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The Effect of Music on Children's Anxiety During Dental Treatment

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ABSTRACT

Background: Dental visits are a significant fear among five to six percent of the population. Music distraction has been demonstrated as an effective destraction method in reducing dental anxiety. This study aimed to determine the effect of music on children's anxiety during dental treatment.

Materials and Methods: This study was a cross-sectional survey, in which we included a convenience sample of 50 children aged between five and 14 years. The sample consisted of children who attended the female outpatient pediatric dentistry clinics at the College of Dentistry, King Khalid University, Abha, Saudi Arabia. Data was collected using a survey questionnaire given to patients before and after the treatment procedure. The questionnaire asked about the anxiety levels related to dental treatment using the Modified Child Dental Anxiety Scale faces version (MCDASf). The study data was collected and then analyzed using the Statistical Package for the Social Sciences (SPSS 20).

Results: Thirty-one participants (62%) were relaxed when asked about their feelings toward dentists in general after music therapy, compared to 22 (44%) before music therapy. Thirty six participants (72%) were relaxed, when asked about their feelings toward checking their teeth after music therapy, compared to 24 (48%) before music therapy. Thirty nine participants (78%) felt relaxed when the treatment was done with music therapy, compared to 25 (50%) before music. Forty participants (80%) reported that they felt calm and comfortable when they listened to music during treatment.

Conclusions: Dental treatment for an anxious pediatric patient is challenging. Many non-pharmacological behavior management techniques were introduced, including distraction. This study indicated that music distraction could decrease the anxiety and stress levels of pediatric patients during dental treatment.

Key words: Anxiety, Dentistry, Music, Child, Saudi Arabia

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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. The etiology of dental anxiety can be attributed to traumatic or painful dental experiences as well as fearful attitudes learned from a dentally anxious family member [1]. Negative dental experiences, especially those resulting from dental pain, can lead to the development of fear and anxiety. This as a result can lead to the avoidance of further dental treatment. Children can be fearful when visiting the dental clinic, especially in the dental waiting area. Pediatric patients having dental fear and anxiety are of concern during dental treatment and are very challenging [2]. Therefore, many children with dental anxiety and fear escape dental treatment thus resulting in compromised treatment. Dental visits are a significant fear among five to six percent of the population. Moreover, this proportion can be up to 16% in children [3]. Unlike adults, many children are not able to express their anxiety and fear; this can affect their behaviour during dental treatment. As a result, the child may be labelled as "uncooperative". The American Academy of Pediatric dentistry has a vital role in decreasing dental fear and anxiety by proposing many pharmacological and non-pharmacological behavior management techniques [3,4]. Research has shown that distraction is an effective type of behavior management techniques for child patients and would help in providing dental treatment. Music is an innovative art that exists in all cultures. Music has an intrinsic expressive power by enhancing spiritual and cultural enrichment. It has many benefits to the body by changes in heat and respiration rate and pleasing experiences [5]. Music distraction is considered to be an efficient, relaxation practice. It is considered safe and inexpensive, which can help during short and painful dental procedures [6]. Music distraction

has been demonstrated as an effective mode in reducing dental anxiety and fear in pediatric patients. Music distraction is used to avoid aversive stimuli by helping the child focus on the audio, which in tern can reduce anxiety levels in children [7,8]. Music therapy is readily available, non-invasive and has no side effects. The objective of the present study is to determine the effect of music on children's anxiety during dental treatment.

MATERIAL AND METHODS

This study was a cross-sectional survey, in which we included a convenience sample of 50 children aged between five and 14 years. The sample consisted of children who attended the female outpatient pediatric dentistry clinics at the College of Dentistry, King Khalid University, Abha, Saudi Arabia. Written informed consents were obtained from parents before the participation of their children. Data was collected using a questionnaire given to patients before and after the treatment procedure. Questionnaires were translated into the local language (Arabic) and then back to English in order to ensure that the translated version gives the proper meaning. The questionnaire was then tested for validity and reliability. The questionnaire asked about backgraound information in the first section. In the following sections the questionnaire asked about the anxiety levels related to dental treatment using the Modified Child Dental Anxiety Scale faces version (MCDASf). The questionnaire was given to children and data was collected from them before and after dental treatment with music therapy. Children who were younger than five years of age, were assessed as cooperative, or had a developmental disability, were not included in this study.

Ethical approval was obtained from the Scientific Research Committee of King Khalid University, College of Dentistry. The study data was collected and then analyzed using the Statistical Package for the Social Sciences (SPSS 20) and values were expressed as percentage.

RESULTS

A total of 50 children aged between five and 14 years were included in this study. Ninteen (38%) were male participants, and 31 (62%) were female participants (Table 1). Participants' anxiety was evaluated using the Modified Child Dental Anxiety Scale faces version (MCDASf) (Figure 1). Thirty-one participants (62%) were relaxed when asked about their feelings toward dentists in general after music therapy, compared to 22 (44%) before music. Thirty-six participants (72%) were relaxed, when asked about their feelings toward checking their teeth after music therapy, compared to 24 (48%) before music therapy. Thirty-nine participants (78%) felt relaxed when the treatment was done with music therapy, compared to 25 (50%) before music. Forty participants (80%) reported that they felt calm and comfortable when they listened to music during treatment (Figure 2). Overall the results showed that the participants' anxiety levels were reduced during music therapy (Table 2 and 3).

Table 1: Dental fear and anxiety (DFA) Frequency by sex and age groups.

	Age			Cumulative frequency N (%)
Sex	**5-7 YEARS N(%)**	**8-10 YEARS N(%)**	**11-14 YEARS N(%)**	
Male	8 (16%)	5 (10%)	6 (12%)	19 (38%)
Female	5 (10%)	14 (28%)	12 (24%)	31 (62%)
Total	13 (26%)	19 (38%)	18 (36%)	50 (100%)

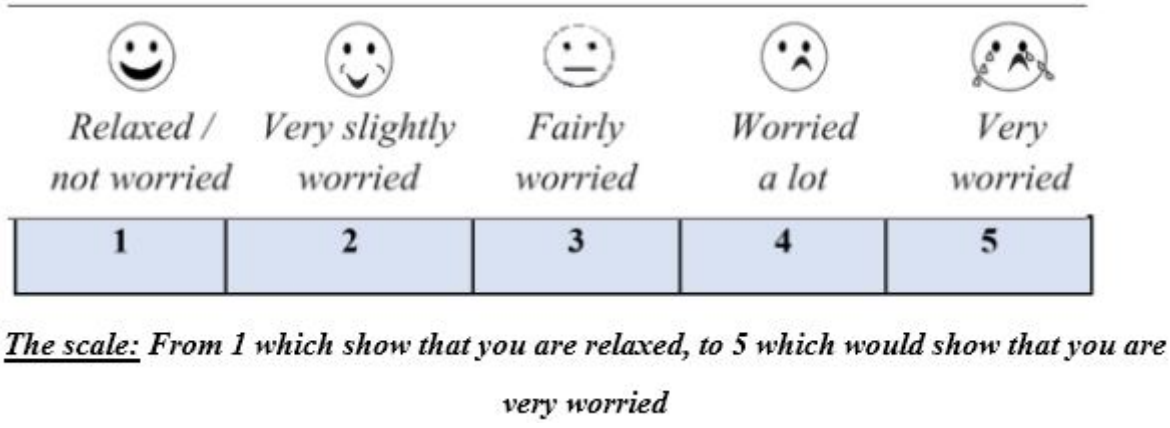

Figure 1: Faces of the modified child dental anxiety scale faces version (MCDASf).

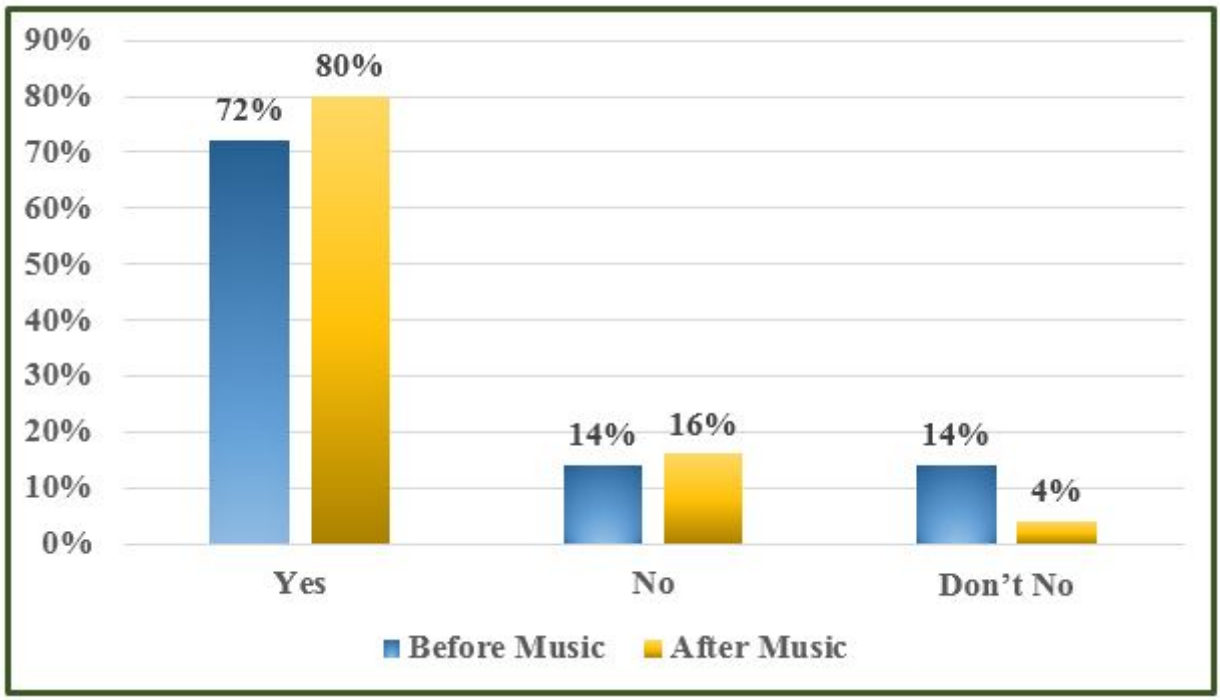

Figure 2: (Q.) Does listening to music during treatment make you feel calm & comfortable?

Table 2: Frequency distribution of anxiety levels before & after music in children (N=50).

Questions	Before music	After music
Q. Does listening to music make the treatment easier?		
Yes	22 (44%)	39 (78%)
No	18 (36%)	9 (18%)
Don't know	10 (20%)	2 (4%)
Q. Do you want to hear music during the next visit?		
Yes	26 (52%)	40 (80%)
No	15 (30%)	9 (18%)
Don't know	9 (18%)	1 (2%)

Table 3: Frequency distribution of anxiety levels before & after music in children (N=50).

Questions	Relaxed N(%)		Very slight worried N(%)		Fairly worried N(%)		Worried a lot N(%)		Very worried N(%)	
	Before music	After music	Before music	After music	Before music	After music	Before music	After music	Before music	After music
Q. How do you feel about the dentist in general?	22 (44%)	31 (62%)	10 (20%)	8 (16%)	8 (16%)	5 (10%)	9 (18%)	6 (12%)	1 (2%)	0 (0%)
Q. How do you feel about dental clinic in general?	25 (50%)	39 (78%)	15 (30%)	6 (12%)	5 (10%)	4 (8%)	3 (6%)	1 (2%)	2 (4%)	0 (0%)
Q. How do you feel about checking your teeth?	24 (48%)	36 (72%)	12 (24%)	7 (14%)	8 (16%)	6 (12%)	3 (6%)	1(2%)	3 (6%)	0 (0%)
Q. What do you feel about our desire to clean your teeth?	18 (36%)	35 (70%)	20 (40%)	10 (20%)	7 (14%)	5 (10%)	3 (6%)	0 (0%)	2 (4%)	0 (0%)
Q. How do you feel about the treatment done today?	25 (50%)	39 (78%)	15 (30%)	6 (12%)	5 (10%)	4 (8%)	3 (6%)	1 (2%)	2 (4%)	0 (0%)
Q. Please select the right face after the treatment	20 (40%)	33 (60%)	18 (36%)	8 (16%)	9 (18%)	9 (18%)	1 (2%)	0 (0%)	2 (4%)	0 (0%)

Q. How do you feel about providing treatment with music?	21 (42%)	30 (60%)	11 (22%)	9 (18%)	10 (20%)	7 (14%)	7 (14%)	4 (8%)	1 (2%)	0 (0%)

DISCUSSION

In children, dental anxiety and fear can result in high caries levels, and poor oral health quality of life. Poor oral health has many adverse effects on the child, which include affected growth and development, disturbed sleep, and degraded performance in studies. Due to unaesthetic dentition appearance, the child may have negative social interactions and thus become subject to bullying [9].

Music has influenced health during history. In the late 19th century music was used in hospitals as an intervention to diminish anxieties associated with surgery, and it has become a growing field of development and research since after World War II [10]. In recent times music therapy has been involved in quantitative and qualitative research within the field of the clinical approach, which includes science and art. A theory proposed that music reduces anxiety by removing negative emotions through the introduction of positive ones [11].

During dental treatment, music may increase audio-analgesic responses by direct neurological suppression of pain. During music, intracerebral endorphins are released, which helps in the distraction of patients from painful stimuli. Music reduces activity in the neuroendocrine and sympathetic nervous systems, which can lead to enhancing of sleep [12]. Maulina et al. (2017) stated that religious music was more effective than classical music on Muslim patients, which suggests the effect of culture on anxiety reduction. Music was also useful for stress and anxiety reduction in patients undergoing surgery [13].

Fear and anxiety have been stated as essential barriers to dental care in adults and children with special needs [14]. For highly anxious patients, conscious sedation and anxiolytic drugs were generally employed. However, pharmacological methods significantly raise the cost of dental treatment [15]. For these reasons, behavior management techniques are increasingly used in dental care. Music therapy for anxiety management is one such intervention and is widely accepted by parents, pediatric and adult patients, and practitioners.

Music therapy in dentistry can have an overwhelming response from the patient by making them calm in a psychological and spiritual way. One study investigating the influence of different types of music genres, including classical, heavy metal or self-selected music, showed that the group who listened to their chosen music had a decreased anxiety and anger level in comparison with those who were in silence condition or listened to heavy metal music. The personal preference of patients may be different from the played music, some people do not prefer any particular music, but some prefer a unique genre [16].

Kim et al. (2011) found that music significantly decreased intraoperative anxiety in a group of 219 participants undergoing extraction, compared with the control group without music therapy [17]. Modified Child Dental Anxiety Scale faces version (MCDASf) was shown in many studies to be very useful in determining dental anxiety among children [18]. Singh et al. (2014) found that music therapy significantly reduced anxiety during dental procedures, compared with the control group without music in children aged between six and 12 years undergoing dental extractions [19].

Aitken et al. (2002) found that in children aged between four and six years, music distraction during the dental procedure was not effective in reducing dental anxiety and pain. Music of choice was not played for children during that dental procedure, and that may be one of the reasons that some children did not fully benefit from the music therapy. In addition, children included in the study were very young, which could be a reason for them not cooperating [20].

For future studies, we recommend that studies go beyond examining the efficacy of passive music distraction and instead investigate the impact of music therapy interventions that allow for more active engagement of patients in the self-management of their anxiety.

CONCLUSION

In conclusion, music therapy is a compelling, complementary, non-pharmacological method that can reduce dental fear and anxiety in children. Music therapy makes the dental clinic more attractive during the dental procedure with less financial burden. We recommend that dental practices consider including music therapy for highly anxious patients and children. To optimize treatment impact, music interventions should start before the onset of dental treatment.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

CONTRIBUTION OF AUTHORS

The authors declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by them.

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