Med Surg Nurs J. 2019;8(1):e90489.

Table & Figure:

Table 1: The comparison of pain score in the intervention and control groups before and after the intervention

Group / Time	Intervention group	Control group	P-value
Before intervention	4.56 ± 0.85	4.94 ± 0.72	P=0.08
After intervention	1.26 ± 0.2	3.97 ± 1.6	P<0.01
P-value	P<0.01	P=0.06	

Table 2: The comparison of anxiety score in the intervention and control groups before and after the intervention

Group / Time	Intervention group	Control group	P-value
Before intervention	2.2 ± 0.71	2.26 ± 0.8	P=0.4
After intervention	1.26 ± 0.82	2.99 ± 0.6	P<0.01
P-value	P<0.01	P=0.06	