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Effect of Music Therapy for Anxiety in Children

B. Aishwarya Reddy[1] and Mebin George Mathew[2]

[1]*Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, 600077, India*

[2]*Senior Lecturer , Department of Pedodontics and Preventive Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai-600077, India*

ABSTRACT

Dental anxiety has been identified as a significant problem in both children and adults and is considered an obstacle in the provision of quality dental care by dental care providers. Music is an alternate treatment option which has been used in different medical fields. Suitable music has been shown to have a strong influence on human brain waves. The aim of the study is to estimate the effect of music therapy for anxiety in children. 60 children aged 7-9years were divided into two groups, Group I: treatment without music and Group II: treatment with music. The treatment done for the children included scaling and pit and fissure sealant application. The method followed for this study was the coin toss method. The analysis was done using SPSS software.The results showed that the pulse rate in children treated with music is decreased. The systolic and diastolic blood pressure is also decreased in children treated with music. A drastic variation was observed in the pulse rate, systolic blood pressure and diastolic blood pressure. Within the limits of the study, music therapy helps children with anxiety.

KEY WORDS: ANXIETY; CHILDREN; MUSIC THERAPY; PULSE RATE.

INTRODUCTION

Dental anxiety can be defined as a state where an individual is evoked and prepared for something to happen, with a non-specific feeling of apprehension, associated with abnormal conditions((Nagaveni, Yadav and Poornima, 2017; Neena et al., 2017). The etiology of dental anxiety can be attributed to traumatic or painful dental experiences as well as fearful attitudes learnt from dentally anxious family members (Locker, Liddell and Shapiro, 1999; Maulina, Djustiana and Nurhalim Shahib, 2017). ('Advances in pain and anxiety management', 2012). Regardless of the classification of dental anxiety, patients with dental anxiety will show some refusal symptoms during treatment. These refusal symptoms of anxiety, can be classified into physiological symptoms, behavioural symptoms, cognitive symptoms, and emotional symptoms (Shives, 1995).

Music surrounds our lives. We hear it on the radio, television, our cars, and home stereos. Even warbling in our bathroom gives us a happy start of the day. Music is also clinically recognized to influence biological responses such as blood pressure , heart rate, respiratory rate, cardiac output, muscle tone, papillary responses, skin responses, and endorphin production. It can entrain the body to calm or to accelerate, depending on the type of music used (Stabholz and Peretz, 1999). Sedative music can lower the anxiety, pain, tension ((Nagaveni, Poornima and Bajaj, 2019; Nagaveni, Poornima and Mathew, 2020)

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and stress levels resulting in less use of anesthetics and pain medication, distraction from thoughts, and higher patient compliance and satisfaction(Corah, Gale and Illig, 1978). By definition, music therapy is the systematic application of music in the treatment of physiological and psychological aspects of an illness or disability. (Fukayama and Yagiela, 2006)

One effective method of providing support for anxiety in children is music therapy, where music becomes the main tool the therapist uses to connect and work with the patient. This kind of therapy has been shown to be effective when treating children and young people living with anxiety based disorders (British Association for Music Therapy, no date). Saarikallio and Erkkilä, 2007).

Music reduces anxiety through its effect on the autonomic nervous responses which regulates bodily functions such as the heart rate, digestion, respiratory rate and pupillary response (Packyanathan, Lakshmanan and Jayashri, 2019).(Chlan, 1998). Several studies have demonstrated reduction in cortisol and other hypothalamic–pituitary–adrenal axis neuropeptides following music listening. This triggers the limbic system releasing endorphins which minimizes discomfort and pain and maximise pleasure (Cooke et al., 2005), (Labrague and McEnroe-Petitte, 2016).

Our department is passionate about child care, we have published numerous high quality articles in this domain over the past 3 years (Govindaraju, Jeevanandan and Subramanian, 2017a, 2017b; Panchal, Gurunathan and Shanmugaavel, 2017; Ravikumar, Jeevanandan and Subramanian, 2017; Jeevanandan and Govindaraju, 2018; Nair et al., 2018; Ravikumar et al., 2018, 2019; Ravindra et al., 2018, 2019; Subramanyam et al., 2018; Vishnu Prasad et al., 2018; Jeevanandan, Ganesh and Arthilakshmi, 2019; Ramadurai et al., 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Veerale Panchal, Jeevanandan and Subramanian, 2019; Vignesh et al., 2019; V. Panchal, Jeevanandan and Subramanian, 2019; Samuel, Acharya and Rao, 2020). With this inspiration we planned to pursue research on the effect of music therapy for anxiety in children.

MATERIAL AND METHODS

In this study, a sample size of 60 children of 7 to 9 years of age who have visited Saveetha Dental College and Hospitals, were randomly selected and were equally divided into two groups. Group I: treatment without music(control group) and Group II: treatment with music(test group). The treatment done for the children included only scaling and pit and fissure sealant application. The subjects were made to choose their own choice of music and were given headphones during the treatment. The pulse rate, systolic and diastolic blood pressure were noted for both the groups before and after the treatment. The analysis was performed using SPSS software by IBM. The mean and standard deviations were calculated for the pulse rate, systolic and diastolic blood pressure, both before and after the treatment. The Pearson's correlation test was performed to correlate the changes in the pulse rate, systolic and diastolic blood pressure before and after the treatment in both the groups.

RESULTS AND DISCUSSION

The aim of this study was to estimate the effect of music therapy for anxiety in children. The study results showed that, out of 60 samples, 30 samples are of the control group(Group I) where there were 16 boys(53.4%) and 14 girls(46.7%). The test group also had 30 samples where there were 17 boys(56.7%) and 13 girls(43.4%). All the samples were from the age group of 7 to 9 years (Table 1).

Table 1. Demographic details

PARAMETER	CONTROL GROUP	TEST GROUP	P VALUE
AGE (years)	7.1 ± 0.7	7.2 ± 0.9	0.712
SEX	Male - 16(53.4)	Male - 17(56.7)	
	Female - 14(4.7)	Female- 13(43.4)	0.795

Before the treatment, the pulse rate in the control group is 102.4 ± 15.8 and the test group is 100.5 ± 15.4 where the p value is 0.763 which is statistically insignificant.The systolic blood pressure in control group is 124.0 ± 12.2 and the test group is 122.3 ± 12.5, which is statistically insignificant (P = 0.697). The diastolic blood pressure in the control group is 81.2 ± 10.8 and the test group is 79.7 ± 12.6, where the p value is 0.654 which is statistically insignificant (Table 2).

Table 2. Pulse rate,SBP, DBP, in control and test group before treatment

VARIABLE	CONTROL GROUP	TEST GROUP	P VALUE
PULSE RATE	102.4 ± 15.8	100.5 ± 15.4	0.763
SBP	124.0 ± 12.2	122.3 ± 12.5	0.697
DBP	81.2 ± 10.8	79.7 ± 12.6	0.654

After the treatment, the pulse rate in the control group is 107.4 ± 19.8 and the test group is 87.1 ± 12.1, where the p value is 0.001 which is statistically significant. The systolic blood pressure in the control group is 127.8 ± 9.5 and the test group is 118.8 ± 12.1, which is statistically significant (P= 0.004). The diastolic blood pressure in the control group is 83.4 ± 8.0 and the test group is 78.2 ± 12.5, where the p value is 0.234 which is statistically insignificant (Table 3).

In this study, it was observed that the pulse rate was decreased after the treatment in the test group when

compared to the control group. In the study given by Marwah N, et.al, 2005 (Marwah, Prabhakar and Raju, 2005), pulse rate is decreased in pediatric dental patients who were subjected to audio distraction but not to a very significant level. Audio distraction is one such nonaversive technique in which a patient listens to music during the dental procedure. Because of its success in medical settings and in adult dental patients many dentists believe that this technique may be successful in management of pediatric dental patients ((Mathew et al., 2020; Mathew, Roopa and Soni, 2020). This study shows similar ethnicity to the present study.

Table 3. Pulse rate,SBP, DBP, in control and test group after treatment

VARIABLE	CONTROL GROUP	TEST GROUP	P VALUE
PULSE RATE	107.4 ± 19.8	87.1 ±12.1	0.001
SBP	127.8 ± 9.5	118.8 ±12.1	0.004
DBP	83.4 ± 8.0	78.2 ±12.5	0.234

In the current study it was observed that the systolic blood pressure is found to be lower in the test group after the treatment than the diastolic blood pressure. In the study given by Dviya Singh, et.al, 2014 (Singh et al., 2014), Systolic blood pressure was found to be lower in music group than DBP which was not having significant variations between both the groups. The study given by Mimi M Y, et.al, 2005 (Tse, Chan and Benzie, 2005), also shows that systolic blood pressure is slightly lower than the diastolic blood pressure.Both the studies show similar findings with the present study. When exposed to slow beat music the parasympathetic nervous system is stimulated decreasing the heart rate and while listening to fast beat music the sympathetic nervous system is stimulated and increases the heart rate. (Mathew, 2020a, 2020b)

The salivary cortisol values before the treatment in both the groups is statistically insignificant where the p value is 0.924. And the p value of salivary cortisol after the treatment is 0.001 which is statistically significant(Table 4).

Table 4. Salivary Cortisol values in control and test group

SALIVARY CORTISOL	CONTROL GROUP	TEST GROUP	P VALUE
BEFORE TREATMENT	1.64 ± 1.31 ug/dl	1.59 ± 1.24 ug/dl	0.924
AFTER TREATMENT	5.33 ± 1.72 ug/dl	1.79 ± 2.04 ug/dl	0.001

While the use of music has been explored within various clinical settings in both medicine and dentistry, the evidence-base for its use in reducing dental anxiety in children remains inconclusive and of limited quality ((Mathew and Soni, 2019).

CONCLUSION

Within the limits of our study we conclude that music therapy reduced anxiety in children. Hence music therapy is significant in reducing anxiety in children visiting dental clinics. However more studies should be done to explore the various reasons and treatment planning for pediatric dental patients with anxiety. This study will act as a guide to understand the effect of music therapy for anxiety in children.

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Conflict of Interest: None to declare

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