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Children's perspective on color, smell and flavor of toothpaste

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ABSTRACT

Background: Tooth brushing must be done to prevent dental caries, but many children resist tooth brushing because of sensory aversions to toothpaste. As children's oral hygiene compliance relies heavily on enjoyment, it is important to know their preferences regarding toothpaste color, odor, and taste. Research indicates that attractive sensory traits can have a great impact on brushing frequency and duration in children.

Objective: To assess children's perspective on sensory attributes of toothpaste namely: color, flavor and smell of toothpaste.

Methods: It is a descriptive cross-sectional study which included 140 students studying in Zenith National Academy, Janakpurdham. The questionnaire along with the consent form, ascent form and information sheet were sent to the parents along with the students to fill the form. The data was analyzed using SPSS. Data were analyzed for frequencies, percentage, mean and standard deviation and presented in form of table.

Results: The main reasons for selecting a particular toothpaste were taste (44%) and cleaning effectiveness (61%), followed by brand loyalty and advertisements. When asked about the most important attribute of toothpaste, most children prioritized how well it cleans their teeth, though sensory factors like taste and color still influenced their satisfaction and motivation. Over half of the children believed that kids' toothpaste should taste like candy and be different from adult toothpaste, reflecting a desire for enjoyable and distinct flavors.

Conclusions: Children prefer red color, sweet taste and minty smell in their toothpaste. Primary motivation in brushing remains maintenance of "clean teeth" even in children.

INTRODUCTION

Maintenance of disease-free oral cavity involves use of various aids like brushing, flossing and oral rinses for achieving good oral hygiene. Most common and simplest method of mechanical plaque removal is via teeth brushing which comprises of two components: tooth brush and toothpaste. It is recommended that toothbrushing should be started in children with eruption of first primary teeth in oral cavity.[1] Adherence to regular brushing habit largely depends on sensory perception of toothpaste in children; namely flavor, color and smell. Good experience with toothpaste can have positive impact of inducing lifelong oral hygiene practice; thus understanding children's perspective and preference can help create child friendly products.[2] Various studies have suggested that children usually get excited by vivid colors while adherence to act of regular brushing requires mild and soothing flavor of toothpaste.[3] While sensory properties of toothpaste are important, achieving these features should not compromise the safety and health features of the product.

The purpose of this study was to assess children perspective of flavor, color and smell of contemporarily available toothpaste in Janakpurdham which gives insight to whether these toothpastes are preferred by children or there is a need of more customized products which can cater to child's need and ultimately make tooth brushing a joyful and awaited event of the day with long-term impact on oral health.

METHODS

The present study was a descriptive cross-sectional study conducted among students of Zenith National Academy, Janakpurdham. All the students of age group 10-16 years belonging to same school and whose parents filled the ascent

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form were included in the study. Ethical clearance for the study was obtained from Madhesh Institute of Health Sciences (MIHS-IRC/081/082-012).

First of all, permission to conduct the study was taken from the school authorities. The questionnaire along with the consent form, ascent form and information sheet were sent to the parents along with the students to fill the form. The next day the students who came along with the consent and ascent participated in the study. In total 140 students participated in this study.

All the patients received a participant information sheet, and informed consent was obtained before data collection. The data were entered into Statistical Package for Social Sciences (SPSS) version 21 for Windows (SPSS Inc, Chicago, IL) for final analysis and interpretation. Data were analyzed for frequencies, percentage, mean and standard deviation and presented in form of table.

RESULTS

A total of 140 students participated in the study where nearly all participants (97.9%) reported brushing their teeth with toothpaste indicating awareness of oral hygiene practices among children. 60.7% students had no experience of herbal toothpaste use while popularity of colgate brand was found to be more with almost 2/3rd of participants (64.3%) favoring it. Some diversity was seen in brand selection with 19.3% participants using other local brands of toothpaste; 12.9 % participants using Pepsodent and 3.6% participants using closeup toothpaste. Determining factor for specific choice of toothpaste was found to be taste in 44.3 % students; known brand in 25.7% of students while, 21 i.e15% students were influenced by advertisement. Only 19 students (13.6%) were using dentist recommended toothpaste (Table 1).

Red (49.3%) followed by white (22.1%) were found to be most preferred toothpaste colors. The majority of children (95.7%) liked the color of their toothpaste, and 85.7% participants reported that an appealing color motivated them to brush more frequently. Mint was the most favored smell ((42.9% participants) followed by light (35.7%) and fruity scents (5.7%). 117 students (83.6%) reported that they were fond of smell of their toothpaste while 23 students (16.4%) didn't prefer smell of their toothpaste (Table 1).

Peppermint and cloves flavor were reported as most common tastes in toothpastes used by students (28.6% of participants) while 20% of students could not appreciate any flavor in their toothpaste. High proportion of participants (94.3%) expressed a liking for the taste of their toothpaste. When asked about important toothpaste attributes, most children (61.4%) valued how well it cleans their teeth over color (12.9%), smell (6.4%), or taste (19.3%). Out of 140 students, 89 students believed that taste of their toothpaste should be like that of candy while 51 students did not prefer that. Although majority of students (53.6%) thought that kid's toothpaste should be different than the adults, but 60.7 % participants answered that would not brush more even if the toothpaste matched their preferred color, taste, and smell. 80% of participants reported using a pea-sized amount of toothpaste (Table 1).

Table 1: Assessment of children's perspective on color , smell and flavour of toothpaste

Distribution of response		Frequency	Percent
Do you brush your teeth with toothpaste?	Yes	137	97.9
	No	3	2.1
What is the brand of toothpaste you are using now?	Colgate	90	64.3
	Pepsodent	18	12.9
	Close-up	5	3.6
	Others	27	19.3
What is the reason behind choosing the present toothpaste?	Taste	62	44.3
	Advertisement	21	15.0
	Dentist's recommendation	19	13.6
	Cost	2	1.4
	Brand	36	25.7
What is the color of your toothpaste?	Blue	16	11.4
	Red	69	49.3
	White	31	22.1
	Green	5	3.6
	Others	19	13.6
Do you like the color of your toothpaste?	Yes	134	95.7
	No	6	4.3
Do you like to brush more due to the color of your toothpaste?	Yes I like to brush more	120	85.7
	Yes but little bit	17	12.1
	No	3	2.1
What is the smell of your toothpaste?	Light	50	35.7
	Mint	60	42.9
	Fruits	8	5.7
	No smell	22	15.7

Do you like the smell of your toothpaste?	Yes	117	83.6
	No	23	16.4
What is the taste of your toothpaste	Peppermint	40	28.6
	Cloves	40	28.6
	Strawberry	3	2.1
	Tasteless	28	20.0
	No taste	29	20.7
Do you like the taste of your toothpaste	Yes	132	94.3
	No	8	5.7
What is more important in toothpaste?	Colour	18	12.9
	Smell	9	6.4
	Taste	27	19.3
	How much does it cleans my teeth	86	61.4
Do you think kids toothpaste should taste as candy?	Yes	89	63.6
	No	51	36.4
Do you think kids toothpaste should be diffetrent than adults?	Yes	75	53.6
	No	22	15.7
	I don't know	43	30.7
Do you ever brush your teeth if your toothpaste was according to your color, taste and smell?	Yes	55	39.3
	No	85	60.7
Do you know about kid's toothpaste	Yes	87	62.1
	No	53	37.9
How much toothpaste do you use?	Pea size	112	80.0
	Toothbrush length	22	15.7
	I don't care	6	4.3
Have you ever used herbal toothpaste	Yes	55	39.3
	No	85	60.7

DISCUSSION

Brand dominance of colgate found in our study (64.3%) was comparable to study by choudhari et al[2] (46%) where choice of particular brand was found to be independent decision by participants(43 %) with minority participants influenced by friends(19 %) and TV commercials(21 %). Brand dominance could be based purely on parental preferences .

European archives of pediatric dentistry (EAPD)[4] recommended using dentifrice with low fluoride concentrations (less than 500 ppm) for children who are below the age of six. While Scottish intercollegiate guideline network (SIGN – 2005)[5] recommends using 1000 ppm of fluoride irrespective of age followed by spitting rather than rinsing. These recommendations aim to reduce incidence of dental fluorosis affecting unerupted and erupting teeth in children less than 6 years of age. Many children lack fine manual dexterity required and fail to expectorate toothpaste after brushing. Thus, a pea size amount of toothpaste is recommended while brushing in children of age between 3 to 6 years old to prevent dental fluorosis[6]. 80% of our participants were found to adhere to this recommendation. While, in study by Choudhari et al[2]; only 24% participants were using “pea-sized” quantity with all remaining participants using toothpaste in excess amount.

Awareness regarding kid’s dentifrice was found to be satisfactory with, majority of participants(62 %) using kids toothpaste which varied from the study by Bennadi[1] et al and Chandra et al[7] where 72% of the mothers used adult tooth pastes to brush their children’s teeth.

Children are attracted to vivid colors, which can increase their degree of excitement about the use of toothpaste. Color-changing toothpaste, being of changing color, can offer an exciting visual experience, which can make the experience more attractive to children.[3] Variations occur in attention to any product with difference in color of the product where warm colors seem to have a stimulating power in comparison to cold colors.[8] Studies indicate that red and pink are two of the most sought-after colors for oral care products, which can suggest that these colors are associated with positive expectations and high acceptability.[2] This observation was also found in our study where red and white were the most preferred toothpaste colors with majority (85.7% participants) stating that color makes them motivated for brushing.

Flavor plays an important role in gaining the acceptance of children. Children's toothpaste typically has mild and non-irritating flavor like clove oil and oleum menthae, so they are the best for young users.[9]The pleasant flavor of the toothpaste also makes brushing more enjoyable and therefore, it is often used.[10]Mint was found to be most favoured smell in our study followed by light and fruity smell. . Most children enjoyed the smell of their toothpaste, which may enhance the brushing experience. The study by choudhari et al[2] found that children prefer sweet taste in their toothpaste(50% participants);similar result was found in our study with 63.6% participants preferring their toothpaste to taste like candy.

Despite various preferences towards color, taste and flavor of toothpaste ,the primary reason for choosing a particular toothpaste was found to be " how well it cleans teeth" (61.4%)

followed by taste (19.3%) and color (12.9 %). This highlights the importance of both sensory appeal and functional benefits in product selection. Prioritization of cleaning efficacy of toothpaste over sensory characteristics like color, smell, or taste indicates a practical understanding of oral hygiene benefits. Despite the emphasis on cleaning, sensory factors remain influential in product satisfaction and motivation to brush.

CONCLUSION

This study aimed to assess children's perspective on sensory attributes like color, smell and flavor of their toothpaste with goal of understanding their choices. The study revealed that children's toothpaste preferences are shaped by a combination of sensory appeal and perceived cleaning effectiveness. While taste, color, and smell are important for product enjoyment, the primary motivation remains oral hygiene in adhering to routine of tooth brushing.

CONFLICT OF INTEREST: None

FINANCIAL DISCLOSURE: None

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AUTHORS CONTRIBUTION: Concept and design: RC and RS; data collection and statistical analysis: PKY, SG, RS and RC; writing of the manuscript: RS and PKY; monitoring and supervising the research finalizing the manuscript: AP, SG, RS and RC; and all authors read and agreed with the contents of the final manuscript.

AVAILABILITY OF DATA AND MATERIALS: The datasets used and analyzed for the study are available from the corresponding author upon reasonable request

REFERENCES:

1. Bennadi D, Kshetrimayum N, Sibyl S, Reddy CVK. Toothpaste utilization profiles among preschool children. J Clin Diagn Res JCDR. 2014;8(3):212. **https://doi.org/10.7860/JCDR/2014/7309.4165**
2. Choudhari S, Gurunathan D, Kanthaswamy AC. Children's perspective on color, smell and flavor of toothpaste. Indian J Dent Res. 2020;31(3):338-42. **https://doi.org/10.4103/ijdr.IJDR_363_18**
3. Vijayakumar P, Mahesh J, Prasad SV, Indrapriyadharshni G, Karthikeyan R, Revanth MP. Reason for Preference of Toothpaste among Buyers - A Cross-sectional Survey. J Prim Care Dent Oral Health. 2024 Aug;5(2):56. **https://doi.org/10.4103/jpcdoh.jpcdoh_9_24**
4. Gugnani N, Gugnani S. Can plaque-identifying toothpastes inspire better oral hygiene among orthodontic patients?. Evidence-Based Dentistry. 2025 May 16:1-2. **https://doi.org/10.1038/s41432-025-01159-y**
5. Scottish Intercollegiate Guideline Network. Prevention and management of dental decay in the pre-school child - a national clinical guideline. Edinburgh: NHS Quality Improvement Scotland, SIGN 83, 2005. **http://www.sign.ac.uk/pdf/sign83.pdf**
6. Edem AP. Early childhood caries update. Dent Caries-Diagn Prev Manag. 2018;79-96. **https://doi.org/10.5772/intechopen.76300**
7. Chandra HS, Ingaleshwar PS, Britto F, Shetty J VR, Kakarla P, Udupa R. Knowledge, Attitude, And Practices of Parents Regarding Kid's Dentifrices in Sullia City, Karnataka, India-A Questionnaire Study. Journal of Pharmaceutical Negative Results. 2022 Oct 6;13. **https://doi.org/10.47750/pnr.2022.13.S05.116**
8. Gollety M, Guichard N. The dilemma of flavor and color in the choice of packaging by children. Young Consum. 2011;12(1):82-90. **https://doi.org/10.1108/17473611111114803**
9. Vieira TI, Mangabeira A, Alexandria AK, Ferreira DMTP, Fidalgo TKDS, Valença AMG, et al. Does flavoured dentifrice increase fluoride intake compared with regular toothpaste in children? A systematic review and meta-analysis. Int J Paediatr Dent. 2018 May;28(3):279-90. **https://doi.org/10.1111/ipd.12354**
10. Dani V. Buying behavior of toothpaste in Urban India: A study on Pune city. Pac Bus Rev Int [Internet]. 2013 [cited 2025 Jul 8];5(11).