

Controlling Acute Post-operative Pain in Iranian Children with using of Music Therapy

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Abstract

Background: Despite the development of pediatric post-operative pain management and use of analgesic/narcotic drugs, post-operative pain remains as a common problem. Some studies suggested, the most effective approach to controlling immediate post-operative pain may include a combination of drug agents and non-drug methods. The aim of this study was to investigate the effect of music therapy on the acute post-operative pain in Iranian children.

Materials and Methods: A quasi-experimental, repeated measure design was used. In this study, 63 children were placed in the music and control groups. In the music group, pain intensity was measured before start intervention (baseline). Then, this group listened to two non-speech music for 20 minutes. Then, pain intensity was measured with numeric rating scale, immediately after intervention, 1 hour, 3 hours and 6 hours after intervention, respectively. Also, in the control group, pain intensity was measured in times similar to music group.

Results: The mean of pain intensity did not significantly different between the 2 groups at baseline ($P>0.05$). The results of repeated measure ANOVA showed that, trend of pain intensity between 2 groups was significant ($P<0.05$), so that pain intensity in the music group had more decrease than control group. Also, mean of used narcotic (Pethidine) in the music group was significant lower than the control group ($P<0.05$).

Conclusion: The current study showed that music therapy as a non-drug, cheap and easy method, can improve acute post-operative pain in children and also inducing lower use of narcotic in children.

Key Words: Children, Complementary Medicine, Music therapy, Post-operative pain.

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1- INTRODUCTION

Post-operative pain in the immediate period after surgery, is one of the main concerns of health teams (1) and also its inevitable consequence of operative procedures (2). Despite the development of pediatric post-operative pain management and use of analgesic/narcotic drugs, post-operative pain remains as a common problem; because of difficulty in pain assessment and concerns about side effects of opioid analgesics in pediatric (1, 2). Although pain is a predictable part after surgery, inadequate management of post-operative pain is common (3, 4). Approximately, patients under surgery, experience moderate to severe post-operative pain by 80 percent (5). Uncontrolled acute post-operative pain in pediatric can cause activation of physiological/biochemical stress response which inducing impaired endocrine, metabolic, pulmonary, cardiovascular, neurologic and immunologic functions (4, 6). For example, physiologic changes to post-operative pain are increase in respiration and heart rate, and blood pressure, sleep disturbance, sweating, crying, flushing or pallor, nausea and muscle tension (4). Associated with these side-affects are economic and medical implications and patient dissatisfaction with medical care (7). Also, post-operative pain inducing stress, anxiety and fear in children and their families (1, 8).

Controlling post-operative pain is important to improve clinical outcome and patients comfort (9). Use of narcotics for controlling pain is not always sufficiently effective and also may have undesired side-effects, especially in pediatric (1, 10, 11). Some studies suggested, the most effective approach to controlling immediate post-operative pain may include a combination of drug agents and non-drug methods (1, 12). Hence, use of non-drug methods might help to improve pain. Music therapy is a Cognitive-behavioral

method which occupies the patient's mind lead to soothing, and also allows the patient to escape from own world (3, 13, 14). But, studies which investigated to effects of music therapy on the acute post-operative pain in pediatric, are limited and also we have no study in this subject in pediatric in Iran country. Hence, the aim of this study was to investigate the effect of music therapy on the acute post-operative pain among children, in Iran.

2- MATERIALS AND METHODS

2-1. Design and settings

A quasi-experimental, repeated measure design was used in 2015-2016 (3 months). This study was conducted at the researching-teaching hospitals affiliated to Ahvaz Jundishapur University of Medical Sciences, Southwest of Iran. Based on the Poukak formula, the sample size determined at least 30.99 patients in each group. Finally, with considering a drop-out rate of 10%, 33 patients elected for each group.

$$n = \frac{(z_{1-\frac{\alpha}{2}} + z_{1-\beta})^2 (s_1^2 + s_2^2)}{(\bar{x}_1 - \bar{x}_2)^2}$$

$$(z_{1-\frac{\alpha}{2}} + z_{1-\beta})^2 = (1.96 + 0.84)^2 = 7.84$$

$$(s_1^2 + s_2^2) = (2.33^2 + 2.17^2) = 10.12$$

$$(\bar{x}_1 - \bar{x}_2)^2 = (7.06 - 8.66)^2 = 2.56$$

$$n = \frac{10.12 * 7.84}{2.56} = 30.99$$

2-2. Inclusion and exclusion criteria

- Eligibility criteria included:
- being 8 to 18 years old;
- being undergoing general anesthesia;
- did not have a prior history of pain which not induced by surgery;
- did not have a prior history of major surgery in 6 months ago;
- did not have history of underlying diseases such as diabetes;

- did not have a severe side-effects after surgery (such as haemorrhagia, transfer to ICU and etc.);
- did not have a problem in hearing.

Eligibility criteria during study included:

- discharge or transfer to other hospitals;
- deterioration in the patient condition;
- unwillingness to continue the study.

Flowchart of the study is shown in (Figure.1). Finally, after drop-out participant during study, the data of 63 children were analyzed (32 children in music group and 31 children in control group).

2-3. Measure and data collection

The data of study were collected using a participants' characteristics form (consist of age, gender, residence and type of surgery) and numeric rating scale (NRS) for pain intensity. NRS is a 10 cm ruler tool and higher score indicates higher pain intensity. The NRS has validity including sensitivity for acute postoperative pain in pediatrics (15).

2-4. Methods

We were starting intervention, one hour after surgery in the pediatric surgery ward, when children were thoroughly oriental. First, the purpose of study was explained to the patient and families. Then, in the music group, pain intensity was measured before start intervention (baseline). Then, this group listened to two non-speech musics (nature sounds such as sounds of water, birds, ocean and etc.) for 20 minutes. The music selected was light, and soft rhythm with 50-60 beats per Minute. Then, pain intensity was measured, immediately after intervention, 1 hour, 3 hours and 6 hours after intervention, respectively. During music therapy a nurse stayed with the children. For play music, used Mp3 player and headphones (for masking environmental sounds). Also, in the control group, pain intensity was measured in times similar to music group.

2-5. Data analysis

The analysis of data was carried out by SPSS version 16 and P-value <0.05 was considered significant. Chi-square and in depended t-test were used for comparison of participants' characteristics between two groups. Also, repeated measure ANOVA used for trend of pain intensity over time in each group and comparison between them.

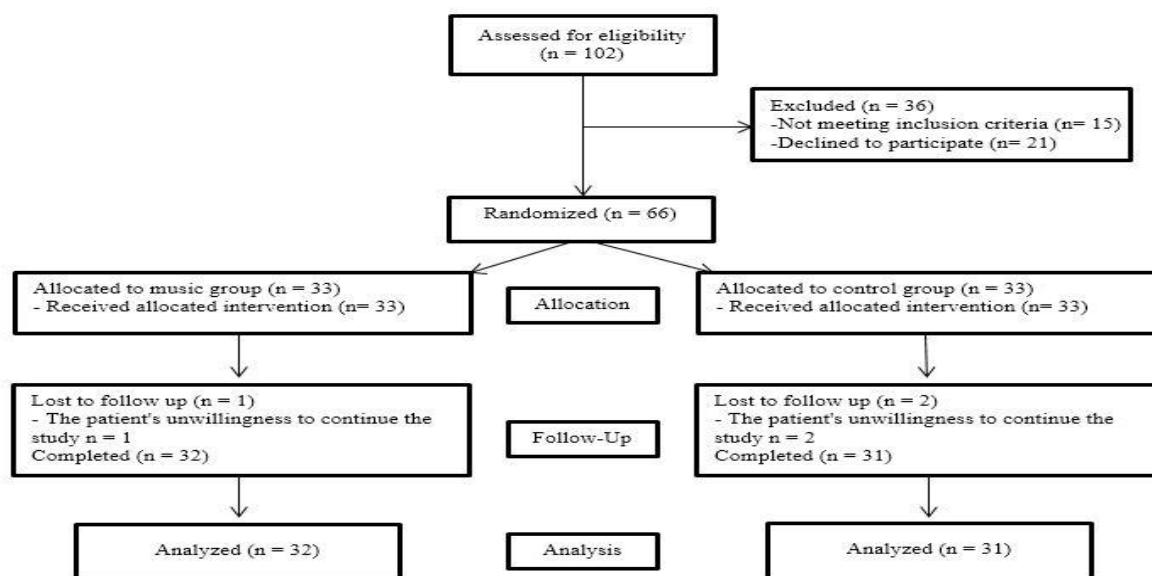


Figure1- Consort flow chart of Randomized Controlled Trial (RCT)

3- RESULTS

On the basis of the findings, the most of pediatric were male (53.9%), urban (74.6%) and under Abdominal surgeries (36.3%). We had no significant difference of all participants' characteristics between two groups. Therefore, pediatric of two groups were identical (**Table.1**). The mean of pain intensity did not significantly different between the two groups at baseline ($P=0.806$). In the music group, was observed decrease in pain intensity, immediately after intervention (=point 1 of measuring). Also, in the control group was observed decrease pain intensity in point 1 (first measuring after baseline). But decrease in music group was more than control group. One hour after intervention

in the music group, we have increase in pain intensity, although it was still lower than the baseline and had a significant difference with that. In the music group, from 1 hour after intervention to the 6 hours after intervention was observed a slight increase in mean of pain intensity; whereas, in the control group from 1 hour after intervention to the 6 hours after intervention was observed a slight decrease in mean of pain intensity. But finally, in the end point (6 hours after intervention), mean of pain intensity in the two groups was equal, approximately (**Figure.2**).

Also, mean of used narcotic (Pethidine) in the music group was significant lower than the control group ($P=0.008$) (**Table. 2**).

Table1: Comparison of participants characteristics between two groups [Mean \pm SD or number(%)]

Variables	Music group (n=32)	Control group (n=31)	P- value
Age	14.26 \pm 2.88	15.05 \pm 3.06	0.284
Gender			
Male	18(56.2%)	16(51.6%)	0.701
Female	14(43.7%)	15(48.3%)	
Residences			
Urban	21(66.7%)	26(58.8%)	0.121
Rural	11(33.3%)	5(41.2%)	
Type of surgery			
Abdominal	13(40.6%)	11(35.48%)	0.091
Orthopedic	4(12.5%)	5(16.1%)	
Urologic	6(18.7%)	5(16.1%)	
Other	9(28.1%)	10(32.25%)	

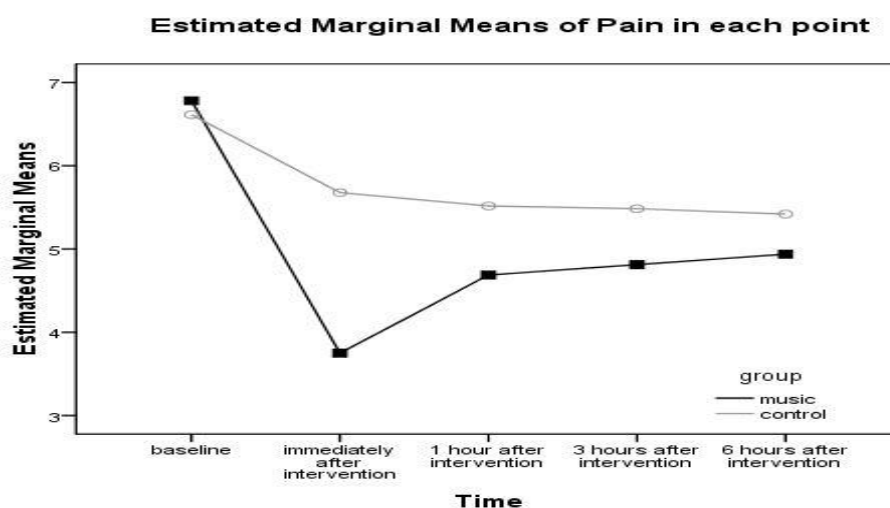


Fig.2: Trend of pain severity in both groups over time

Table2: Comparison of received PRN drugs between two groups (Mean \pm SD)

Narcotic	Music group (n=32)	Control group (n=31)	P- value
Mean of used narcotics mg)	0.7 \pm 0.22	1.1 \pm 0.38	0.008*

Independent t-test was used. * P- value < 0.05.

4- DISCUSSION

These study finding showed that, non-speech music therapy can improve pediatrics' acute post-operative pain and also can reduce in the use of opioids. Study by Sunitha Suresh et al. (2015) showed that, Audio/music therapy reduced post-surgical pain in pediatric undergoing major surgeries (16). In the randomized clinical trial by Yu et al. (2009) on the children with cerebral palsy undergoing acupuncture, showed that music therapy has no effect on the pain during acupuncture (17). Difference in patients which were undergoing study and difference in pain assessment tools and type of procedure, difference in culture and ethnicity may be the causes of difference in results. Also, in the one systematic review and meta-analysis of randomized controlled trial (2015) on the effects of perioperative music interventions in children undergoing surgery (26 full text were evaluated), demonstrated that music interventions have effect in reducing post-surgery pain, in pediatric (18).

Beside, use of music therapy for controlling post-surgery pain can lead to decreasing undesired side-affects, decreasing medical costs, increasing patients' satisfaction, increase in adherence health care by patients, decreasing fear and anxiety and lower use of drugs. Also, music therapy as a non-drug, easy and safe intervention is acceptably by majority of patients (19). Surgical nurses have a key role in the care of patients with pain, and because they spend much time with patients. Hence they can with use of non-drug methods such as music therapy, help to controlling pain

after surgery (19, 20). Finally, we suggesting similar studies in future are needed with larger sample sizes and in different ethnicities with longer follow-up post-operative pain periods.

5- CONCLUSION

Finally, this study showed that music therapy as a non-drug, cheap and easy method, can improve acute post-operative pain in children and also inducing lower use of narcotic in children. Therefore, hospital staff (specially, nurses), should pay attention to this approach in clinical practice and knowledge of them, regarding the application of this method should be increased for controlling acute post-operative pain in children.

6- CONFLICT OF INTEREST: None.

7- ACKNOWLEDGMENT

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