

## Dentist's Preference Of Mode Of Teaching Brushing Technique For Children With Primary Dentition

Research Article

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### Abstract

**Introduction:** Caries and gum disorders such as gingivitis are prevalent among children and can result in tooth loss or accumulation of plaque that can later become calcified forming - a calculus, that can result in a wide variety of problems. Brushing of teeth is an integral part in the maintenance of oral hygiene and dentists play a crucial role in educating children in their early age about the techniques of brushing to avoid plaque formation and reduce caries.

**Aim:** To evaluate the most commonly taught brushing technique by dental students in pediatric patients with primary dentition.

**Materials and Method:** A retrospective study was conducted among the outpatient population in Saveetha Dental College, Chennai between July, 2019 and September, 2019. The data of the mode of teaching brushing techniques was collected using 150456 case sheet records of pediatric patients visiting the Department of Pediatric Dentistry. Patients of 2-6 years were selected for the study. The data that was obtained was tabulated in an excel spreadsheet and the analysis of the data was made using SPSS software with a chi-square test for association.

**Results and Discussion:** Gender distribution was male (52.17%) and female (47.83%) respectively. Most common mode of teaching brushing technique was the digital method (66.67%) followed by model method (21.74%). Comparison based on gender and age against the mode of teaching did not show any statistical significance ( $p > 0.05$ ).

**Conclusion:** Within the limitations of the present study, the digital method was the most commonly taught method for teaching the brushing technique by dental students.

**Keywords:** Innovative Mode of Teaching; Oral Cavity; Tooth Brush; Plaque; Primary Dentition; Pediatrics.

### Introduction

The proper preservation of primary dentition is essential for the development of permanent teeth and the improper maintenance can result in changing this balance [1]. The most common problem pertaining to young children is dental caries and periodontal problems such as gingivitis [2]. These may induce pain and can lead to expensive and time consuming treatment procedures to alleviate the pain [3].

Dental caries is a multifactorial microbial infectious disease that is characterized by the demineralisation of the inorganic portion

and the destruction of the organic substances. The etiology of formation of dental caries can range from the role of carbohydrates, role of plaque due to improper brushing and increased ingestion of sticky carbohydrates and the role of the bacteria colonised in the plaque itself [4]. The bacteria first adhere to a pellicle-coated surface of the tooth structure causing the formation of a mature biofilm that along with the role of acids resulting in an acidogenic environment can cause the bacteria to firmly adhere and starts the demineralisation process that proceeds faster than the remineralisation causing further damage [5, 6].

Tooth brushing is an effective method to reduce plaque forma-

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tion, thereby reducing the bacterial accumulation that can in turn reduce the bacterial accumulation resulting in reduced carious lesions. The act of using a brush with tooth paste along with interdental cleaning is the most effective in the maintenance of proper oral hygiene [7]. The process of keeping one's oral cavity clean and free of diseases by proper dental habits such as brushing with tooth brushing coupled with interdental brushing is referred to as oral hygiene. Effective plaque removal in the most effective method is the art of brushing. Brushing however is highly dependent on one's manual dexterity and the motivation to do so, to prevent tooth decay. Young children lack the manual dexterity for effective brushing [8].

Dentists are the most important medical professionals to help in inculcating proper brushing techniques to prevent carious lesion development. Effective teaching can have a positive impact on the child and their parents that can thereby help in increasing the oral hygiene of the pediatric patient for proper overall development [9].

There is a wide range of brushing techniques that were developed over the last 20-30 years. From the various techniques, the most used and recommended is the modified bass technique [10]. Employment of the right technique can help in successful removal of plaque as well as prevent the detrimentation of the hard tissues. Teaching can be done in various methods such as employment of models, verbal communication and the use of technology in education. The latter is currently the most commonly used method of teaching in general. Therefore, proper mode of teaching brushing techniques should be delivered to the pediatric patients to effectively control plaque and reduce the formation of caries or periodontal problems, helping in proper development of permanent teeth. Our team has extensive knowledge and research experience that has translate into high quality publications [11-23, 24-30].

The aim of the study was to analyse the preferred method of teaching brushing techniques used by dental students in the pediatric patients in their primary dentition stage.

## Materials and Methods

The retrospective study was conducted in a university setting that principally consists of South Indian population. The approval for the study was obtained from the institutional ethical committee.

## Data Collection

The outpatient data was collected from among the pediatric patients that had visited the Department of Pediatric Dentistry at the institution between July 2019 and September 2019 with all age groups and gender. Data was obtained using 150456 case sheet records. The number of patient records reviewed was 1000. Inclusion criteria included patients with only primary dentition that is, between 2-6 years of age. Exclusion criteria was patients with mixed dentition (6-12 years) or permanent dentition ( $\geq 13$  years) and incomplete or repeated data. Verification of the data collected was done by cross checking with the photographic evidence. Simple random sampling was done to reduce bias. The final sample size was finalised as 69.

The collected data was then tabulated using a Microsoft Excel Spreadsheet. The data was then analysed using SPSS software by IBM (Version 23), a statistical software with defined variables. Significance of the study was obtained using chi-square test and the results are interpreted.

## Results and Discussion

Age distribution of the study was 2 years (1.45%), 3 years (5.80%), 4 years (15.94%), 5 years (18.84%), 6 years (57.97%) respectively. The most common age group in the study included pediatric patients with six years of age [Figure 1]. Among the participants of the study, there were 52.17% males and 47.83% females respectively [Figure 2]. The most commonly employed teaching method of brushing technique was the digital method (66.67%) followed by the usage of models (21.74%) and verbal (11.59%) [Figure 3].

Prevalence of digital methods was seen in both male and female participants of the study [Figure 4]. Prevalence of digital methods was seen in 4,5,6 year old participants respectively. No prevalence was seen in model or digital method among 3 year old participants [Figure 5].

Brushing teeth is of extreme importance in plaque control. The accumulation of plaque thereby leading to calcification forming calculus can cause bad odour and can also result in periodontitis and gingival recession [31]. Tooth brushing is the foundation of maintenance of oral hygiene in order to prevent caries and other periodontal compromises. The effectiveness of brushing teeth and prevention of gingivitis is an ongoing research study and it is required to investigate it in higher quality.

**Figure 1. Graphical representation of age of pediatric population with primary dentition. X-axis represents the age of the child and the Y-axis represents the number of participants in the primary dentition stage. Children of the age group 2-6 years with primary dentition were taken for the study. Children at six years of age were higher in the study population (57.97%).**

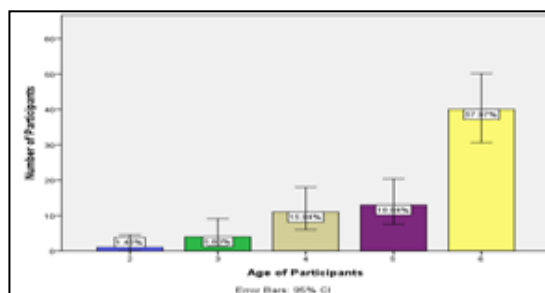


Figure 2. Graphical representation of gender of pediatric population with primary dentition. X-axis represents the gender of the child and the Y-axis represents the number of participants in the primary dentition stage. Majority of the study population in the primary dentition stage was males (52.17%).

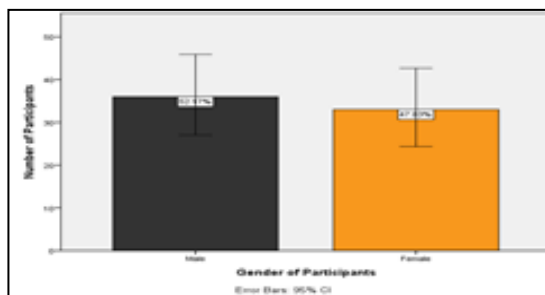


Figure 3. Graphical representation of the prevalence of mode of brushing technique in the pediatric population with primary dentition. X-axis represents the different modes of teaching brushing techniques and Y-axis represents the number of the pediatric population in the primary dentition stage. Digital mode of teaching brushing technique was the most commonly employed with 66.67% followed by the usage of models at 21.74%.

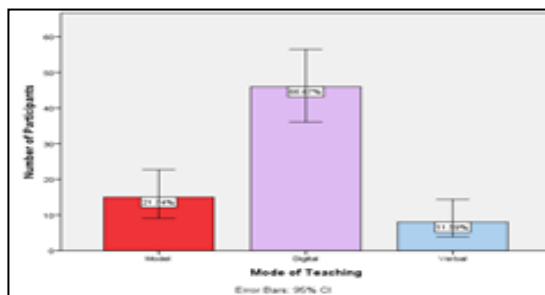


Figure 4. Graphical representation of the comparison of mode of teaching brushing techniques with the age of the participants. X-axis represents mode of teaching brushing techniques and Y-axis represents the number of children. The colours represent the age of the children. Blue represents age 2, green represents age 3, beige represents age 4, purple represents age 5 and yellow represents age 6. Digital mode of teaching is commonly employed for teaching among two (1.45%), four(10.14%), five(11.59%) and six(40.58%) years of age respectively. Usage of models and digital methods of teaching was used collectively among three (2.90%) years of age respectively. This was not statistically significant (p=0.123).

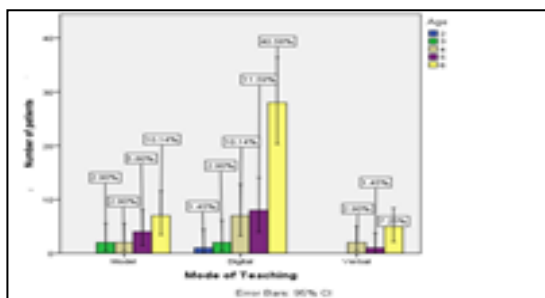
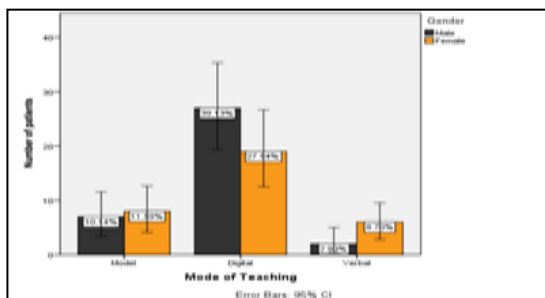


Figure 5. Graphical representation of the comparison of mode of teaching brushing techniques with the gender of the participants. The X-axis represents the mode of teaching brushing techniques and the Y-axis represents the gender of the participants in the primary dentition stage. The blue colour represents male participants and red represents the female participants respectively. Digital mode of teaching brushing technique was most commonly employed in both males (39.13%) and females (27.54%) respectively. This was not statistically significant (p=0.42).



Patients, both pediatric and adult, do not pay much attention to cleaning their teeth in a proper technique. Vigorous scrubbing is followed by most patients in a horizontal/vertical pattern which although useful in helping plaque removal, can lead to loss of tooth structure and weakening the tooth itself [32]. The effectiveness of brushing teeth depends on dexterity of the patients, type of toothbrush used and the understanding of the particular technique by the patients [33]. The most common problems pediatric patients are associated with is the development of caries in an

early stage and periodontal compromisations.

It is of extreme importance to conserve the primary tooth as much as the permanent teeth as primary teeth affect the development of the permanent dentition. Hence, educating patients and parents is a must on the methods of conservation of teeth and prevention of any dental problems for healthy teeth growth. Although challenging, the dentist must be a skilled professional in analysing his/her patient and changing the mode of teaching accordingly.

Verbal communication is one of the various methods of lecture that can be used to educate patients. It is however best used in patients able to comprehend language and understand the technique adequately [34]. Children less than four years of age or children with special needs must be taught by other means as words such as 'behind', 'under', 'inside' may be hard for them to understand. In such patients, use of models or digital methods must be employed.

Models are an excellent way to show the patient exactly how it is done. Types of toothbrushes - hard, soft and medium can be displayed along with models of dentition that can be present along with the dentist. The dentist can then demonstrate the various brushing techniques and ask the patient to repeat the technique once done. This method of demonstration is better as it employs usage of the five senses [35]. The jaw model can be used to teach the pediatric patients about the grooves and the lingual regions where the accumulation of the plaque is high. This uses four senses and is hence helpful. The jaw model method is highly recommended as a study concludes that the model method is more advantageous in special needs patients when compared to lecturing/verbal method of teaching [36].

Digital mode of teaching is one of the most recent methods that were developed in educating children. Virtual learning or e-learning is an effective use of technology to inculcate the child with adequate knowledge of dental hygiene maintenance [37]. A study done in 2016, with a newly developed digital toothbrushing monitoring and training system(DTS) effectively improved the brushing technique, the overall oral hygiene with a prolonged learning effect [38].

This said, a study done in 2013, with children being divided into groups for model training, individual lecturing and audio-visual learning revealed that children had a better inclination to study casts when compared to the other groups. The casts were also preferred by the dentists as it is cheap to obtain the models and can be better taught with [39].

Advantage of the study was the easy access, availability of a large amount of data and the similarity in ethnicity. Limitations of the study is the unavailability of external validity. The sample size was also small and limited to a particular geographical area. The future scope of the study is that it should be conducted as a multicentered study with wide geographical location into consideration.

## Conclusion

Within the limitations of the study, it can be concluded that the digital mode of teaching is better preferred by dental students, followed by the usage of models in educating the various brushing techniques in pediatric patients between the age group of 2-6 years respectively (primary dentition stage).

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