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AWARENESS OF DENTAL FLOSSING TECHNIQUE AMONG DENTAL TRAINEES - A SURVEY

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ABSTRACT

Periodontal disease has become a major public health problem in India and also in the developing countries of the world. The aim of the present study is to analyse the awareness of dental flossing technique among dental trainees and practitioners in India. This is a questionnaire based study conducted in a private dental college in Chennai circulated to the 50 dental trainees, knowledge and attitude related questions. The responses are collected and the data is tabulated. The results are analysed using the SPSS tool for descriptive and association analysis. About 27% of the people reported they were aware of dental floss. 30% of the people reported that the dental floss can remove the gingival inflammation. 15% of the people reported that dental floss can injure our Interdental gingiva. 13% of the people say that dental floss is necessary to our daily routine. Majority of the females (20%) agree that routine dental flossing is necessary. Pearson chi square value = 17.016 p value = 0.001 (<0.05), which is statistically significant. Hence there is a significant difference in the responses between the gender regarding the statement routine dental flossing is necessary**.** The findings of the current survey suggests that the awareness of dental flossing among dental trainees was moderate.

Key words: Dental Floss; oral health ; awareness; oral hygiene

INTRODUCTION

Periodontal diseases are one among the major chronic infections at present. Even though these are preventable diseases, their prevalence is increasing in the world **(Madan *et al.*, 2014)**. Periodontal disease has become a major public health problem in India and also in the developing countries of the world. Dental plaque is the main factor in causing the periodontal diseases and effective removal of the bacterial plaque will help in preventing periodontal diseases. It has been reported that toothbrush alone is inadequate for effective removal of dental plaque **(Petersen and Ogawa, 2005)**. Maintenance of oral hygiene is the most effective means of preventing diseases of the teeth and their supporting structures or tissue. Several researches have been proved that improper oral hygiene can lead to tooth abrasion and gingival injury **(Walters and Chang, 2003)**. It is assumed that removing plaque will help prevent gum diseases and tooth decay. Gum diseases which appear as red bleeding gums, may eventually contribute to tooth loss. Toothbrush removes some plaque, but does not reach the Interdental area to clean **(Sambunjak *et al.*, 2019)**. Clinical studies have been said that orthodontic treatment can be associated with decreased Periodontal health. Clinical alterations during orthodontic treatment include gingival enlargement, covering significant portions of the teeth. It has been found that daily use of dental floss not only prevents periodontal diseases, but also lowers the risk of cardiovascular system. The use of dental floss has long been considered to be effective in controlling the interproximal plaque and gingivitis **(Zanatta, Moreira and Rösing, 2011)**. Dental floss is much used by small populations in various countries. It is very important for the dentist and auxiliary personnel to recommend the use of the dental floss as well to strive to improve frequency by the public which will help to prevent periodontal diseases. Supporting studies said that an association between cardiovascular disease (CVD) and periodontitis, determined whether patients with chronic periodontitis, who are otherwise healthy individuals, have higher serum concentrations of emerging risk markers of CVD such as C-reactive protein (CRP) and interleukin 6 (IL-6) and investigated the effect of subsequent periodontal treatment on The levels of these markers **(Bauroth *et al.*, 2003)**. The study validates a method to measure interproximal quantities of the dental plaque, thereby permitting quantitative evaluations of the teeth **(El Fadl *et al.*, 2011), (Bellamy *et al.*, 2004)**. They

analysed 9 studies which includes outcome variables like plaque index, bleeding index, gingival index, and pocket depth. Although the reduction in the plaque was consistent in comparing IDBs to brushing alone and compared with the combination of tooth brushing and the dental floss even though the positive result did not apply uniformly in bleeding and dental index **(Gluch, 2012)**. To the best of our knowledge, no studies have revisited the gingival health. The aim of the study was to make people aware about the oral health and oral habits such as brushing twice a day and use of flossing to reduce your interdental problems **(de Freitas *et al.*, 2016)**. There is a need to know the factors affecting the prescription of dental floss and identify their barriers among indian population. Previously our team has a rich experience in working on various research projects across multiple disciplines. **(Muthukrishnan and Warnakulasuriya, 2018), (Govindaraju, Neelakantan and Gutmann, 2017), (Chen *et al.*, 2019), (Priyanka *et al.*, 2017), (Sitharthan *et al.*, 2019), (Priyadharsini *et al.*, 2018), (Azeem and Sureshbabu, 2018), (Wu *et al.*, 2019), (Abitha and Santhanam, 2019), (Manohar and Abilasha, 2019), (Venu, Dhana Raju and Subramani, 2019), (Wang *et al.*, 2019), (Girija, Jayaseelan and Arumugam, 2018), (Sheriff, Ahmed Hilal Sheriff and Santhanam, 2018), (Dhinesh *et al.*, 2017)**. Now the growing trend in this area motivated us to pursue this project. This study aims to analyse the awareness of dental flossing technique among dental trainees in India.

MATERIALS AND METHOD

The present study was a cross sectional study conducted at a private dental college and hospital in Chennai. The survey was approved by the institutional review board. The questionnaire consists of 18 questions based on the knowledge and attitude domains. The questionnaire is distributed among 50 dental trainees and responses are collected. Seven questions are about the knowledge of dental flossing and responses include Yes, No, Don't know. Eleven questions are about attitudes related to dental flossing and its responses include agree, strongly agree, disagree, strongly disagreeing. The responses of the participants are collected, tabulated and analysed statistically using SPSS for descriptive and association analysis.

RESULTS AND DISCUSSION

The gender proportion of the participants of the study includes, **Figure 1** represents 36% of the male and 64% of the female. The **Figure 2** represents that 68% of the participants reported yes that the dental floss can remove plaque and debris from the Interdental area, 18% said no and 12%

of the respondents don't know about the dental floss. The **Figure 3** represents dental floss polish the tooth surface as it removes the plaque 76% of the respondents said yes, 14% of the participants said no and 10% of the participants said they didn't know. The dental floss massage in the interdental area where 42% of the participants said yes, 50% of the participants said no and 8% of the participants said they didn't know. The dental floss can remove the gingival inflammation where 58% of the participants said yes, 32% of the participants said no and 10% of the respondent said dont know. The **Figure 4** represents that dental floss should be used regularly with the brushing, 66% of the participants said yes, 18% of the participants said no and 16% of the participants said they didn't know. The **Figure 5** represents that modern toothbrushes with advanced bristles are similar to the dental floss, 56% of the respondents said yes, 34% of the participants said no and 10% of the participants said they didn't know. The **Figure 6** represents that dental floss could damage the interdental gingiva, 64% of the participants said yes, 28% of the participants said no and 8% of the respondents don't know. The brushing alone is sufficient to maintain good oral health, the responses are 36% of the participants agree to it, 8% of the participants strongly agree, 38% of the participants disagree with it and 18% of the participants neither agree and nor disagree. The **Figure 7** represents that dental floss is essential to maintain good oral health 38% of the participants agreed, 34% participants strongly agreed, 14% of the participants disagreed and 14% of the participants neither agreed or nor disagreed . The **Figure 8** represents dental floss would maintain good periodontal health 48% of the participants agreed, 24% of the participants strongly agreed, 16% of the participants disagreed and 12% of the participants neither agree nor disagreed. The **Figure 9** represents dental flossing is necessary 52% of the participants said yes, 18% of the participants strongly agreed, 16% of the participants disagreed and 12% of the participants neither agree nor disagree. The lack of patience in using the dental floss leads to a lot of compliance, the responses are 26% of the participants agreed, 42% of the participants strongly agreed, 26% of the participants disagree and 6% of the participants neither agree nor disagree. The dental floss is freely available 42% of the respondents agree, 10% of the participants strongly agree, 22% of the participants disagree and 42% participants neither agree or nor disagree. The dental flossing is a time consuming process, the

responses are 36% of the participants agree, 16% of the participants strongly agree, 36% of the participants disagree and 12% of the participants neither agree nor disagree. The dental floss is not marked as oral hygiene products in India where 38% of the participants agreed, 22% of the participants strongly agreed, 30% of the participants disagreed and 10% of the participants neither agreed nor disagreed. The awareness about dental floss among people was better, the responses included 24% of the participants agree, 16% of the participants strongly agree, 34% participants disagree and 26% of the participants neither agree nor disagree. Association between the genders in awareness of dental flossing among dentists in India, analysed by using chi-square tests are depicted as bar graphs **(Figure 10-14)**. The statistical analysis showed that there is significant association between the awareness of dental floss and gender by the respondents. Majority of the females (15%) disagree that a tooth brush is enough to clean the interdental gingiva. Pearson chi square value = 10.976 p value = 0.012 (<0.05), which is statistically significant. Hence there is a significant difference in the responses between the gender regarding the statement tooth brush is enough to clean the interdental gingiva. Majority of the females (20%) agree that routine dental flossing is necessary. Pearson chi square value = 17.016 p value = 0.001 (<0.05), which is statistically significant. Hence there is significant difference in the responses between the gender regarding the statement routine dental flossing is necessary.

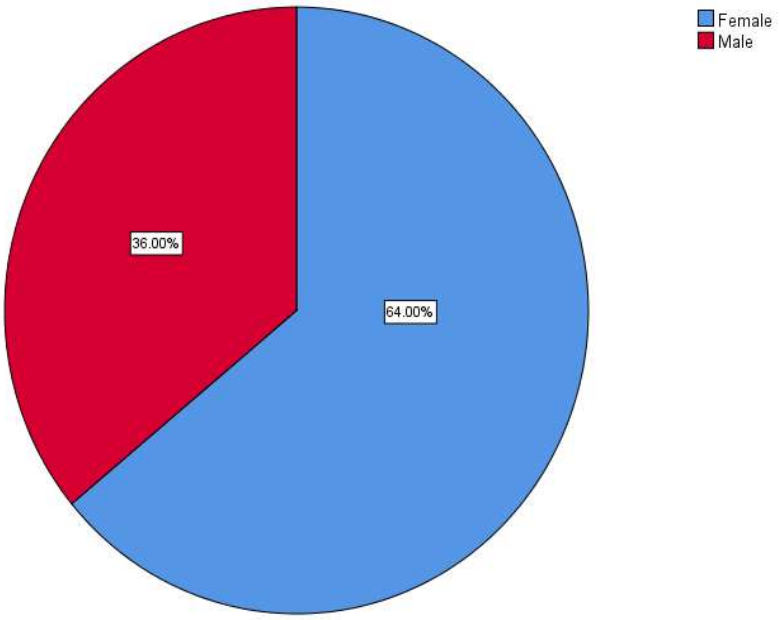

Figure 1: The pie chart shows the percentage distribution of the participants based on gender, 64% female denoted in (Red) and 36% male denoted in (Blue)

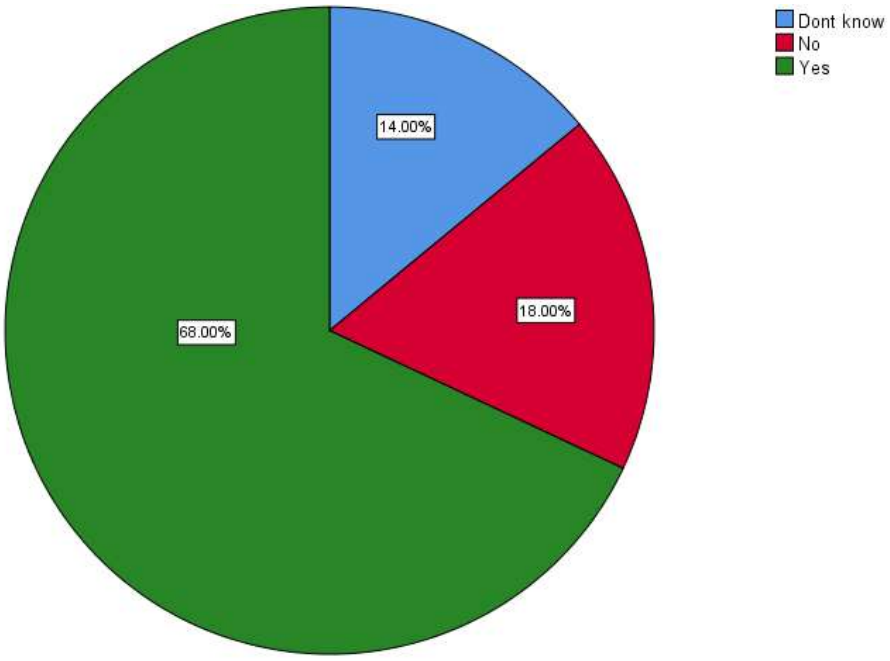

Figure 2: The pie chart shows the percentage distribution of the participants, Knowledge about the dental floss removes the plaque from interdental area, 68% of the participants said yes represent in (Green), 18% said no represent in (Red) and 14% said dont know represented in (Blue). Majority (68%) of participants responded as yes

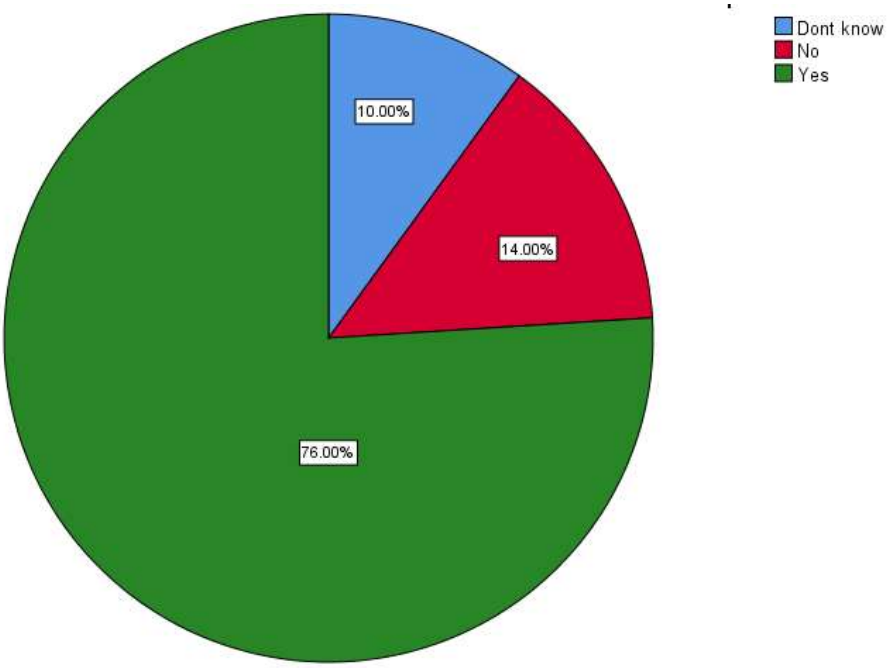

Figure 3: The pie chart shows the percentage distribution of the participants, Knowledge about the dental floss polish the tooth surface by removing the plaque and debris.76% of the participants said yes represent in (Green), 14% reported as no represent in (Red) and 10% said dont know represented in (Blue). Majority (76%) of the participants responded yes

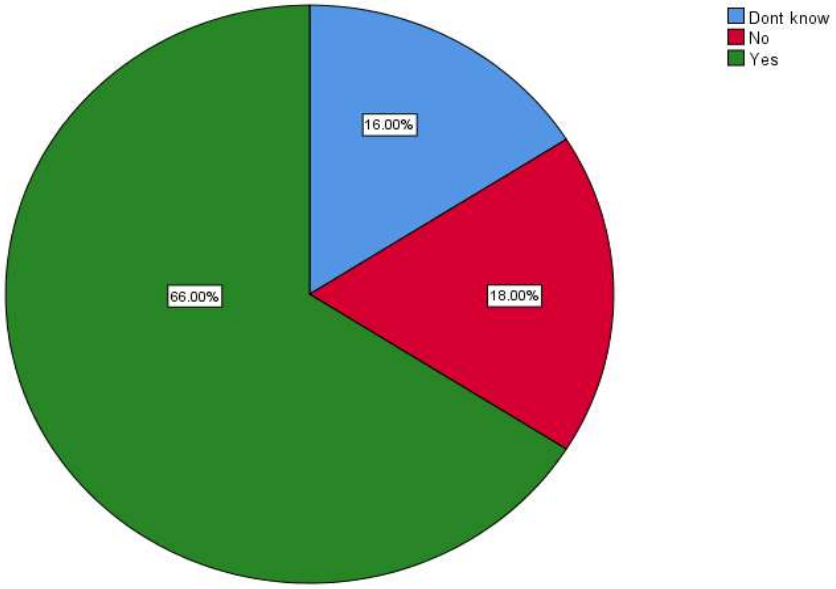

Figure 4: The pie chart shows the percentage distribution of the participants, Awareness about the dental floss should be used regularly.66% of the participants said yes represent in (Green), 18% said no represent in (Red) and 16% said dont know represented in (Blue). Majority (66%) of participants responded yes.

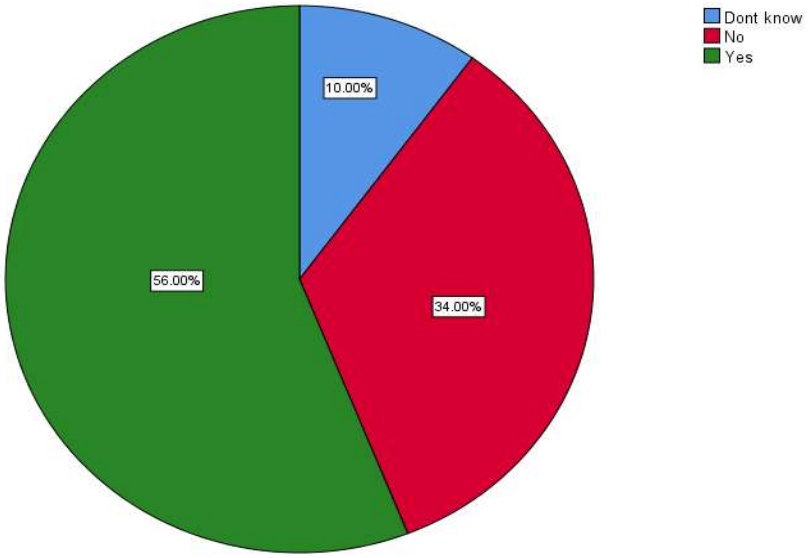

Figure 5: The pie chart shows the percentage distribution of the participants, Awareness about the modern toothbrush and advanced bristle similar to dental floss .56% of the participants said yes represent in (Green), 34% said no represent in (Red) and 10% said dont know represented in (Blue). Majority (56%) of the participants responded yes.

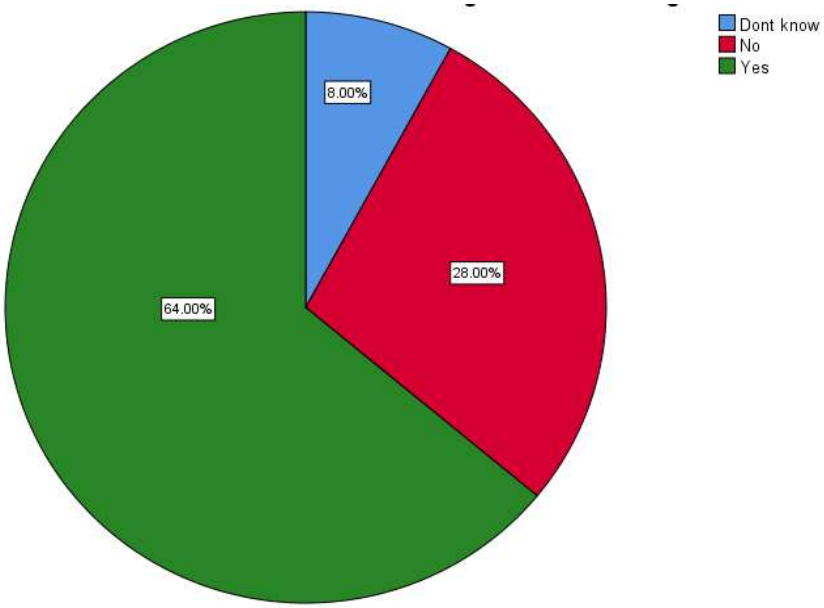

Figure 6: The pie chart shows the percentage distribution of the participants, Knowledge about the dental floss that would damage the interdental gingiva.64% of the participants said yes represent in (Green), 28% said no represent in (Red) and 8% said dont know represented in (Blue). Majority (64%) of the participants responded yes.

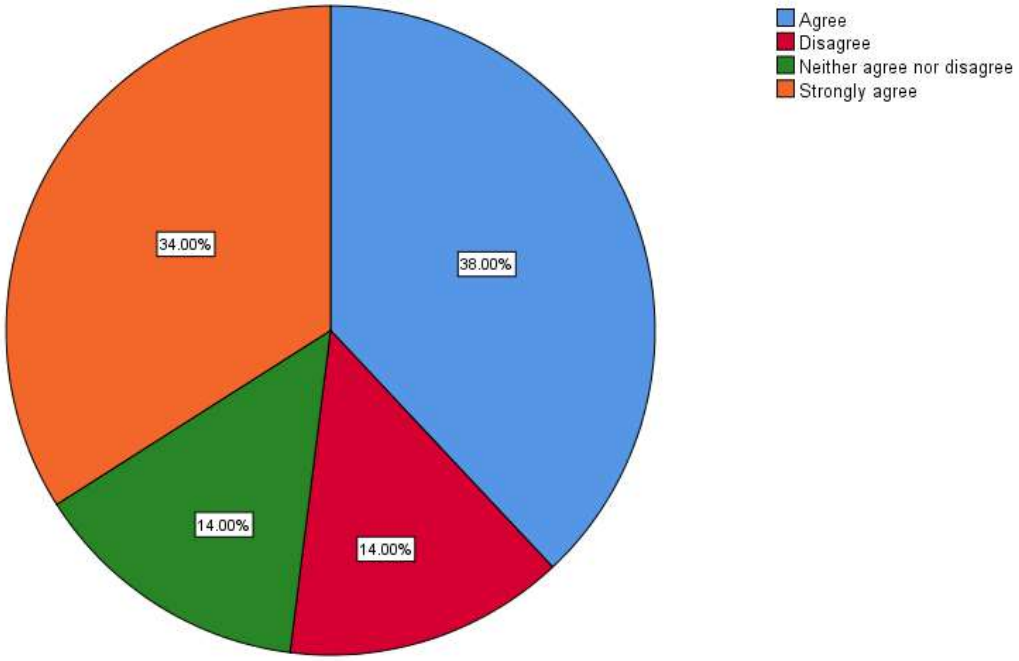

Figure 7: The pie chart shows the percentage distribution of the participants, Knowledge about the dental floss to maintain good oral hygiene. 38% of the participants agree which is represent in (Blue), 34% of the participants strongly agree (Orange) ,14% of the participants disagree (Red) and 14% participants neither agree nor disagree (Green). Majority (38%) of the participants agreed.

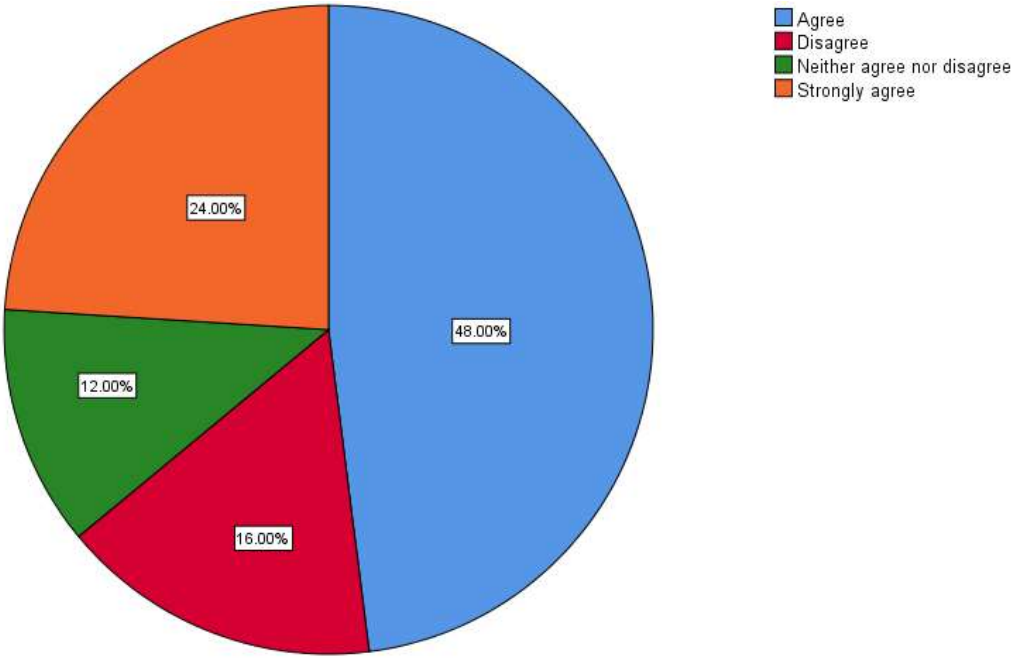

Figure 8: The pie chart shows the percentage distribution of the participants, Knowledge about the dental floss has to maintain good periodontal health. 48% of the participants agree which is represented in (Blue), 24% of the participants strongly agree (Orange) ,16% of the participants disagree (Red) and 12% participants neither agree nor disagree (Green).

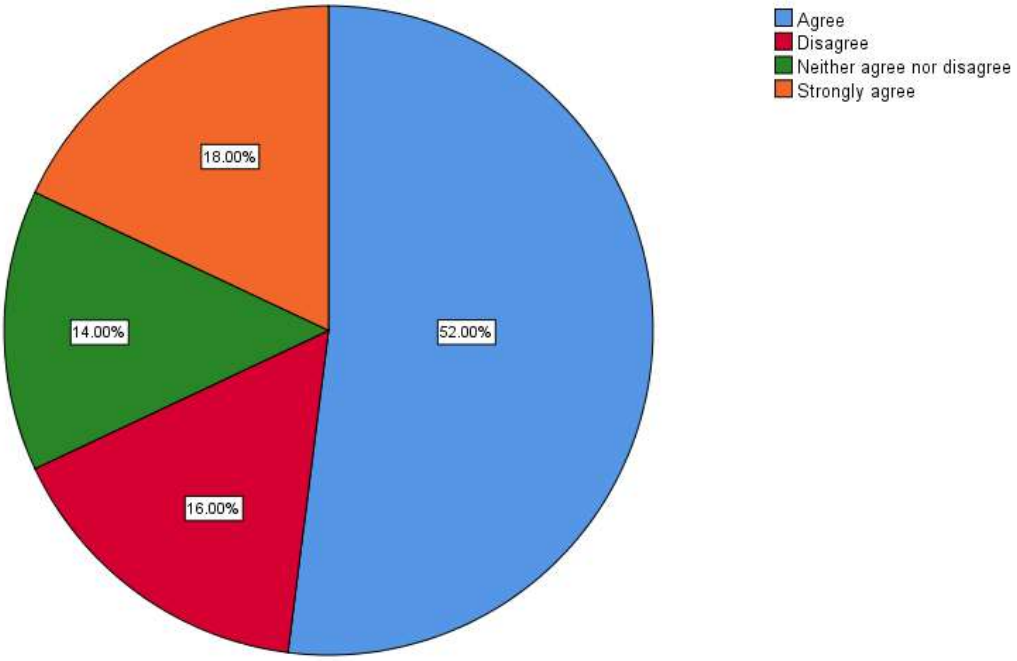

Figure 9: The pie chart shows the percentage distribution of the participants, Knowledge about the routine dental flossing is necessary. 53% of the participants agree which is represented in (Blue), 24% of the participants strongly agree (Orange) ,16% of the participants disagree (Red) and 12% participants neither agree nor disagree (Green). Majority (53%) of participants agreed.

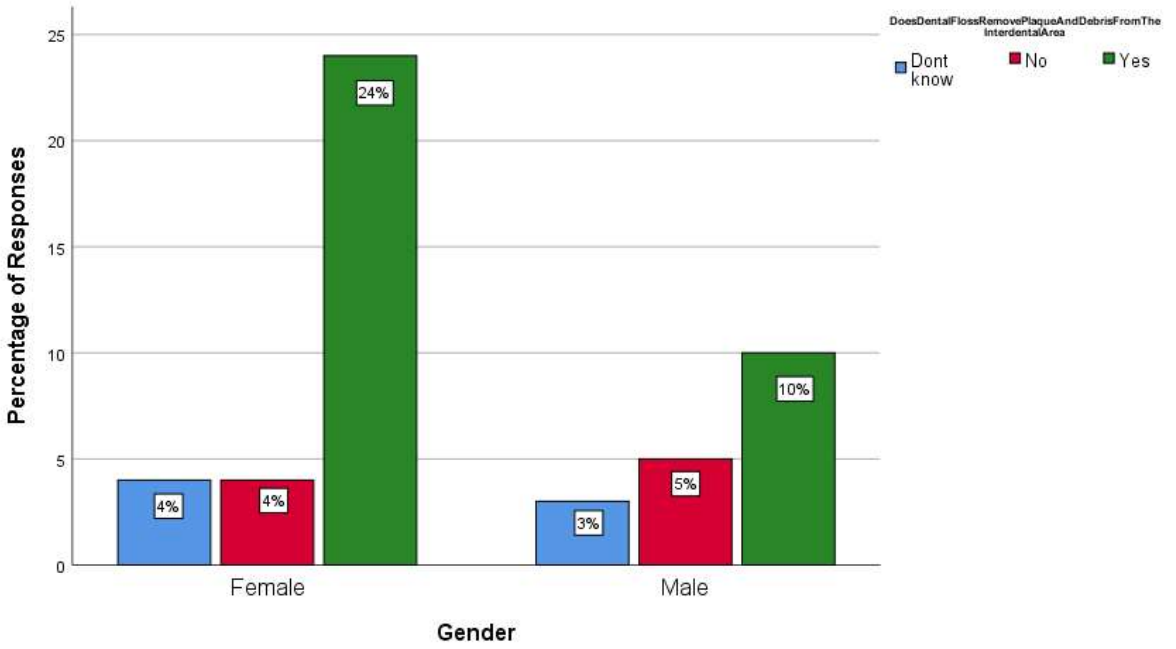

Figure 10:The bar graph represents the association between the gender and knowledge about the dental floss which is enough to clean the interdental gingiva. X axis represents the gender and Y axis represents the percentage of responses, in which green denotes yes, red denotes no and blue denotes don't know.Majority of the female (24%) responded yes that dental floss is enough to clean the interdental gingiva. Pearson chi square value = 2.277 p value = 0.20 (>0.05), which is statistically not significant. Hence there is no significant difference in the responses between gender with regard to given statements.

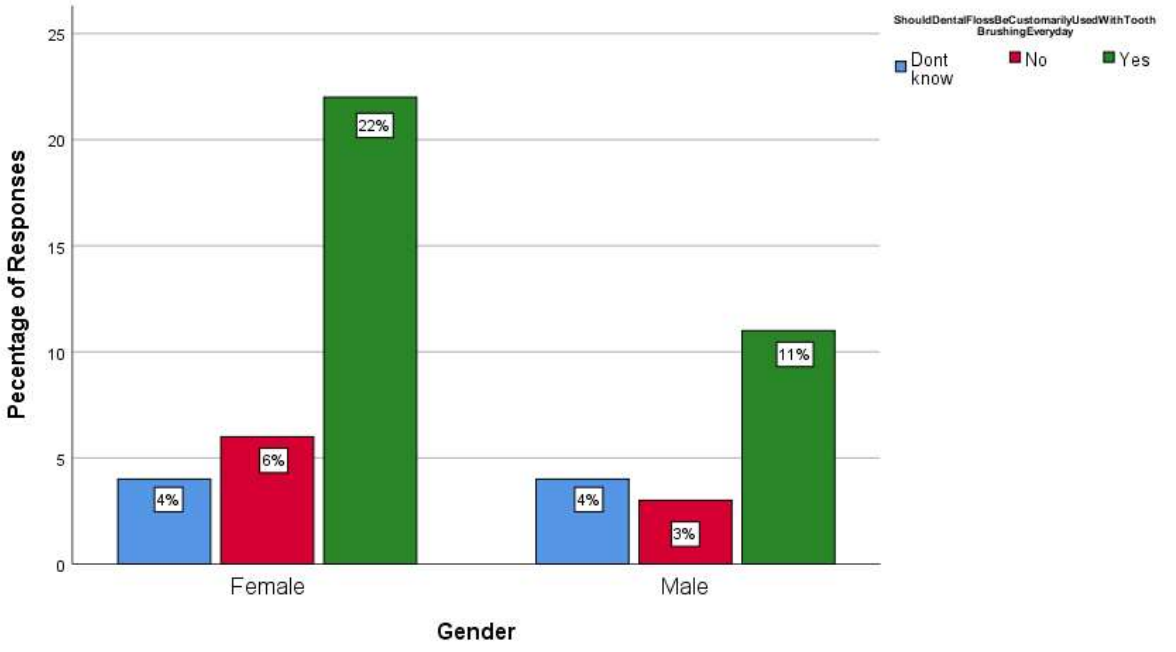

Figure 11: The bar graph represents the association between the gender and dental floss that should be used regularly with tooth brushing everyday. X axis represents the gender and Y axis represents the percentage of responses, in which green denotes yes, red denotes no and blue denotes don't know. Majority of the females (22%) responded yes that dental floss should be used regularly with tooth brushing. Pearson chi square value = 0.810 p value = 0.667 (>0.05), which is statistically not significant. Hence there is no significant difference in the responses between the gender..

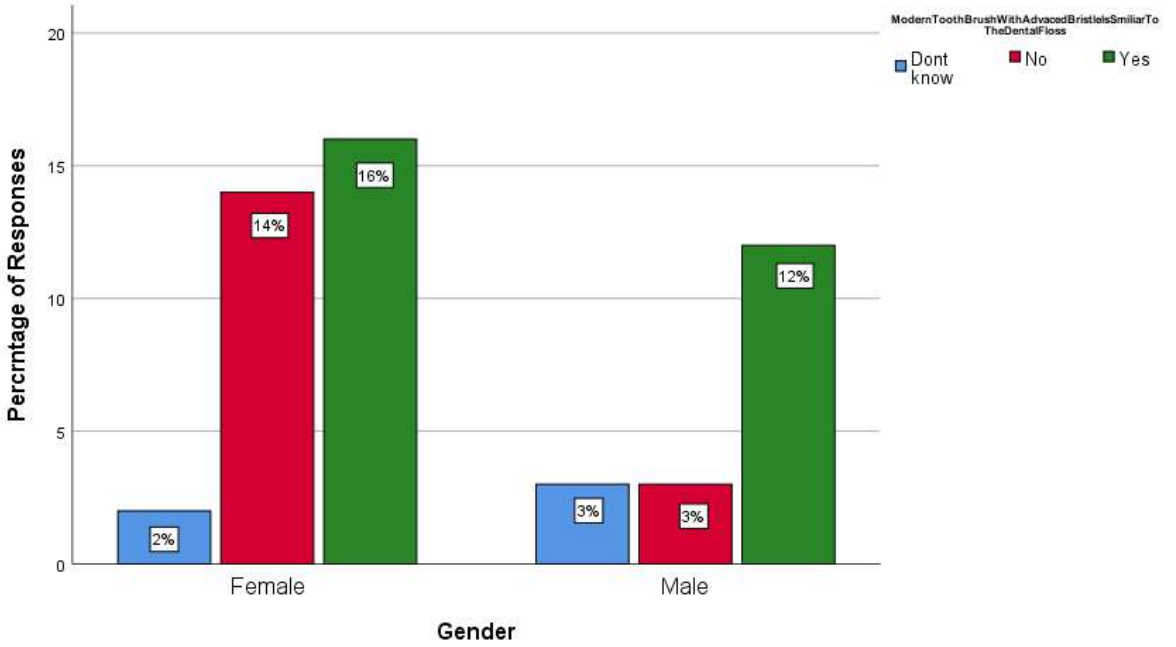

Figure 12: The bar graph represents the association between the gender and modern tooth brush is similar to the advanced bristle. X axis represents the gender and Y axis represents the percentage of responses, in which green denotes yes, red denotes no and blue denotes don't know. Majority of the females (16%) responded yes that modern tooth brush is similar to the advanced bristle. Pearson chi square value = 4.307 p value = 0.116 (>0.05), which is statistically not significant. Hence there is no significant difference between the gender responses.

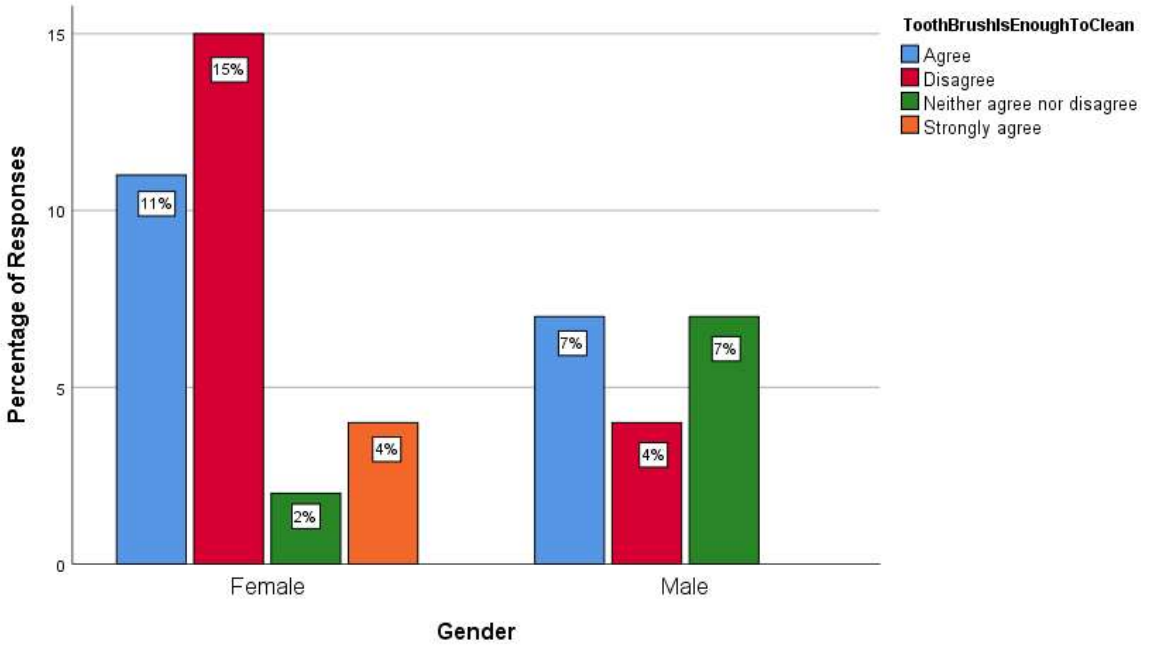

Figure 13: The bar graph represents the association between the gender and tooth brush is enough to clean the interdental gingiva. X axis represents the gender and Y axis represents the percentage of responses, in which green denotes neither agree nor disagree, red denotes disagree and blue denotes agree , orange denotes strongly agree. Majority of the females (15%) disagree that a tooth brush is enough to clean the interdental gingiva. Pearson chi square value = 10.976 p value = 0.012 (<0.05), which is statistically significant. Hence there is a significant difference in the responses between the gender.

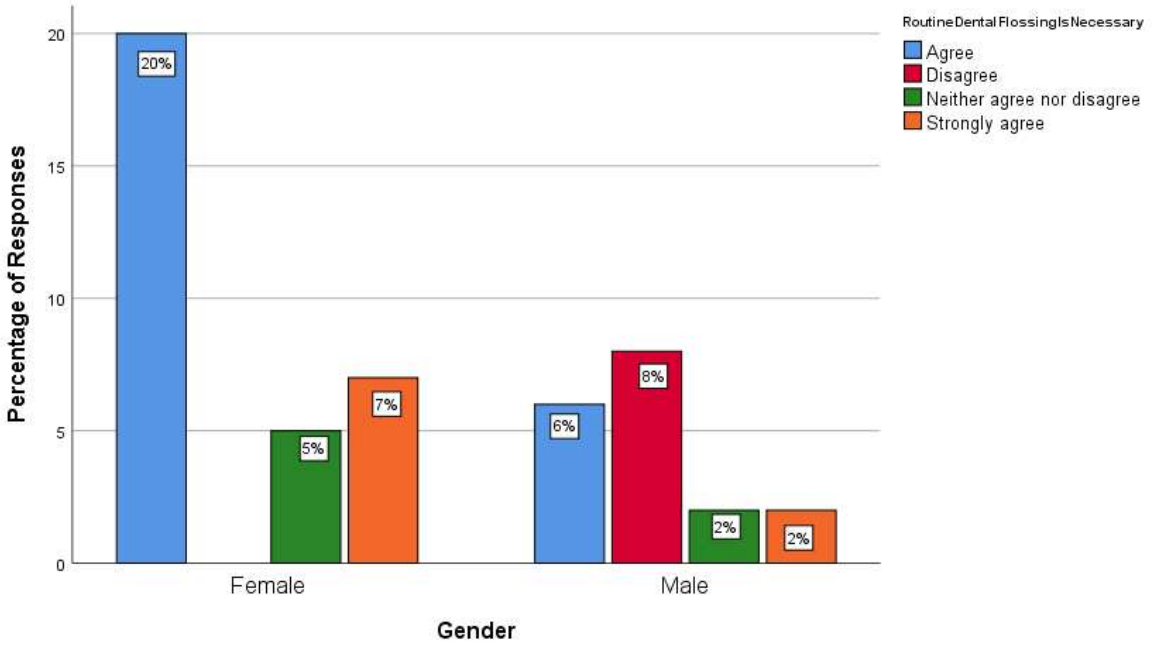

Figure 14: The bar graph represents the association between the gender and routine dental flossing is necessary. X axis represents the gender and Y axis represents the percentage of responses, in which green denotes neither agree nor disagree, red denotes disagree and blue denotes agree , orange denotes strongly agree. Majority of the females (20%) agree that routine dental flossing is necessary. Pearson chi square value = 17.016 p value = 0.001 (<0.05), which is statistically significant. Hence there is a significant difference in the responses between the gender.

In a study conducted regarding the dental floss there is less awareness among Indian people, 7% of the people agreed to it. The percentage of Indian dentists using dental floss is extremely low at 9.2% **(Levin and Ashkenazi, 2008)** which is similar to our study. This is regarding attitude related questionnaires. By comparing the previous study usage of dental floss along with regular tooth brushing to prevent gingival disease, 84.9% of people say dental floss can remove gingival inflammation. 62% of the people say dental floss is essential for life. The previous study reported that 55.9% of dentists will brush twice a day which will reduce your gingival problems **(Gopinath, 2010)**. By comparing the both studies our research has a limited number of people. So the percentage and statistics may differ from them. Previous studies revealed that current oral hygiene practices of dentists may have different prescription patterns. .However our study also revealed that usage of dental floss among dentists was less. Since the daily users of dental floss among dentists in India are less, there is a high possibility that the non-daily users may not recommend dental floss routine to their patients **(Merchant *et al.*, 2002)**. It is also important just prescribing dental floss is not enough, it is also essential to demonstrate correct flossing technique as incorrect flossing may result in cervical abrasion of the teeth and angular alveolar bone loss **(Salas *et al.*, 2012) (Manjunath *et al.*, 2011)**. In the previous article the

majority of the participants 87.0% cleaned their teeth using a toothbrush which is not similar to our study **(Al-Tayar *et al.*, 2019)**.

In a study the frequency of dental flossing among the trainees considerably varied; however, the majority reported that usage of dental floss 4–6 times per week. The relatively higher percentage of the trainees who do flossing at 2–4 times per week may be because they have more knowledge about its benefits and how it works as part of their pharmacy courses **(Aljrais *et al.*, 2018)**. In a study 67.8% identified that toothbrush, dental floss, and mouthwash all together are the best cleaning aid, In our study 38% of the participants agreed. 44.6% of the children recognized dental floss as a cleaning device for between the teeth, which means that the importance of cleaning between teeth was apparently less well-understood, as 40% of the children thought that cleaning between teeth using a toothbrush is adequate, and 7.1% do not know the right way **(Al-Darwish, 2016)**. Knowledge towards the dental floss is needed. Flossing is practiced by fewer individuals, but frequency has slowly increased in females which is similar to our study. The majority of the females are aware about dental floss and its usage. Flossing has been shown to reduce gingival inflammation **(Vandana, Mahajan and Savitha, 2015)**. In this study 50% of trainees said that dental flossing is more time consuming hence they were reluctant to floss their teeth regularly, which is similar to our study 36% of the participants agreed that dental flossing is a time consuming procedure. **(Ramananda and Talwar)** Our institution is passionate about high quality evidence based research and has excelled in various fields **(Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Vijayashree Priyadharsini, Smiline Girija and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Chandrasekar *et al.*, 2020; Mathew *et al.*, 2020; R *et al.*, 2020; Samuel, 2021)**. We hope this study adds to this rich legacy.

CONCLUSION

The findings of the current survey suggests that the awareness of dental flossing among dental trainees was moderate. To maintain good oral health dental floss can be incorporated in practice. The awareness and confidence regarding the usage of dental floss techniques need to be created among the dental trainees for the well being of the society.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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