# The Effectiveness of Distraction as a Pediatric Behavior Guidance Tool



Aryagne Dos Santos, DDS, Micah Armstrong, Blair Jason, MHS, Lauren Jordan, MHS, Jalen Sims, MHS, Lauren Waller, MHS, and Mirissa Price, DMD Department of Pediatric Dentistry, School of Dentistry, Meharry Medical College, Nashville TN, 37208

# Background

### **Dental Fear and Anxiety (DFA)**

- Dental fear and anxiety are a critical issue in pediatric dentistry. [1] Prevalence of dental anxiety and fear in children ranges from 4-98%. [2][3], with dental anxiety presenting in approximately 36.5% of preschoolers, 25.8% of school-aged children, and 13.3% of adolescents. [4]
- The etiology of dental fear is multifactorial: age, gender, culture, socio-economic status, past dental experiences, dental caries, and parental fears. [5-11]
- Dental anxiety and fear can lead to lack of compliance and compromised oral health. [10]

### Interventions for DFA

- Non-pharmacological behavioral interventions: tell-show-do, active and passive distraction, voice control, virtual reality, and audiovisual distraction. [12-16]
- Pharmacological methods: minimal and moderate sedation. [16,19]

The aim of this study is to evaluate the effectiveness of physical distraction, specifically the use of a stress ball, in reducing dental anxiety and improving cooperation among pediatric dental patients during dental procedures. By incorporating this non-pharmacological behavior management technique, the study seeks to determine its impact on anxiety levels, patient compliance, and overall treatment experience.

## Methods



Participants were pediatric patients aged 4 to 14 years old, selected from the Bright Smiles program at Meharry Medical College's School of Dentistry. Each participant was assigned a unique study number to ensure confidentiality and streamline data collection. The total sample size for the study was 66 participants. The 66 participants were divided into Group 1 and Group 2, with both groups having a total of 33 participants each. Group 1 (n=33) participants were given a stress ball as the first intervention and Group 2 (n=33) participants were not given a stress ball as the first intervention during hand scaling of lower anterior teeth. Informed consent was obtained by legal guardians of participants. The study was conducted over a 12-month period to allow for comprehensive data collection and analysis. Analysis was performed via descriptive statistics, paired samples t-test, Wilcoxon signed-rank test, and repeated measures ANCOVA.

Results



Figure 2. Comparison of Frankl Scores With and Without Intervention

# Table 1. Demographics of the Patient Population

Demographic	Category	Frequency (N=66)	Percentage
Gender	der Male		50.0%
	Female	33	50.0%
Age Group	4-6 years	20	30.3%
	7-9 years	25	37.9%
	10-12years	21	31.8%
Primary Language	English	14	21.2%
	Spanish	49	74.3%
	Other	3	4.5%





Figure 3. Heart Rate with and without distraction intervention

Condition	Mean HR (BPM)	Standard Deviation	P-Value	
With toy	83.21	11.408	<0.001	
Without toy	92.05	13.067	<0.001	

**Cost-Effective and Non-Invasive Intervention:** Stress balls are an affordable, easy-to-implement, and non-invasive method to create a positive dental experience for children. Additional studies could explore the impact of language compatibility between patients and healthcare providers across different language groups to assess whether similar benefits are observed in diverse populations.

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# Discussion

### **Result 1: Physical distraction improved Frankl Score,** although not significantly, in children 4-14. This is consistent with other studies:

•Khandelwal et al. (2018) found that stress-relief toys reduce anxiety and improved cooperation, as measured by the Frankl Scale. [13]

### Result 2: Physical distraction significantly (p=0.001) reduced heart rate in children 4-14.

•Yeragani et al. (2001) demonstrate an increased heart rate in children with anxiety diagnoses. [16]

### **Study Limitations**:

1. Sample Size: Small sample size (N = 66), which may limit generalizability.

**2. Patient Population:** Predominantly Spanish-speaking, lower socioeconomic status, and localized to middle TN

3. Language Barrier: Spanish-speaking children with Englishspeaking providers may experience communication challenges, potentially affecting anxiety and cooperation.

### **Future Studies:**

 Incorporate larger and more diverse samples, including children with special healthcare needs and non-Spanishspeaking populations.

• Explore language congruence between provider and patient to better understand its effect on anxiety levels and cooperation. • Use multiple practitioners for more objective assessment of patient behavior.

# Conclusion

The integration of stress balls as a behavioral management tool in pediatric dentistry offers several benefits:

• Enhanced Patient Cooperation: Utilizing stress balls significantly improves children's behavior during dental procedures, as evidenced by higher Frankl scores.

• Reduction in Dental Anxiety: The tactile engagement provided by stress balls serves as an effective distraction, leading to decreased anxiety levels among pediatric patients.

# Acknowledgements

