



# A Study on Use of Interdental Brushes among Patients Who are Undergoing Fixed Orthodontic Treatment: An Epidemiological Survey

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## Abstract

**Introduction** Maintenance of periodontal health is very important during fixed orthodontic treatment as accumulation of plaque can cause dental challenges that may interfere with orthodontic treatment; hence the present investigation was carried out to examine the knowledge of patients who were using interdental brushes during fixed orthodontic treatment.

**Methods** Total 150 subjects aged 14 to 30 years from Mangalore city were selected. Majority of them were in the age group of 14 to 18 years (39.33%). Overall, 77 females (51.3%) and 73 males (48.7%) who were undergoing fixed orthodontic treatment and had given consent for the participation in epidemiological questionnaire survey were included. Demographic information and use of interdental brushes during fixed orthodontic treatment for maintaining periodontal health were included in the survey.

**Result** Overall, 58% of the participants undergoing fixed orthodontic treatment were using interdental brushes, which was statistically significant. The frequency of using interdental brush was 72.4%, 19.5%, and 8.04% daily, weekly, and monthly, respectively.

**Conclusion** The majority of the study participants who sought fixed orthodontic treatment were using interdental brushes daily in order to maintain periodontal health, which was statistically significant. Patient education and motivation was shown to be strongly associated with maintaining of periodontal health among study participants.

## Keywords

- ▶ periodontal health
- ▶ fixed orthodontic treatment
- ▶ Interdental brushes

## Introduction

Gum disease, also known as periodontal disease, is a widespread illness that affects the entire population. A tooth surface, periodontal support tissues (gums), saliva, and an appropriate substrate must all be present for these diseases to manifest. The advancement of periodontal disease and dental caries depends on the presence of these four

components. Plaque is created when bacteria cluster in a breeding environment created by the mixture of saliva and substrate. Plaque is the main cause of periodontal disease and tooth caries.<sup>1</sup>

Plaque retention rises in individuals receiving fixed appliances (fixed braces), which increases the quantity of plaque on the tooth surface. The ability and work necessary to keep up a high standard of oral hygiene are also increased by the

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presence of orthodontic brackets. After fixed orthodontic treatment, the interaction of these two elements seems to enhance gingivitis and enamel decalcification.<sup>2</sup> Past studies have shown that after the underlying holding, there is a rapid decline in oral cleanliness uniformity. Additionally, the arch-wire encourages the growth of plaque, which is detrimental to good hygiene practices like brushing and flossing.<sup>3</sup> Gum disease may possibly result from this.

An additive of 20 mL of Listerine use twice a day to maintain oral hygiene, other than flossing and brushing, was advised to the patients who were undergoing fixed orthodontic treatment.<sup>4</sup> Gingival disease, periodontal infections, gingival hypertrophy, dehiscences, alveolar bone destruction, fenestrations, interdental crease, and open gingival embrasures are the most common periodontal complications associated with orthodontic therapy.<sup>5-8</sup>

All more recent investigations, however, have shown that using just a toothbrush—manual or electric—does not sufficiently clean all tooth surfaces. Demineralization and consequent white spots are brought on by leftover plaque behind the archwire and in the vicinity of the brackets.<sup>9</sup> Therefore, it is advised to use interdental cleaning tools more often.

The purpose of this research was to examine the efficiency of interdental brushes at preventing plaque in patients undergoing fixed orthodontics treatment.

## Methods

An epidemiological survey questionnaire was undertaken among patients in Mangalore City who were seeking fixed orthodontic treatment from dental colleges. The research was carried out in May to June 2023. A survey of 150 patients was undertaken.

Individuals who were receiving fixed orthodontic treatment were provided a set of questions to fill out, and collected later if they were unable to complete it at the time of the survey. There are two components to it. The first part of the questionnaire asks patients about their name, gender, age, and socioeconomic status (occupation, education, etc.), while the other section asks them 12 questions about their fixed orthodontic treatment history, awareness of interdental tools and brushes, and to determine if they have bleeding or swollen gingiva.

By reviewing records and questionnaires that each patient completed, awareness of patients was evaluated.

The data were analyzed using SPSS version 20.0 after being entered into statistical software. Data showed that 48.5% of individuals were using interdental brushes.<sup>10</sup> With an absolute accuracy of 8% and a 95% confidence level, 150 samples are analyzed.

## Results

The participants who were selected for the study were between the age group of 14 and 30 years and the mean value was 20.86 and standard deviation (SD) was 4.931 years.

Majority of study participants (59 [39.33%]) were between the age group of 14 and 18 years. Among all study

participants, females (77 [51.3%]) were more than males (73 [48.7%]). Regarding the participants who were aware of interdental brushes, the survey concludes that a total of 104 (69.3%) participants out of 150 were aware about the interdental brushes and the remaining 46 (30.7%) participants were unaware. Data regarding the usage of interdental brushes by the participants show that a total of 87 (58.0%) participants out of 150 agreed to the usage of interdental brushes while the remaining 63 (42.0%) participants were not using interdental brushes. In terms of the technique used by the participants for interdental brushes, a total of 67 (77.01%) participants out of 87 were using interdental brushes in the interdental space with horizontal (to and fro) technique while 14 (16.09%) participants were using with vertical (up and down) technique and remaining 6 (6.89%) participants were using the brushes on the tooth surface.

Regarding the frequency of usage of interdental brushes by the participants, data revealed that a total of 63 (72.4%) participants out of 87 were using interdental brush daily while 17 (19.5%) participants were using weekly and the remaining 7 (8.04%) participants were using it monthly.

The purpose of this research was to investigate the opinions and behaviors of participants undergoing fixed orthodontic treatment. The mean age of the individuals in this research who were undergoing fixed orthodontic treatment was  $20.86 \pm 5.0$  years. Similar outcomes were seen in a research by Sawai et al,<sup>10</sup> with a majority of study participants aged between 11 and 15 years. The average age of the participants in a research by Anuwongnukroh et al<sup>11</sup> was 20 years (SD, 6.4 years), while in a study by Alhajja et al,<sup>12</sup> it was 17.7 years (SD, 5.0 years).

In the current study, there were more female patients than male patients overall. In an investigation by Anuwongnukroh et al<sup>11</sup> and Alhajja et al,<sup>12</sup> similar findings were seen, showing that more girls than males underwent orthodontic treatment. This could be because young women are more self-conscious about their appearance. In a research by Shah et al,<sup>13</sup> contrary findings were found, showing that more men than women received orthodontic treatment.

The majority of the research participants received fixed orthodontic treatment in order to maintain their periodontal health, indicating adequate knowledge and behavior. In a research by Sawai et al,<sup>10</sup> with a majority of study participants who had intermediate awareness, similar outcomes were seen.

In this research, participants' education was shown to be substantially related to their knowledge of and behavior toward maintaining periodontal health.

The present study includes only interdental brushes; further studies need to be done that includes other interdental aids for better maintenance of periodontal health.

## Conclusion

From the details that are provided above, it can be determined that more girls than males underwent fixed orthodontic treatment. Most of the participants were in the

20.86 ± 5.0 years age group. The majority of research participants underwent orthodontic treatment in an effort to maintain their periodontal health, indicating acceptable knowledge and behavior. Education was shown to be substantially related to awareness and behavior toward promoting periodontal health.

### Limitation

The limitation of this study is the small sample size and also that it is a single-center study.

#### Ethical Approval

Ethical Clearance has been obtained from the institutional ethical committee (Ref. No. ETHICS/ABSMIDS/373/2023) before the start of the study.

#### Conflict of Interest

None declared.

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