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Dentistry Section

Comparative Evaluation of Tell-Show-Do, Music of Choice and Traditional Music Therapy as Audio Distraction Techniques on Anxiety Levels in Children Undergoing Restorative Treatment: A Randomised Clinical Trial

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ABSTRACT

Introduction: Fear and anxiety are the most prevalent concerns among young children, often leading to uncooperative behaviour that poses challenges in providing effective dental care. Hence, implementing appropriate strategies can significantly improve a child's dental experience. Music therapy as audio distraction technique is one such promising non-pharmacological methods to reduce the anxiety in children. Different kinds of music influence human brain waves, leading to deep relaxation and calmness, and thereby reducing pain and anxiety.

Aim: To evaluate and compare the Tell-Show-Do (TSD), Music of Choice and traditional music therapy as audio distraction techniques on anxiety levels in children undergoing restorative treatment.

Materials and Methods: The present randomised three arm controlled clinical trial was carried out in the Department of Paediatric and Preventive Dentistry, KAHER'S KLE VK. Institute of Dental Sciences, Belagavi, Karnataka, India from May 2024 to November 2024. A total of 66 children aged 6-10 years were included in the study and allocated into three groups: Group I TSD, Group II Music of Choice and Group III Traditional Music Therapy. All Children by single operator received class I restorative procedure in primary/permanent molars. Anxiety was evaluated with pulse rate and Venham's Picture Test at pre and post interventions. The child's behaviour was also determined by the Frankl's behaviour rating scale before and after the restorative procedure. The pre and post intervention scores of all the assessed parameters were recorded. Descriptive statistics were used to summarise the demographic data. For inferential analysis, the Kruskal-Wallis test was used to compare anxiety-score changes between the three groups (inter-comparison), the Wilcoxon matched-pairs test for intra-group comparison, and the Mann-Whitney U test was used for pair-wise comparison among the groups. The level of significance was set at $p<0.05$.

Results: 66 patients were recruited for the study in which females were 36 (54.55%) and males were 30 (45.46%) with the mean age of 8.20 years. The results revealed no significant differences in pre intervention scores among the three groups, confirming comparable baseline levels. For Venham's Picture Test, post intervention, significant differences were observed between TSD and Music of Choice ($p=0.003$*) and between TSD and traditional music ($p=0.001$*). However, Music of Choice and traditional music exhibited no significant difference ($p=0.1490$). Pulse rate mean scores differed significantly between the groups TSD (97.00), Music of Choice (91.05), and traditional music (89.35) with $p=0.0370$*. Intra-group comparison of pre and post intervention scores illustrated that Group II (Music of Choice) showed statistically significant reduction in both Venham's Picture Test ($p=0.001$*) and pulse rate ($p=0.0016$*). Group III (traditional music) showed statistically significant changes for both measures with the p-value of 0.001*. In contrast, Group I (TSD) there were no statistically significant changes. Overall, all three groups showed a significant reduction in anxiety. Among them, traditional music yielded the lowest anxiety scores followed by Music of Choice group and highest with the TSD group. Additionally, there was a significant improvement in patients' behaviour measured by Frankl's behaviour rating scale from negative to positive and definitely positive across the three groups.

Conclusion: Traditional music therapy and Music of Choice showed statistical significant changes in anxiety reduction over TSD group. Traditional music therapy had a significant impact over Music of Choice. Both the audio distraction techniques are promising, safer, non-invasive and effective behaviour guidance techniques in children.

Keywords: Behaviour guidance, Folk songs, Pulse rate and Venham's Picture Test

INTRODUCTION

Stress is a prime driver of fear and anxiety in children undergoing dental treatment. Other major factors include drilling noise, office environment, dental equipment, and negative experiences or pessimism from family members-all of which may contribute to a child's anxiety about dental visits [1]. Dental visits are associated with significant contributors to the overall anxiety experienced by children undergoing treatment. Dental fear and anxiety are major concerns in paediatric dental set-ups, often hindering the provision of effective dental treatment in children. If dental fear and anxiety are left untreated for a longer period of time, it will worsen the oral health, which eventually leads to invasive and complex dental treatment that in turn increases the negative behaviour in an anxious child [2]. To make the dental visits stress-free and fear-free and to bring down the anxiety of patients, a wide variety of pharmacological and non-pharmacological behaviour guidance techniques are available. But more often, non-pharmacological techniques are preferred by both paediatric dentists and parents due to their low side-effects and costs [3]. Ranging from fundamental basic

communication, varied non-pharmacological behaviour techniques are used in paediatric dental setups, among those, the audio distraction techniques are most commonly used to distract the child's mind from the operating unpleasant treatment procedures [4]. Hence, there is an exigency for new non-aversive techniques which are more acceptable to children and parents.

Music therapy as an audio-distraction technique is one such method [5]. A systematic review and meta-analysis stated music distraction is a better behaviour management technique when compared to no music in children undergoing dental treatment [6]. Different music influences human brain waves, leading to deep relaxation, calm and thus resulting in the alleviation of pain and anxiety [7]. When a child listens to the familiar songs or music of choice, it makes the child to gain control over unpleasant stimuli and the feeling of being in a known environment, thus in turn reducing anxiety [8]. The musical melodies system of India is deeply rooted in Traditional Music, mainly focused on folk songs since ages ago, passed from one generation to another [9]. Although there is a wide variety of folk songs available, but sparse scientific literature [10] on folk songs which reduces the anxiety in children undergoing dental treatment. Most clinical studies have focused exclusively on different forms of music and without music therapy [11-13]. The conceptual shift toward patient-centered care in dentistry highlights the need for thorough comparative assessments of different behaviour-management techniques. The current study employed a controlled experimental design to evaluate the anxiety-reducing effectiveness of three different intervention modalities. Thus, with the existing lacunae, the present study was aimed to evaluate and compare the TSD, music of choice, and Traditional Music therapy on anxiety levels in children undergoing restorative treatment.

MATERIALS AND METHODS

The present study was a concurrent three arm randomised controlled clinical trial conducted on patients reporting to the Outpatient Department of Paediatric and Preventive Dentistry, KAHER'S KLE VK Institute of Dental Sciences, Belagavi, Karnataka, India from May 2024 to November 2024. Ethical approval was received from the 'Institutional Research and Ethics Committee KLEVKIDS, Belagavi (EC/NEW/INST/2021/2435-408)'. This study was officially registered under the Clinical Trial Registry India bearing CTRI/2024/05/081725 (https://www.ctri.nic.in/) before recruiting the first study participant. Detail study protocol was explained prior to the study. Information sheets were provided to parents or caretakers and written informed consent was obtained from them. Oral assent was also obtained from child participants, using age-appropriate language.

Inclusion and Exclusion criteria: The inclusion criteria consisted of children aged 6-10 years who had a minimum of one carious tooth deemed restorable. Children with special healthcare needs, those with a history of previous dental treatment, children exhibiting a definitely negative/Frankl Behaviour rating 1 [14] and patients with auditory impairment were excluded from the study.

Sample size calculation: The sample size was estimated by the following standard formula for two independent means 5% α error and 90% power using SD estimates from the Study by Suresh K and Chandrashekara S [15]. The final sample size estimated was 66 in which 22 children were equally allocated into three study groups, respectively.

The present study was a single-blinded trial, in which the outcome assessor-a trained, Paediatric Dentist was blinded. Participants and principal investigator were not blinded due to the type of study interventions. To overcome the bias, the same Paediatric Dentist provided the treatment for all the study groups.

Eligible participants were equally divided into three groups by computer sequence method (https://www.graphpad.com/quickcalcs/randomselect) to ensure random allocation. Blinded trained Paediatric Dentist used sequentially numbered, opaque, sealed envelopes (prepared in advance) to assign each selected participant to their allocated group according to the randomisation sequence prior to the start of the trial.

A total of 66 participants were randomly allocated to three groups:

Group I (Control): TSD (n=22)

Group II (Experimental): Music of Choice (n=22)

Group III (Experimental): Traditional Music therapy (n=22)

Study Group Interventions

Tell-Show-Do (TSD): Participants from this group received the TSD behaviour guidance method, where children were given verbal explanations of the procedure followed by showing the instruments and materials used in the procedure and demonstration of the procedure on a tool or model. Finally the treatment was rendered [16].

Music of choice: Each child had the opportunity to select their preferred Music of Choice. Child along with the parent/caretaker was asked to select 12 different kinds of favourite songs/music (inclusive of Film songs, Rhymes, Classical musical songs etc., either in Kannada, Hindi and Marathi languages). The same songs were downloaded from Youtube downloader and saved in the MP3 format.

Traditional Music therapy: The kind of songs selected were Regional Kannada, Marathi, Urdu Folk songs and Children Folk songs. A total of 12 songs were selected by the principal investigator and content was validated from Music Experts, KLE School of Music, Belagavi, Karnataka, India. Same songs were used for all the children allocated to this group. An adjustable sound level was provided through the headphones, and patients were asked to set it prior to the procedure. Whole music was played about 25-30 minutes through the head phones via blue tooth connected mobile phone throughout the treatment procedure. Either the Paediatric Dentist or child if wanted to communicate, the music was temporarily paused and then it was restarted after necessary communication/clarification for both the musical groups.

Study Procedure

Under the standard operating protocols, the Principal Investigator carried out the restorative procedure. Class I cavity was prepared in primary or permanent molars and was restored using posterior high strength Glass Ionomer Cement for primary molars and composite resin for permanent molar teeth. Whole procedure was lasted out for approximately 25-30 minutes for all the three groups.

Outcome assessment parameters: Outcome parameters were assessed for changes in the anxiety levels, pre and post restorative procedures for all the three groups by 'Frankl's behaviour rating scale, Venham's Picture Test scale and Pulse rate'.

a. Behaviour: Child's behaviour was assessed by the Frankl's behaviour rating scale [Table/Fig-1] prior to the intervention and changes in the behaviour were again determined at the end of the treatment procedure.

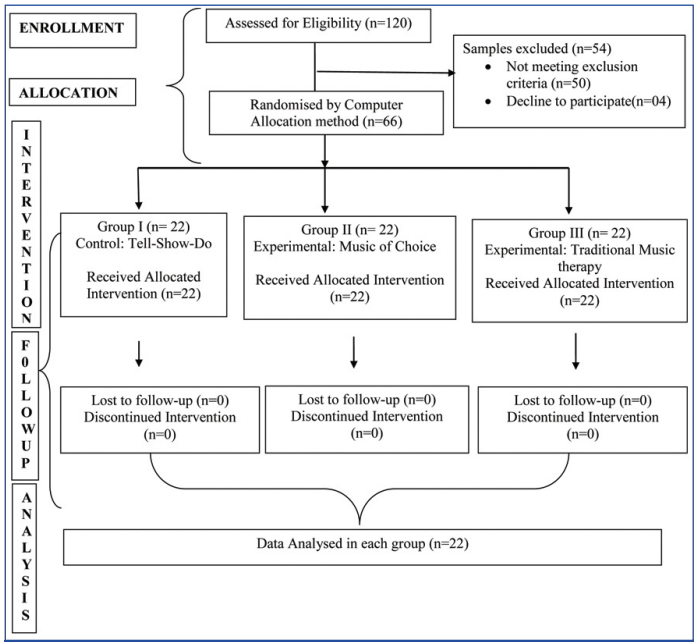
b. Venham's Picture Test scale: Venham's Picture Test scale was a self reported subjective scale by the patient it was evaluated by an expert trained Paediatric Dentist pre and post intervention. Venham's Picture Test scale compromises of eight set of figures (1-8), with two figures on each, one 'anxious' figure and one 'non anxious' figure. Child was asked to point the picture they could most relate to at that moment.Score one was given if the child points out at the anxious picture and zero score for the non-anxious picture. The number of times the 'anxious' figure was chosen was totalled to give a final score (minimum score, zero; maximum score, eight) [17].

c. Pulse rate: Using finger held pulse oximeter, the physiological parameter anxiety that is pulse rate was assessed by recording pulse rate after 20 seconds of application [18] which was considered as baseline measures and same was recorded after the completion of the procedure as pulse rate scores, which was beats/min.

1	Definitely negative: refusal of treatment, crying forcefully, fearful, or any other overt evidence of extreme negativism
2	Negative: reluctant to accept treatment, uncooperative, some evidence of negative attitude but not pronounced, i.e., sullen, withdrawn
3	Positive: acceptance of treatment; at times curious, willingness to comply with the dentist, at times with reservation but patient follows the dentist's directions cooperatively
4	Definitely positive: good rapport with the dentist, interested in the dental procedures, and laughing and enjoying the situation

[Table/Fig-1]: Frankl's behaviour rating scale [14].

The consolidated study design was illustrated by CONSORT flow diagram [Table/Fig-2].



[Table/Fig-2]: CONSORT flow diagram of the study design.

STATISTICAL ANALYSIS

The obtained data were entered on the excel sheet and then subjected to statistical tests using the 'SPSS Software version 22.0 (SPSS Inc., Chicago, IL, USA)'. The normality of pre and post intervention scores was assessed with Shapiro-Wilk test. Data of all the assessed parameters for the three groups did not meet the assumption of normality. Hence, the non-parametric test was applied. Descriptive statistics was used to compile the demographic data and inferential statistics like Kruskal-Wallis Analysis of Variance (ANOVA) used to compare the changes in the scores among three groups, Wilcoxon matched pairs test was used to compare change in anxiety scores within the groups and Mann Whitney test for pair-wise comparison among three groups. The level of significance was set at p<0.05.

RESULTS

The study recruited a total of 66 children, in which females were 36 (54.55%) and male were 30(45.46%) with the mean age group of 8.20 years (standard deviation 1.94).

Comparison of Venham's Picture Test Score: Pre intervention anxiety scores among the three groups did not show a statistically significant (p=0.665) difference, indicating that all groups had similar baseline levels of anxiety. Following the intervention, a statistically significant difference in anxiety scores emerged among the groups (p=0.001*). The Traditional Music group demonstrated the lowest post intervention anxiety scores (Mean=1.65), followed by the music of choice group (Mean=2.15) and highest anxiety levels exhibited with the TSD group (Mean=4.10).When pre- to post intervention difference scores were evaluated, it was statistically significant (p=0.001*) [Table/Fig-3].

Pair-wise comparisons revealed no significant differences in pre intervention scores among the three groups, confirming comparable baseline levels. Post intervention, significant differences were observed between TSD and music of choice (p=0.003*) and between TSD and Traditional Music (p=0.001*). However, music of choice and Traditional Music exhibited no significant difference (p=0.1490). Analysis of the pre and post difference scores further showed statistically significant differences between TSD and music of choice and with TSD and Traditional Music (both p=0.001*). The comparison between music of choice and Traditional Music remained non-significant [Table/Fig-4].

Times	Summary	Group I Tell-Show-Do (TSD)	Group II (Music of Choice)	Group III (Traditional Music)	H-value	p-value
Pre intervention	Mean	4.55	4.05	4.00	0.8160	0.6650
	SD	1.99	1.15	1.17		
	Median	4.00	4.00	4.00		
	IQR	1.75	0.75	1.00		
Post intervention	Mean	4.10	2.15	1.65	16.3410	0.001*
	SD	2.20	1.27	0.81		
	Median	4.00	2.00	1.50		
	IQR	1.50	1.00	0.50		
Pre and post difference	Mean	0.45	1.90	2.35	23.4440	0.001*
	SD	1.36	0.64	0.67		
	Median	0.00	2.00	2.00		
	IQR	0.75	0.25	0.50		

[Table/Fig-3]: Comparison of three groups (I, II, III) with pre and post intervention Venham's picture test scores by Kruskal-Wallis ANOVA.
*p<0.05, SD: Standard deviation; IQR: Interquartile range

Times	Group I vs Group II TSD vs Music of Choice		Group I vs Group III TSD vs Traditional music		Group II vs Group III Music of Choice vs Traditional music	
	Z-value	p-value	Z-value	p-value	Z-value	p-value
Pre intervention	-0.7270	0.4950	-0.8160	0.4290	-0.1130	0.9250
Post intervention	-2.9530	0.0030*	-3.6600	0.001*	-1.5490	0.1490
Pre and Post Difference	-3.5930	0.001*	-4.2230	0.001*	-2.0200	0.05

[Table/Fig-4]: Pair-wise comparison of three groups (I, II, III) with pre and post intervention Venham's picture test scores by Mann-Whitney U test.
*p<0.05, TSD: Tell-Show-Do

Comparison of pulse rate scores: With the inter-group comparison, at pre intervention, the mean scores were similar across the three groups: TSD (97.80), music of choice (97.00), and Traditional Music (101.80)-exhibiting no statistically significant difference (p=0.269). However, after the intervention, mean scores differed significantly between groups: TSD (97.00), music of choice (91.05), and Traditional Music (89.35) with the p=0.0370*. Analysis of change (difference between pre- and post intervention) illustrated with a highly significant group difference (p=0.001*). This indicates that Traditional Music produced the greatest mean reduction, followed by music of choice, while TSD showed minimal change [Table/Fig-5].

Pair-wise comparisons, at pre intervention revealed that there were no significant differences in pulse rate between the groups, confirming group equivalence before intervention. Post intervention comparisons, illustrated statistical significant changes only for TSD with Traditional Music (p=0.007*), whereas other groups were non-significant. Analysis of pre and post difference scores showed statistically significant differences between TSD and music of choice (p=0.009*), between TSD and Traditional Music (p=0.001*), and for between music of choice and Traditional Music (p=0.001*) [Table/Fig-6].

Comparison of Venham's Picture Test and Pulse Rate Scores: Intragroup comparison analysis revealed that TSD did not show

Times	Summary	Group I Tell-Show-Do (TSD)	Group II (Music of Choice)	Group III (Traditional Music)	H-value	p-value
Pre intervention	Mean	97.80	97.00	101.80	2.6260	0.2690
	SD	11.25	11.50	9.38		
	Median	96.00	98.50	102.00		
	IQR	8.75	9.00	4.75		
Post intervention	Mean	97.00	91.05	89.35	6.5740	0.0370*
	SD	8.78	11.21	9.10		
	Median	95.50	91.00	87.50		
	IQR	5.50	9.50	5.00		
Pre and post difference	Mean	0.80	5.95	12.45	35.2050	0.001*
	SD	7.96	8.14	3.58		
	Median	3.50	7.00	12.00		
	IQR	4.75	1.00	1.50		

[Table/Fig-5]: Comparison of three groups ((I, II, III) with pre and post intervention pulse rate scores by Kruskal-Wallis ANOVA.
*p<0.05, SD: Standard deviation, IQR: Interquartile range

Times	Group I vs Group II TSD vs Music of Choice		Group I vs Group III TSD vs Traditional music		Group II vs Group III Music of Choice vs Traditional music	
	Z-value	p-value	Z-value	p-value	Z-value	p-value
Pre intervention	-0.1490	0.8830	-1.3960	0.1650	-1.3970	0.1650
Post intervention	-1.6800	0.0960	-2.6460	0.0070*	-0.3260	0.7580
Pre and post Difference	-2.6000	0.0090*	-5.1400	0.001*	-4.5490	0.001*

[Table/Fig-6]: Pairwise comparison of three groups ((I, II, III) with pre and post intervention pulse rate scores at by Mann-Whitney U test
*p<0.05, TSD: Tell-Show-Do

any significant changes (Venham's Picture Test: p=0.1771 and pulse rate: p=0.3411). In contrast, both music of choice and Traditional Music elicited significant reductions in both measures. Traditional Music demonstrated the greatest effect, with highly significant changes in Venham's Picture Test (p=0.001*) and pulse rate (p=0.001*), followed by music of choice which also showed significant reductions in Venham's Picture Test (p=0.001*) and pulse rate (p=0.0016*) [Table/Fig-7].

Variables	Group	Changes from	Mean	% change	Z-value	p-value	Effect size
Venham's Picture test	Group I	Pre to Post	0.45	9.89	1.3497	0.1771	0.1040
	Group II	Pre to Post	1.90	46.91	3.9199	0.001*	0.9030
	Group III	Pre to Post	2.35	58.75	3.9199	0.001*	0.9380
Pulse rate	Group I	Pre to Post	0.80	0.82	0.9520	0.3411	0.0110
	Group II	Pre to Post	5.95	6.13	3.1546	0.0016*	0.3600
	Group III	Pre to Post	12.45	12.23	3.9199	0.001*	0.9270

[Table/Fig-7]: Intra-group comparison of pre and post intervention scores of Venham's Picture Test and pulse rate among three groups by Wilcoxon Matched Pairs test.
*p<0.05, Group I: Tell-Show-Do (TSD), Group II: Music of Choice, Group III: Traditional Music

Comparison of Frankl scores at pre and post intervention: At pre intervention, Frankl behaviour scores differed significantly among groups (p=0.007*), with music of choice showing the highest proportion of negative behaviour. Post intervention, there was a highly significant difference in behaviour distributions between groups (p=0.001*), with the greatest proportion of definitely positive behaviour in the Traditional Music group, followed by music of choice and then TSD. Intra-group analysis showed statistical significant improvements from pre to post intervention in all groups, p=0.02* for TSD; p=0.001* for music of choice and Traditional Music, consistent with enhanced cooperative behaviour following the interventions [Table/Fig-8].

[Table/Fig-9] illustrates the distribution of Frankl behaviour ratings for each of the three groups comparing behaviour, pre and post intervention. Pre intervention, Group I (TSD) had 50% Negative and 50% Positive behaviour, Group II (Music of choice) had predominantly Negative behaviour (80%) with fewer positive (20%), and Group III (Traditional Music) had 46% negative and 54% positive behaviour. Post intervention, Group III showed the greatest improvement, with 77% definitely positive and 23% positive behaviour and no negative ratings. Group II also improved substantially, with 23% definitely positive, 73% positive, and 4% negative behaviour, while Group I showed modest gains, with 19% definitely positive, 59% positive, and 22% negative behaviour. Overall, all groups demonstrated significant improvement in behaviour after the intervention.

Thus, the overall study reveals the significant effects of TSD, music of choice and Traditional Music therapy on anxiety reduction in children aged 6-10 years. However, high significant reduction of overall scores and behaviour changes was observed in Traditional Music therapy followed by music of choice and TSD group.

DISCUSSION

Children can exhibit a wide range of behaviours during dental treatment ranging from extremely cooperative, fearful, extremely stubborn, and defiat. Understanding these behaviours and removing the underlying root causes is essential for effective dental care [19]. Anxiety can be more prominent and noticeable among children, especially in the course of specific dental procedures. The management of pre-procedural anxiety among any patients undergoing restorative treatments are often due to the "4 S" principle. "Main rationale involved to remove four main sensory stimuli that triggers anxiety in dental setup includes: sights (air turbine drills and needles), sounds (drilling), sensations (high-frequency vibrations), and smells (cut dentine)" [20].

Distraction is one of the safest, efficient and cost-beneficiary non pharmacological behaviour guidance techniques which can be used to reduce anxiety in children [21]. Among distraction, audio distraction with the use of different kinds of music is widely used among healthcare practices due to its beneficiary impacts on the psychological and physiological changes [22,23]. By fostering positive thoughts and removing negative emotions, music can reduce anxiety [24].

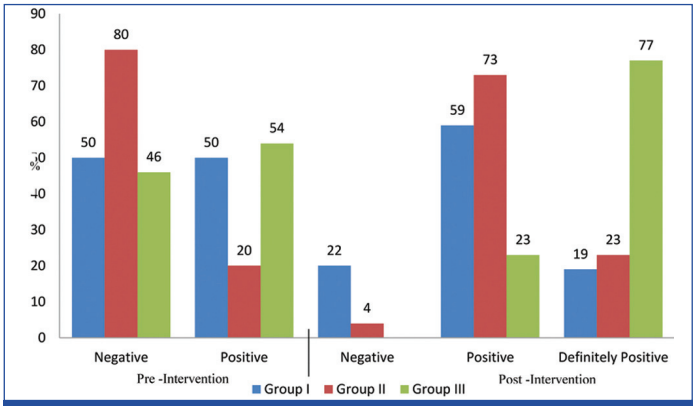
Music on human minds has wide variety of physiological changes. By direct neurological suppression of pain, music may increase audio analgesic responses. Intra cerebral beta endorphins are released thus helps in the distraction of patients mind from painful stimuli. It also results to enhance the neuro-endocrine and sympathetic nervous systems thus enable the relaxation of mind [25].

Music therapy in Paediatric Dentistry can elicit a highly positive response from children by promoting a sense of calm both psychologically and emotionally [26]. In exploring different musical interventions with significant potential to reduce anxiety in children, this randomised trial aimed to validate the effectiveness of TSD, music of choice and Traditional Music therapy in children undergoing restorative treatment. The present study's inclusion criteria strictly adhered to subset age group in the range of 6-10 years focusing mainly on their cognitive abilities and role in different behaviour guidance techniques. To overcome the potential bias, the first dental visit of the patient was included in the study thus, prior negative experiences were minimised. Among the dental procedures, prime focus was on class I restorations in primary/permanent molars to treat a generic dental condition among children.

In the present study, two types of musical interventions (experimental groups) were assessed, Music of Choice and Traditional Music

Frankl scores	Group I (TSD)	%	Group II (Music of Choice)	%	Group III (Traditional Music)	%	Kruskal-Wallis ANOVA	p-value
Pre intervention								
Negative	11	50.00	16	80.00	10	46.00	10.0090	0.0070*
Positive	11	50.00	6	20.00	12	54.00		
Post intervention								
Negative	5	22.00	1	4.00	0	0.00	28.6300	0.001*
Positive	13	59.00	16	73.00	5	23.00		
Definitely Positive	4	19.00	5	23.00	17	77.00		
Total	22	100.00	22	100.00	22	100.00		
Pre vs Post	Z=-2.3330, p=0.02*		Z=-4.2430, p=0.001*		Z=-4.0650, p=0.001*			

[Table/Fig-8]: Comparison of three groups (I, II, III) with Frankl scores at pre and post intervention by Kruskal-Wallis ANOVA.
*p<0.05, TSD: Tell-Show-Do



[Table/Fig-9]: Comparison of three groups (I, II, III) with Frankl scores at pre and post intervention.
Group I: Tell-Show-Do, Group II: Music of Choice, Group III: Traditional Music

therapy by folk songs. Music of Choice allowed children to select their own choice of music or songs that made them to feel in familiar environment.

In Traditional Music therapy group, folk songs were selected, since folk songs are rich in melody which influences the folk music through the ages by one generation to another [9]. Folk songs are well explanatory, narrative and mainly focus on cultural background. Thus helps in understanding the socio-cultural and religious life. Maulina T et al., (2017) stated that religious music showed more anxiety reduction than classical music which suggests the effect of culture on diminution of anxiety level [27]. TSD advocated by Addleston HK in 1959 was incorporated as control Group in the study [28]. The corner stone in the behaviour guidance techniques in Paediatric Dentistry [29]. TSD has been determined to be an effective way of diminution of anxiety level in paediatric patients [30].

A key strength of this randomised trial was the concurrent evaluation of anxiety using a physiological indicator (pulse rate), an objective behaviour rating assessment (Frankl behaviour rating scale), and a subjective self-report scale (Venham's Picture Test) in children undergoing restorative treatment. These parameters were analysed to increase the fidelity and reliability of the study. 'Increase in the pulse rate is the salient indicator of anxiety' [21]. Hence, it was assessed at pre and post intervention. The self reported pictorial version of Venham's Picture Test scale as an anxiety assessment tool was included in the study; same has been used and confirmed by many previous studies [7,12]. Frankl behaviour rating scales assessed the behavioural reactions of children to the anxiety.

The current study's findings revealed that in all the three groups there was a significant reduction among all the parameters assessed. However, statistical significant difference and decrease in anxiety was observed in Traditional Music therapy (Group III) followed by Music of Choice (Group II) and then for TSD group (Group I). Additionally, all the groups demonstrated statistically significant improvements in behavioural scores, as measured by the Frankl behaviour rating scale. Traditional Music therapy with the use of folk songs had a more significant effect on anxiety reduction than the preferred music from the patient themselves, because there might be associated with an events that accelerated a previously conceived emotions, thoughts, narrative stories behind the selected songs. Therefore, combination of musical melodies in the module to express with the form of cultural narration that made a beneficial impact on the child's mind to focus more on songs resulted in relaxation. However, there is lack of specific studies focusing solely on the impact of folk music on reducing anxiety in children. To the best of our knowledge, this trial is one of the novel studies on the use of folk songs for anxiety reduction in children undergoing restorative procedures.

The present study also investigated the impact on Music of Choice. Music, when offered to patients, mainly according to their preference and choice, like in this study ; the kind of music enhanced the neural engagement and helped to increase the parasympathetic activity of the brain thus facilitated the anxiety diminution.Music accentuated the parasympathetic nervous system, which was responsible for reducing pulse rate which indicated the anxiety reduction. Similar findings also support the previous studies where Music of Choice effectively reduces anxiety in children [10,12].

Control group of the present study: TSD listed highest anxiety scores compared to other musical intervention groups. Reason attributed for this might be the external dental environment. Certainly specific stimulus like drilling noises, smell of dental materials, dental instruments might triggered the responses inspite of explaining the detailed procedure prior to the dental procedures [31]. Similar findings support the trial done by Pande P et al., [32].

Audio distraction, such as music interventions, is a low-cost, non-pharmacological behaviour guidance technique that is well accepted by parents and particularly suitable in developing countries like India. Leveraging India's rich cultural music traditions, including folk melodies, can be seamlessly integrated into paediatric clinical practice. All three groups showed reductions in anxiety and significant improvements in child's behaviour, with the Traditional Music group demonstrating the greatest anxiety reduction followed by the Music of Choice group. The more noticeable factor was the marked improvement in the child's behaviour at the post intervention. Decrease in the negative behaviour and strategic shift towards positive and definitely positive behaviour with the greater acceptance and attitude towards treatment procedures.

Limitation(s)

The present study had certain limitations. The primary challenge was impaired communication due to music distraction; however, this was not a major concern and was managed by adjusting the music volume and instructing children to raise their hands if they felt uncomfortable with the music or the procedure. Additionally, the relatively small sample size limits the generalisability of the findings to a broader population. The present research explores innovative frameworks aimed at reducing anxiety in children. Different forms of regional folk songs around the broader geographical areas can be incorporated. By aligning with the needs of parents, children and

paediatric dentists, this research could usher in a transformative new approach to behaviour guidance techniques.

CONCLUSION(S)

Traditional Music therapy and Music of Choice were found to be significantly efficacious in alleviating anxiety compared to TSD group. Traditional Music therapy with the folk songs showed significant advantages over Music of Choice and TSD groups. However, both the audio-distraction techniques represent safe and effective methods for behaviour guidance in children, offering non-pharmacological alternatives in paediatric dental set-ups.

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