PERCEPTION AND PRACTICES WITH REGARD TO TOOTH SHADE SELECTION FOR COMPOSITE RESTORATION AMONG DENTISTS IN SOUTH INDIA

Nandini Palanivel, Dr. Sankeerthana K

Nandini Palanivel
Saveetha Dental College and Hospitals
Saveetha Institute of Medical and Technical Sciences
Chennai- 77
Email id : 151901034.sdc@saveetha.com

Dr. Sankeerthana Kolli
Senior lecturer
Department of conservative dentistry and endodontics
Saveetha Dental College and Hospitals
Saveetha Institute of Medical and Technical Sciences
Chennai- 77
Email id : sankeerthanak.sdc@saveetha.com

Corresponding Author
Dr. Sankeerthana Kolli
Senior lecturer
Department of conservative dentistry and endodontics
Saveetha Dental College and Hospitals
Saveetha Institute of Medical and Technical Sciences
Chennai- 77,
Tamilnadu, india.
Email id : sankeerthanak.sdc@saveetha.com
Contact no: 9500066706

Abstract

Introduction : The perception of tooth color is an important goal for the dentist who needs to choose the right tooth shade to create satisfactory esthetic restorations as well as for the patient who desires a better smile. The success of any tooth-colored (anterior) restoration is however directly related to the accuracy of chairside shade selection .The aim of this study was to determine the knowledge and practices of dentists on shade selection in composite restorations among south india .

AIM : Perception and practices with regard to tooth shade selection for composite restoration among dentist in south India

Materials and methods :Self administered questionnaire as designed On the topic “Perception and practices with regard to tooth shade selection for composite restoration among dentists in south India" The questionnaire was distributed through a google forms link.

Results : Majority of respondents had good knowledge (67.5%), while 60.5% of them had good practices. The highest proportion (66.5%) used only visual shade selection in natural daylight (89.0%), while only 48% determined the tooth shade at the cervical, middle, and incisal third of the tooth; 73% had never taken a color blind test. Dentists had practiced for more than 10 years and restorative dentistry consultants had significantly better knowledge about shade selection. Respondents who had poor knowledge had significantly poorer shade selection practices (P = 0.036). After controlling for confounders by multivariate logistic regression, all categories of dentists with good knowledge and consultants still had significantly better dental shade selection practices.

Conclusion : Experienced dentists and restorative consultants appear to have adequate knowledge about shade selection and this had a significant impact on their practice. A need however exists to bridge the gap among other categories of dental personnel to improve the esthetic outcome of composite restorations.

KEYWORDS : Tooth shade selection , keynote software, diagnostic models,innovative technology ,

Introduction

Contemporary dentistry requires the effective use of dental restorative materials to achieve the best esthetic results.In addition, the demand for better esthetic outcomes has increased over the years; hence, the need for precise color matching of the restorative materials used has become imperative.With recent improvements and innovations in composite resins, re-establishment of the exact tooth form can be achieved satisfactorily. Furthermore, due to its wide variety of color shades and effects, which facilitates different combinations of translucency and opacity, as well as its ease of handling, composite resins have become suitable restorative materials in patients

requiring anterior restorative procedures to be integrated to the other teeth that compose their smile, with resultant satisfactory esthetic results.

The success of any tooth-colored (anterior) restoration is directly related to the accuracy of chairside shade selection.Patients are currently demanding esthetic replacement that must match their existing dentition and are more concerned about the shade match of their restorations rather than quality of the restoration.Consequently, chairside shade selection has become a very important step even for experienced dental practitioners, in the overall treatment of the patient.To ensure accuracy, various shade selection protocols have been devised for clinical setup, lighting, patient's setup, operator's position, and use of a standard shade guide. A thorough knowledge of these protocols is important so that visual shade selections can be carried out with accuracy and repeatability. However, these protocols are either not known or are not fully understood by the majority of the dental community,including undergraduate students, interns, and general dentists.

Tooth color has been shown to be one of the most important factors when assessing a patient's satisfaction with their dental appearance as demonstrated by some recent studies.There may, however, be differences in the patient's evaluation of esthetic parameters such as the color of the tooth and restoration.Restorative materials should match the natural teeth when placed, although several factors such as the color of the tooth and the luting agent as well as the translucency of the material used would affect the optical behavior of the final restoration.Three elements are important in color: hue, which is the color as perceived by the observer; chroma, which is the intensity or concentration of the hue, and the value, which refers to the lightness or darkness of a hue and is related to the amount of the existing white or black pigments. The paths of light inside the tooth determine the natural color of the tooth. Furthermore, the paths of light and the absorption along these paths determine natural tooth color, and the light paths inside the tooth are determined by scattering.

The perception of tooth color is a very important goal for the dentist who needs to choose the right tooth shade to create satisfactory esthetic restorations as well as for the patient who desires a better smile; thus, shade selection is a very important aspect of clinical practice.The aim of this

study was to determine the knowledge and attitude of dentists to shade selection and their perception of factors that influence tooth shade selection for composite restorations in south india.

Materials and methods

Self administered questionnaire as designed On the topic “Perception and practices with regard to tooth shade selection for composite restoration among dentists in south India " The questionnaire was distributed through a google forms link. The study population also included 125 postgraduate dental students. The sample size was calculated prior to keeping the confidence interval 95%. The participants were explained about the purpose of the study in detail .The questions were carefully studied and the corresponding answers were marked by the participants and the data was collected and statistically analysed through SPSS software with a significant p value 2.37 (>0.05).

Statistical analysis :

All the outcomes were put into graphs and comparative graphs are made between males and females. The statistical test used was SPSS Software.

Results and discussion

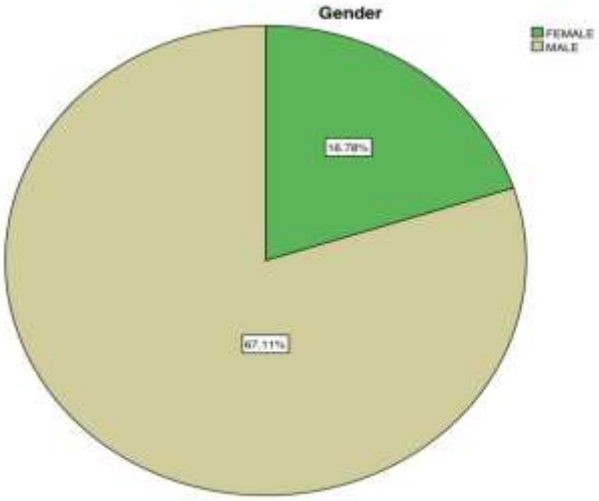

Figure 1 : The pie chart shows the percentage distribution of gender among the Perception And Practices With Regard To Tooth Shade Selection For Composite Restoration Among Dentist In South India 67.11% of the doctors are males (yellow) and the other 16.78% are females (green). Majority of the doctors were Males in the study.

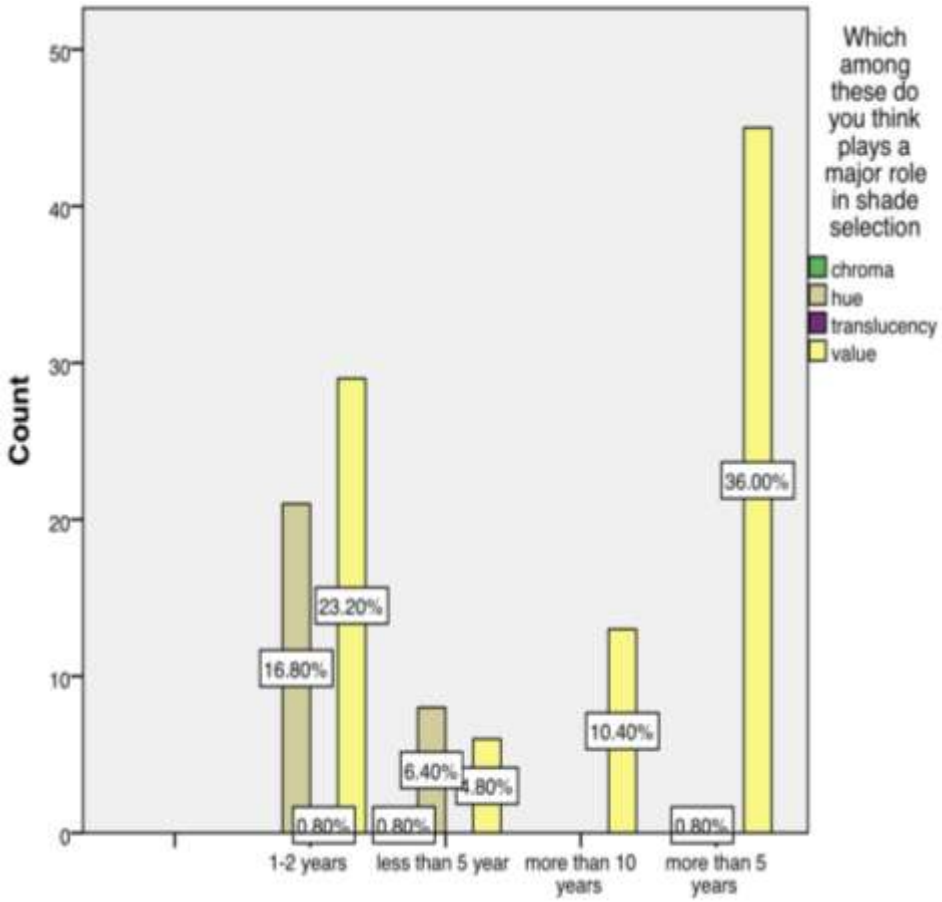

FIGURE 2 : The bar chart shows the correlation of gender with what people think which plays a major role in shade selection . It shows that there are more participants among interns compared to the other year dental students. The bar graph shows the association between gender and what people think which plays a major role in shade selection . The X-axis represents the years of experience of dental students, and dentists and the Y-axis represents the percentage of responses that people think which plays a major role in shade selection. Yellow depicts the people who said hue has a major role in shade selection and light yellow depicts the major role in shade selection . The majority of people said chrome plays a major role in shade selection . However, Chi-square analysis (Chi-square value = .002) shows statistical significance with p=0.105 (p>0.05).

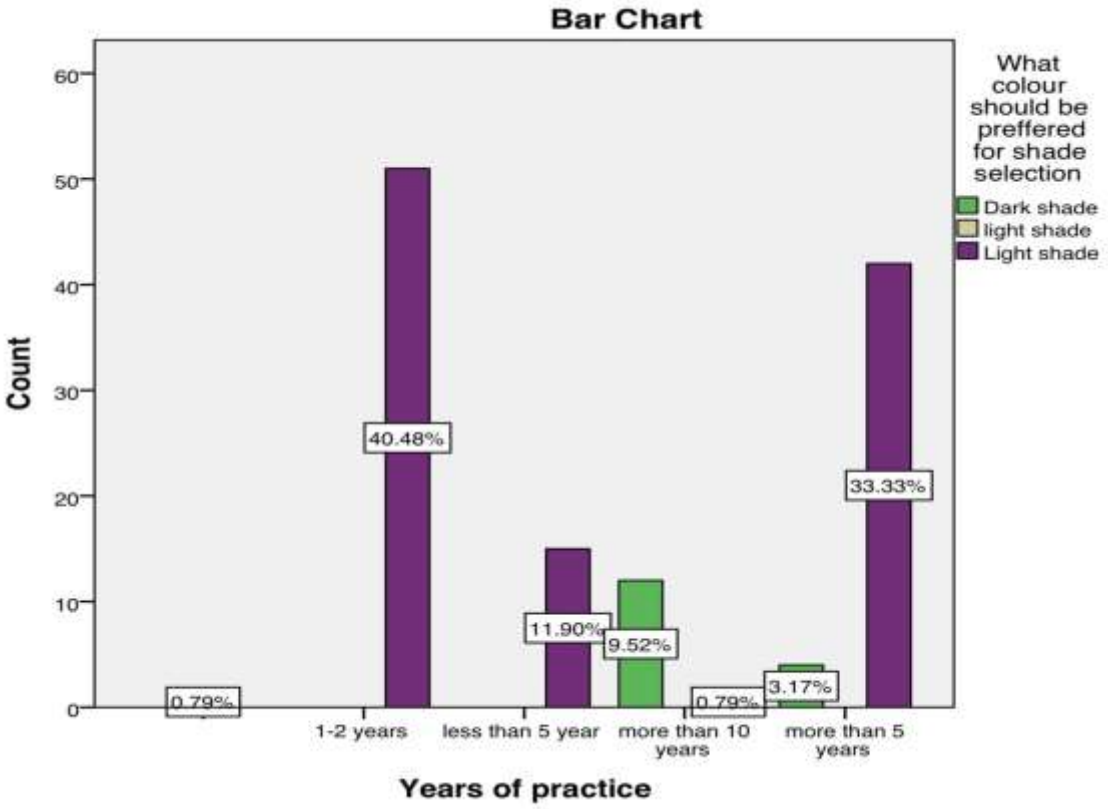

FIGURE 3: The bar chart shows the correlation of gender with what people think which plays a major role in colour for shade selection . It shows that there are more participants among interns compared to the other year dental students. The bar graph shows the association between gender and what people think which plays a major role in colour preferred for shade selection . The X-axis represents the years of experience of dental students, and dentists and the Y-axis represents the percentage of responses that people think which plays a major role in colour selection. purple depicts the people who said light shade has a major role in colour selection and some said green depicts the major role in shade selection . The majority of people said purple plays a major role in colour selection . However, Chi-square analysis (Chi-square value = .052) shows statistical significance with p=0.105 (p>0.05).

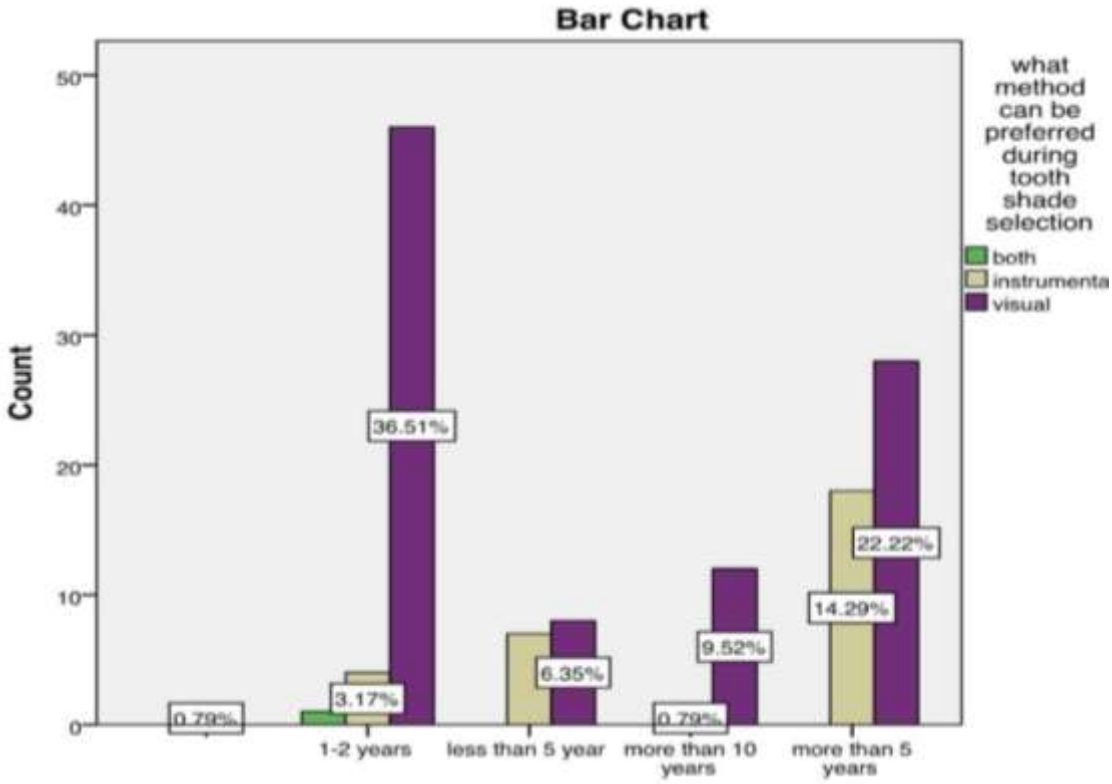

FIGURE 4: The bar chart shows the correlation of gender with what method can be preferred during tooth shade selection for shade selection . It shows that there are more participants among dental students compared to the dentist. The bar graph shows the association between gender and what people think method can be preferred during tooth shade selection for shade selection. The X-axis represents the years of experience of dental students, and dentists and the Y-axis represents the percentage of responses that people think can be preferred during tooth shade selection for shade selection. Purple depicts visually the people can be preferred during tooth shade selection and some said light yellow depicts instrumental people can be preferred during tooth shade selection . and some people said that both are depicted in green colour. The majority of people said purple plays can be preferred during tooth shade selection . However, Chi-square analysis (Chi-square value = .042) shows statistical significance with p=0.105 (p>0.05).

DISCUSSION

This study is the first to provide a detailed survey on the knowledge and practice of south dental practitioners about tooth shade selection with regard to composite restoration. The sample was broadly selected and representative of the population of dental surgeons in south india. The highest proportion of the respondents belonged to the 31–40 years age group, were under training, and had been in dental practice for 5–10 years. Majority of them were female.

On the knowledge about shade selection, about half of the respondents felt that the knowledge of the individual observer was the most important variable in dental shade selection. Half of them correctly identified that the cervical third, middle third, and incisal third of the tooth should have the shade determined independently. The perception of tooth color is complex and is influenced by the viewer's visual experience, the quality of light while viewing the tooth and the optical properties of the tooth such as translucency, opacity, scattering of light, and surface gloss. Evaluation of color can be qualitative or quantitative and can be determined instrumentally or visually. The qualitative method involves the visual subjective comparison of the restoration or sample to a shade guide.Evaluating color quantitatively involves an instrumental measurement which consists of valid intraoral optical-electronic determination of the color or shade such as the use of a spectrophotometer,Digital imaging method has also become increasingly relevant in contemporary dentistry. In addition, advanced computerized instruments (CIELab System) offers a precise quantification of color thus eliminating the subjective visual process variable from the shade selection process, Okubo found that there was no significant difference between the shade matching accuracy of the colorimeter and human observers. In addition, the high cost and limited utility of these instruments prevent their common use in clinical dental practice. However, whether instrumental or visual, for an accurate determination of color, the parameters to be measured must be known Close to 40% of the study participants stated that the ideal time for shade selection was within 5–10 s, and majority of them opined that shade selection is best done

at the beginning of an appointment and natural light should ideally be used. They must have stated that whenever an object such as a tooth is viewed for longer than 10 s, the color vision capability of the eyes decreases rapidly and the perceived color does not remain stable. To overcome any inaccuracies arising from eye fatigue, it has been recommended to get a second opinion including the opinion of the patient whenever shade selection is being made. Shade matching should be determined in daylight or under standardized daylight lamps not the dental operational lamps. Bright colors must be removed from the field of view and the walls of the operator must be neutral in color. An important factor necessary for good color perception during shade matching is the type and quantity of illumination. Too much light would overwhelm the observer and result in colors appearing higher in value and less chromatic. While on the other hand, low light intensity will cause a decreased perception of value and increased chroma.

Conclusion

We can conclude that there is moderate knowledge about thePerception And Practices With Regard To Tooth Shade Selection For Composite Restoration Among Dentists In South India

Acknowledgment : We thank saveetha dental college for providing us the support to conduct the study.

SOURCE OF FUNDING:

- The present study was supported by following agencies
- Saveetha Dental College,
- Saveetha Institute of Medical and Technical Science,
- Saveetha University
- Palanivel group of companies

Conflict of interest : Nil.

CONFLICT OF INTEREST : Not declared

ACKNOWLEDGEMENT : The research was done under the supervision of the department of research of saveetha dental college and hospitals .we sincerely grateful to the corresponding.

FUNDING SOURCES:

The present study was supported by the following agencies

- Saveetha Dental College and Hospitals
- Saveetha Institute of Medical and Technical Science,
- Saveetha University
- Palanivel group of companies Dindigul .

References

1. Muthukrishnan L. Imminent antimicrobial bioink deploying cellulose, alginate, EPS and synthetic polymers for 3D bioprinting of tissue constructs. Carbohydr Polym. 2021 May 15;260:117774.

2. 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.

3. Chakraborty T, Jamal RF, Battineni G, Teja KV, Marto CM, Spagnuolo G. A Review of Prolonged Post-COVID-19 Symptoms and Their Implications on Dental Management. Int J Environ Res Public Health [Internet]. 2021 May 12;18(10). Available from: http://dx.doi.org/10.3390/ijerph18105131

4. Muthukrishnan L. Nanotechnology for cleaner leather production: a review. Environ Chem Lett. 2021 Jun 1;19(3):2527–49.

5. Teja KV, Ramesh S. Is a filled lateral canal - A sign of superiority? J Dent Sci. 2020 Dec;15(4):562–3.

6. Narendran K, Jayalakshmi, Ms N, Sarvanan A, Ganesan S A, Sukumar E. Synthesis, characterization, free radical scavenging and cytotoxic activities of phenylvilangin, a substituted dimer of embelin. ijps [Internet]. 2020;82(5). Available from: https://www.ijpsonline.com/articles/synthesis-characterization-free-radical-scavenging-and-cytotoxic-activities-of-phenylvilangin-a-substituted-dimer-of-embelin-4041.html

7. Reddy P, Krithikadatta J, Srinivasan V, Raghu S, Velumurugan N. Dental Caries Profile and Associated Risk Factors Among Adolescent School Children in an Urban South-Indian City. Oral Health Prev Dent. 2020 Apr 1;18(1):379–86.

8. Sawant K, Pawar AM, Banga KS, Machado R, Karobari MI, Marya A, et al. Dentinal Microcracks after Root Canal Instrumentation Using Instruments Manufactured with Different NiTi Alloys and the SAF System: A Systematic Review. NATO Adv Sci Inst Ser E Appl Sci. 2021 May 28;11(11):4984.

9. Bhavikatti SK, Karobari MI, Zainuddin SLA, Marya A, Nadaf SJ, Sawant VJ, et al. Investigating the Antioxidant and Cytocompatibility of Mimusops elengi Linn Extract over Human Gingival Fibroblast Cells. Int J Environ Res Public Health [Internet]. 2021 Jul 4;18(13). Available from: http://dx.doi.org/10.3390/ijerph18137162

10. Karobari MI, Basheer SN, Sayed FR, Shaikh S, Agwan MAS, Marya A, et al. An In Vitro Stereomicroscopic Evaluation of Bioactivity between Neo MTA Plus, Pro Root MTA, BIODENTINE & Glass Ionomer Cement Using Dye Penetration Method. Materials [Internet]. 2021 Jun 8;14(12). Available from: http://dx.doi.org/10.3390/ma14123159

11. Rohit Singh T, Ezhilarasan D. Ethanolic Extract of Lagerstroemia Speciosa (L.) Pers., Induces Apoptosis and Cell Cycle Arrest in HepG2 Cells. Nutr Cancer. 2020;72(1):146–56.

12. Ezhilarasan D. MicroRNA interplay between hepatic stellate cell quiescence and activation. Eur J Pharmacol. 2020 Oct 15;885:173507.

13. Romera A, Peredpaya S, Shparyk Y, Bondarenko I, Mendonça Bariani G, Abdalla KC, et al. Bevacizumab biosimilar BEVZ92 versus reference bevacizumab in combination with FOLFOX or FOLFIRI as first-line treatment for metastatic colorectal cancer: a multicentre, open-label, randomised controlled trial. Lancet Gastroenterol Hepatol. 2018 Dec;3(12):845–55.

14. Raj R K, D E, S R. β-Sitosterol-assisted silver nanoparticles activates Nrf2 and triggers mitochondrial apoptosis via oxidative stress in human hepatocellular cancer cell line. J Biomed Mater Res A. 2020 Sep;108(9):1899–908.

15. Vijayashree Priyadharsini J. In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens. J Periodontol. 2019 Dec;90(12):1441–8.

16. Priyadharsini JV, Vijayashree Priyadharsini J, Smiline Girija AS, Paramasivam A. In silico analysis of virulence genes in an emerging dental pathogen A. baumannii and related species [Internet]. Vol. 94, Archives of Oral Biology. 2018. p. 93–8. Available from: http://dx.doi.org/10.1016/j.archoralbio.2018.07.001

17. Uma Maheswari TN, Nivedhitha MS, Ramani P. Expression profile of salivary micro RNA-21 and 31 in oral potentially malignant disorders. Braz Oral Res. 2020 Feb 10;34:e002.

18. Gudipaneni RK, Alam MK, Patil SR, Karobari MI. Measurement of the Maximum Occlusal Bite Force and its Relation to the Caries Spectrum of First Permanent Molars in Early Permanent Dentition. J Clin Pediatr Dent. 2020 Dec 1;44(6):423–8.

19. Chaturvedula BB, Muthukrishnan A, Bhuvaraghan A, Sandler J, Thiruvenkatachari B. Dens invaginatus: a review and orthodontic implications. Br Dent J. 2021 Mar;230(6):345–50.

20. Kanniah P, Radhamani J, Chelliah P, Muthusamy N, Joshua Jebasingh Sathiya Balasingh E, Reeta Thangapandi J, et al. Green synthesis of multifaceted silver nanoparticles using the flower extract of Aerva lanata and evaluation of its biological and environmental applications. ChemistrySelect. 2020 Feb 21;5(7):2322–31.