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EVALUATION OF KNOWLEDGE AND AWARENESS ON COMPOSITE PLACEMENT TECHNIQUE AMONG UNDERGRADUATES - A SURVEY

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ABSTRACT:

Introduction: Marginal leakage, secondary caries, poor load bearing ability, high wear rate and inability to restore the contact were considered limitations of composite resins as posterior restorative material. Resins and adhesive technology have made rapid strides from those initial days and now offer numerous alternatives. Composite restorations have made their presence felt ominously and also have solidified their position in the field of dentistry because of their esthetic varieties, longer life and their capability to provide an instant result which may sometimes be almost equivalent to laboratory based ceramic restorative materials. The aim of the survey is to evaluate the knowledge and awareness on composite placement techniques among the undergraduates.

Materials and methods:A survey was conducted among dental students about knowledge and awareness about composite placement techniques among dental students. The sample size of this survey is a total of 100 people. The entered data were analysed using SPSS. Descriptive analysis and Chi square tests were done and $p<0.05$ was considered as statistically significant

Results and discussion: From the obtained data it was concluded that 32.67% were aware of all the advantages of incremental placement of composite. Majority of the participants had knowledge about the indications and techniques of incremental placement of composite and it had no significant association with gender (P value=0.532).

Conclusion: From this survey, it was concluded that the majority of the students have adequate knowledge on composite placement techniques.

KEYWORDS: Composite; Placement technique; Marginal leakage; Caries; Layering; Innovative technique

INTRODUCTION:

The modern world we live in puts so much importance on appearances. Appearance is believed to contribute to professional success(1). A pleasant face and pearly white smile breed confidence, and are often considered as parameters for youth and vitality(2). Dentists have been entrusted with the job of restoring smiles from time immemorial . Introduction of polymerizing resins in the 1950s opened up new avenues for dentists and ever since remains one of the most popular treatments in dentistry.

Composite resins became the unanimous choice for anterior restorations but failed miserably for posteriors(3). Marginal leakage, secondary caries, poor load bearing ability, high wear rate and inability to restore the contact were considered limitations of composite resins as posterior restorative material(4) . Resins and adhesive technology have made rapid strides from those initial days and now offer numerous alternatives. Composite restorations have made their presence felt ominously and also have solidified their position in the field of dentistry because of their esthetic varieties, longer life and their capability to provide an instant result which may sometimes be almost equivalent to laboratory based ceramic restorative materials (4,5).

Composite placement techniques are universally recognized as a considerable factor in the modification of shrinkage stress(6). By maneuvering specific restorative techniques, stress resulting from constrained shrinkage may be scaled down(7). Per contra, it is not clear which restorative technique should be used to demolish shrinkage stress(8). Administering the composite in layers instead of using a bulk technique is recommended to reduce shrinkage stress.Three main factors concur to reduce shrinkage stress: use of a small volume of material, a lower cavity configuration factor, and minimal contact with the opposing cavity walls during polymerization(9). It is widely accepted that incremental filling decreases shrinkage stress as a result of reduced polymerization material volume. There are various techniques for composite placement (9,10). However there are many disadvantages like technique sensitivity ,polymerization shrinkage, inadequate dry area to work causing failure and inadequate light curing being some of them. Our team has extensive

knowledge and research experience that has translated into high quality publications(11–20),(21–24),(25–29)(30). The aim of the survey is to evaluate the knowledge and awareness on composite placement techniques among the undergraduates.

MATERIALS AND METHODS:

Study design, Area and study population:

A survey was conducted among dental students about knowledge and awareness about composite placement techniques. The sample size of this survey is a total of 100 people. Participation in this study was voluntary and no incentives were provided to the participants. The survey was conducted in the month of February 2021

Study Instruments:

A questionnaire was prepared after extensive review of the existing literature. The questionnaire was reviewed and amendments were made to improve clarity of pertinent questions and eliminate ambiguous responses. The survey instrument was a structured questionnaire with close ended questions. It consists of a brief introduction regarding the purpose of the study, questions pertaining to demographic data and questions regarding research objective 10 questions were circulated to the participants in a google form.

Data analysis

Only completely filled online forms were included in the study.The full response was verified by two reviewers and the controlled data was entered on the same day. The entered data were analysed using SPSS. Descriptive analysis was performed to calculate frequencies of categorical variables. Chi square analysis was used to determine the association. The level of significance was set at $p<0.05$.

TABLE 1: Table representing the responses and percentage of the knowledge and awareness on composite placement technique among students

Questions	Response	Percentage
Gender		
Male	73	27.72%
Female	28	72.28%
Incremental placement of composite		
reduce polymerisation shrinkage	30	29.70%
Reduce shrinkage stress	33	32.67%
both of the above	31	30.69%
None of the above	7	6.93%
Incremental layering of composite is used in which technique		
only anterior		
only posterior	41	40.59%
both anterior and posterior	50	49.50%
	10	9.90%
Wedge shaped composite increments are placed in which technique		
Horizontal layering		
Oblique layering	47	46.53%
vertical layering	42	41.58%
	12	11.88%
Which layering technique helps in obtaining a functional and anatomic composite restoration		
Centripetal layering	43	42.57%
Stratified layering	42	41.58%
Oblique layering	16	15.84%
Which layering technique reduces the C factor from 5 to 0.5		
Stratified layering		
Split incremental layering	25	24.75%
Centripetal layering	54	53.47%
	22	21.78%

In which technique different shades of composite material are added Polychromatic layering technique Dual shade layering technique Not sure	 34 49 18	 33.66% 48.51% 17.82%
An addition of opaque composite is added in which technique Dual shade layer technique Polychromatic layering technique Not sure	 47 44 10	 46.53% 43.56% 9.90%
Do you practice incremental layering technique in your clinical practice Always Sometimes Never	 42 49 10	 41.58% 48.51% 9.90%
How long do you cure each layer of composite 20 sec 30 sec 40 sec	 40 48 13	 39.60% 47.52% 12.87%

RESULTS AND DISCUSSION:

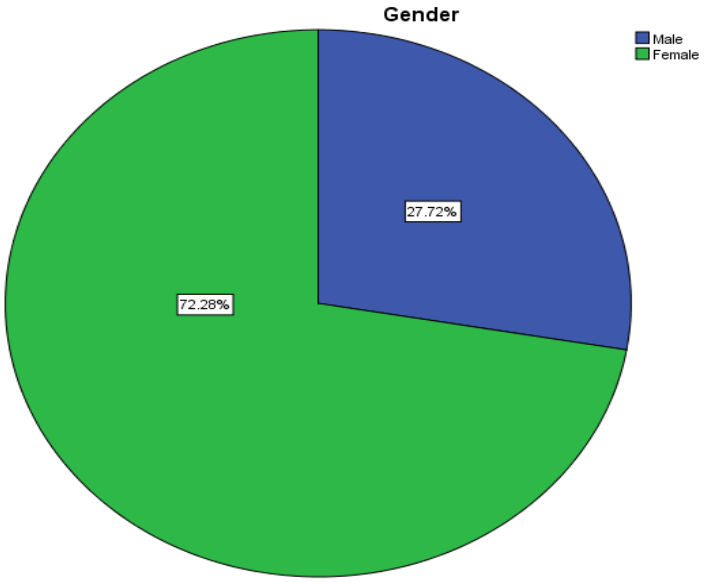

FIGURE 01: Pie chart represents the percentage distribution of the gender of the participants 72.28% of participants were females (green) and 27.72% were males (blue).

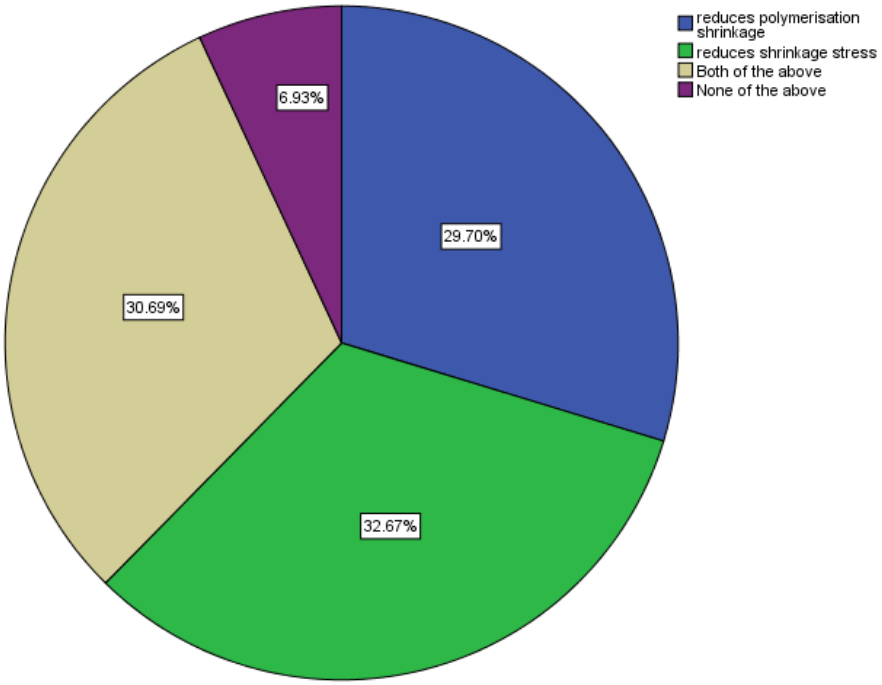

FIGURE 02: Pie chart represents the percentage distribution of the advantages of incremental placement of composite. 32.67% responded for reduction in shrinkage stress(green),30.69% responded for both of the above (yellow),29.70% responded for reduction in polymerisation shrinkage(blue) and 6.93% responded for none of the above (violet).

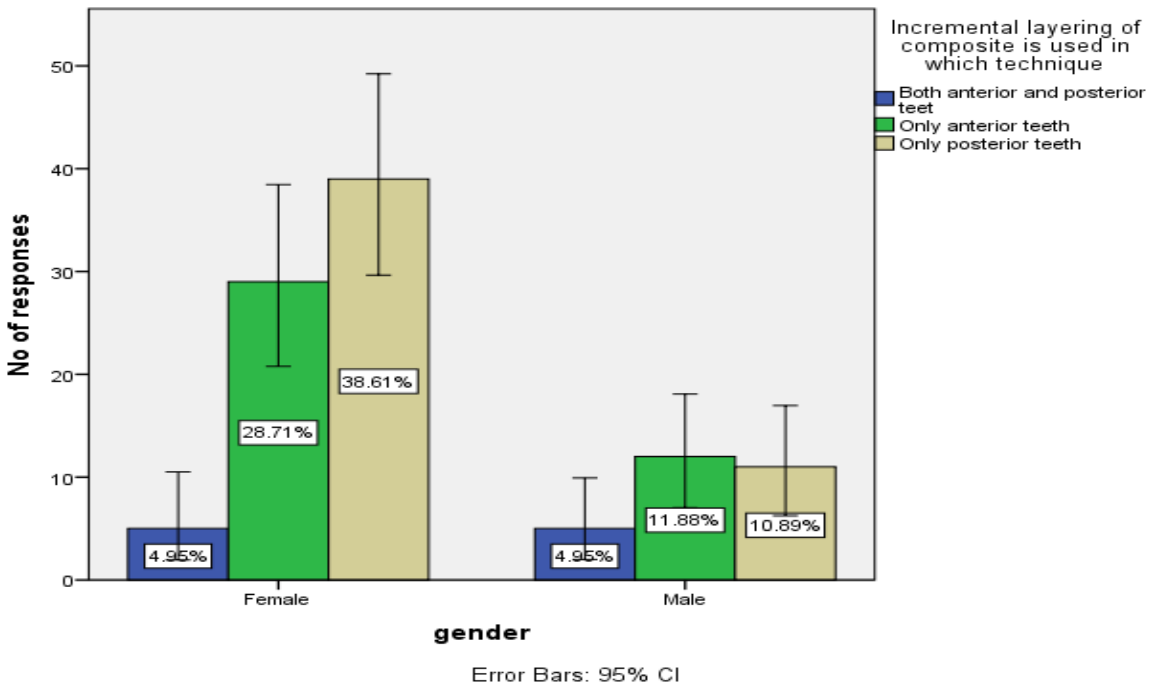

FIGURE 03: Bar graph represents the association between the gender and their knowledge and awareness on different types of teeth where incremental layering of composite can be done. Only anterior teeth (green), only posterior teeth (yellow), both anterior and posterior (blue). X axis represents the gender and Y axis represents the number of responses. Females (28.71%) preferred only anterior teeth and males (11.88%) preferred anterior teeth. Females (38.61%) selected posterior and males (10.89%) selected posterior. Males and Females (4.95%) of them preferred both anterior and

posterior .Chi Square test and the association was found to be statistically not significant. Pearson's Chi Square value**:**1.261, P value:0.532 (>0.05), Statistically not significant.

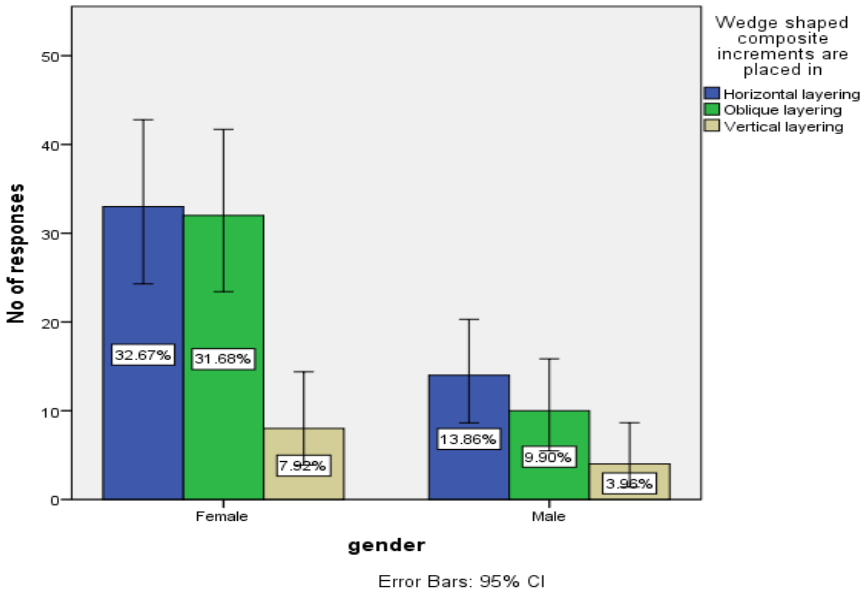

FIGURE 04: Bar graph represents the association between the gender and their knowledge and awareness of technique in which wedge shaped composite increments are placed oblique(green), vertical (yellow), horizontal (blue). X axis represents the gender and Y axis represents the number of responses . Females (31.68%) preferred only oblique layering technique and males (9.90%) preferred only oblique layering technique. Females (7.92%) preferred vertical layering technique and males (3.96%)vertical layering technique.Males(13.86) and Females(32.67%) of them preferred horizontal layering technique .Chi Square test and the association was found to be statistically not significant. Pearson's Chi Square value**:**1.261, P value:0.532 (>0.05), Statistically not significant.

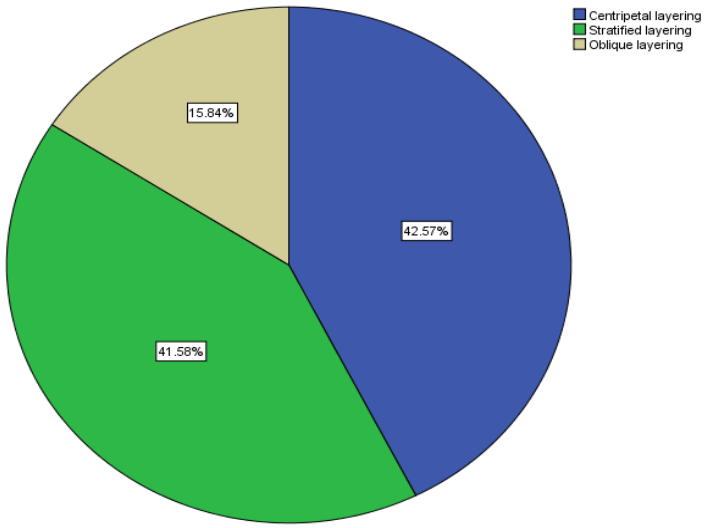

FIGURE 05: Pie chart represents the percentage distribution of the technique used for obtaining a functional and anatomic composite restoration. 41.58% responded it as stratified layering technique (green),42.57% responded as centripetal layering technique (blue),15.84% responded as oblique layering technique(beige)

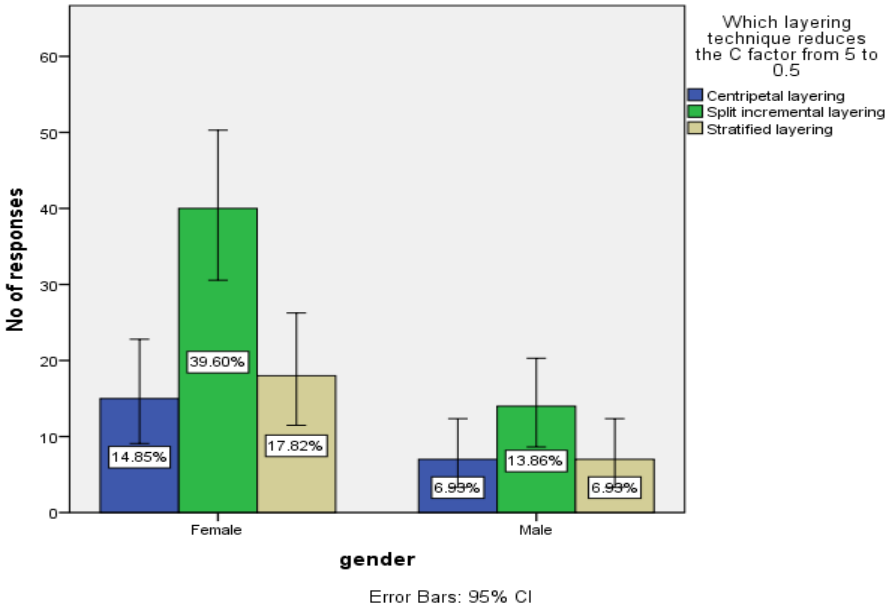

FIGURE 06: Bar graph represents the association between the gender and their knowledge and awareness on technique which reduces c factor from 5 to 0.5.Split incremental layering technique (green), stratified layering technique (yellow), centripetal layering technique (blue). X axis represents the gender and Y axis represents number of responses.Males (13.86%) Females (39.60%) preferred split incremental layering technique . Males (17.82%) and females (6.93%) preferred stratified layering technique . Males (14.85%) Females (6.93%) preferred centripetal layering technique . Chi Square test and the association was found to be statistically not significant. Pearson's Chi Square value**:**1.261, P value:0.532 (>0.05), Statistically not significant.

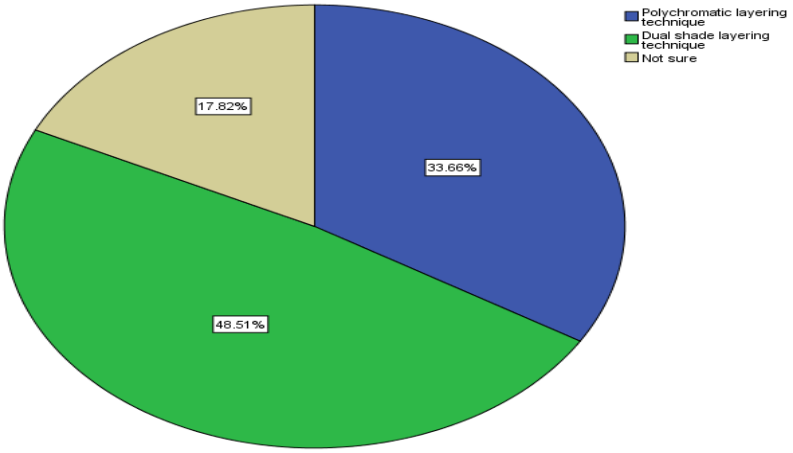

FIGURE 07: Pie chart depicts the knowledge and awareness on composite placement technique among dental students regarding techniques in which different shades of composite material are added. 48.51% responded for dual shade layering technique (green),33.66% responded for polychromatic layering technique (blue), 17.82% responded for not sure(yellow)

Out of 100 students 72.3% of them were females and remaining 27.7% were males as shown in figure 1. 30.7% of the students answered that incremental placement of composite reduce shrinkage and reduce polymerisation ,32.7% of them answered that it reduces shrinkage stress and the remaining 29.7% of them answered that it reduces polymerisation shrinkage as shown in figure 2. Females (28.71%) preferred only anterior teeth and males (11.88%) preferred anterior teeth. Females (38.61%) preferred posterior and males (10.89%) preferred posterior.Malesand Females(4.95%) of them preferred both anterior and posterior figure 3. Females (31.68%) preferred only oblique layering technique and males (9.90%) preferred only oblique layering technique. Females (7.92%) preferred vertical layering technique and males (3.96%)vertical layering technique.Males(13.86) and Females(32.67%) of them preferred horizontal layering as shown in figure 4. 42.6% of the students answered that centripetal layering technique helps in obtaining a functional and anatomical composite restoration and 41.6% of them answered stratified layering technique and remaining 15.8% of them answered oblique layering technique as shown in figure 5. Males (13.86%) Females (39.60%) preferred split incremental

layering technique . Males (17.82%) and females (6.93%) preferred stratified layering technique . Males (14.85%) Females (6.93%) preferred centripetal layering technique as shown in figure 6. 48.5% of the students answered that with dual shade layering technique different shades of composite material are added and 17.8% of them were not sure and remaining answered polychromatic layering technique as shown in figure 7. Males (32.67%) Females (13.86%) preferred dual shade layering technique . Males (2.97%) and females (6.93%) preferred not sure . Males (32.67%) Females (10.89%) preferred polychromatic layering techniques . Males (5.94%) Females (3.96%) answered never. Males (30.69%) and females (10.89%) answered always. Males (12.87%) Females (35.64%) answered so. 48.5% of the students answered that they sometimes practice incremental layering techniques in their clinical practice and 41.6% of them answered always and the remaining 9.9% of them answered never . 47.5% of the students answered that they need 30 sec to cure each layer of composite and 39.6% of them answered 20 sec and remaining 12.9% of them answered 40 sec as shown in table 1.

has done a survey on the influence of different composite placement techniques on microleakage in preparations with high C- factor (6) . The service life of a resin composite restoration is dependent on several factors, including the cavity-composite interface sealing. The service life of a resin composite restoration is dependent on several factors, including the cavity-composite interface sealing. (8) done a survey on Knowledge and Attitude of Dental Practitioners Towards Composite Restorations .The success of a composite restoration depends on various clinical conditions like condition of operating field, type of composite and bonding system, different design of tooth preparation, method of filling the cavity (incremental/ bulk), time and type of finishing and polishing of composite restoration. (7)done a study on Incremental techniques in direct composite restoration.incremental technique showed lower microleakage compared to bulk. Among the incremental techniques, split horizontal incremental technique showed least microleakage followed by centripetal technique and oblique placement technique at occlusal margin of Class II restoration. At the gingival margin, there was no significant difference in microleakage between centripetal incremental and oblique placement technique, and split horizontal incremental technique showed least microleakage.

CONCLUSION:
From this survey, it was concluded that the majority of the students are aware of composite placement techniques. Further studies require large populations for better results.

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CONFLICT OF INTERESTNIL

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REFERENCE:
1. Rudrapati L, Chandrasekhar V, Badami V, Tummala M. Incremental techniques in direct composite restoration [Internet]. Vol. 20, Journal of Conservative Dentistry. 2017. p. 386. Available from: http://dx.doi.org/10.4103/jcd.jcd_157_16
2. Santhosh L, Bashetty K, Nadig G. The influence of different composite placement techniques on microleakage in preparations with high C- factor: Anin vitrostudy [Internet]. Vol. 11, Journal of Conservative Dentistry. 2008. p. 112. Available from: http://dx.doi.org/10.4103/0972-0707.45249
3. Sajad M, Shafia S, Sharma N. Knowledge and Attitude of Dental Practitioners Towards Composite Restorations - A Questionnaire based Survey [Internet]. Vol. 5, International Journal of Contemporary Medical Research [IJCMR]. 2018. Available from: http://dx.doi.org/10.21276/ijcmr.2018.5.8.12
4. Assessment of Knowledge, Attitude and Practice Based Survey Towards Successful Restorations of Composite Among practitioners [Internet]. Vol. 27, Journal of Contemporary Issues in Business and Government. 2021. Available from: http://dx.doi.org/10.47750/cibg.2021.27.02.044
5. Akbar I. Knowledge and Attitudes of General Dental Practitioners Towards Posterior Composite Restorations in Northern Saudi Arabia [Internet]. JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH. 2015. Available from: http://dx.doi.org/10.7860/jcdr/2015/11843.5610
6. Shortall A. Summary of: "General dental practitioners" knowledge of polymerisation of resin-based composite restorations and light curing unit technology' [Internet]. Vol. 211, British Dental Journal. 2011. p. 276–7. Available from: http://dx.doi.org/10.1038/sj.bdj.2011.791
7. Santini A, Turner S. General dental practitioners' knowledge of polymerisation of resin-based composite restorations and light curing unit technology [Internet]. Vol. 211, British Dental Journal. 2011. p. E13–E13. Available from: http://dx.doi.org/10.1038/sj.bdj.2011.768
8. Mobarak SA, Al Mobarak S, Department of Clinical Dental Science, College of Dentistry, PNU. The Knowledge and Preference of Postendodontic Restorations: A Survey study among General Practitioners in Governmental

Universities [Internet]. Vol. 5, Journal of Medical Science And clinical Research. 2017. Available from: http://dx.doi.org/10.18535/jmscr/v5i12.77
9. Gambhir A, Kumar A. Attitude of Patients towards Orthodontic Treatment: A Questionnaire Survey [Internet]. Vol. 01, Dental Health: Current Research. 2015. Available from: http://dx.doi.org/10.4172/2470-0886.1000103
10. Bawa SS. Evaluation of Public Perception, Awareness and Attitude towards Dental Implant in Punjab Using Web-Based Questionnaire Technique [Internet]. Vol. 5, Open Access Journal of Dental Sciences. 2020. Available from: http://dx.doi.org/10.23880/oajds-16000260
11. Muthukrishnan L. Imminent antimicrobial bioink deploying cellulose, alginate, EPS and synthetic polymers for 3D bioprinting of tissue constructs. CarbohydrPolym. 2021 May 15;260:117774.
12. 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.
13. 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
14. Muthukrishnan L. Nanotechnology for cleaner leather production: a review. Environ ChemLett. 2021 Jun 1;19(3):2527–49.
15. Teja KV, Ramesh S. Is a filled lateral canal - A sign of superiority? J Dent Sci. 2020 Dec;15(4):562–3.
16. 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
17. 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.
18. 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 AdvSciInstSer E Appl Sci. 2021 May 28;11(11):4984.
19. 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
20. 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
21. 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.
22. Ezhilarasan D. MicroRNA interplay between hepatic stellate cell quiescence and activation. Eur J Pharmacol. 2020 Oct 15;885:173507.
23. Romera A, Peredpaya S, Shparyk Y, Bondarenko I, MendonçaBariani G, Abdalla KC, et al. Bevacizumabbiosimilar 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 GastroenterolHepatol. 2018 Dec;3(12):845–55.
24. 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.
25. VijayashreePriyadharsini 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.
26. 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
27. 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.
28. 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 ClinPediatr Dent. 2020 Dec 1;44(6):423–8.
29. 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.
30. Kanniah P, Radhamani J, Chelliah P, Muthusamy N, Joshua JebasinghSathiyaBalasingh E, ReetaThangapandi J, et al. Green synthesis of multifaceted silver nanoparticles using the flower extract of Aervalanata and evaluation of its biological and environmental applications. ChemistrySelect. 2020 Feb 21;5(7):2322–31.