



Comparative Evaluation of Efficacy of Chewable Brush and Manual Brush in School Going Children

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Abstract

Aim: The goal of this study was to assess the effectiveness of chewable and manual toothbrushes on forty children aged of between 10-12 years.

Material and Method: A total of 40 children were randomly selected and categorized in to group A manual brush (MB) and group B (chewable brush). The plaque index scores were determined using the oral hygiene simplified index (OHI-S). Following the assessment of a child's plaque score, they were directed to a "brushing room" where, under adult supervision, they brushed their teeth for two minutes using either a manual toothbrush or a chewable brush. Before students received their chewable brush handles, 25 cm of floss was already attached to them. Afterwards, parents allowed their children to brush their teeth for two minutes with the

chewable brush. The chewable brush was used without dentifrice because it already contains dentifrice, as directed by the manufacturer. They moved the brush about their mouth like they were chewing gum. Post brushing plaque indices were obtained after reexamining the children.

Result: In table 1 it was shown that the initial or pre brushing OHIS in manual brushing group was 1.48 ± 0.45 which was reduced to 0.79 ± 0.39 after brushing ($p < 0.05$) similarly initial OHI-S mean values for chewable toothbrush was 1.54 ± 0.49 which reached a mean of 0.67 ± 0.32 after brushing ($p < 0.05$).

Conclusion: In present study it was found that the chewable tooth brush were superior to manual tooth brush.

Keywords: Dental Plaque, Chewable Toothbrush, Manual Toothbrush

Introduction: Dental caries is a widespread issue in dental health with significant regional variations. It is still the most prevalent infectious disease among children. *Streptococcus mutans* is the main factor in the emergence of dental caries in this multifactorial illness. Dental plaque is a biofilm made of *S. mutans* bacterial cells that have colonised a tooth.¹

Dental plaque is a biofilm that develops on the surfaces of teeth and other oral cavity restorations. One of the aetiological causes of dental caries, gingivitis, and periodontitis is thought to be dental plaque.² Effective plaque control is crucial for preserving oral health, preventing dental caries, and maintaining good gingival and periodontal health.^{3,4}

For plaque control, a number of chemical and mechanical techniques are available. Plaque removal is found to be easiest and most popular when teeth are brushed. Because manual teeth brushing is inexpensive, simple to use, readily available, and effective at removing plaque, the majority of people still prefer it. It has been shown to be just as efficient as powered toothbrushes.^{5,6,7} Clinical evidence, however, indicates that a plaque-free condition is rarely achieved by simply brushing your teeth. Determinants including a technically sound brush, brushing technique, brushing time, manipulative competence, manual dexterity, and parental engagement are all important for effective tooth brushing.^{8,9,10}

A recent innovation for plaque removal is the discovery of a chewable toothbrush (CB), comprised of fluoride and xylitol.¹¹ Fluoride at low concentration is bacteriostatic and at high concentration, it is bactericidal.¹² Xylitol, a nonsugar sweetener used in foods is noncariogenic and has cariostatic effect. The CB is a recent innovation in oral hygiene. This disposable, all-in-

one brush is comprised of Xylitol, flavoring, aqua, and polydextrose.¹³ Therefore, the aim of this study was to compare the effectiveness of a chewable toothbrush and manual toothbrush for plaque removal in children.

Material and Method: The goal of the current study was to compare the effectiveness of chewable brushes to manual brushes in the removal of plaque in 40 youngsters between the ages of 10 and 12 years. The Institutional Review Board gave their approval to the trial protocol. The primary researcher addressed a letter to the parents of the children through the school administration with information about the study in local language in order to get their written informed permission.

Inclusion criteria:

- Children aged 10 to 12 years with good general and oral health.
- No systemic illness
- Children and parents who are willing to participate and signed the informed consent were included.
- Children with DMFT score less than 3

Exclusion criteria:

- Children on medication
- Medically compromised patient

The initial visit involved recording the children's information. The results of the extraoral and intraoral examination were recorded. To ensure that all individuals had similarly clean teeth at the beginning of the trial, a professional prophylaxis was completed and teeth were polished. Prior to the trial, participants were asked to skip brushing for 24 hours.

A total of 40 children were randomly selected and categorized in to group A manual brush (MB) and group B chewable brush (CB). Allocation concealment was done by using sealed envelopes, where in the respective brushes (MB & CB) were randomly allocated by the toss of a coin to 40 children. Prior to the experiment, chewable brushes were discussed to parents, teachers, and kids. To more clearly observe the plaque, a microbrush was used to apply a plaque-disclosing agent to all tooth surfaces. Patients were told to swirl it about for the following

30 seconds before spitting it out. The plaques' colour changes were then monitored. The plaque index scores were determined using the oral hygiene simplified index (OHI-S).

Following the assessment of a child's plaque score, they were directed to a "brushing room" where, under adult supervision, they brushed their teeth for two minutes using either a manual toothbrush or a chewable brush. Before students received their chewable brush handles, 25 cm of floss was already attached to them. Afterwards, parents allowed their children to brush their teeth for two minutes with the chewable brush. The chewable brush was used without dentifrice because it already contains dentifrice, as directed by the manufacturer. They moved the brush about their mouth like they were chewing gum. Post brushing plaque indices were obtained after reexamining the children. The changes in plaque score were tabulated and analyzed with SPSS software (Version 19.0, IBM, USA).

Result: In table 1 it was shown that the initial or pre brushing OHIS in manual brushing group was 1.48 ± 0.45 which was reduced to 0.79 ± 0.39 after brushing ($p < 0.05$) similarly initial OHI-S mean values for chewable toothbrush was 1.54 ± 0.49 which reached a mean of 0.67 ± 0.32 after brushing ($p < 0.05$). The dental plaque was effectively removed by both the chewable and manual tooth brushes. In eliminating the plaque, chewable brushes were somewhat more successful than manual methods.

Table no 1: Comparative evaluation of efficacy of manual brush and chewable brush			
Group	Pre Brushing OHIS	Post Brushing OHIS	P Value
Manual Brush	1.48 ± 0.45	0.79 ± 0.39	< 0.05
Chewable Brush	1.54 ± 0.49	0.67 ± 0.32	< 0.05

Discussion: The consensus report given at the Second International Congress on Oral Health Promotion in 1999 noted that plaque plays a critical role in the development of dental caries and periodontal disorders. Thus, it is crucial to remove tooth plaque effectively. Hence the aim of present study was to assess the effectiveness of chewable and manual toothbrushes on forty children aged of between 10-12 years.^{14,15}

The mechanical cleaning process using a toothbrush is effective as long as it is done thoroughly and frequently. Conventional toothbrushes are less effective when used by patients

who lack the necessary technical knowledge. Many chewable toothbrushes have been offered to help make teeth brushing easier and more effective.^{2, 13}

An alternative to using a regular toothbrush when there isn't any water available is a chewable toothbrush. Despite their typical small size, they should never be ingested and should always be discarded after usage. They come in convenient bathroom vending machine sizes and are made of polydextrose, xylitol, and flavouring aqua. There are also disposable toothbrushes with a little, breakable plastic ball of toothpaste attached to the bristles that may be used dry and are quite useful for travellers. These brushes should be rotated from left to right between the teeth and then moved around the mouth with the tongue in a manner similar to how one would move a piece of gum.^{16,17}

Due of its simplicity, the oral hygiene simplified index was utilised in the current study to determine plaque scores. It might help more people because it can be put into action faster. According to John Green et al. analysis of large-scale oral health surveys, the OHIS index provides a more accurate assessment of plaque reduction scores.¹⁸

The results of this present clinical trial demonstrated the effectiveness of the CB brush and MB in lowering plaque scores. From the result of present study it was observed that the both chewable and manual tooth brushes eliminated the teeth plaque in an efficient manner. Chewable brushes were a bit more effective at removing the plaque than manual techniques

Conclusion: According to the findings of the current investigation, oral plaque was effectively removed by chewable and manual tooth brushes. When compared to manual methods, chewable brushes were somewhat more successful at eliminating the plaque.

Limitation: To evaluate the long-term efficacy of these brushes on plaque, longitudinal trials with a larger sample size are required.

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Conflicts of interest: There are no conflicts of interest.

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