

Submit Date : 06-01-2025 • Accept Date : 27-01-2025 • Available online: 01-04-2025 • DOI : 10.21608/edj.2025.349728.3326

# KALEIDOSCOPE AND TELL-SHOW-PLAY-DOH IN REDUCING DENTAL ANXIETY FOR CHILDREN UNDERGOING PULPOTOMY IN PRIMARY MOLARS - A RANDOMIZED CONTROLLED CLINICAL TRIAL

Eman Mohamed Yousef Elmansy<sup>\*</sup>, Abeer Mostafa Abdellatif<sup>\*\*</sup> *and* Ahmed Hamdy Wahba<sup>\*\*\*</sup>

#### ABSTRACT

**Aim:** To assess the efficacy of Kaleidoscope glasses and Tell-Show-Play-Doh technique to reduce dental anxiety for children undergoing pulpotomy in primary molars.

**Material and Methods:** Sixty-six children 4–6 years old required pulpotomy treatment in deciduous molars with no previous dental visit, were chosen from the Pediatric dental clinic, Faculty of Dentistry, Mansoura University. All children were allocated randomly into three main groups (22 children each); control group I (Tell Show Do) and two experimental groups II and III (Tell-Show-Play-Doh and Kaleidoscope glasses). The child's behaviour was evaluated both when they arrived and after the visit came to an end using Frankl behaviour rating scale and during injection of local anaesthesia & pulpotomy procedure by FLACC scale (Face, Legs, Activity, Cry, and Consolability). Each child's heart rate was measured before and after behavior management and post-operatively, to determine their level of dental anxiety. All readings and scores were recorded, and results were tabulated and statistically analyzed.

**Results:** Regarding behaviour, in comparison with Tell-Show-Do group, a statistically significant improvement in behaviour of Frankl behaviour rating scale scores between before and after the dental procedure and during local anesthesia & pulpotomy procedure of FLACC scores among Tell-Show-Play-Doh and Kaleidoscope glasses groups. Regarding anxiety, a significant reduction was found in heart rate measures among Tell-Show-Play-Doh and Kaleidoscope glasses groups. The least reduction of the level of the anxiety was found in Tell Show Do group.

**Conclusion:** Both Tell-Show-Play-Doh and Kaleidoscope glasses techniques could be a viable alternative to reduce dental anxiety in children undergoing pulpotomy treatment.

**KEYWORDS:** Tell-Show-Play-Doh, Kaleidoscope, Childhood dental anxiety, Behaviour management, Distraction, Tell-Show-Do.

Article is licensed under a Creative Commons Attribution 4.0 International License

<sup>\*</sup> MSc Student, Department of Pediatric Dentistry and Dental Public Health, Faculty of Dentistry, Mansoura University

<sup>\*\*</sup> Professor, Head of Pediatric Dentistry and Dental Public Health Department, Faculty of Dentistry, Mansoura University, Egypt

<sup>\*\*\*</sup> Associate Professor, Pediatric Dentistry and Dental Public Health Department, Faculty of Dentistry, Mansoura University, Mansoura , Egypt.

# INTRODUCTION

The child's mastication, aesthetics, space maintenance, phonetics, and avoidance of abnormal habits all depend on maintaining the primary dentition in a healthy and non-pathologic state.<sup>1</sup> So we need a good management technique which reduce child dental anxiety fear and during the dental procedures to achieve the best treatment results for children.

The cause of the dental anxiety of the children may not always be known, however it can be defined as a generalized sensation of fear, worry, or discomfort.<sup>2</sup> Because of the weird noises, the unfamiliar surroundings, the fear of pain, needles, drills, or the smell of eugenol, many children may experience anxiety or panic when they go to the dentist.<sup>3-5</sup> Additionally, a variety of endogenous factors can contribute to the development of anxiety such as (Genetics, Temperament, Brain chemistry, Developmental factors and Medical conditions), and exogenous factors like (Family stress, Media exposure, Traumatic events, School-related stress and Parental anxiety).<sup>6</sup>

Using behavior management techniques help reduce children's levels of stress and worry while receiving their dental treatment, and these techniques are being separated into two categories. The first category includes non-pharmacological behavior management approaches such as (Tell-Show-Do technique, Tell-Play-Do technique, Distraction, Role modelling and Positive reinforcement). The second one includes pharmacological techniques such as (General anesthesia, Oral sedation, Nitrous oxide, and Intravenous sedation).<sup>7,8</sup>

The Tell Show Do technique is founded on the ideas of learning theory principles and it occurs in the operatory by dentists themselves. It involves giving the children the verbal description of the steps in a way they can easily understand (tell); presentation of the procedure's visual, auditory, olfactory, and tactile aspects is carefully done without being threatening (show); and finally, the procedure must be performed without departing from the demonstration and explanation (do).<sup>9</sup>

Using the idea of learning by doing, the Tell-Show-Do technique was changed into the Tell-Show-Play-Doh technique to help children feel less anxious about dental treatment and encourage adaptive behavior.<sup>10</sup> Children utilize Play-Doh, a reusable modeling compound for arts and crafts projects. A plastic human head with slots for Play-Doh molded teeth is part of the Play-Doh Doctor Drill 'n Fill toy set. To replicate cavity preparation and restoration using tooth-colored cement, a battery-operated toy drill is used to drill into and clean the black, cavitated tooth model. The model is then filled with white Play-Doh compound.<sup>11</sup>

According to its definition, distraction is a mental condition that diverts attention from unpleasant stimuli and prevents the reception of those unpleasant stimuli that create worry.<sup>12</sup> The quality of dental care appears to be improved by distraction, which appears to be a low-cost and safe strategy that can help young people with their dental anxiety and fear.<sup>13,14</sup>

Kaleidoscope displays an endless number of fascinating geometric shapes in the form of a flower, repeating and reflecting images of colored goggle fragments in the front section in a prism mirroring the inner surface.<sup>15</sup> In the present study we used Kaleidoscope as glasses which is a new shape of conventional Kaleidoscope which is a toy looked like a tube and was used in previous studies. So, Kaleidoscope glasses are considered one of the distraction techniques that may help in reducing the anxiety levels brought on by local anaesthetic injections and dental treatments, which could allow the dentist to make the dental experience more child friendly.

Anxiety in a dental clinic is usually recorded based on subjective and objective measures. Subjective measures such as Frankle behaviour rating scale, RMS Pictorial scale and FLACC scale (Face, Legs, Activity, Cry, and Consolability) objective measures like measuring "Pulse rate and Saturation of oxygen (SpO<sub>2</sub>)".<sup>16</sup>

Because of the joyful atmosphere that may be affected by the two formers behavior management techniques, Tell-Show-Play-Doh & Kaleidoscope glasses with possible anxiety reduction for children, the focus of this study, was to evaluate and compare the effectiveness of Kaleidoscope glasses and the Tell-Show-Play-Doh technique to alleviate dental anxiety of children.

## MATERIALS AND METHODS

This clinical trial was conducted upon approval of the ethical committee of the Faculty of Dentistry, Mansoura University (Code A01011023PP). Written consent that has been informed was obtained for every participating child in the study by each child's parents after a brief description of the study's methods. The present clinical trial was registered on ClinicalTrials.gov under the number NCT06673030.

The estimated sample size determined by the results of (Ibrahim et al., 2023)<sup>17</sup> using G power program version 3.1.9.4 to calculate sample size based on expected difference of 35.5%, using 2-tailed test,  $\alpha$  error =0.05 and power = 80.0%. The total calculated sample size of three groups will be 18 in each group then 10% will be added to compensate for possible drop out then total sample size will be 20 in each group at least. The sample size was increased to 22 participants for each group (total 66) to compensate for incomplete data and to increase the study power.

A randomized controlled clinical study was carried out on sixty-six children aged between 4-6 years included children who came to the outpatient clinic of Pediatric Dentistry and Dental Public Health Department, (Faculty of Dentistry, Mansoura University) with the following inclusion and exclusion criteria: Healthy children without systemic diseases aged between 4-6 years including both boys and girls attended the dental clinic for their first time with their parents with Frankl's behavior rating score 2,3 and 4 and they had carious lesions in lower primary molars and indicated for pulpotomy.

#### Group Assignment and Randomization: 18

66 opaque, sealed envelopes were prepared, 22 of which were for group I (Tell-Show-Do) and 22 of which were for group II (Tell-Show-Play-Doh) and 22 of which were for group III (Kaleidoscope glasses). The envelopes were mixed randomly, then the envelope was selected by colleague who didn't participate in the intervention before treatment was begun, and the child was assigned to the selected distraction method.

Group 1: Tell-Show-Do (TSD) technique in which technique was done in three stages; Tell: The dental procedures were explained to the children using language and expressions appropriate for their age. Show: This began with showing the child the instruments and the topical anesthetic gel, highspeed handpiece and explaining the purpose of using the handpiece. and how the water removed using the suction device. Do: Performing the dental procedure immediately.

Group 2: Tell-Show-Play-Doh (TSPD) technique in which a Play-Doh dental model was presented to the children and the dentist started to explain how the treatment procedures would be done and how they can use the suction, and the feeling of the air-water syringe. After that, the child was left to play and try it by himself, and children were permitted to play with a battery-operated toy drill and worked in a playful way.

Group 3: Distraction using Kaleidoscope glasses in which the child was given Kaleidoscope glasses that have different changing colors and patterns to watch through just before the starting of the procedure and was asked to wear it until the procedure ends.



Fig. (1) Kaleidoscope as Glasses

#### **The Clinical Procedure**

The Behaviour of each child was assessed at his arrival to the clinic and at the end of the visit using Frankl scale, and during local anesthesia injection and pulpotomy by using the FLACC scale. All the procedures were video recorded, and the FLACC scores were registered in the child's data recording sheet after watching the recorded videos. The assigned scores of the observer were reviewed by the supervisors.

All children's dental anxiety were evaluated by measuring heart rate using a finger pulse oximeter at three intervals: The first time: (Before behavior management), the second time: (pre-operatively after behaviour management), and the third time: (Post-operatively at the end of the visit). All readings and scores were recorded in the child's data recording sheet.

## **Statistical Analysis**

Data analysis was performed by SPSS software, version 26 (SPSS Inc, PASW statistics for windows version 26. Chicago: SPSS Inc). Qualitative data were described using number and percent. Quantitative data were described using median (minimum and maximum) for non-normally distributed data and mean $\pm$  Standard deviation for normally distributed data after testing normality using Kolmogorov-Smirnov test. The significance of the obtained results was judged at the ( $\leq 0.05$ ) level.



Fig. (2) The Play-Doh Doctor Drill 'n Fill toy set.

Chi-Square, Monte Carlo tests were used to compare qualitative data between groups as appropriate. Marginal homogeneity test was used to compare more than 2 studied periods for categorical variables. Kruskal Wallis test was used to compare more than 2 studied groups, for non-normally distributed data. Wilcoxon signed Rank test was used to compare between more than 2 studied periods. Repeated measures ANOVA test with post Hoc Tukey test and paired t test was used to compare more than 2 paired readings and 2 paired readings for normally distributed data.

# RESULTS

As shown in table (1), regarding Frankl, there was no statistically significant difference between studied groups before and after procedure (P=0.486 and P=0.228 respectively). For Tell-Show-Do (TSD) technique; there was no statistically significant difference was found between before and after procedure (P=0.540). For Tell-Show-Play-Doh (TSPD) technique a statistically significant improvement between before and after procedure (P=0.01) was revealed. For Kaleidoscope glasses technique a statistically significant difference between before and after procedure (P=0.05) was detected. This explains that the behaviour improvement after the procedure occurred in both TSPD and Kaleidoscope glasses groups.

Frankl	Tell-Show-Do (TSD) technique n=22	Tell-Show-Play-Doh (TSPD) technique n=22	Kaleidoscope Glasses n=22	Test of significance	within group significance
Before procedure					
-ve	5(22.7)	8(36.4)	8(36.4)	χ <sup>2MC</sup> =3.45 <b>P=0.486</b>	P1=0.178
+ve	17(77.3)	13(59.1)	14(63.6)		P2=0.327
Definitely +ve	0	1(4.5)	0		P3=0.678
After procedure					
-ve	8(36.4)	2(9.1)	4(18.2)		P1=0.055
+ve	13(59.1)	19(86.4)	17(77.3)	χ <sup>2MC</sup> =8.14	P2=0.221
Definitely +ve	0	1(4.5)	1(4.5)	P=0.228	P3=0.462
Definitely-ve	1(4.5)	0	0		
МН	P=0.540	P=0.01*	P=0.05*		

TABLE (1): Comparison of Frankl before procedure (at patient's arrival) and after procedure (at the end of the visit) among studied groups.

MH: Marginal homogeneity test,  $\chi^2$ =Chi-Square test, MC:Monte Carlo test

p1: difference between Tell Show Do (TSD) technique and Tell-Show-Play-Do (TSPD) technique

p2: difference between Tell Show Do (TSD) technique and Kaleidoscope Glasses

p3: difference between Tell-Show-Play-Do (TSPD) technique and Kaleidoscope Glasses

As shown in table (2), there was a statistically significant difference between studied groups during anesthesia as regard FLACC (P=0.037). Post Hoc test shows statistically significant difference between Kaleidoscope glasses technique and Tell-Show-Play-Doh (TSPD) technique (P=0.01) in which the mean FLACC scores showed that patients were less in pain in the Kaleidoscope glasses group (4.73±3.58) than in Tell-Show-Play-Doh (TSPD) group  $(6.18\pm3.92)$ . The highest mean FLACC score during anesthesia was detected among Tell-Show-Do (TSD) technique, and the lowest mean FLACC score was in Kaleidoscope glasses (7.59±3.28 and  $4.73\pm3.58$  respectively), which confirmed that the children reported (severe discomfort/pain) in the TSD group and (Moderate pain) in Kaleidoscope glasses group during anesthesia.

During pulpotomy there was no statistically significant difference between studied groups as regard FLACC (P=0.07) using Kruskal Wallis test. Post Hoc test shows statistically significant difference between Tell Show Do technique group and Tell-Show-Play-Doh technique group (P=0.045) and between Tell-Show-Do technique group and Kaleidoscope glasses group (P=0.04). The mean FLACC scores showed that patients reported (Mild discomfort) in Kaleidoscope glasses group and Tell-Show-Play-Doh (TSPD) respectively  $(3.0\pm3.55,$  $3.05\pm3.35)$  and in Tell-Show-Do (TSD) group patients reported (Moderate pain) ( $5.14\pm3.25$ ). Higher mean FLACC score was detected among (TSD) technique followed by (TSPD) technique and Kaleidoscope glasses respectively ( $5.14\pm3.25$ ,  $3.05\pm3.35, 3.0\pm3.55$ ).

Within group significance demonstrates statistically significant decrease in FLACC score during anesthesia and during pulpotomy in Tell-Show-Do (TSD) technique from  $7.59\pm3.28$  to  $5.14\pm3.25$  respectively (P=0.001) and from  $6.18\pm3.92$  to  $3.05\pm3.35$  for Tell-Show-Play-Doh (P=0.001) and from  $4.73\pm3.58$  to  $3.0\pm3.55$  for Kaleidoscope glasses (P=0.009).

FLACC	Tell Show Do (TSD) technique n=22	Tell-Show-Play- Doh (TSPD) technique n=22	Kaleidoscope Glasses n=22	test of significance	within group significance
During	7.59±3.28	6.18±3.92	4.73±3.58	KW=3.48	p1=0.185
anesthesia	9(0-10)	8(0-10)	5(0-10)	P=0.037*	p2=0.199
					p3=0.01*
During	5.14±3.25	3.05±3.35	3.0±3.55	KW=2.85	p1=0.045*
pulpotomy	5(0-10)	2(0-10)	1(0-10)	P=0.07	p2=0.04*
					p3=0.965
Wilcoxon signed rank test	pa=0.001*	pa=0.001*	pa=0.009*		

TABLE (2) Comparison of FLACC During anesthesia and pulpotomy between studied groups.

KW: Kruskal Wallis test, \*statistically significant

pa: comparison between during anesthesia and during pulpotomy

p1: difference between Tell Show Do (TSD) technique and Tell-Show-Play-Do (TSPD) technique

p2: difference between Tell Show Do (TSD) technique and Kaleidoscope Glasses

p3: difference between Tell-Show-Play-Do (TSPD) technique and Kaleidoscope Glasses

As shown in table (3), as regard the mean heart rate, there was no statistically significant difference between studied groups at first and second reading (P=0.922 and P=0.08 respectively) while, a statistically significant difference was detected between studied groups as regard the heart rate at third reading (P=0.046) with higher mean value was detected for Tell Show Do (TSD) technique group followed by Kaleidoscope glasses group and Tell-Show-Play-Doh (TSPD) technique group  $(104.95\pm12.96, 100.95\pm15.65 \text{ and } 94.32\pm13.27)$ respectively. Post Hoc Tukey test illustrates statistically significant difference between Tell Show Do technique and Tell-Show-Play-Doh technique at second and third reading (P=0.025 and P=0.014 respectively).

For comparison of different readings within

the same group; a statistically significant increase in heart rate at third reading at the end of the visit than second reading after behaviour management (P=0.049) for Tell-Show-Do (TSD) technique group.

For Tell-Show-Play-Doh (TSPD) technique group; a statistically significant reduction in the mean heart rate at second reading as compared to first reading (P=0.001) and statistically significant decrease in mean heart rate at third reading as compared to first reading (P=0.001). For Kaleidoscope glasses, a statistically significant reduction in the mean heart rate at second reading as compared to first reading (P=0.002), and a statistically significant decrease in mean heart rate at third reading as compared to first reading (P=0.002).

Heart rate (b/	Tell Show Do	Tell-Show-Play-Do	Kaleidoscope	test of	within group
min)	(TSD) technique	h(TSPD) technique	Glasses	significance	significance
mean ±SD	n=22	n=22	n=22		
First reading	$104.59 \pm 13.94$	104.23±12.05	103.14±11.11	F=0.082	p1=0.923
				P=0.922	p2=0.699
					p3=0.923
Second reading	98.68±13.24	90.91±7.66	93.27±12.66	F=2.65	p1=0.025*
				P=0.08	p2=0.123
					p3=0.497
Third reading	$104.95 \pm 12.96$	94.32±13.27	100.95±15.65	F=3.23	p1=0.014*
				P=0.046*	p2=0.347
					p3=0.121
Within group	pa=0.135	pa=0.001*	pa=0.002*		
significance ##	pb=0.850	pb=0.001*	pb=0.002*		
	pc=0.049*	pc=0.329	pc=0.109		

TABLE (3) Comparison of heart rate among studied groups.

F: One Way ANOVA test ## by Repeated Measures ANOVA test \*statistically significant

p1: difference between Tell Show Do (TSD) technique and Tell-Show-Play-Do (TSPD) technique, p2: difference between Tell Show Do (TSD) technique and Kaleidoscope Glasses, p3: difference between Tell-Show-Play-Do (TSPD) technique and Kaleidoscope Glasses

 $p_a$ : difference between first and second readings,  $p_b$ : difference between first and third readings,  $p_c$ : difference between second & third readings

# DISCUSSION

For pediatric dentists, managing dental anxiety of children, is an important procedure, since it is the primary factor for preventing children from receiving the proper dental treatment.<sup>19</sup> One of the most frequent causes of children's refusal of dental treatment is fear of injections, particularly painful IANB injections, which can negatively impact the child's behavior.<sup>20</sup>

According to Igna. 2021,<sup>21</sup> pulpotomy is the most common treatment in primary molars with cariously exposed pulps. A common clinical procedure in the primary with an extensive amount of caries is pulpotomy. Children with carious teeth requiring pulpotomy in lower primary molars were our concern upon comparing the three different management techniques efficacy.

Tell Show Do technique was used as a control group in this study as it is considered the most

used basic behavior management technique. It is almost considered the gold standard for behavior management techniques, this is in compliance with Vishwakarma et al. 2017,<sup>22</sup> and Ibrahim et al., 2023.<sup>17</sup>

Tell-Show-Do technique have a modification to Tell-Show-Play- Doh technique in which it is more effective than the traditional Tell-Show-Do method for reducing pulse rate and enhancing behavior, as in the study by Radhakrishna et al. 2019.<sup>23</sup> As playing with a Play-Doh dental model toy established a bridge for future communication, helped them get used to the dental setup, made them feel less anxious, and helped them be ready for additional sessions of treatment.

Kaleidoscope toy which is looked like a tube through which the child looked, was used in many studies such as Aditya et al. 2021,<sup>24</sup> TÜFENK et al. 2024,<sup>25</sup> and Anchala et al. 2024<sup>26</sup>. However, the difficulty of its use as the child's hand may hinder the accessibility during the dental procedures when he holds the toy. As a result, Kaleidoscope glasses was used in our study as a distraction method with more advantages as they give more accessibility to the dentist during the treatment procedures, also glasses are more applicable to be used and comfortable for the child instead of raising his/her hands to hold it along the procedures. There was no previous research in literature performed on Kaleidoscope as glasses. So, our study may be the first study using Kaleidoscope glasses as a distraction technique.

In our current study, children between the ages of four and six were chosen as an inclusion criterion. This age range was chosen in concurring with Sedky et al. 2024.<sup>27</sup> As children in this range age group are challenging to treat because of their more disruptive activity, they are the hardest to manage. At this age range from 4 to 6 years old, the child would be understanding enough to participate in the study and could be able to select the score of the RMS Pictorial scale properly.

All children had never visited a dental clinic before to be sure that, children included in this study were not exposed to any previous psychologically traumatic dental situation and their anxiety is related to their own fear not to any subjective fear. This inclusion criteria were confirmed in accordance with Lekhwani et al. 2023,<sup>28</sup> Shah et al. 2018,<sup>29</sup> Anthonappa et al. 2017.<sup>30</sup>

Children with definitely negative behaviors according to the Frankl scale were not included in this study. This criterion was selected in compliance with Kaya et al. 2022,<sup>31</sup> Altan et al. 2021,<sup>32</sup> Yıldırım et al. 2020,<sup>33</sup> and Abd Ellatif. 2018.<sup>34</sup> Children anxiety and behavior in the current research were assessed. The behavior of the child pre-operatively and post-operatively was evaluated by using Frankl behavior rating scale (FBRS). The children chosen for the study were with Frankl behavior ratings 2, 3, and 4 which came in accordance with Aggarwal et al. 2024.<sup>35</sup>

Face, Legs, Activity, Cry, and Consolability scale (FLACC) was used in this research during the local anesthesia administration and pulpotomy procedure to evaluate the behavior of the child as pain has a direct influence on behavior according to AAPD recommendations on behavior guidance in (2022).<sup>36</sup> Pulse oximeter was used in this study to assess the anxiety level as it measures pulse rate, using pulse oximeter also came in agreement with other studies such as Goyel et all. 2022,<sup>37</sup> Aditya et al. 2021.<sup>24</sup>

The child behavior improved according to (FBRS) at the end of the procedure with significant improvement in Tell-Show-Play-Doh (TSPD) technique group and Kaleidoscope glasses technique group as children in this two groups showed more cooperative behavior while, in Tell-Show-Do (TSD) technique group; there were more patients exhibiting negative behavior, so TSPD was the most effective technique for increasing the cooperative behavior and this came in agreement with Radhakrishna et al . 2019.<sup>23</sup>

The mean pulse rate decreased for all groups when anxiety was assessed using a pulse oximeter in the second reading after behavior management with the most significant reduction in Tell-Show-Play-Doh (TSPD) group followed by Kaleidoscope glasses group then Tell-Show-Do group and this was matched with study by Radhakrishna et al. 2019<sup>23</sup>, in which the second reading of heart rate was reduced than the first reading after behaviour management.

The third reading at the end of the visit in the Tell-Show-Play-Doh (TSPD) and Kaleidoscope glasses group was also reduced less than the first reading, but it was still higher than the second reading. In contrast, the third reading of heart rate in Tell-Show-Do(TSD) group was increased more than the first and the second reading and this may be due to lack of enjoyable time of playing, or using an attractive distraction technique during the procedures compared to ones used in other two groups which was matched with the study by Sedky et all. 2024<sup>27</sup>, in which the results for the Tell-Show-Do (TSD) group showed an increase in mean postoperative heart rate.

On the other hand, the result of Radhakrishna et al .2019<sup>23</sup>, argued our results as they found that the postoperative third reading of the heart rate was the least in all groups. This could be attributed to the treatment procedures as in Radhakrishna et al<sup>23</sup>, study where children were not exposed to local anesthesia injection since children's caries is restricted to enamel and two-thirds of dentin, they only have Class I or Class II lesions, which require a restoration without the use of local anesthetic were incorporated into the study. As a result, children were not exposed to invasive or painful procedures. In contrast, pulpotomy was the dental procedure in our study which is considered an invasive or painful procedure and needs the local anesthesia administration. So, children were exposed to stress causing more increase in heart rate postoperatively than preoperatively.

According to the FLACC scores, more children felt relaxed in the Kaleidoscope glasses group and the Tell-Show-Play-Doh groups as compared to the Tell-Show-Do group due to the distraction occurred by wearing Kaleidoscope glasses and the joyful method of illustration of the dental procedures and instruments by playing with The Play-Doh Doctor Drill 'n Fill toy set which helped in reducing dental anxiety and subsequently the postoperative pain, this outcome was consistent with Radhakrishna et al. 2019<sup>23</sup>, where higher FLACC score was detected among Tell-Show-Do (TSD) technique. Other studies such as Karakaya et al. 2016,<sup>38</sup> Kunjumon et al. 2018 <sup>39</sup> showed that, using a Kaleidoscope to manage pain during treatment processes was effective.

#### CONCLUSION

Both Tell-Show-Play-Doh and Kaleidoscope glasses techniques can be regarded as a successful strategy for reducing children's dental anxiety in children undergoing pulpotomy treatment.

# LIMITATIONS

The current study's findings cannot be extended to children displaying disruptive and definitely negative behavior in the dental clinic according to the inclusion criteria.

## REFERENCES

- Mortada A, King NM. A simplified technique for the restoration of severely mutilated primary anterior teeth. Int J Clin Pediatr Dent. 2004;28(3):187-192.
- Shah HA, Nanjunda Swamy KV, Kulkarni S, Choubey S. Evaluation of dental anxiety and hemodynamic changes (Sympatho-Adrenal Response) during various dental procedures using smartphone applications v/s traditional behaviour management techniques in pediatric patients. Int J Appl Res. 2017;3(5):429-433.
- Cushing SR. Have No Fear of the Dental Chair: A Guide for Reducing Dental Fear. Richer Press. 2016.
- Zulkipli AS, Alam MK, Patel ES, Haque S. A perceptual evaluation of resonance disorders in children with repaired unilateral cleft lip and palate in Hospital UniversitiSains Malaysia. Bangladesh J Med Sci. 2018;17(2):282-289.
- Alam MK, Zulkipli AS, Percival SE, Haque S. A perceptual evaluation of speech disorders in children with repaired unilateral cleft lip and palate in Hospital UniversitiSains Malaysia. Bangladesh J Med Sci. 2018 Jun;17(3):470-478.
- Seshadri VRA, Ramakrishnan M. Managing Anxiety In Children: The Role Of Oral Sedation In Pediatric Dentistry. Journal of Population Therapeutics and Clinical Pharmacology. 2023; 30(10):502-514.
- Koticha P, Katge F, Shetty S, Patil DP. Effectiveness of virtual reality eyeglasses as a distraction aid to reduce anxiety among 6-10- year-old hildren undergoing dental extraction procedure. Int J Clin Pediatr Dent. 2019;12(4):297-302.
- Asl Aminabadi N, Erfanparast L, Sohrabi A, Ghertasi Oskouei S, Naghili A. The impact of virtual reality distraction on pain and anxiety during dental treatment in 4-6 year-old children: a randomized controlled clinical trial. J Dent Res Dent Clin Dent Prospects. 2012;6(4):117-124.
- Lavanya S, PonnuduraiArangannal, Jeevarathan J, Amudha S, AarthiJ, Vijayakumar M. Key Stone Entity in Paediatric Dentistry: Tell Play Do. Indian J of Forensic Medicine & Toxicology. 2020;14(4):1073-1075.

- Shekhar S, Suprabha BS, Shenoy R, Rao A, Rao A. Effect of active and passive distraction techniques while administering local anaesthesia on the dental anxiety, behaviour and pain levels of children: a randomised controlled trial. Eur Arch Paediatr Dent. 2022;23(3):417-427.
- 11. Gs G, George S, Anandaraj S, Sain S, Jose D, Sreenivas A, Pillai G, Mol N. Comparative Evaluation of the Efficacy of Virtual Reality Distraction, Audio Distraction and Tell-show-do Techniques in Reducing the Anxiety Level of Pediatric Dental Patients: An In Vivo Study. Int J Clin Pediatr Dent. 2021;14(2):173-178.
- Aitken JC, Wilson S, Coury D. The effect of music distraction on pain, anxiety and behaviour in Pediatric dental patients. Pediatric Dent. 2002;24(2):114-118.
- Singh D, Samadi F, Jaiswal JN, Tripathi AM. Stress reduction through audio distraction in anxious pediatric dental patients: an adjunctive clinical study.Int J Clin Pediatr Dent. 2014;7(3):149-152.
- Srouji R, Ratnapalan S, Schneeweiss S. Pain in children: assessment and nonpharmacological management. Int J Pediatr. 2010;2010.
- Koç Özkan T, Polat F. The Effect of Virtual Reality and Kaleidoscope on Pain and Anxiety Levels during Venipuncture in Children. J Perianesth Nurs. 2020;35(2):206-211.
- Kar S, Samir PV, Pattanaik A. Anxiety Rating Scales in Pediatric Dentistry. International Journal of Science and Research. 2022;11(12):602-608.
- Ibrahim RA, El Taweel SB, Mahmoud SA, Elchaghaby MA. Effectiveness of the tell-play-do technique in comparison to the tell- show-do technique for the management of anxious children: A randomized controlled trial. Advanced Dent J. 2023;5(2):230-242.
- Kumprasert P, Prapansilp W, Rirattanapong P. Video games, audiovisual, and conventional distractions for pediatric dental patients: A crossover randomized controlled clinical trial. Mahidol Dental Journal. 2021;41(3):225-234.
- Shukla H, Kulkarni S, Wasnik MB, Rojekar N, Bhattad D, Kolekar P. Acceptance of parents for behavior management technique with reference to previous dental expertise and dental anxiety. International Journal of Clinical Pediatric Dentistry. 2021;14(2):193-198.
- Dean JA, editor. McDonald and Avery's Dentistry for the Child and Adolescent-E-Book. Elsevier Health Sciences. 2021;326–330.

- Igna A. Vital Pulp Therapy in Primary Dentition: Pulpotomy—A Year Challenge. Children. 2021; 8(10): 841-847.
- Vishwakarma AP, Bondarde PA, Patil SB, Dodamani AS, Vishwakarma PY, Mujawar SA. Effectiveness of two different behavioral modification techniques among 5-7-year-old children: A randomized controlled trial. J Indian Soc Pedod Prev Dent 2017;35(2):143-149.
- Radhakrishna S, Srinivasan I, Setty JV, D R MK, Melwani A, Hegde KM. Comparison of three behavior modification techniques for management of anxious children aged 4-8 years. J Dent Anesth Pain Med. 2019;19(1):29-36.
- Aditya PVA, Prasad MG, Nagaradhakrishna A, Raju NS, Babu DN. Comparison of effectiveness of three distraction techniques to allay dental anxiety during inferior alveolar nerve block in children: A randomized controlled clinical trial. Heliyon. 2021;7(9).
- TÜFENK N, BÜYÜK ET. The Effects of Virtual Reality and Kaleidoscope on Pain and Fear During Blood Draw in Children: A Randomized Controlled Trial. Bezmialem Science. 2024;12(1):63-70.
- 26. Anchala K, Tirumala V, Saikiran KV, Elicherla NR, Rahul S, Nuvvula S. Efficacy of kaleidoscope, virtual reality, and video games to alleviate dental anxiety during local anesthesia in children: a randomized clinical trial. J Dent Anesth Pain Med. 2024;24(3):195-204.
- Sedky MM, Waly NG, Samee PNA. Mobile App versus Tell-Show-Do Technique in Reduction of Anxiety and Pain during Administration of Local Anaesthesia in Children: A Randomized Clinical Trial. Advanced Dental Journal. 2024;6(1):1-13.
- Lekhwani PS, Nigam AG, Marwah N, Jain S. Comparative evaluation of Tell-Show-Do technique and its modifications in managing anxious pediatric dental patients among 4-8 years of age. J Indian Soc Pedod Prev Dent. 2023;41(2):141-148.
- Shah U, Bhatia R. Effectiveness of Audiovisual Distraction Eyeglass Method Compared to Tell-Play-do Technique among 4–7 year-old Children: A Randomized Controlled Trial. Int J Oral Care Res. 2018;6(2):1-7.
- Anthonappa RP, Ashley PF, Bonetti DL, Lombardo G, Riley P. Non–pharmacological interventions for managing dental anxiety in children. Cochrane Database Systematic Reviews. 2017;2017(6).

- Kaya E, Yıldırım S. Effect of a needle–free system versus traditional anesthesia on pain perception during palatal injections in children. International Journal of Paediatric Dentistry. 2022;33(2):132-140.
- 32. Altan H, Belevcikli M, Coşgun A, Demir O. Comparative evaluation of pain perception with a new needle-free system and dental needle method in children: a randomized clinical trial. BMC anesthesiology. 2021;21(1):1-8.
- 33. Yıldırım S, Tokuç M, Aydın MN. The effect of preanesthesia with a needle-free system versus topical anesthesia on injection pain of the inferior alveolar nerve block: a randomized clinical trial. Clinical Oral Investigations. 2020;24(12):4355-4361.
- Abd Ellatif E. Comparison Between needle-less injection system and Conventional injection Technique to Perform anesthesia In Children: A Randomized Clinical Trial. Egyptian Dental Journal. 2018;64(3):1981-1985.
- 35. Aggarwal P, Mathur S, Chopra R. Assessment of Medical Clowning in Influencing the Anxiety and Behavior Scores

of Children Undergoing Various Dental Treatments and the Stress Levels of the Operator.

- 36. American Academy of Pediatric Dentistry. Behavior guidance for the pediatric dental patient. The Reference Manual of Pediatric Dentistry Chicago, Ill: American Academy of Pediatric Dentistry. 2022:321-339.
- Goyel V, Mathur S, Dhingra N, Nair U, Singh S, Phukan AH. Evaluation of Different Pre-treatment Behaviour Modification Techniques in 4–7-year Olds: A Randomised Controlled Trial. Indian Journal of Dental Research. 2022;33(1):58-62.
- Karakaya A, Gözen D. The Effect of Distraction on Pain Level Felt by School-age Children During Venipuncture Procedure--Randomized Controlled Trial. Pain Manag Nurs. 2016;17(1):47-53.
- Kunjumon D, Upendrababu V. Effect of kaleidoscope on pain perception of children aged 4-6 years during intravenous cannulation. American Journal of Nursing Science. 2018;7(4):137-142.