ID: JCDR/2012/2641:1831

Original Article

Music and Anxiety in Hospitalized Children

Paediatrics Section

SHIDA KAZEMI, SHIMA KAZEMI, KOOSHA GHAZIMOGHADDAM, SIMA BESHARAT, LEILA KASHANI

ABSTRACT

Purpose: Music is a method of stress reduction and could be used as a non-invasive therapeutic tool to relieve the pain and anxiety of patient. This study is designed to evaluate the role of music therapy on the level of anxiety in children aged 912 years-old, in an academic hospital in Gorgan, northeast of Iran.

Methods: Sixty hospitalized children were categorized into the intervention (case=30) and the control groups (N=30) by using a simple randomized method. The data gathering instruments were questionnaires which included demographic information and a trait anxiety inventory for children, the Spielberger test (STAIC). For the intervention group, for 2 days, 20 minutes (3 am-6 pm), the soothing rhythmic music of Johann Sebastian Bach was released through a tape recorder which was equipped with a headphone and then, the Spielberger questionnaires were refilled by each patient. The control group did not receive any intervention.

Results: The results showed that the anxiety scores between the control and the intervention groups had no significant difference before the application of the music. The mean anxiety after the application of music in the control group was 49.4±7.2 and in the intervention group, it was 30.7±7.5. The results showed a significant difference between the mean anxiety in the control and the intervention groups ($p<0.05$).

Conclusions: Our results showed that in hospitalized children, music therapy reduced the anxiety level.

Key Words: Music therapy, Hospitalized children, Anxiety, Spielberger test

INTRODUCTION

About 30 percent of children are hospitalized at least once during their childhood in the hospital; about 5 percent of them are hospitalized several times [1]. Hospitalization is considered as a stressful event for children; the environment which surrounds the children in a hospital, physical conditions such as pain and underlying disease, hospital procedures such as blood tests or even a medical examination in the hospital could be a stressor for children. The stress in children can lead to sleep or appetite disorders and developmental disorders and it can delay the disease recovery process [2].

To reduce the effects of stress on admitted children, various methods such as reading stories and showing cartoons or games [3] are used. Music also is a method of stress reduction and when used as a cognitive technique, it acts as a distracter [4]. Various studies have mentioned the physiological and psychological effects of music on hospitalized children [5]; besides, music therapy is a low-cost non-pharmacological treatment [6].

Because of the developmental differences in children, their stress is usually not expressed verbally, but it occurs as behavioural and psychological changes [7-8]. Stress can be measured in children by different methods. There are many studies on clinical examinations in children, such as the heart rate variability reviews for this use [9]. Many others use stress scales such as the Spielberger test [10].

Music, as an effective method and a part of the patient care plan, could be used as a non-invasive therapeutic tool to relieve pain and anxiety, increase the sense of relaxation and body immunity and decrease the blood pressure and the pulse and respiration rate in humans. Listening to music leads to endorphin secretion and thus, can lead to the modifications of emotions and pain relief; also, it can increase individual comfort. Producing comfort for the patients is one of the nursing services.

Due to the high percentage of hospitalization in children and its complications and the many side effects of medications, more attention is paid to non-pharmacological methods including the use of the music program. This study conducted in Golestan province to measure the effect of music therapy on the reduction of anxiety in 9-12 years-old hospitalized children in an academic hospital.

MATERIALS AND METHODS

This randomized, controlled trial was performed on sixty children aged 9-12 years old, admitted to the main paediatric hospital of Gorgan city, by a team of trained nurses. The patients were categorized into the intervention (case) and the control groups by using a simple randomized method. There were 30 patients in each group.

The inclusion criteria were: accompanying of one of the parents during hospitalization, no history of previous hospitalization, no surgical disorders at the time of admission, no fever, pain and mental health problems, no use of anxiety-reducing drugs upon the doctors' orders which were recorded in the medical file and having a score of at least 20 in the Spielburger anxiety score test.

In this study, the data gathering instruments were questionnaires which included demographic information and the Spielberger test for the trait anxiety inventory in children, (STAIC). Included demographic Data were as followings:

age, sex, birth rank, cause of hospitalization, history of head trauma, previous history of mental shocks, epilepsy, enuresis, stuttering, nail biting, somnambulism, history of failing, average grade point, drugs and also mother's occupation; some of these data were considered to measure the inclusion criteria and some of them were used for matching the case and the control groups.

The Spielberger anxiety questionnaire is a self-report questionnaire which has been designed for the study of trait and attitude anxiety (anxiety due to hospitalization) in children. This questionnaire includes 20 questions in order to measure the trait anxiety and 20 questions for attitude anxiety. Trait anxiety refers to the stability and constancy aspect of anxiety; while attitude anxiety is variable and it shows the variable aspects of anxiety. In this study, only attitude anxiety (ten direct questions and ten reverse scoring questions) was used. The minimum and maximum numeric scores that a person would get were 20 and 60, respectively. Scores which were less than or equal to 33 indicated mild anxiety, and those which were greater than or equal to 47 indicated severe anxiety; other scores showed moderate anxiety.

To determine the image test score, the face anxiety children examined scale Piyeri (FACES) was used. This included seven painted faces which are numbered from 1 to 7, which would make the score measurement. Children select a figure which is commensurate with his/her attitude, before and after the music was programed. The Spielberger anxiety measurement test has been produced by Spiel Burger and colleagues (1973), for evaluating the anxiety level in children who were aged 9-12 years old and who had a very high scientific credibility. This was regarded as the standard test [10].

Also, to ensure scientific validity for this research, the Spielberger questionnaire, along with a copy of the title and research purposes, were distributed among ten faculty members in the Nursing Department of Welfare and Rehabilitation Sciences, University of Tehran and their informative suggestions and feedbacks were collected.

The Spielberger anxiety questionnaires were evaluated by Tiedemann (1990) and the reliability rate was calculated as 87.0. By using a pilot study, the reliability rate was calculated as 89%. After explaining the purpose of the study to the patients and after taking the parents' informed consent, the demographic information questionnaire was gathered and the Spiel Burger anxiety test was completed by each child in the presence of at least one of the researchers. For the intervention group, two day, 20 minutes, the soothing rhythmic music of Johann Sebastian Bach was released through a tape recorder which was equipped with a headphone, and then, the Spielberger questionnaires were refilled by each patient.

The control group did not receive any intervention; they rested only 20 minutes and also had minimum communication with the intervention group; then, the Spiel Burger questionnaires were refilled by them. The time of research was from 3 am to 6 pm. The scoring calculation was done by a psychiatrist who was not aware of the randomization of the groups. After the data was gathered and entered into the SPSS 16 software, frequency tables and diagrams were used to describe them. The mean level of anxiety was measured before and after the music broadcasting in the case groups; the data which were collected before and after the intervention were analyzed by using the Kolmogrov-Smironov, the χ^2, the independent-sample T, the Wilcoxon signed Ranks, the Bartlet and the Mann Whitney tests.

All the parents and children had taken verbal consent and the treatment process was not affected by the intervention. The CONSORT flowchart has been attached to the article.

RESULTS

The mean age of the children in the control group was 10.2 ± 1.3 years and in the intervention group, it was 10.1 ± 1.2 years. By using the Mann Whitney test, no significant statistical difference was found between the two groups.

The sex distribution between the two groups was not statistically significant (the male to female ratio was 1.1 to 1 in the control and it was 1.3 to 1 in the cases; the p-value was >0.05).

The mean attitude anxiety score before the application of the music in the control group was 49.6±7.2 and in the intervention group, it was 49.1 ± 6.4. The test results showed that the anxiety scores between the control and intervention groups showed no significant difference before the application of the music.

The mean anxiety after the application of the music in the control group was 49.4±7.2 and in the intervention group, it was 30.7±7.5. The results showed a significant difference in the mean anxiety between the control and intervention groups ($p<0.05$).

Comparison of the scores of attitude anxiety, before and after the music program in the intervention group, rejected the equality assumption for the mean scores of anxiety in this group. A significant difference was seen between the scores before and after application of the music in the intervention group ($p<0.05$, $t=10.2$) and it showed that listening to music reduced the anxiety in the intervention group.

DISCUSSION

From the results of our study, it was seen that the level of attitude anxiety in both the control and intervention groups had no significant statistical difference before the application of music and after that. A significant difference was observed in reducing the anxiety level in the intervention group ($p<0.05$).

Similar studies evaluated the effect of music therapy in reducing the anxiety and pain in leukaemic children who underwent painful procedures such as lumbar puncture [11-14]. The anxiety measurement in one study was the patients vital sign before, during and after the procedure and in another study, it was the childrens activity and the social scales. The results revealed an effective influence of music on the reduction of the pain and anxiety before and after the procedure. Also, the same type of results were obtained from Bradt et al study on adult patients with congestive heart disease [13].

Walworth et al showed that live music therapy sessions with self-preferred music had a great influence on the improvement of the quality of the life factors such as anxiety, stress and relaxation [15]. It was also found to reduce the duration of hospitalization. Nillson et al, in their study, evaluated the influence of music therapy on stress and the dosage of analgesic drugs in postoperative children [16]. They showed that music could reduce the dosage of analgesic drugs and stress levels. The same study was performed on women who underwent caesarean section surgery and the same results were obtained [17]. Holm et al showed that music could also decrease the level of anxiety in patients who were waiting in the emergency department's waiting room [18]. Liu et al studied the effect of music on the pulse rate in young children and

compared it in children who were in the waiting and cast rooms. The music group had less pulse rate in each area. Also, the pulse rate difference was compared between the children in the waiting room and the cast rooms. The music group had less increase in the pulse rate (15.3 versus 22.5) [19]. In another study in 2007, the effects of music were evaluated on paediatric burn patients during nursing procedures. This non-pharmacological therapy apparently affected the mood, compliance and the relaxation of the patients [20].

CONCLUSION

According to the results of this study, it could be concluded that the music therapy in hospitalized children who were aged 9-12 years reduced their anxiety levels. Therefore, the negative effects of hospitalization and the anxiety which was caused by it, can be reduced by music therapy in hospitals, or by equipping the medical wards with tape recorders, headphones and music tapes.

These results could recommend that non-pharmacological treatment during the hospitalization of children can lead to a better time and better management of these children.

ACKNOWLEDGEMENT

The authors would like to thank Dr. Rahgoui, Dr. Ashayeri, Dr. Rahgozar and Dr. Soleimani because of their invaluable suggestions and help. Also, the authors would hereby appreciate the kind efforts of the faculty members of the Golestan University of Medical Sciences and the Taleghani Pediatric hospital.

REFERENCES

[1] Brunner L, Sudarth S. *Text book of Medical Nursing*. Philadelphia. Lippincott Company. 2000; 62.
[2] Kemper KJ., Danhauer SC. Music as therapy. *South Med J*. March 2005; 98(3).
[3] Cohen LL. Reducing infant immunization distress though distraction. *Health Psychol*. 2002; 21: 207–11.
[4] Uman LS, Chambers CT, McGrath PJ, et al. Psychological interventions for needle-related procedural pain and distress in children and adolescents. *Cochrane Database Syst Rev*. 2007;1: 1–73.
[5] Bouhairie A, Kemper K, Martin K, Woods C . Staff attitudes and expectations about music therapy: the pediatric oncology versus the neonatal intensive care unit. *J Soc Integr Oncol*. 2006 ; 4:71–74
[6] Dunn K. Music and the reduction of post-operative pain. *Nurs Stand* 2004;18: 33–39.
[7] Cremeens J, Eiser C, Blades M. Factors influencing the agreement between the child self-report and the parent proxy-reports on the Pediatric Quality of Life Inventory 4.0 (PedsQL) generic core scales. *Health Qual Life Outcomes*. 2006; 4:58
[8] Varni JW, Limbers CA, Burwinkle TM. Parent proxy-report of their children's health-related quality of life: an analysis of 13,878 parents reliability and validity across the age subgroups by using the PedsQL 4.0 Generic Core Scales. *Health Qual Life Outcomes*. 2007; 5:2
[9] Kemper KJ, Hamilton CA, McLean TW, Lovato J. Impact of music on pediatric oncology outpatients. *Pediatr Res*. 2008; 64: 105–09,
[10] Shabanloei R, Golchin M, Esfahani A, Dolatkhah R. Effects of music therapy on pain and anxiety in patients who were undergoing bone marrow biopsy and aspiration. *Aorn*. 2010; 95(6), 746-51.
[11] Nguyen TN, Nilsson S, Hellström AL, Bengtson A. Music therapy to reduce pain and anxiety in children with cancer who were undergoing lumbar puncture: a randomized clinical trial. *J Pediatr Oncol Nurs*. 2010;27(3):146-55.
[12] Bufalini A. Role of interactive music in oncological pediatric patients who were undergoing painful procedures. *Minerva Pediatr*. 2009; 61(4):379-89. [Article in Italian]
[13] Bradt J, Dileo C. Music for stress and anxiety reduction in coronary heart disease patients. *Cochrane Database Syst Rev*. 2009 Apr 15; (2):CD006577.
[14] Kemper KJ, Hamilton CA, McLean TW, Lovato J. The impact of music on pediatric oncology outpatients. *Pediatr Res*. 2008 Jul; 64(1):105-09.
[15] Walworth D, Rumana CS, Nguyen J, Jarred J. Effects of live music therapy sessions on the quality of life indicators, medications which were administered and the length of hospital stay in patients who underwent elective surgical procedures for the brain. *J Music Ther.* 2008;45(3):349-59.
[16] Nilsson S, Kokinsky E, Nilsson U, Sidenvall B, Enskär K. School-aged children's experiences of post-operative music medicine on pain, distress, and anxiety. *Paediatr Anaesth*. 2009;19(12):1184-90.
[17] Ebneshahidi A, Mohseni M. The effect of patient-selected music on early post-operative pain, anxiety, and the hemodynamic profile in cesarean section surgery. *J Altern Complement Med*. 2008; 14(7): 827-31.
[18] Holm L, Fitzmaurice L. Emergency department waiting room stress: can music or aromatherapy improve the anxiety scores? *Peadiatr Emerg Care*. 2008; 24(12):836-38.
[19] Liu RW, Mehta P, Fortuna S, Armstrong DG, Cooperman DR, Thompson GH, Gilmore A. A randomized, prospective study on music therapy for reducing anxiety during cast room procedures. *J Peadiatr Orthop*. 2007; 27(7):831-33.
[20] Whitehead-Pleaux AM, Zebrowski N, Baryza MJ, Sheridan RL. Exploring the effects of music therapy on pediatric pain: phase 1. *J Music Ther*. 2007;44(3):217-41.

AUTHOR(S):
1. Ms. Shida Kazemi
2. Ms. Shima Kazemi
3. Dr. Koosha Ghazimoghaddam
4. Dr. Sima Besharat
5. Dr. Leila Kashani

PARTICULARS OF CONTRIBUTORS:
1. MSc of Pediatrics' Nursing, Education and culture organization of Mazandaran
2. Researcher, Golestan University of Medical Sciences, MSc student of Management in Azad University of Sari
3. MD, Researcher, Golestan University of Medical Sciences.
4. MD, Researcher, Golestan Research Center of Gastroenterology and Hepatology, Golestan University of Medical Sciences.
5. MD, Assistant of Psychiatry, Tehran University of Medical Sciences

NAME, ADDRESS, TELEPHONE, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Shima Kazemi, Researcher, Golestan University of Medical Sciences, MSc student of Management in Azad University of Sari, 2nd floor, Research Deputy of Golestan University of Medical Sciences, Falsafi Educational complex, Shastkola road, Gorgan city, Golestan province, Iran.
Postal code: 49177-65181
Tel: 0098-171-4421654; Fax: 0098-171-4421657
Mobile: 0911-270-3871

FINANCIAL OR OTHER COMPETING INTERESTS:
None.

Date of Submission: **Jun 08, 2011**
Date of Peer Review: **Aug 23, 2011**
Date of Acceptance: **Oct 24, 2011**
Date of Publishing: **Feb 15, 2012**