Impact of Parenting styles on the Sexual awareness and dating behaviour in Teenagers in India : A case study in Lucknow

by Jana Publication & Research

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Assessment of Novel sensory technique for managing gingivitis in visually impaired children- A randomized control trial on smell and taste.

Abstract

Children with visual disability struggle to practice oral hygiene due to limited access to visual sense, resulting in a higher prevalence of plaque-induced gingivitis. Traditional oral hygiene procedures rely on visual sense, which limits their effectiveness. The current study aims to assess the efficacy of flavored dentifrices in promoting oral hygiene by sensory stimulation, notably aroma and taste.

Methods

The study was conducted at AME Dental College and Hospital in Raichur, Karnataka, India. 62 visually impaired children (aged 6-14 years) were involved in a double-blind, parallel-group, randomized clinical investigation according to CONSORT guidelines. Participants were allocated at random to one of either the study group, which received flavored toothpaste (Pediflor® Kids), or the control group, which received unflavored toothpaste. The plaque index (PI) and gingival index (GI) were measured at baseline, 30 days, and 90 days. The data was analyzed using SPSS software, with statistical significance defined as p-values < 0.05.

Results

When unpaired t test is performed both groups resulted in a decrease in plaque and gingivitis scores over follow up. However, the flavored toothpaste group showed considerably higher decreases in GI and PI at 30 and 90 days ($p<0.05$). There were no adverse consequences noted.

Conclusion

Flavored toothpaste enhances oral hygiene in visually challenged youngsters by promoting sensory engagement. It improves compliance and brushing efficiency, making it a feasible option for controlling gingivitis in this population.

Original research manuscript

Introduction

The primary means of interpreting our surroundings is through our vision, and when it is compromised in early life, it can negatively impact a child's physical, neurological, cognitive, and emotional development[1]. Over 1.4 million children globally are thought to have vision impairments, with India having the biggest population (15 million) [2].Visually impaired children frequently encounter difficulties in their daily lives including tooth brushing which leads to plaque accumulation. Removal of plaque is an essential component of dental practice that ensures the long-term success of periodontal and dental care[3]. Brushing your teeth on a daily basis is vital for optimal oral wellness, recommended by the Centers for Disease Control and Prevention (CDC).Mechanical aids for plaque elimination or management include toothbrushes, dental floss, mouth rinses, and dentifrices[4]. Plaque removal through mechanical aid is a common and user-friendly way of treating plaque and gingivitis[5]. Visually impaired children struggle more than normally sighted youngsters to maintain appropriate dental hygiene, resulting in gingivitis, periodontal issues, and tooth loss.

The prevalence of gingivitis is higher among those with disabilities who have continuously poorer oral hygiene. Since brushing the teeth is the most popular way to maintain good oral hygiene, dentifrices are the best way to provide antibacterial agents daily. These chemotherapeutic agents are intended to have a prophylactic effect on gingivitis and cavities. Traditional approaches to maintaining oral hygiene rely primarily on visual perception and the use of disclosing agents to demonstrate plaque that can be eliminated by brushing teeth. These agents are frequently re-displayed regularly to track the children's progress in improving their oral hygiene condition.However, this method of maintenance for oral hygiene practices cannot be achieved in Visually Impaired children. Children who are visually challenged learn brushing skills better by feeling and hearing and by the good taste and aroma of dentifrices they use[6]. The visually impaired population's acquisition of information abilities are limited since these kids rely largely on sound, speech, touch, smell, and taste to navigate their surroundings.[7].

One such method for oral hygiene maintenance is the use of flavored dentifrices and as well as the good aroma of it. The natural flavors should be used in the dentifrices to make a kid feel the original taste of daily consumables like fruits and vegetables. The current study

involves the comparison of flavored and unflavoured toothpaste in plaque and gingivitis reduction.

Methodology

The current investigation is a double-blind, parallel-group, randomized controlled clinical experiment. The study was carried out at AME Dental College and Hospital from June 2, 2024 to January 15, 2025.The oral screening was carried out on 62institutionalized visually impaired school children of 6–14 years. All 62 children had plaque-induced gingivitis, which was diagnosed using the American Academy of Periodontology (AAP) recommendations. Hence all 62 children were included under the sample size.

The Institutional Ethics Committee of AME Dental College and Hospital in Raichur, Karnataka, provided ethical permission before the study began. The study is registered with India's clinical trial registration. The study was carried out in accordance with CONSORT (Flowchart 1) standards and is registered in the Clinical Trial Registry of India (CTRI/2025-02/080966). The parents or legal guardians of the students from the residential school for the blind provided their consent once the study's design and goal were presented to the school administration. To establish a strong rapport and mutual understanding with the youngsters, an interactive session was held at the start of the study. Students' personal information, including name, age, and gender, as well as a questionnaire that evaluated their understanding of oral hygiene procedures and regularity of dental visits, were recorded using a self-designed format[8].

The study involved children aged six to fourteen years. Furthermore, they had to have mild to moderate gingivitis, as determined by a thorough clinical examination. The study included children with partial or complete visual impairment, including blind and low-vision individuals. The study comprised participants who had not had any periodontal therapy within the previous six months.

Children with advanced periodontal disease were excluded, as were those with any systemic illness, such as diabetes or immunocompromised conditions, which could have an impact on dental health. Furthermore, children who were taking medications that could impact gingival health, such as anticonvulsants and immunosuppressants, were incapable to participate. Finally, participants with a history of allergies to toothpaste chemicals, particularly flavoring compounds, were excluded from the study.

All patients' gingival index (according to Loe and Silness,1963) and plaque index (according to Silness and Loe,1964) were measured and recorded at their school while seated in a normal chair, under good lighting, and using a sterilized mouth mirror and CPI probe while wearing disposable gloves and masks to prevent cross infection. All examinations were carried out by the same experienced professional investigator (Figure 1). Plaque Index (PI) was determined using the disclosing dye solution. The revealing dye solution was transferred to a new cotton swab, well saturated, and gently applied to the tooth surfaces. The surplus solution was removed by allowing the individuals to rinse with tap water once, and the PI was measured. Patients were randomly allocated to a study group (flavored toothpaste) and a control group (unflavored toothpaste); both received full mouth scaling and were educated on a home oral hygiene method based on the Fones Circular brushing method, which has greater neuromuscular control in children and is also easier to use than other brushing techniques (Figure 2).

The trial participants were instructed to brush their teeth twice a day with a commercially available flavored toothpaste (Pediflor® Group Pharmaceuticals Kids, India), which came in four different flavors: melon, bubble gum, green apple, and orange. To keep things interesting, the youngsters were requested to switch flavors every other day, whereas the control group was given commercially available unflavored toothpaste (Enafix®, Group Pharmaceuticals, India) and told to clean their teeth twice a day. Neither the investigator nor the patients were informed of their group assignment. Every patient was urged not to use any other toothpaste and to report any side effects. The same expert investigator measured PI and GI at 30 and 90 days, respectively.

Statistical Analysis

IBM SPSS software version 20. O (Armonk, NY: IBM Corp., USA) was used to evaluate the statistical assessment data after it was uploaded into a Microsoft Excel spreadsheet. The mean and standard deviation values were shown along with the numerical data. If the test's p-value is less than 0.05, it is considered statistically significant. An unpaired t-test is used to compare groups, and the Shapiro-Wilks test is used to determine whether the data set is normal.

Result

The study included 30 patients with a mean age of 10 ± 4 years. Table 1 indicates the Comparison of mean GI and SD between 2 groups at 0,30 and 90 days The baseline GI scores

showed no apparent variation between groups 1 and 2. At the 0 and 30-day time intervals, both groups' GI ratings decreased gradually. The toothpaste utilized provided the foundation for the discovery, which showed the mean GI at various time points. The GI did not alter significantly after using unflavored toothpaste. In group 1, the GI was 2.74 + 0.39 at baseline and 1.64 ± 0.33 after 30 days. Group 2 had a GI of 2.79 ± 0.24 at baseline and 2.03 ± 0.37 after 30 days of treatment. At 0 and 30 days, there was a discernible difference between groups. Using Flavoured and unflavoured toothpaste did not cause any negative side effects during the experiment.

Table 2 indicates the Comparison of mean PI and SD between 2 groups at 0,30 and 90 days. The baseline PI values showed no prominent variation between groups 1 and 2. The PI scores in both groups decreased gradually at the 0 and 30-day time intervals. The toothpaste used was the foundation for the discovery, which showed the mean PI at various time points. PI did not significantly alter after using unflavored toothpaste. For group 1, the PI was 1.94 + 0.22 at baseline and 1.78 ± 0.26 after 30 days. Group 2's PI was 1.93 ± 0.34 at baseline and 1.92 ± 0.24 after 30 days. At 0 and 30 days, there was a noticeable difference between Groups 1 and 2.

Discussion

Dental caries, periodontal problems, and tooth loss are some of the oral diseases that can have a significant impact on a person's overall health. Because of their enormous incidence and prevalence worldwide, these disorders are regarded as serious health risks, even among specially abled youngsters. Plaque accumulates faster in the primary and mixed dentitions in children than in adults[9]. In kids, the key factors responsible for lowering the efficacy of mechanical toothbrush-aided removal of plaque include lack of enthusiasm to brush, inadequate toothbrushing methods, and inadequate motor dexterity[10,11]. But the biggest obstacle faced by those with disabilities has been the societal misconception that they are a "breed apart," as they have traditionally been disregarded, or even kept secret in institutions and homes. It will be difficult to provide health care services for people with the unique medical requirements of these disabled people[12]. For children with visual impairments, maintaining dental hygiene requires a dentifrice and a high-quality bristle toothbrush.In addition to toothbrushes, toothpaste is still the cornerstone of oral hygiene and is regarded as the major additive for controlling plaque in general. Dentifrices, which come in a variety of forms and have additional beneficial effects, are mainly thought of as a way to administer

flavor for the easy and tasty experience of toothbrushing. In our study to obtain patient compliance and increase the efficiency of toothbrushing various commercially available flavored toothpaste have been used. The natural flavor of daily consumables like the flavor of melon, orange, bubble gum and green apples would have a better taste in dentifrices. This flavored toothpaste has shown better acceptance from children and has been liked by all the samples of the group due to which group F has shown a significant reduction in the Gingival index thus showing better oral hygiene.

The primary cause of gingival irritation is dental plaque. If treatment is not received, chronic gingival inflammation may worsen into the more damaging stages of periodontitis and cause tissue damage. Controlling plaque and gingivitis so contributes to the preservation of a healthy oral cavity. Flavored toothpaste and toothbrushes can be used to mechanically control plaque in an efficient manner[13]. Mechanical plaque control requires patient cooperation and motivation, hence chemical plaque control is utilized to get the necessary results[14]. However, it should be appropriate for visually impaired children[15]. Our research found that using flavored toothpaste results in a considerable reduction in the gingival index and plaque index.

The current study is the first to evaluate the efficacy of flavored toothpaste in visually impaired children based on taste and aroma[16]. However, Anju Merin Koshy et al[17]When the anti-plaque efficacy and consumer happiness of herbal toothpaste were compared to commercially available non-herbal toothpaste, it was observed that herbal toothpaste had higher consumer satisfaction and a lower plaque and gingival index score. Jayashri Prabakar et al. [18]Probiotics, green tea, chlorhexidine, and fluoride-containing dentifrices were tested for their effectiveness on dental plaque and gingivitis, and all four groups demonstrated antiplaque and anti-gingivitis activity, resulting in a significant reduction in mean Plaque & Gingival Index at the 30-day follow-up. Group III (chlorhexidine dentifrice) performed better than the other groups. Bharani S M et al[19]when the effects of aloe vera toothpaste on gingivitis and dental plaque were examined, it was found that the toothpaste's effects on GI and PI were comparable to those of fluoride toothpaste, suggesting that it might be used as a substitute for chemical toothpaste. As a result, adding an additional flavour to toothpaste will boost patient acceptance, hence increasing the efficiency of the brushing technique.

Conclusion

By meeting certain sensory needs and creating positive associations, toothpaste tastes enjoyable to visually impaired children and can greatly improve their oral hygiene habits. Due to the lack of visual inputs, these kids rely more on taste and other sensory signals, hence toothpaste flavor is crucial to making brushing enjoyable and interesting. Additionally, by making brushing more pleasurable, flavored toothpaste can lessen resistance to brushing, increasing brushing time and enhancing overall oral health results. These healthy behaviors are further reinforced by parental support and instruction, which guarantees that kids form lifetime dental hygiene habits. In conclusion, adding flavors to children's toothpaste is a useful and successful way to encourage improved dental health in kids with visual impairments.

Clinical significance: Use of flavoured tooth paste in daily routine brushing of visually impaired children would enhance the oral hygiene status among them.

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Conflict of Interest: NIL

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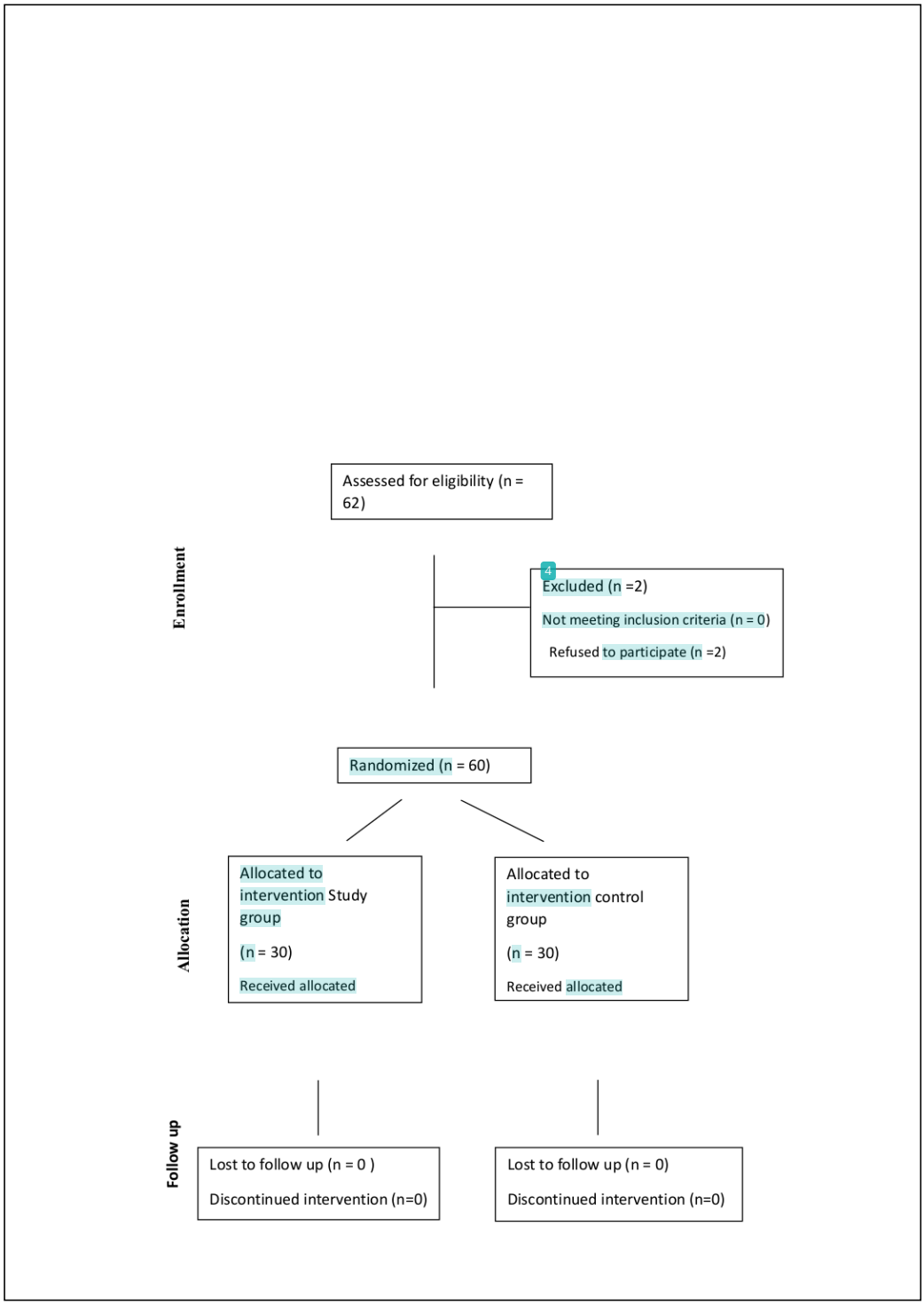
Assessed for eligibility (n = 62)
Enrollment
Excluded (n =2)
Not meeting inclusion criteria (n = 0)
Refused to participate (n =2)
Randomized (n = 60)
Allocation
Allocated to intervention Study group
(n = 30)
Received allocated
Allocated to intervention control group
(n = 30)
Received allocated
Follow up
Lost to follow up (n = 0)
Discontinued intervention (n=0)
Lost to follow up (n = 0)
Discontinued intervention (n=0)

Flowchart 1: CONSORT FLOWCHART

	Gingival index during					
	0 days		30 days		90 days	
	Group1	Group2	Group 1	Group 2	Group 1	Group 2
Mean	2.74000	2.79667	2.12333	2.45000	1.68000	2.03667
SD	0.39357	0.24280	0.55627	0.35307	0.33876	0.37277
t Value	0.67117		2.71565		3.87840	
P value	0.5047		0.0087*		0.00027*	

Table 1 – Comparison of mean GI and SD between 2 groups at 0,30 and 90 days

* P value significant (<0.05)

	Plaque index during					
	0 days		30 days		90 days	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2

Mean	1.94	1.93	1.78	1.92	1.26	1.74
SD	0.22	0.34	0.26	0.24	0.4	0.34
P value	**0.893**		**0.034***		**0.00002***	

Table 2 – Comparison of mean PI and SD between 2 groups at 0,30 and 90 days

* P value significant (<0.05)

Figure 1:Oral examination by trained Pedodontist

Figure 2: Brushing technique education

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