

KNOWLEDGE ATTITUDE AND PRACTICES REGARDING DENTAL FLOSS AMONG UNDERGRADUATE DENTAL STUDENTS

Authors:

S. Santhosh Bala

Saveetha Dental College and Hospitals

Saveetha Institute of Medical and Technical Sciences (SIMATS)

Saveetha University

Chennai - 600077, India

Dr. Parkavi Arumugam

Senior lecturer

Department of Periodontics

Saveetha Dental college and Hospitals

Saveetha Institute of Medical and Technical Sciences

Saveetha University

Chennai- 77, India

ABSTRACT:

INTRODUCTION:

Periodontal disease is one of the most common chronic infections now afflicting humanity. Despite the fact that many diseases are avoidable, their prevalence is on the rise around the world. In underdeveloped countries, the prevalence of periodontal disorders is higher. It has been discovered that using dental floss on a regular basis not only prevents periodontal disease but also reduces the risk of other systemic inflammatory disease, thus its relevance must be emphasised.

MATERIALS AND METHOD:

Online survey containing the questionnaire was sent to 100 undergraduate dental students. Results were tabulated and analysed. Pie charts and bar graphs were used to represent the data obtained.

RESULTS AND DISCUSSION:

In this current study it was found out that students were well aware about the different types of floss used as 63% responded saying all three ergonomic floss, specialised plastic wand and regular floss. A question based on attitude was asked to the students about the rules of dental flossing for which students had to choose the wrong option out of the following rules, 36% believed the option "always apply pressure on gums" to be the inexact rule out of the following.

CONCLUSION:

Upon analysing the results obtained, it was concluded that dental students hold a satisfactory level of knowledge regarding the practice of flossing. It can be increased by case based scenarios and visual aids.

KEY WORDS: Dental flossing, periodontitis, gingivitis, dental hygiene, knowledge, innovative technique

INTRODUCTION

Periodontal disease is one of the most common chronic infections now afflicting humanity. Despite the fact that many diseases are avoidable, their prevalence is on the rise around the world. In underdeveloped countries, the prevalence of periodontal disorders is higher(1). Periodontal disease has emerged as a serious public health concern in India, with incidence rates ranging from 50 to 100 percent in various sections of the Indian subcontinent(2).The key etiological element in the pathogenesis of periodontal disease is dental plaque or biofilm, and elimination of bacterial plaque is the gold standard for its prevention(3). Plaque control by mechanical means is unquestionably the simplest and most effective approach of preventing periodontal disease.(4) The use of various oral hygiene tools such as dental floss has been stressed because it has been found that a toothbrush alone is insufficient for effective removal of dental plaque(5). Despite the fact that dental floss is more effective than a manual toothbrush at removing interdental plaque, the use of dental floss as a supplement to oral hygiene is still not followed rigorously all over the world(6). According to several statistics, dental floss is only used by a small percentage of the population on a daily basis(7).

Our team has extensive knowledge and research experience that has translate into high quality

publications.(17–29),(30–34) (35) (36)

It has been discovered that using dental floss on a regular basis not only prevents periodontal disease but also reduces the risk of cardiovascular disease, thus its relevance must be emphasised(8). One of the major issues confronting the modern dentistry practitioner is changing patient behaviour towards oral hygiene care(9).

In this context, it is critical for dentists and dental auxiliaries to promote the use of dental floss and to work to increase the frequency with which the general public uses it, as this will aid in the prevention of periodontal diseases(10).

Periodontal disease is one of India's most serious public health problems, so finding preventive ways to lessen the illness's impact is critical(11). Dentists play a vital role in recommending effective oral hygiene aids for the preservation of excellent oral health, however reports indicate that dental floss is not recommended to every patient in dental practise on a regular basis(12). It's critical to understand the factors that influence dental floss prescriptions, as well as the restrictions that exist among Indian dentists.

Materials and methods

This cross-sectional questionnaire based online survey was conducted among the undergraduate dental students of Saveetha Dental College with a sample size of 100 participants. A well structured and validated questionnaire was prepared in english language and circulated through an online Google forms link. The survey was conducted for a duration of 1 month. Anonymity was maintained, the purpose of the study was explained to the participants in detail and the questionnaire was filled with their consent. The responses were obtained and statistically analysed using SPSS software to obtain the results. The descriptive data obtained were plotted in bar graphs. The difference in the level of the knowledge and attitude between various years of study and between males and females were compared using the Chi-square test with a p value of 0.05 set as statistically significant.

RESULTS AND DISCUSSION

In the present study a total of 100 students participated of which 57% were female and 43% were male . Among the people who participated 20% were first years, 27% second years, 23% third years ,20% final years and the remaining 10% were interns(14). The questionnaire was created to assess the knowledge attitude and practices of the following participants with regards to Dental floss. In the present study, 60% of the participants were aware that dental floss was made of “Both nylon and silk” , 27% responded “Nylon”, 9% responded “Cotton” and 4% responded “Silk”. Fig2. The participants when asked about other alternative methods to substitute dental flossing, 51% of them chose all three options which were interdental brushing, toothpick and water flossing(15) Fig3. When asked further about the advantages of water flossing majority of the participants answered that water flossing corrects deep pockets and are usually more gentle on the gums, however few responded water flossing removes all calculus and plaque on tooth surface which is on the contrary according to another study which states that regular flossing cleans more plaque and calculus on the tooth surface than water flossing, tooth brushing and other alternative methods but also causes irritation and pain when compared to water flossing (16).Fig4. In this current study it was found out that students were well aware about the different types of floss used as 63% responded saying all three ergonomic floss, specialised plastic wand and regular floss .Fig6.

A question based on attitude was asked to the students about the rules of dental flossing for which students had to choose the wrong option out of the following rules, 36% believed the option “always apply pressure on gums” to be the inexact rule out of the following .Fig5. In this study students were also asked about their practices related to dental flossing (37).When asked about the type of floss usually prescribed 62% responded waxed floss and the remaining 38% responded with non waxed floss this result is in contrary to other studies which states that non waxed floss is the most commonly prescribed type of floss(38). Fig 1. When asked whether the participants prescribed flossing to their patients 92% responded saying “yes” and the remaining 8% responded “no”, this is also in contrary to many studies as more than 90% of the dentists thought that dental floss is not as well marketed as other oral hygiene aids in India and that there is a lack of awareness regarding dental floss among the general population(39). 89.8% of the respondents felt that dentists should create awareness and motivate people to use dental floss regularly(40). A bar chart showing

the association between Year of study and the responses to the question “What are the alternate methods of flossing”. X axis represents Year of study and Y axis denotes the number of responses. The Pearson Chi square value was found to be 16.396, and the p value was found to be 0.002 which is statistically significant. From the following correlation we found out that third year students chose all of the above .

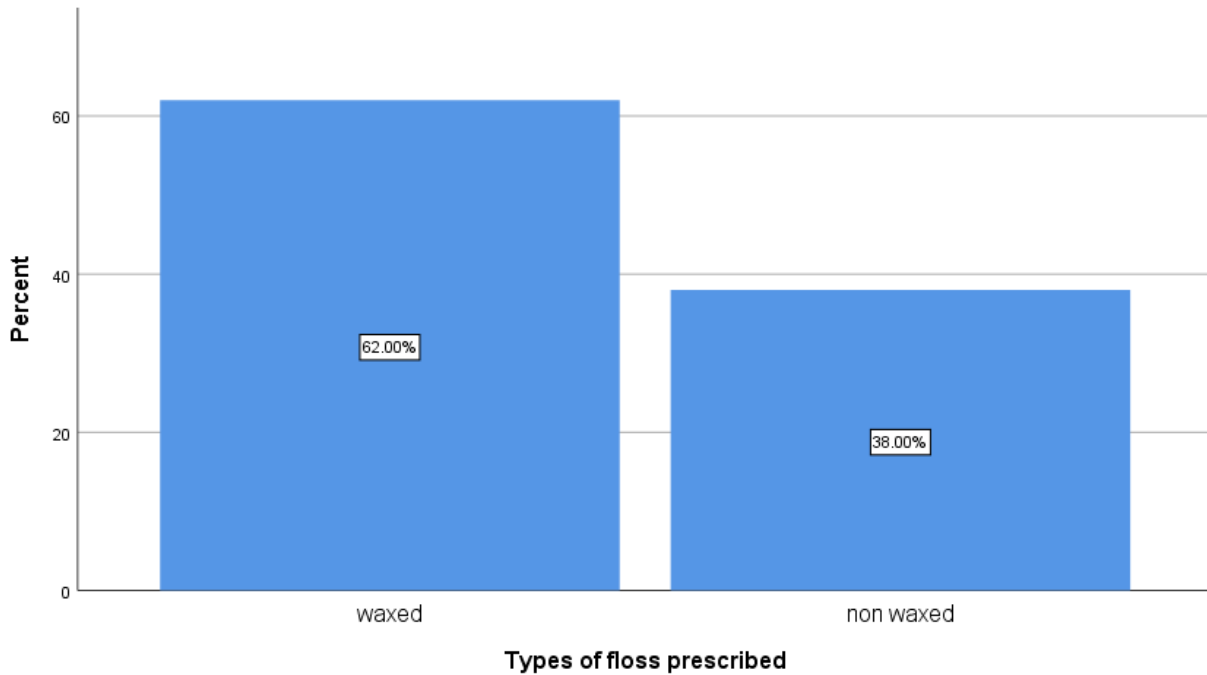


Fig. 1: Bar graph depicting the responses to the question, “Which type of floss is usually prescribed?”. In which 62% responded “waxed” and 38% responded “non-waxed”

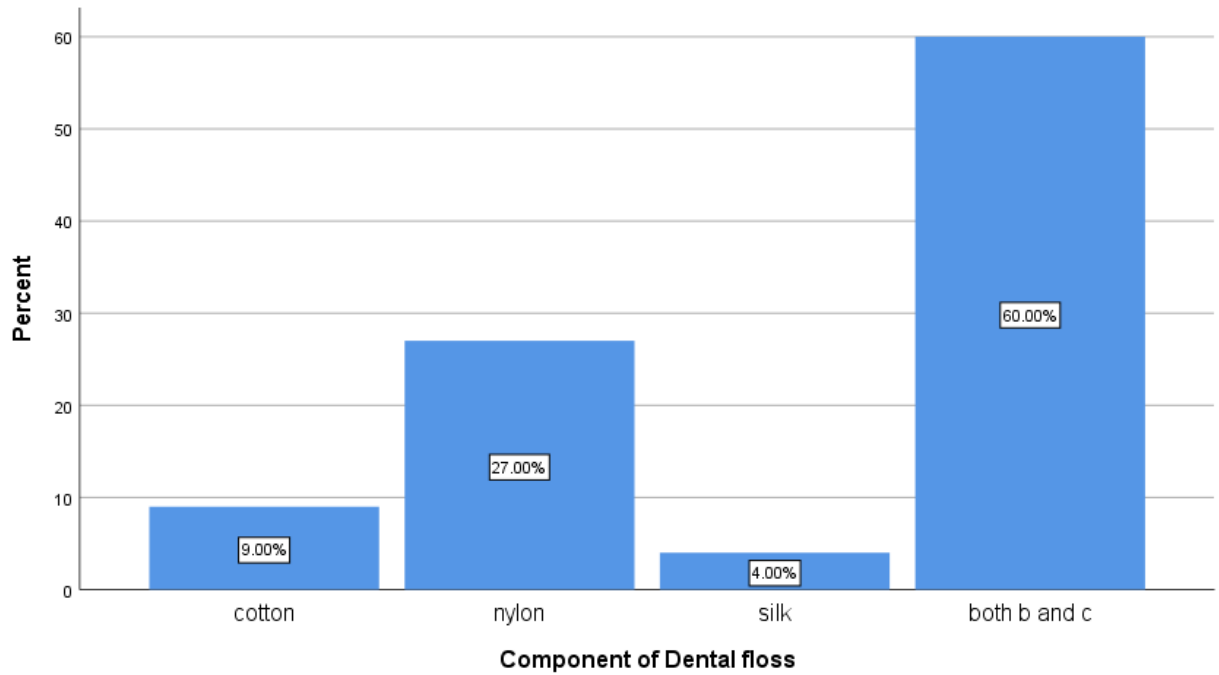


Fig. 2: Bar graph depicting the responses to the question, “Dental floss is made of?”. In which 60% responded “Both nylon and silk” and 27% responded “Nylon”, 9% responded “Cotton” and 4% responded “Silk”.

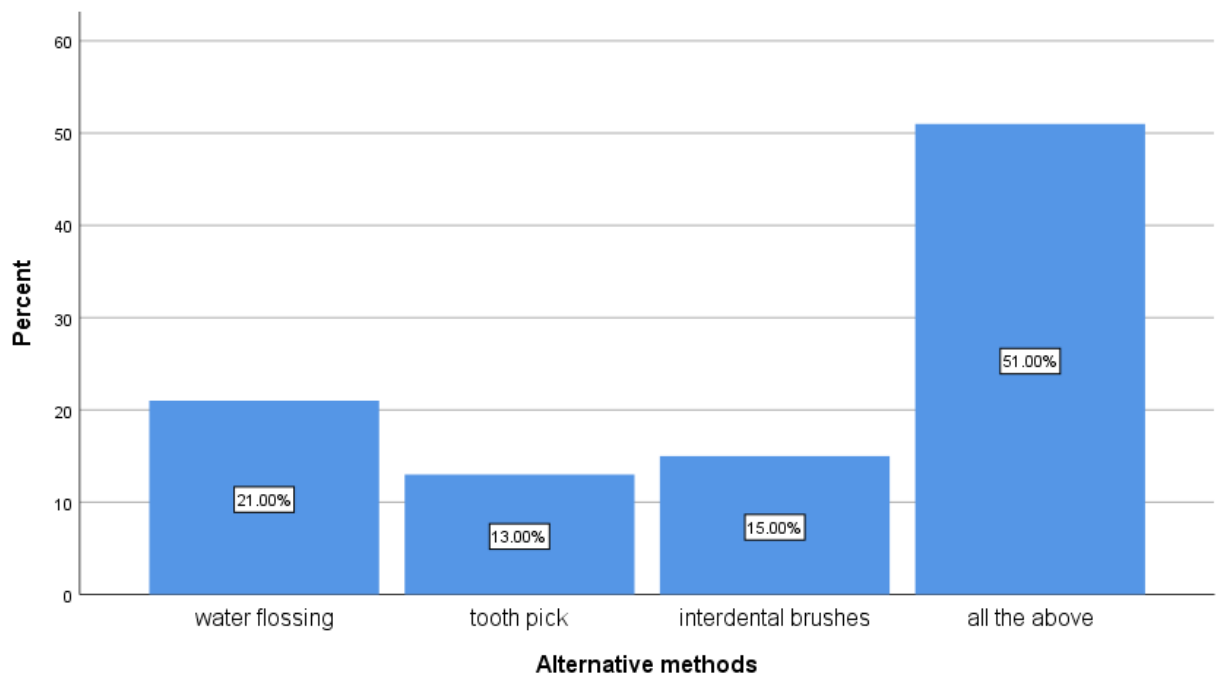


Fig. 3: Bar graph depicting the responses to the question, “What are the alternative methods for dental flossing?”. In which 51% responded “All of the above” and 13% responded “Tooth pick” , 21% responded “Water flossing” and 15% responded “Interdental brushes .

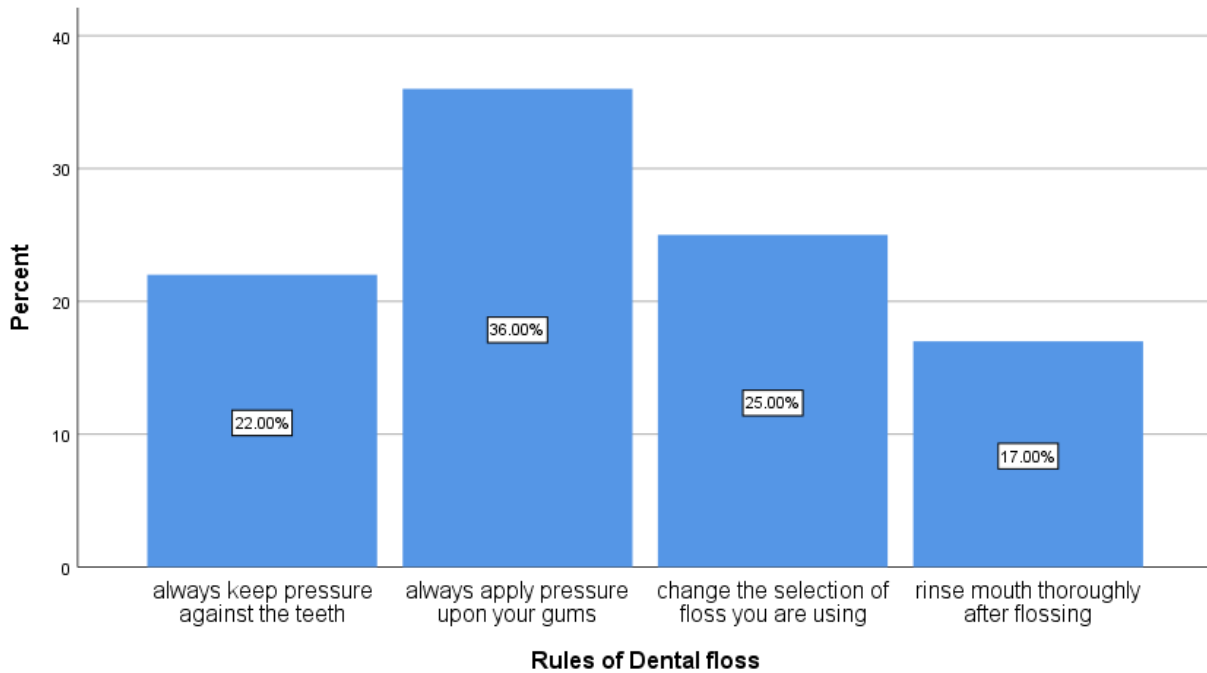


Fig. 4: Pie chart depicting the responses to the question, “The rules of dental flossing are all of these except?”. In which 17% responded “Rinse mouth thoroughly after flossing” and 36% responded “Always apply pressure upon your gums” 22% responded “Always keep pressure against the teeth” and 25% responded “Change the selection of floss you are”

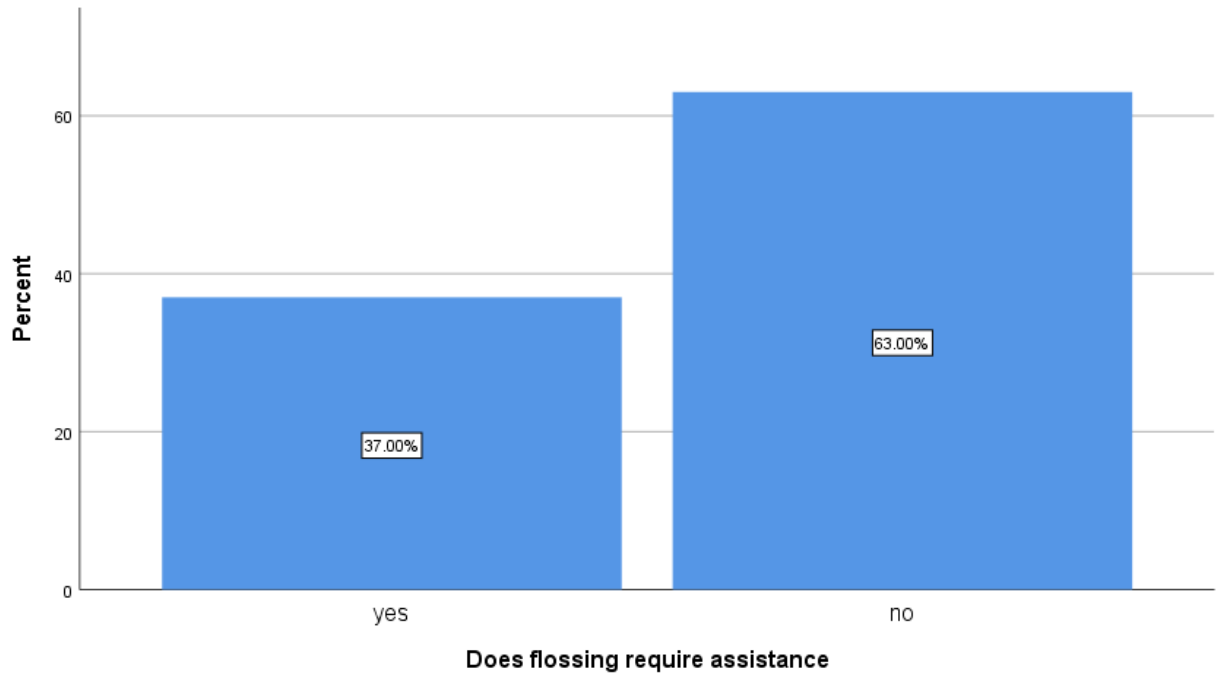


Fig 5: Bar graph representing responses to the question “Does Flossing require assistance?” To which 37% responded “Yes” and 63% responded “No”.

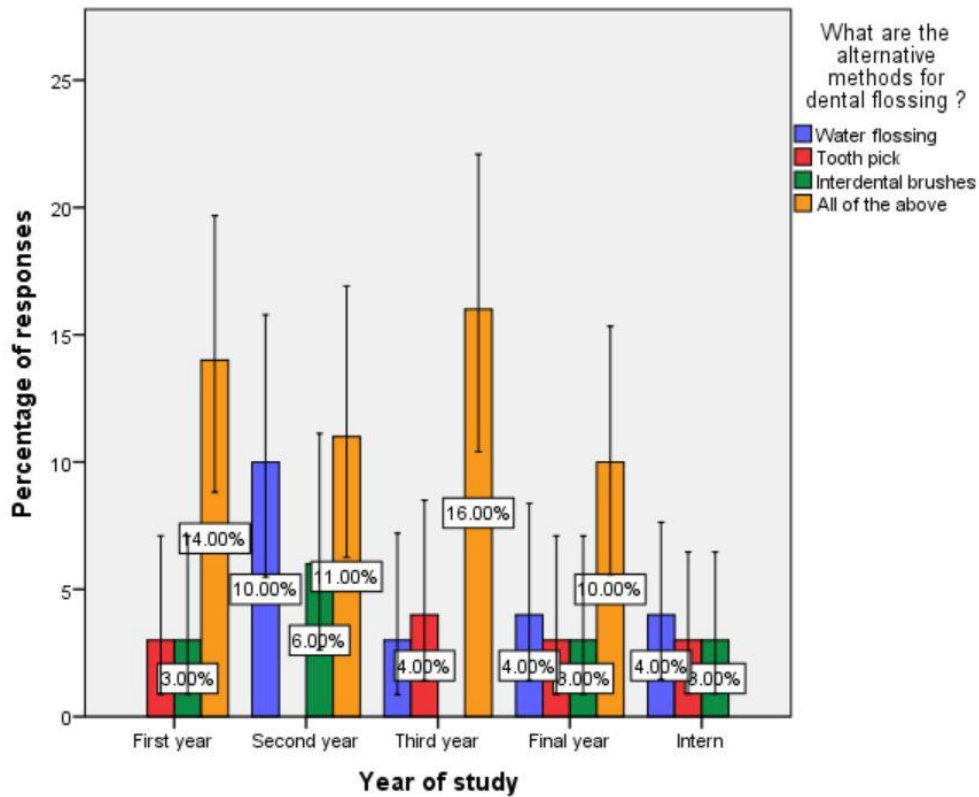


Figure 6: A bar chart showing the association between Year of study and the responses to the question “What are the alternate methods of flossing”. X axis represents Year of study and Y axis denotes the number of responses. The Pearson Chi square value was found to be 16.396, and the p value was found to be 0.002 which is statistically significant.

CONCLUSION

It can be concluded that dentists hold a satisfactory level of knowledge with respect to flossing and its practice. Some concepts surrounding flossing can be reinforced to the dental students through visual aids, case based scenarios etc.

Acknowledgement

We would like to thank our college and management for their constant support and encouragement in completing the research work.

Conflict of interest

The authors declare that there are no conflict of interest in the present study.

Source of funding

- **Saveetha Dental college**
- **Saveetha university**
- **SIMATS**
- **JHS Developers**

REFERENCES:

1. Madan C, Arora K, Chadha VS, Manjunath BC, Chandrashekar BR, Rama Moorthy VR. A knowledge, attitude, and practices study regarding dental floss among dentists in India. J Indian Soc Periodontol. 2014 May;18(3):361–8.
2. Jin LJ, Armitage GC, Klinge B, Lang NP, Tonetti M, Williams RC. Global Oral Health

- Inequalities [Internet]. Vol. 23, *Advances in Dental Research*. 2011. p. 221–6. Available from: <http://dx.doi.org/10.1177/0022034511402080>
3. Petersen PE, Ogawa H. Strengthening the prevention of periodontal disease: the WHO approach. *J Periodontol*. 2005 Dec;76(12):2187–93.
 4. Marya CM, Kumar V, Khatri M, Agarwal V, Singh G, Gupta G. Prevalence of Periodontal Diseases in India [Internet]. Vol. 4, *Journal of Oral Health and Community Dentistry*. 2010. p. 7–16. Available from: <http://dx.doi.org/10.5005/johcd-4-spl-7>
 5. Pinto TMP, de Freitas GC, Dutra DA, Kantorski KZ, Moreira CH. Frequency of mechanical removal of plaque as it relates to gingival inflammation: a randomized clinical trial. *J Clin Periodontol*. 2013 Oct;40(10):948–54.
 6. Claydon NC. Current concepts in toothbrushing and interdental cleaning. *Periodontol* 2000. 2008;48:10–22.
 7. Gluch JJ. As an adjunct to tooth brushing, interdental brushes (IDBs) are more effective in removing plaque as compared with brushing alone or the combination use of tooth brushing and dental floss. *J Evid Based Dent Pract*. 2012 Jun;12(2):81–3.
 8. Fine PD, Louca C, Leung A. *Sports Dentistry: Principles and Practice*. John Wiley & Sons; 2018. 232 p.
 9. Yuen HK, Hant FN, Hatfield C, Summerlin LM, Smith EA, Silver RM. Factors associated with oral hygiene practices among adults with systemic sclerosis. *Int J Dent Hyg*. 2014 Aug;12(3):180–6.
 10. Folayan MO, Khami MR, Folaranmi N, Popoola BO, Sofola OO, Ligali TO, et al. Determinants of preventive oral health behaviour among senior dental students in Nigeria. *BMC Oral Health*. 2013 Jun 18;13:28.
 11. Hsu K-J, Yen Y-Y, Lan S-J, Wu Y-M, Lee H-E. Impact of oral health behaviours and oral habits on the number of remaining teeth in older Taiwanese dentate adults. *Oral Health Prev Dent*. 2013;11(2):121–30.
 12. Farsi JMA, Farghaly MM, Farsi N. Oral health knowledge, attitude and behaviour among Saudi school students in Jeddah city. *J Dent*. 2004 Jan;32(1):47–53.
 13. El Fadl KA, Ragy N, El Batran M, Kassem N, Nasry SA, Khalifa R, et al. Periodontitis and cardiovascular disease: Floss and reduce a potential risk factor for CVD. *Angiology*. 2011 Jan;62(1):62–7.
 14. Adair PM, Burnside G, Pine CM. Analysis of health behaviour change interventions for preventing dental caries delivered in primary schools. *Caries Res*. 2013 Oct 7;47 Suppl 1:2–12.
 15. Judah G, Gardner B, Aunger R. Forming a flossing habit: an exploratory study of the

- psychological determinants of habit formation. *Br J Health Psychol.* 2013 May;18(2):338–53.
16. Manjunath BC, Praveen K, Chandrashekar BR, Rani RMV, Bhalla A. Periodontal infections: a risk factor for various systemic diseases. *Natl Med J India.* 2011 Jul;24(4):214–9.
 17. Ramesh A, Varghese S, Jayakumar ND, Malaiappan S. Comparative estimation of sulfiredoxin levels between chronic periodontitis and healthy patients - A case-control study. *J Periodontol.* 2018 Oct;89(10):1241–8.
 18. Paramasivam A, Priyadharsini JV, Raghunandhakumar S, Elumalai P. A novel COVID-19 and its effects on cardiovascular disease. *Hypertens Res.* 2020 Jul;43(7):729–30.
 19. S G, T G, K V, Faleh A A, Sukumaran A, P N S. Development of 3D scaffolds using nanochitosan/silk-fibroin/hyaluronic acid biomaterials for tissue engineering applications. *Int J Biol Macromol.* 2018 Dec;120(Pt A):876–85.
 20. Del Fabbro M, Karanxha L, Panda S, Bucchi C, Nadathur Doraiswamy J, Sankari M, et al. Autologous platelet concentrates for treating periodontal infrabony defects. *Cochrane Database Syst Rev.* 2018 Nov 26;11:CD011423.
 21. Paramasivam A, Vijayashree Priyadharsini J. MitomiRs: new emerging microRNAs in mitochondrial dysfunction and cardiovascular disease. *Hypertens Res.* 2020 Aug;43(8):851–3.
 22. Jayaseelan VP, Arumugam P. Dissecting the theranostic potential of exosomes in autoimmune disorders. *Cell Mol Immunol.* 2019 Dec;16(12):935–6.
 23. Vellappally S, Al Kheraif AA, Divakar DD, Basavarajappa S, Anil S, Fouad H. Tooth implant prosthesis using ultra low power and low cost crystalline carbon bio-tooth sensor with hybridized data acquisition algorithm. *Comput Commun.* 2019 Dec 15;148:176–84.
 24. Vellappally S, Al Kheraif AA, Anil S, Assery MK, Kumar KA, Divakar DD. Analyzing Relationship between Patient and Doctor in Public Dental Health using Particle Memetic Multivariable Logistic Regression Analysis Approach (MLRA2). *J Med Syst.* 2018 Aug 29;42(10):183.
 25. Varghese SS, Ramesh A, Veeraiyan DN. Blended Module-Based Teaching in Biostatistics and Research Methodology: A Retrospective Study with Postgraduate Dental Students. *J Dent Educ.* 2019 Apr;83(4):445–50.
 26. Venkatesan J, Singh SK, Anil S, Kim S-K, Shim MS. Preparation, Characterization and Biological Applications of Biosynthesized Silver Nanoparticles with Chitosan-Fucoidan Coating. *Molecules* [Internet]. 2018 Jun 12;23(6). Available from: <http://dx.doi.org/10.3390/molecules23061429>
 27. Alsubait SA, Al Ajlan R, Mitwalli H, Aburaisi N, Mahmood A, Muthurangan M, et al. Cytotoxicity of Different Concentrations of Three Root Canal Sealers on Human

Mesenchymal Stem Cells. *Biomolecules* [Internet]. 2018 Aug 1;8(3). Available from: <http://dx.doi.org/10.3390/biom8030068>

28. Venkatesan J, Rekha PD, Anil S, Bhatnagar I, Sudha PN, Dechsakulwatana C, et al. Hydroxyapatite from Cuttlefish Bone: Isolation, Characterizations, and Applications. *Biotechnol Bioprocess Eng*. 2018 Aug 1;23(4):383–93.
29. Vellappally S, Al Kheraif AA, Anil S, Wahba AA. IoT medical tooth mounted sensor for monitoring teeth and food level using bacterial optimization along with adaptive deep learning neural network. *Measurement*. 2019 Mar 1;135:672–7.
30. PradeepKumar AR, Shemesh H, Nivedhitha MS, Hashir MMJ, Arockiam S, Uma Maheswari TN, et al. Diagnosis of Vertical Root Fractures by Cone-beam Computed Tomography in Root-filled Teeth with Confirmation by Direct Visualization: A Systematic Review and Meta-Analysis. *J Endod*. 2021 Aug;47(8):1198–214.
31. R H, Ramani P, Tilakaratne WM, Sukumaran G, Ramasubramanian A, Krishnan RP. Critical appraisal of different triggering pathways for the pathobiology of pemphigus vulgaris-A review. *Oral Dis* [Internet]. 2021 Jun 21; Available from: <http://dx.doi.org/10.1111/odi.13937>
32. Ezhilarasan D, Lakshmi T, Subha M, Deepak Nallasamy V, Raghunandhakumar S. The ambiguous role of sirtuins in head and neck squamous cell carcinoma. *Oral Dis* [Internet]. 2021 Feb 11; Available from: <http://dx.doi.org/10.1111/odi.13798>
33. Sarode SC, Gondivkar S, Sarode GS, Gadbail A, Yuwanati M. Hybrid oral potentially malignant disorder: A neglected fact in oral submucous fibrosis. *Oral Oncol*. 2021 Jun 16;105390.
34. Kavarthapu A, Gurumoorthy K. Linking chronic periodontitis and oral cancer: A review. *Oral Oncol*. 2021 Jun 14;105375.
35. Vellappally S, Abdullah Al-Kheraif A, Anil S, Basavarajappa S, Hassanein AS. Maintaining patient oral health by using a xeno-genetic spiking neural network. *J Ambient Intell Humaniz Comput* [Internet]. 2018 Dec 14; Available from: <https://doi.org/10.1007/s12652-018-1166-8>
36. Aldhuwayhi S, Mallineni SK, Sakhamuri S, Thakare AA, Mallineni S, Sajja R, et al. Covid-19 Knowledge and Perceptions Among Dental Specialists: A Cross-Sectional Online Questionnaire Survey. *Risk Manag Healthc Policy*. 2021 Jul 7;14:2851–61.
37. Nakamura F, Hirayama Y, Morita I, Nakagaki H. Factors associated with Japanese dentists encouraging patients to use dental floss. *Community Dent Health*. 2011 Mar;28(1):111–5.
38. Särner B, Birkhed D, Andersson P, Lingström P. Recommendations by dental staff and use of toothpicks, dental floss and interdental brushes for approximal cleaning in an adult Swedish population. *Oral Health Prev Dent*. 2010;8(2):185–94.
39. Heasman P. *Master Dentistry E-Book: Volume 2: Restorative Dentistry, Paediatric Dentistry*

and Orthodontics. Elsevier Health Sciences; 2013. 437 p.

40. Chernin D, Shklar G. Levi Spear Parmly: father of dental hygiene and children's dentistry in America. *J Hist Dent*. 2003 Mar;51(1):15–8.