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Oral hygiene practices among family of orthodontic patients-survey

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Abstract: Orthodontic care can lead to increased demineralisation , tooth decay and gingivitis. Poor oral hygiene is associated with greater incidence of white spot lesions. So, it is a challenging task to maintain acceptable oral hygiene to prevent dental caries and gingival inflammation . The aim of this study was to assess the oral hygiene practices among families of patients undergoing orthodontic treatment. A survey containing 14 questions were sent to patients undergoing orthodontic treatment through an online survey platform and the results were tabulated. The survey link was sent to patients who underwent orthodontic treatment. Around 60% of the respondents brush the teeth twice a day. 36% of them used extra soft toothbrushes than the hard bristled toothbrush , also 37% of the orthodontic patients and their families don't use any other aids apart from brushing their teeth. From the results it was evident that the oral hygiene practises among orthodontic patients and their families was found to be good.

Keywords: Brushing ; Dental aids ; Gingivitis ; Oral hygiene ; Orthodontic treatment innovative technique.

INTRODUCTION

Orthodontic treatment is mostly received by individuals to improve dentofacial appearance.(Shaw, O'Brien and Richmond, 1991) The orthodontic mechanotherapy often involves the use of fixed appliances in the management of malocclusion and malrelationship of the dental arches. However, the placement of fixed orthodontic appliances could affect the ease of oral hygiene procedures among patients. A high standard of oral hygiene is therefore essential for all patients undergoing orthodontic treatment. Inadequate oral home care and dental hygiene practices can lead to accumulation of plaque and make orthodontic patients more prone and at increased risk of developing gingivitis, gingival recession, loss of gingival attachment and periodontal support and dental caries. (Zachrisson and Alnaes, 1973; Alexander, 1991) Good oral hygiene is very important to ensure successful orthodontic treatment.(Da'ameh *et al.*, 2011) Maintaining good oral hygiene in orthodontics is one of the elements related to compliance . (Dinesh *et al.*, 2013; Krishnan, Pandian and Kumar S, 2015)Assessment of all the oral hygiene practices is essential for adequate understanding of patients oral health care needs. (Al-Shammari *et al.*, 2007; Aljabaa, McDonald and Newton, 2015)Plaque buildup is greater in patience wearing fixed orthodontic appliances due to the difficulty to clean their teeth. (Felicita, Chandrasekar and Shanthasundari, 2012; Felicita, 2017a, 2018)Even with good cleaning of the teeth during the treatment period, generalised gingivitis commonly developed in most of the patients.(Ramesh Kumar *et al.*, 2011; Pandian, Krishnan and Kumar, 2018) Retention of plaque results in subsequent oral health problems like decalcification, caries, periodontal diseases, halitosis and staining of teeth. Spot lesions are found predominantly in fixed orthodontic patience.(Kamisetty *et al.*, 2015; Vikram *et al.*, 2017) Both patients and Dentists should play an active role in controlling plaque build up by maintaining good oral hygiene. (Travess, Roberts-Harry and Sandy, 2004; Sivamurthy and Sundari, 2016; Samantha, Sundari and Chandrasekhar, 2017)Plaque control and removal can be done by mechanical or chemotherapeutic measures. (Viswanath *et al.*, 2015; Felicita, 2017b)Mechanical removal involves usage of tools like toothbrush, dental floss and interdental brushes.(Buschang *et al.*, 2019) Chemotherapeutic agents include mouthwashes and dentifrices.(Jain, Kumar and Manjula, 2014; Rubika, Sumathi Felicita and Sivambiga, 2015) Daily fluoride toothpaste and rinses provide a cariostatic effect that prevents and reduces enamel decalcifications.(Laing *et al.*, 2008)

Our department is passionate about research we have published numerous high quality articles in this domain over the past years (Abraham *et al.*, 2005; Devaki, Sathivel and BalajiRaghavendran, 2009; Neelakantan *et al.*, 2010,

2015; Arja *et al.*, 2013; Ramshankar *et al.*, 2014; Sumathi *et al.*, 2014; Surapaneni and Jainu, 2014; Surapaneni, Priya and Mallika, 2014; Ramamoorthi, Nivedhitha and Divyanand, 2015; Manivannan *et al.*, 2017; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; J *et al.*, 2018; Ravindiran and Praveenkumar, 2018; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Krishnaswamy *et al.*, 2020; Samuel, Acharya and Rao, 2020; Sathish and Karthick, 2020)
The aim of this study was to identify the oral hygiene practices followed in the families of orthodontic patients.

MATERIALS AND METHODS

Study design and setting: A total of 100 patients who were undergoing orthodontic treatment in Saveetha dental college were randomly selected.
Inclusion criteria:

- Patients undergoing orthodontic treatment in Saveetha dental college, irrespective of the appliance type.

Exclusion criteria:

- Patients who had discontinued the treatment were neglected .
- Incomplete survey responses were also excluded to prevent errors.

Ethical Approval: The study was commenced after approval from the institutional review board (Ethical approval number : SDC/SIHEC/2020/DIASDATA/0619-0320).

Informed consent: A written informed consent was obtained from all the study subjects.

Subjects and Procedures

Totally 100 patients who were undergoing Orthodontic treatment at Saveetha dental college were chosen randomly for the study. The following data retrieved from the dental records: Patient's name , age, gender and contact number . The survey was created using an online survey platform and the link was shared to the patients. The participants were asked to answer questions from a short questionnaire regarding their oral hygiene practices. Oral hygiene practices were assessed through questions on the type, and frequency use of toothbrush, type of toothpaste used, other cleaning materials or tools used daily such as dental floss, interdental brush, and toothpick . Tooth brushing method , experience of halitosis , bleeding upon brushing and dietary modification like avoiding hard and sticky foods were also included in the questionnaire.

Statistical analysis

The statistical analysis was done using SPSS software version 21.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics (percentage and mean) and Inferential statistics (Chi Square test and Fisher's exact test) were done.

RESULTS AND DISCUSSION

There were about 60% of male population and 40% of the female population who participated in the survey. Figure 1 depicts the frequency of brushing where 35% of the participants brushed only once a day, 60% brushed their teeth twice in a day and 5% brushed more than twice a day. Figure 2 represents the type of toothpaste use where 61% used normal toothpaste, 36% used fluoridated toothpaste and 3% used a paste with unknown composition of ingredients. Figure 3 represents the type of toothbrush used about 36% used extra soft toothbrush, 32% used medium result toothbrush 8% of them used soft bristle toothbrush and 24% used hard bristle toothbrush. Figure 4 shows the brushing technique followed where 39% of them follow the horizontal brushing method , 30% brush the teeth in up and down motion , 18% in straight motion and 13% in vertical motion. Figure 5 depicts other dental aids used where 45% of the patients used toothpick, 37% of them used none of the dental aids , 9% of them used interdental brushes and 9% used dental floss. On the question asked about improvement of oral hygiene 90% of the patients found improvement in their oral hygiene and the rest of the 10% didn't. This is depicted in figure 6 . Figure 7 depicts the bleeding on brushing, about 70% of the patients experienced bleeding while brushing whereas the rest 30% did not experience this. About 76% of them avoided hard and sticky food which got stuck to their teeth whereas the rest of them didn't. This is depicted in figure 8. Also 74% of the patients reported that they have the experienced halitosis (Fig 9) . In Fig 10 , The association between gender and frequency of brushing is seen. Upon evaluating the correlations, the P value of association between gender and halitosis was 0.264 which was lesser than the association between gender and bleeding gums by the P value was 1.
Assessment of oral hygiene practices is important for adequate understanding of the oral healthcare needs of patients. This information can be used to establish a baseline information for a future preventive program.Wang et al found that a comprehensive oral hygiene care programme helps patients to control plaque, decrease gingivitis and improve the patient's overall oral health status. (Wang, Yang and Chang, 2007)
In a study done in Malaysia, two thirds were female patients and the rest were male whereas in our study the male population was about 60% and the female population was 40%.(Ajayi, 2014) Majority of the patients brushed at

least twice a day similar to other studies. (Al-Shammari *et al.*, 2007; Elanchezhiyan, 2010; Ajayi, 2014) Also it was found that brushing twice daily among orthodontic patients showed good aspects in maintaining good oral hygiene.
In our study extra soft bristles were used by 36% of the population and 32% of them used medium results whereas most of them used soft bristle brushes in other studies(Ajayi, 2014).
Current oral hygiene measures include toothbrush, floss, interdental cleanser, mouth princess, dented prices et cetera in our study only 9% of them used interdental brushes and mouth washes. In comparison to the above-mentioned studies patients reported a higher oral hygiene practice as most of them brush the teeth twice daily.

CONCLUSION

All the patients used toothbrushes for brushing and most of them brushed twice daily. The most preferred type was extra soft bristle brushes. Almost all patients found an increase in oral hygiene in an overall aspect.

AUTHOR CONTRIBUTIONS
We thank all the above mentioned authors for their valuable support and contribution to this study.

Conflicts of interest: There are no conflicts of interest.

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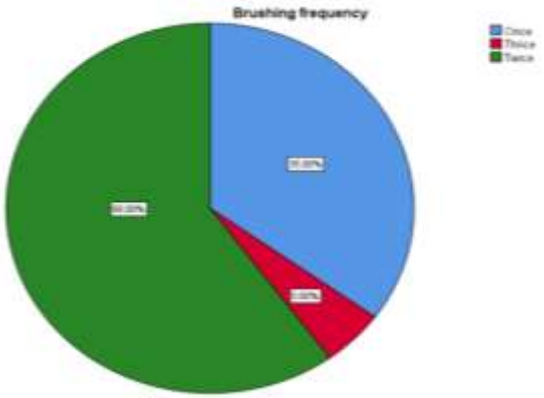

Fig.1: The pie chart depicts the frequency of brushing teeth. Predominantly 60% of them brush twice a day (green) followed by 35% of the patients brushing once (blue) and 5% of them brushing thrice a day (red).

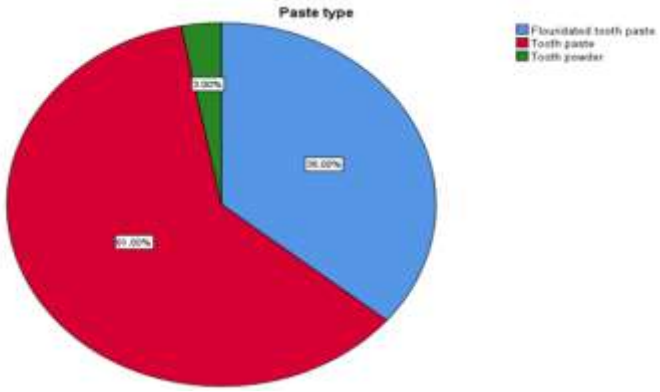

Fig.2: The pie chart depicts the type of toothpaste used. Here 61% of them used regular toothpaste , 36% used fluoridated toothpaste and only 3% used toothpowder which is very rare.

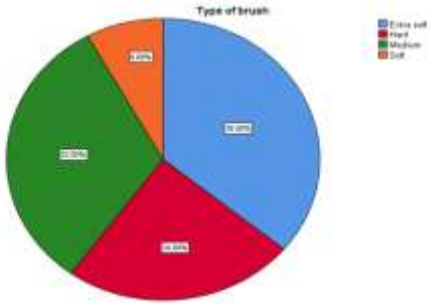

Fig.3: The pie chart depicts the type of toothbrush used. Here 36% of them used extra soft toothbrushes (blue), 8% used soft bristled brushes (orange) , 32% used medium bristle brushes (green) and 24% used hard bristled brushes (red) .

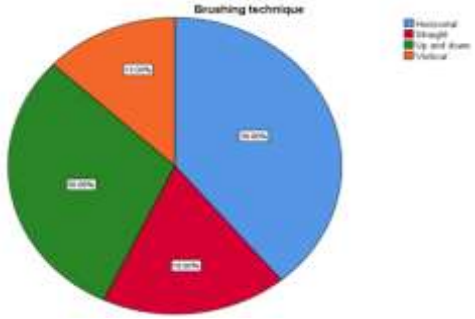

Fig.4: The pie chart depicts the brushing technique followed. 39% of the patients followed horizontal technique (blue), 30% did up and down movement (green) , 18% brushed in straight technique (red) and 13% followed vertical brushing technique (orange) .

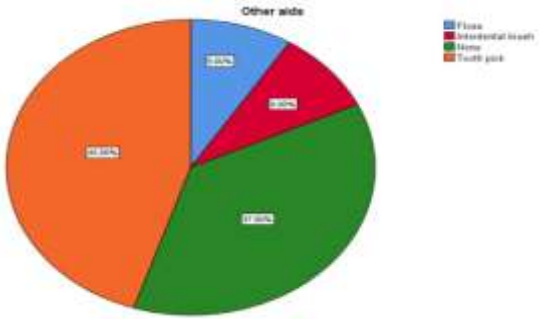

Fig.5: The pie chart represents other dental aids used with toothbrushing . Only 9 % of the patients used dental floss (blue) , 45% used toothpicks (orange) , 9% of them used interdental brush (red) and 37% of them used none of the aids (green) .

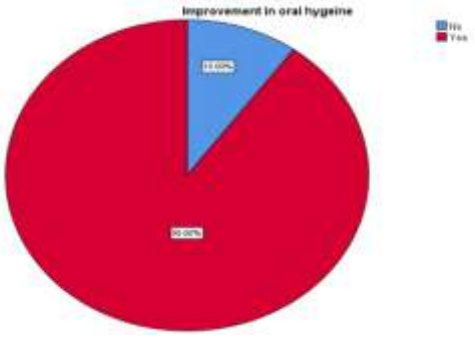

Fig.6: The pie chart depicts the Improvement in Oral hygiene after orthodontic treatment. Almost 90% of them experienced improvement in Oral hygiene and 10% did not feel any difference in their oral hygiene.

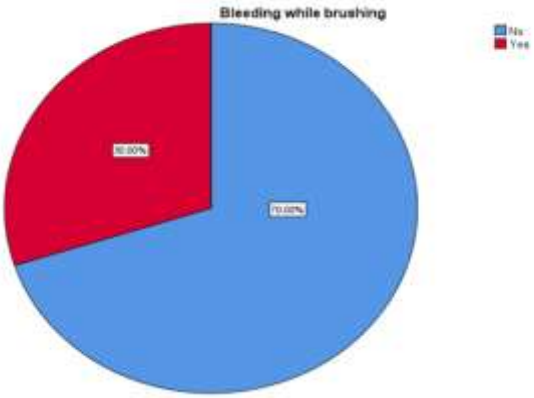

Fig.7: Pie chart representing responses for bleeding on brushing . Bleeding while brushing was significantly absent in 70% and observed only by 30% of the patients.

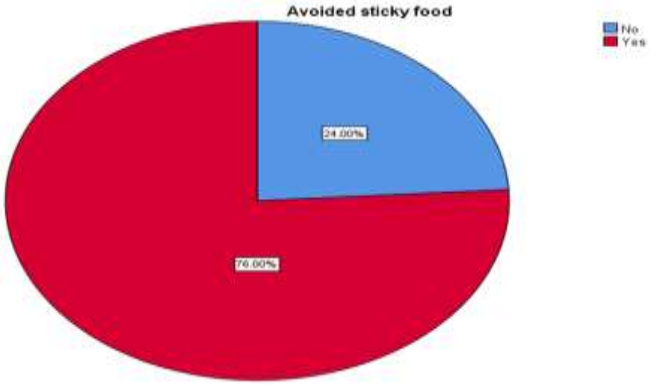

Fig.8: Pie chart denotes the response for those who avoided hard and sticky food. Here almost 76% of the respondents avoided sticky food due to the fear of appliance breakage and 24% of them didn't have any eating restrictions .

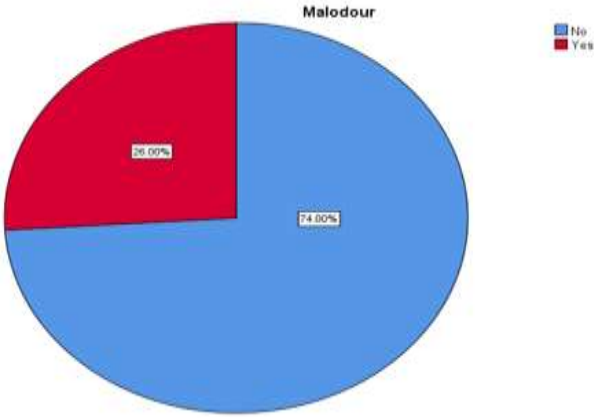

Fig.9: Pie chart denotes the response for those who experienced halitosis/ breath malodour. Malodour was significantly absent in 76% of the population and only 24% reported of experiencing malodour while in orthodontic treatment.

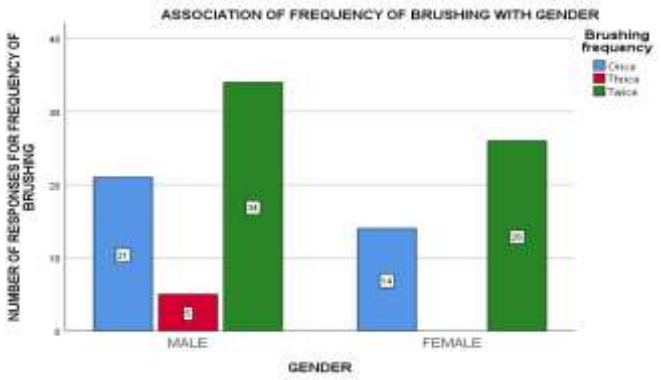

Fig.10: Bar graph depicting the association between gender and frequency of brushing . X axis represents the gender and Y axis represents the number of responses for frequency of brushing .Brushing twice a day was common in both males and females [Pearson's Chi square test p value- 0.164 (p>0.05 , statistically insignificant)]. Brushing twice a day was mostly seen in both the genders .However, males had a higher frequency of brushing than females.

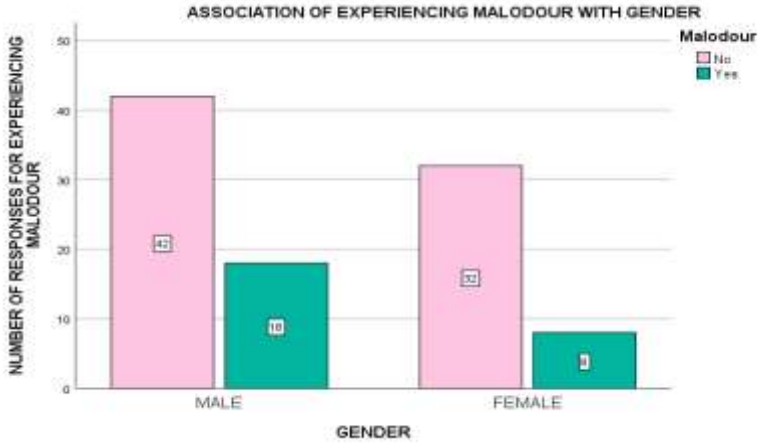

Fig.11: Bar graph depicting the association between gender and malodour. X axis represents the gender and Y axis represents the responses for experiencing malodour. [Pearson's Chi square p value = 0.264 (p>0.05 ; statistically insignificant)]Malodour was significantly absent in both the genders. However, malodour was more experienced by males than females.

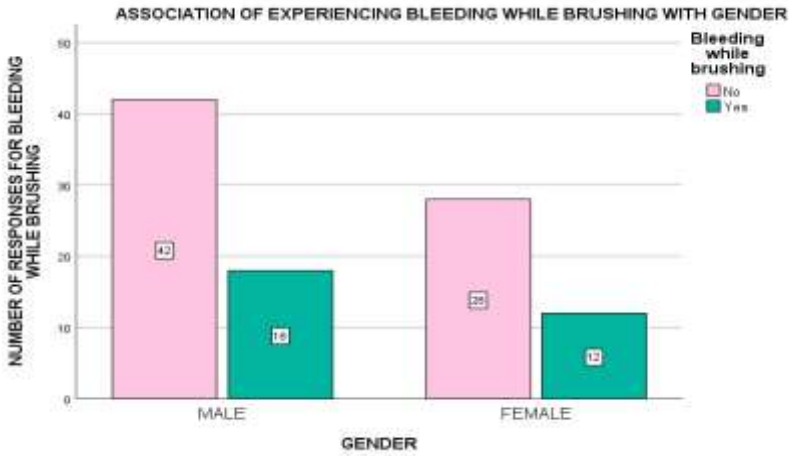

Fig.12: Bar graph depicting the association between gender and bleeding while brushing. X axis denotes the gender and Y axis denotes the responses for presence of bleeding while brushing. [Pearson's Chi square p value = 1 (p>0.05; statistically insignificant)].The presence of bleeding while brushing was significantly absent in both males and females . However, Bleeding while brushing was more common in males than females.