A STUDY TO ASSESS THE EFFECTIVENESS OF MUSIC ON THE POSTOPERATIVE PAIN IN CHILDREN UNDERGOING MAJOR SURGERIES IN A TERTIARY CARE HOSPITAL, BANGALORE

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ABSTRACT

Music releases endorphins thus reduce the perception of pain through the components of the gate control theory of pain. Distracting can be effective in moderating pain primarily through the cognitive component of the gate control theory of pain. Acute pain is experienced immediately after surgery (up to 7 days). It is advisable that music become a part of nursing care offered to patients experiencing pain, because music is a low-cost therapy with no side effects. The objectives of the study were to find the effectiveness of music on postoperative pain in children and to determine the association of postoperative pain with selected baseline variables. The conceptual framework of the study was based on the Melzack and Wall's Gate control theory 1965.A pre experimental one group pre test post test design was adopted for the study. The area selected for the study was the pediatric surgery and orthopaedic wards of St.John's Medical College Hospital, Bangalore. Fifty subjects who underwent major surgeries were selected by purposive sampling technique. Demographic variables were collected by structured interview schedule and the pre intervention and post intervention pain score was assessed using Wong Baker Faces Pain Scale. The music was provided for about 20 minutes using headphones and laptop at 50-65 db, given twice with a gap of atleast 4 hours in between. The statistical analysis showed that there was an effectiveness of music on the post operative pain which was significant; $p<0.001$.The findings showed that there was no significant association between the post operative pain and the baseline variables under the study. It was evident from the present study that music reduced the post operative pain in children and it can be used as an effective inexpensive non pharmacological measure for pain relief.

INTRODUCTION

Music has the potential to obviate or decrease the need for pharmacotherapy. The effects of music on human emotinal and physiological responses have been observed. Music can ease pain and anxiety by moving conscious thought away from the symptoms [1]. Music can be a powerful healing tool, when used in the right way and in the right dose. The therapeutic and healing effect of music is recognised throughout history. 'Ayurveda' the age old alternative medicine practised in India makes use of classical music. Hippocrates, the father of modern medicine used music to cure human diseases. The therapeutic effect of music in nursing dates

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Research Article

back to Florence Nightingale time. She marked that wind instruments were capable of continuous sound generally resulted in beneficial effects [2]. Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage [3]. Music therapy, as a non-invasive intervention, reduces the use of analgesics and pain level without giving patients side effects. In a study, it is indicated that playing music during and after surgery reduced the use of sedatives, anxiolytics and analgesics. Therefore, understanding how to intervene with music therapy helps patients manage pain more effectively and decreases the side effects caused by pain relievers [4]. Listening to music is theorized to release endorphins and reduce catecholamine levels, thereby resulting in lower BP and a decreased need for analgesics and oxygen consumption; and improves the heart rate, respiratory rate. According to the gate control theory of pain, distractors such as music can block certain pain pathways and diminish the amount of perceived pain. A randomised controlled clinical trial study on the therapeutic effects of music in children following cardiac surgery showed that there was a significant reduction in the pain and anxiety of patients during the immediate period and a reduction in heart rate due to the effect of music [5].There is also a paucity of studies regarding the effectiveness of music on postoperative pain in children and music is not routinely emphasised as a non pharmacological measure for pain management in postoperative children. Thus it is important to evaluate the effectiveness of music in postoperative pain in children as this may be an effective non pharmacological intervention, which is relatively inexpensive, non invasive and easily administrable.

Statement of the problem : A study to assess the effectiveness of music on the postoperative pain in children undergoing major surgeries in a tertiary care hospital, Bangalore.

Objectives of the study :
1. To find the effectiveness of music on postoperative pain in children.
2. To determine the association of postoperative pain with selected baseline variables.

Hypotheses
 H1: There will be a significant difference in the postoperative pain in children after administering the music.
 H2: There will be an association between postoperative pain and selected baseline variables

MATERIALS AND METHODS
            The research approach used was pre-

experimental with one group pre test – post test design. The study was conducted at pediatric surgery ward and orthopaedic ward of St.John's Medical College Hospital, Bangalore.50 children who underwent major surgeries within the age group of 3-16 years and completed 24 hours post operatively were selected using purposive sampling technique. The pilot study was conducted among 6 samples.

Tools and techniques
• Proforma to elicit the on baseline variables
• Wong Baker Faces pain rating scale - is a standardised tool where the validity and reliability has been proven by Wong and Baker in 1988.
            A group of 8 instrumental music were selected with the help of an expert and sent to 5 experts for validation. As per their suggestions 5 music were selected for the intervention. The decibel of the music was adjusted at 50-65 decibel using a calibrated sound level meter.

Data collection process
            After obtaining the permission from the authorities to conduct the research study, the purpose of the study was explained to the parents and a written consent was obtained. The subjects were identified according to the inclusion and exclusion criteria. The demographic data was collected using a structured interview schedule. A pre intervention orientation was given regarding the study to the child and the primary caregiver using laptop and headphones. The intervention was given after 24 hours of the surgery; the pain level of the child was obtained through self reporting using the Wong Baker Faces Pain Scale, before giving analgesics so as to get the actual pain level of the child. The music was provided for about 20 minutes using headphones at 50-65 db. The music was given twice with a gap of atleast 4 hours in between. The pain level was again obtained immediately after the administration of music.

Analysis and interpretation
            The data was entered into a MS Excel sheet and the results of the study were computed using the descriptive and inferential statistics. Wilcoxon's sign rank test was used to find the effectiveness of music on post operative pain and the chi-square and Fisher exact tests were used to find the association of post operative pain with the baseline variables.

RESULTS
Section 1 Findings related to sample characteristics
            The data in the above table 1 shows that out of the fifty children, 52% of them belong to 6-11 years of age and the mean age is 9.4years with a standard

deviation of 3.65. 50% of them are first born child. Most of them (50%) belonged to the 2nd post operative day.

The data represented in figure 2 shows that majority (78%) of the subjects are males.

From figure 3, it is clear that majority (48%) of the subjects have undergone thoracic and abdominal surgeries.

Figure 4 show that most of the subjects (80%) have no previous experience of surgery.

The data depicts that most of the subjects (56%) express the mean pre intervention pain score as 2 and majority (28%) of the subjects have mean post intervention pain score of 1.

The data shows that there is significant difference in the pain scores before and after the intervention of music. The pre intervention mean pain score is 3.24 and the post intervention mean pain score is 1.78.The median of the pre intervention score is 2 and that of the post intervention score is 1.The p value is <0.001 which is significant. Hence the hypothesis I is accepted.

Section 3- Findings related to association between post operative pain scores and selected baseline variables.

The data in the table 3a shows the number of subjects in above mean and below mean pain scores in association with the baseline variables, age, gender, birth order of the child. The p - values are found to be not significant. Hence hypothesis II is rejected.

The data in the table 3b shows the number of subjects in above mean and below mean pain scores in association with the baseline variables, type of surgery, history of previous surgery and number of post operative days. The p values are found to be not significant. Hence hypothesis II is rejected.

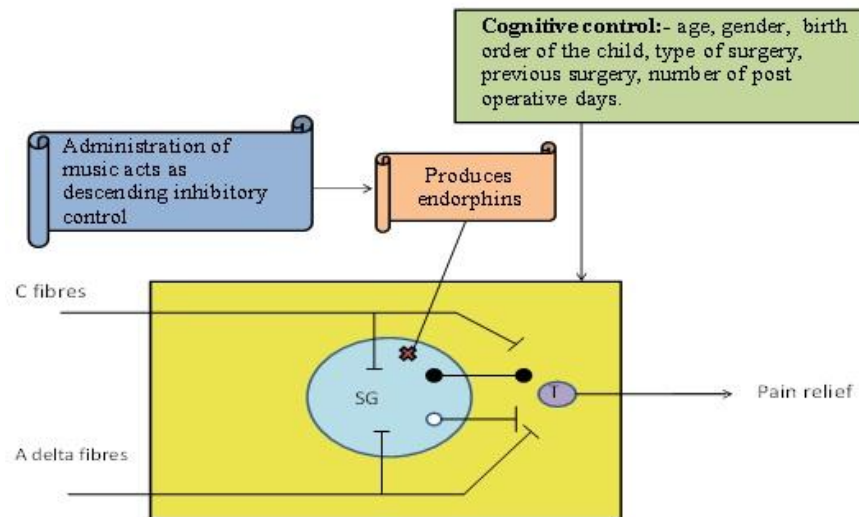**Figure 1. Conceptual framework based on Gate control theory**

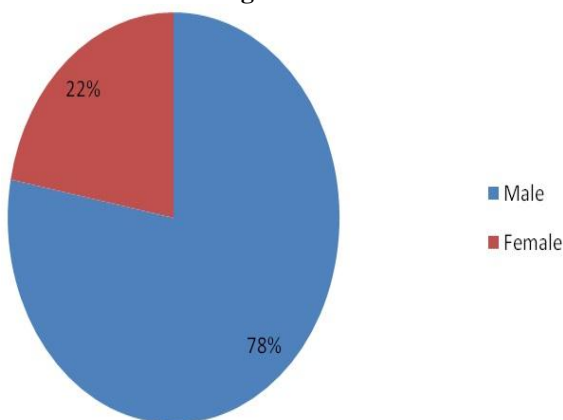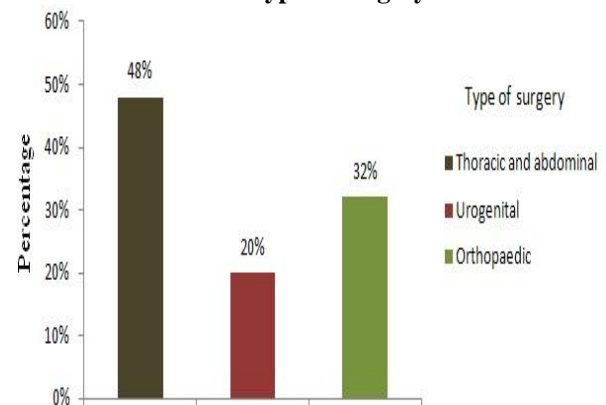**Figure 2. Percentage distribution of subjects according to gender.**

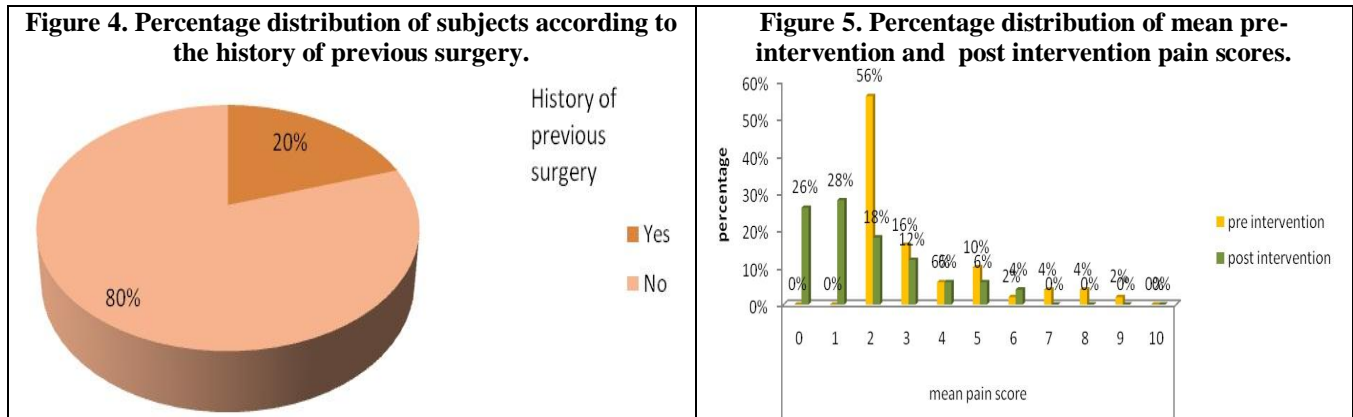**Figure 3. Percentage distribution of subjects according to the type of surgery.**

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Figure 4. Percentage distribution of subjects according to the history of previous surgery.

Figure 5. Percentage distribution of mean pre-intervention and post intervention pain scores.

Table 1. Frequency, percentage distribution of subjects according to age, birth order and number of post operative days.   n=50

Sl.no.	Baseline variable	Frequency (f)	Percentage (%)	Mean	SD
1	**Age**				
	3-5yrs	9	18		
	6-11 yrs	26	52	9.4	3.65
	12-16yrs	15	30		
2	**Birth order**				
	1	25	50		
	>=2	25	50		
3	**Number of post operative days**				
	1	11	22		
	2	25	50		
	>=3	14	28		

Table 2. Findings related to effectiveness of music on post operative pain.   n=50

Sl.no.	Pain scores	Range	mean	median	SD	Wilcoxon's test	p value
1	Pre intervention pain score	2-9	3.24	2	1.89	6.000	<0.001*
2	Post intervention pain score	0-6	1.78	1	1.69		

*significant

Table 3a. Association between the pre intervention pain score and the baseline variables age, gender and birth order of the child.   n=50

Sl.no.	Baseline variables	Above mean(f)	%	Below mean(f)	%	Chi-square/Fisher exact*	p value
1	**Age**						
	3-5yrs	3	33.33	6	66.67		
	6-11yrs	8	30.77	18	69.23	0.702*	0.704 NS

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Sl.no.		Above mean(f)	%	Below mean(f)	%	Fisher exact	p value
	12-16yrs	3	20	12	80		
2	**Gender**						
	Male	10	25.64	29	74.36	0.489*	0.476 NS
	Female	4	36.36	7	63.64		
3	**Birth order**						
	1	6	24	19	76	0.397 χ^2	0.529 NS
	>=2	8	32	17	68		

NS-not significant *Fisher exact probability test

Table 3b. **Association between the pre intervention pain score and the baseline variables type of surgery, history of previous surgery, and number of post operative days.**

n=50

Sl.no.	Baseline variables	Above mean(f)	%	Below mean(f)	%	Fisher exact	p value
1	**Type of surgery**						
	Thoracic and abdominal	6	25	18	75		
	Urogenital	2	20	8	80	1.14	0.565 NS
	Orthopaedic	6	37.50	10	62.50		
2	**History of previous surgery**						
	Yes	4	40	6	60	0.892	0.436 NS
	No	10	25	30	75		
3	**No. of post operative days**						
	1	3	27.27	8	72.73		
	2	7	28	18	72	0.005	0.997 NS
	>=3	4	28.57	10	71.43		

NS-not significant

DISCUSSION

In the present study, the age of the children was analysed under 3 groups: 3-5 years, 6-11 years and 12-16 years. The mean age of the subjects was 9.4 years. Among the 50 samples, 18% of the children belong to 3-5 years, 52% belong to 6-11 years and 30% belong to 12-16 years. In this study, more about 3/4th of the samples (78%) are males and 22% are females. This may be because a fair number of urogenital surgery patients were included as the samples in which most of them were males. Also male children are more prone to accidents and fractures.

In the present study the birth order is classified into 1 or >=2. In both the groups an equal number of samples were obtained. From the raw data it can be found that the birth order >=3 were very few. This strongly agrees the small family norms in our society. In the present study 48% of the samples had thoracic and abdominal surgeries, 20% had urogenital surgeries and 32% had orthopaedic surgeries. A variety of surgeries was included for the study in order to get adequate number of samples. The previous experience of the surgery reduces pain and anxiety among the clients and even the caretakers. The findings of the present study showed that 80% of the samples had no previous experience of the surgery and only remaining 20% had previous experience of the surgery. Because the samples had no experience of previous surgery, the surgery itself might have produced stress and anxiety over the patient which may also aggravated the pain level.

In the present study, after the major surgery, for the children round the clock analgesic medications were administered. The intervention was given just before the administration of the analgesics so as to nullify the effect of the medicine. The intervention was given twice a day

with a time gap of 4 hours in between to prevent the carry over effect. The pain was assessed just before and after administration of music using Wong Baker Faces Pain Scale. The mean of the pain scores were obtained for the intervention I and II. From the pain scores obtained it is evident that most the scores were 2 or 1. This may be because of the effect of the round the clock analgesics given in the post operative period. In the present study, the pre intervention mean pain score was 3.24 with a standard deviation of 1.89 and the post intervention mean pain score was 1.78 with a standards deviation of 1.69.The p value is <0.001 which is significant. Therefore the results of this study is in concordance with the study conducted by Ozer N et al [6] where the difference between the mean pain intensity of the music group after the music therapy and the mean pain intensity of the control group after the resting period was found to be statistically significant(p=0.000 1.20 in music group and 2.20 in control group). There was no difference between pretest means. After the music therapy, the decrease in mean pain intensity of the music group was statistically significant (p=0.000) 2.13 before music and 1.20 after music. This present study showed that a significant effect of music on post operative pain scores after major surgeries.

In another study done by Haten et al [5], statistical analyses were performed and the results from the pain scores before and after the intervention showed that there is a statistically significant difference observed between the two groups at the end of the intervention (p=<0.001).In the study by Good et al [7], the participants had different choices more chose harp music and fewer chose jazz and some preferred Buddhist hymns and popular songs heard in Taiwan. In the present study majority liked the instrumental music even though it was not familiar. Only a few preferred their own choice.

In the present study the association of the pain scores with the baseline variables were computed. But none of those 'p' values were less than 0.05 therefore they were not found to be significant. This shows that there is no difference in the pain with respect to the baseline variables. Hence the hypothesis II is rejected. This indicates that according to the present study, irrespective of the age, gender, birth order, history of previous surgery and number of post operative days, the post operative pain varies. So there is no influence for these factors on the post operative pain.

CONCLUSION

About half of the samples belong to the age groups of 6-11 years. Majority of them were males and half of the samples were first born. Majority of them had thoracic and abdominal surgeries and most of them had no previous experience of surgery. Half of them belonged to the 2nd post operative day. There was a significant difference in the postoperative pain in children after administering the music at p<0.001 level of significance. There was no significant association between post operative pain scores and the selected baseline variables, age, gender, birth order, type of surgery, history of previous surgery and number of post operative days.

Nursing implications

The nursing personnel in the hospitals can be trained in rendering care and managing pain by providing music as an inexpensive non pharmacological intervention to the pediatric population. The findings from the study can be utilised in preparing student nurses for providing competent care for pain management by using music as a complementary therapy in the pediatric clients. The nurse administrators should provide the oppurtunities for the nursing staff in practising the newer non pharmacological measures like the use of music in reducing the pain and improving comfort in the pediatric clients. The nurse managers should organise inservice educational programmes on the use of music as a non pharmacological measure in the pain management among the children.Music can be made available in the pediatric wards as an evidence based practice for the management of post operative pain.

REFERENCES

1. Klassen J A, Liang Y, Tjosvold L, Klassen T P and Hartling L.Music for Pain and Anxiety in Children Undergoing Medical Procedures: A systematic Review of Randomised Controlled Trials.Ambulatory. Pediatrics.2008;8:127-128
2. Mary M A. A study to assess the effectiveness of music therapy among mother's with pregnancy in a selected hospital, Bangalore. Master of Science in Nursing. RGUHS.2011.
3. International Association for the study of pain.1979; available from http://www.iasppain.org/Content/NavigationMenu/GeneralResourceLinks/PainDefinitions/default.htm. accessed on 5th Nov 2011.

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4. Shu T T. Effects of duration of selected music as an intervention on post operative pain in open heart surgery patients during chair rest on the first post operative day. Masters theses and Dissertations. 2010; Paper 321 from http://commons.emich.edu/theses/321

5. Haten T P, Lira P I C and Mattos S S. The therapeutic effects of music in children following cardiac surgery. Journal de Pediatria.2006; 82(3):186-192

6. Ozer N, Ozulu Z K, Arslan S and Gunes N. Effect of Music on post operative pain and physiological parameters of patients after open heart surgery. Pain Management Nursing.2010.available from http://www.sciencedirect.com/science/article/pii accessed on 2nd Jan 2012.

7. Good M and Chin C C. The effects of Western music on post operative pain in Taiwan available from http://www.remember themission.com/wp-content/docs/JC-August-2005.pdf accessed on 20th Feb 2012.

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