

Restorative Practice Profile Among Undergraduate Dental Students

Research Article

Sai Pavithra .R¹, S. Delphine Priscilla Antony^{2*}¹ Graduate Student, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai - 600077, India.² Senior Lecturer, Department of Conservative and Endodontics, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai- 600077, India.

Abstract

Introduction: Restorative treatment requires meticulous procedure that would bring about the desired result and increase the longevity of the restoration done. This study investigates the restorative practice profile of undergraduate dental students, to explore the materials and methods employed by them during clinical practice.

Aim: The aim of this study is to assess the knowledge about Restorative practice profile among undergraduate dental students.

Materials and Methods: A total of 10 questions were meticulously framed and distributed to undergraduate students. A total of 120 respondents answered the questionnaire. All of them were undergraduate students. A printed copy of the questionnaire was distributed and collected back from the respondents.

Results: Out of the 120 respondents only 110 were completely filled, the 10 were not filled adequately, so it was not included for the study. Out of the undergraduates it was observed that interns and final year students preferred to use proper isolation methods for restoration. On the whole it was observed that the practice profile was practiced by interns followed by final year students and then the third year students.

Conclusion: The study revealed a high level of knowledge and extremely positive attitude towards the utility of guidelines and protocols towards the various restoration practice profiles. The protocols for restorative procedure are important to achieve longevity of the restoration. Thereby more emphasis to be made to undergraduate students about its importance.

Keywords: Restoration; Practice; Wedging; Amalgam; Polishing.

Introduction

Dental caries is a major public health problem nowadays. Despite much effort in health promotion and disease prevention dental restorations are still needed. The choice of materials for dental caries depends on a number of factors such as: the tooth, site and size of the caries lesion, as well as healthcare provision, patient preference, health care provider preference, technology, cost and environmental factors [1].

Worldwide, dental caries prevalence is high among adults as the disease affects nearly 100% of the population in the majority of countries. Dental amalgam is widely used in restorative care and is a compound of mercury and silver-based alloys; however, some concerns have been expressed about the possible health effects

of mercury in amalgam and contamination of the environment from mercury. In 1997, the WHO held a Consultation The objective of this consultation was taking into account the benefits, but also risks for individual, occupational, and environmental health of restorative materials. [2, 3] Previously our team has a rich experience in working on various research projects across multiple disciplines [4-18] Now the growing trend in this area motivated us to pursue this project.

Types Of Dental Restorative Materials

Two types of restorative materials are commonly used in dentistry; they are designated depending on whether they can be applied directly to the tooth or require fabrication of the restoration in the dental laboratory [19]. Dental materials are used for direct restoration of a tooth in order to save its function while indirect

***Corresponding Author:**

S. Delphine Priscilla Antony,
Senior Lecturer, Department of Conservative and Endodontics, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai-600077, India.
Tel: 9790856274
E-mail: delphy.priscilla@gmail.com

Received: May 05, 2021

Accepted: June 20, 2021

Published: June 29, 2021

Citation: Sai Pavithra. R, S. Delphine Priscilla Antony. Restorative Practice Profile Among Undergraduate Dental Students. *Int J Dentistry Oral Sci.* 2021;8(6):2880-2884. doi: <http://dx.doi.org/10.19070/2377-8075-21000561>

Copyright: S. Delphine Priscilla Antony©2021. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

materials include preformed metal crowns, dental porcelain, and cast restorations. The principal material types for direct restoration are:

- Dental amalgam
- Resin-based composite materials (RBC).
- Modifications of RBCs (poly-acid modied composites);
- Glass-ionomer cements/water-based cements: Self-setting ("pure" glass ionomers) or, more usually, light cured (resin modified glass-ionomers).
- Long-term temporary materials e.g. reinforced zinc oxide-eugenol cements.

The indications for use of restorative materials span from small cavities to extensive loss of tooth substance [20].

While tooth-coloured restorative materials are generally more expensive than amalgam, they offer an aesthetic alternative to traditional amalgam fillings. However there are concerns about their longevity and wear particularly in areas subjected to masticatory forces [21].

Isolation During Restorative Procedure

Restorative dental treatments are used to repair damage to teeth caused by tooth decay or accidents. Creating a physical barrier around a treatment site to reduce contamination of the site with saliva is a common practice. Reducing the amount of saliva in the area may enable the materials used for repair to bond together more effectively, improving the performance and reliability of the restoration. It may also reduce exposure to bacteria in the mouth.

Two methods of creating a barrier are commonly used; either a rubber dam around the tooth or cotton rolls together with suction to remove excess saliva [22].

Rubber dam was introduced to the dental profession by Barnum in 1864. The use of the rubber dam while performing dental procedures has numbers of advantages such as: control of cross-infection as it results in a significant reduction in the microbial content of air turbine aerosols and moisture control, thereby reducing the risk of cross-infection in the dental practice.

Materials And Methods

Study Population

This cross-sectional survey was done among undergraduate dental professionals to determine the restorative practice profile. This study is conducted among 120 participants.

Questionnaire

A valid self administered questionnaire was used to evaluate the knowledge among the study population.

Questionnaires were manually checked for completion of data. All data were entered in a data entry form.

Opinion of Students on Awareness of Restorative Practice Profile Among Undergraduate Students.

- 1) When do you prefer isolation during restorative procedure
 - a) Amalgam restoration
 - b) Composite restoration
 - c) Both a and b
 - d) I don't use
- 2) Amalgam polishing should be initiated
 - a) Immediately after restoration
 - b) After 24hrs
 - c) After a week
- 3) Polishing agent that you prefer for amalgam
 - a) Pumice
 - b) Tin oxide
 - c) Others mention
- 4) Which restorative material do you prefer if the depth of the cavity is 0.5-1mm after cavity preparation?
 - a) Composite resin restoration
 - b) Compomer
 - c) Glass ionomer cement
 - d) Amalgam
- 5) When do you prefer class II inlay
 - a) <2mm at proximal surface
 - b) >2mm at proximal surface
 - c) > 4 mm at proximal surface
- 6) When do you use liner/base
 - a) > 0.5 mm of remaining dentin thickness
 - b) < 0.5 of remaining dentin thickness
 - C) None of the above
- 7) Do you prepare a study model and take putty index before restoration of class III and class IV Restoration
 - a) Yes
 - b) No
- 8) Do you brushing matrix band before placement
 - a) Yes
 - b) No
- 9) Triangular wedges are recommended for
 - a) Deeper or wider proximal preparation
 - b) Shallow or narrow proximal preparation
 - c) Both a and b
- 10) Name the bur used for amalgam cavity preparation
 - a) 245 bur
 - b) Inverted cone

Results And Discussion

Out of 120 distributed questionnaires, 110 were returned with completely filled questionnaires. The results of the questionnaire are shown in table 1 .Majority of the interns and final year , 92% of them use rubber dam isolation during amalgam and composite restoration while it is comparatively less (72%)among III year students.

A higher proportion (94%)of interns are aware that amalgam polishing should be initiated after 24 hrs ,final year 82% were also adequately known about the duration of polishing and there was lack of knowledge among the III year students when compared to final years and interns.

On the other hand 92% of the interns prefer pumice as polishing agent for amalgam restoration which is higher compared to third and final year students .Most of the students agreed with the opinion that composite resin restoration is used to restore cavity which is 0.5-1mm .A higher proportion of respondents (92%) use triangular wedges for deeper or wider proximal preparation . Majority of the intern students(96 %) and 92% of final year use 245 bur for amalgam preparation .Where has only 86 % of interns and only 50 % of the third years prepare study model and take putty index before restoration of class III and class IV restoration .

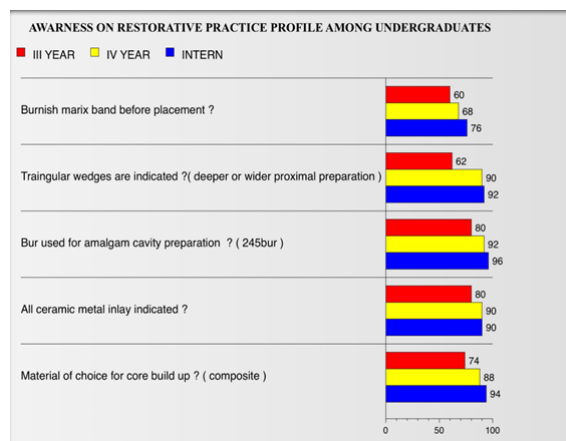
Rubber dam (RD) is considered as an ideal device for tooth isolation .A dry field , improved operator visibility and access, increased patient comfort and safety, infection control are some of the many documented benefits of using a rubber dam .The use of rubber dam in the present study is higher compared to previous studies. [23] The use of rubber dam improves the work efficiently by preventing the pooling of saliva , interruption of the patient's tongue [24] and providing a better field of view. Prevention of recurrent decay, prevention of deterioration of the amalgam surface, maintenance of periodontal health, and prevention of occlusal problems are the benefits of amalgam polishing. Awareness of initiation of amalgam polishing in the present study was similar to previous studies [25]. A previous study stated that amalgam restoration was preferably general practitioners due to its longevity , ease of use and economical [26].

A properly contoured, polished restoration will contribute to the longevity of the restoration and health of surrounding periodontium .Pumice is mostly considered polishing agent for amalgam restoration in the present study .The key advantage of using matrix band is ease in restoring larger three or more surface preparation. The result of burnishing matrix band is comparatively less compared to other studies. [27] It is essential to check the contact point of the matrix as it plays a pivotal role in re-establishing the contour of the restoration.[28] In recent times the use of sec-

Table 1. Response given by 3rd years , 4th years, Interns.

Questions	3rd yr	4th year	Interns
Isolation during RESTORATIVE procedure	31(62%)	46(92%)	46(92%)
Amalgam polishing should be initiated	33(66%)	41(82%)	47(94%)
Polishing agent that you prefer for amalgam	40(80%)	45(90%)	46(92%)
Cavity is 0.5mm what restoration do you prefer?	30(60%)	40(80%)	41(82%)
Prefer class II Inlay?	32(64%)	45(90%)	46(92%)
When base is indicated?	36(72%)	43(86%)	47(94%)
Study model and putty index for class3	25(50%)	32(64%)	43(86%)
Burnish matrix band?	30(60%)	34(68%)	38(76%)
Triangular wedges indicated	31(62%)	45(90%)	46(92%)
Bur used for amalgam cavity preparation	40(80%)	46(92%)	48(96%)
When all ceramic /metal inlay indicated	40(80%)	45(90%)	46(92%)
Technique sensitive	37(74%)	44(88%)	47(94%)

Figure 1. Awareness of restorative practice profile among undergraduates.



tional matrix has helped to achieve better contact and contour of restoration compared to conventional methods. [29, 30] When compared to the use of plastic matrices, the metal matrices are easier to apply, thinner and provide better interproximal contacts [31].

Wedging is an essential part of restorative dentistry: their main use is for adapting a matrix band to the proximal part of a cavity. There are many types and sizes of dental wedge. Originally made of sycamore wood, they are now available in a variety of plastics, with customized designs for different situations. Triangular wedge are recommended for deeper or wider proximal preparation. The results for using triangular wedges in the present study (92%) was more or less equal to previous studies. [32] The metal matrix adapted to the prepared walls touches the cavosurface angle of the proximal preparation and surpasses the height of marginal ridges; after that, it must be stabilised with a wooden wedge in the right size which is mostly triangular [28] Care to be taken during the placement of metal matrix, as it acts as a mechanical stimulus on the gingiva resulting in gingival inflammation or bleeding which will have a negative impact on the class II restoration. [22] [33, 35]. Our institution is passionate about high quality evidence based research and has excelled in various fields [35-44].

Conclusion

The study revealed a high level of knowledge and an extremely positive attitude towards the utility of guidelines and protocols towards the various restoration practice profiles. Since there is an advance in the field of dentistry there should be conduction of continued dental education programs in the field of conservative dentistry to encourage and implement the new technologies in their daily practice.

Acknowledgement

The study was supported by the university who provided insights and expertise that greatly assisted the study. We would like to thank the reviewers of the article for their insights and contributions.

References

- World Health Organization. Oral Health Country/Area Profile Programme WHO Headquarters Geneva. Oral Health Programme (NPH) WHO Collaborating Centre, Malmö University, Sweden. 2008 Nov.
- Petersen PE. World Health Organization global policy for improvement of oral health—World Health Assembly 2007. *Int Dent J*. 2008 Jun;58(3):115-21. Pubmed PMID: 18630105.
- Petersen PE. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century—the approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol*. 2003 Dec;31 Suppl 1:3-23. Pubmed PMID: 15015736.
- Govindaraju L, Gurunathan D. Effectiveness of Chewable Tooth Brush in Children-A Prospective Clinical Study. *J Clin Diagn Res*. 2017 Mar;11(3):ZC31-ZC34. Pubmed PMID: 28511505.
- Christabel A, Anantanarayanan P, Subash P, Soh CL, Ramanathan M, Muthusekhar MR, et al. Comparison of pterygomaxillary dysjunction with tuberosity separation in isolated Le Fort I osteotomies: a prospective, multi-centre, triple-blind, randomized controlled trial. *Int J Oral Maxillofac Surg*. 2016 Feb;45(2):180-5. Pubmed PMID: 26338075.
- Soh CL, Narayanan V. Quality of life assessment in patients with dentofacial deformity undergoing orthognathic surgery—a systematic review. *International journal of oral and maxillofacial surgery*. 2013 Aug 1;42(8):974-80.
- Mehta M, Deeksha, Tewari D, Gupta G, Awasthi R, Singh H, et al. Oligonucleotide therapy: An emerging focus area for drug delivery in chronic inflammatory respiratory diseases. *Chem Biol Interact*. 2019 Aug 1;308:206-215. Pubmed PMID: 31136735.
- Ezhilarasan D, Apoorna VS, Ashok Vardhan N. Syzygium cumini extract induced reactive oxygen species-mediated apoptosis in human oral squamous carcinoma cells. *J Oral Pathol Med*. 2019 Feb;48(2):115-121. Pubmed PMID: 30451321.
- Campeau PM, Kasperaviciute D, Lu JT, Burrage LC, Kim C, Hori M, et al. The genetic basis of DOORS syndrome: an exome-sequencing study. *Lancet Neurol*. 2014 Jan;13(1):44-58. Pubmed PMID: 24291220.
- Kumar S, Sneha S. Knowledge and awareness regarding antibiotic prophylaxis for infective endocarditis among undergraduate dental students. *Asian Journal of Pharmaceutical and Clinical Research*. 2016;154.
- Christabel SL, Gurunathan D. Prevalence of type of frenal attachment and morphology of frenum in children, Chennai, Tamil Nadu. *World J Dent*. 2015 Oct;6(4):203-7.
- Kumar S, Rahman RE. Knowledge, awareness, and practices regarding biomedical waste management among undergraduate dental students. *Asian Journal of Pharmaceutical and Clinical Research*. 2017;10(8):341.
- Sridharan G, Ramani P, Patankar S. Serum metabolomics in oral leukoplakia and oral squamous cell carcinoma. *J Cancer Res Ther*. 2017 Jul-Sep;13(3):556-561. Pubmed PMID: 28862226.
- Ramesh A, Varghese SS, Doraiswamy JN, Malaiappan S. Herbs as an antioxidant arsenal for periodontal diseases. *J Interact Ethnopharmacol*. 2016 Jan 27;5(1):92-6. Pubmed PMID: 27069730.
- Thamaraiselvan M, Elavarasu S, Thangakumaran S, Gadagi JS, Arthie T. Comparative clinical evaluation of coronally advanced flap with or without platelet rich fibrin membrane in the treatment of isolated gingival recession. *J Indian Soc Periodontol*. 2015 Jan-Feb;19(1):66-71. Pubmed PMID: 25810596.
- Thangaraj SV, Shyamsundar V, Krishnamurthy A, Ramani P, Ganesan K, Muthuswami M, et al. Molecular Portrait of Oral Tongue Squamous Cell Carcinoma Shown by Integrative Meta-Analysis of Expression Profiles with Validations. *PLoS One*. 2016 Jun 9;11(6):e0156582. Pubmed PMID: 27280700.
- Ponnulakshmi R, Shyamaladevi B, Vijayalakshmi P, Selvaraj J. In silico and in vivo analysis to identify the antidiabetic activity of beta sitosterol in adipose tissue of high fat diet and sucrose induced type-2 diabetic experimental rats. *Toxicol Mech Methods*. 2019 May;29(4):276-290. Pubmed PMID: 30461321.
- Ramakrishnan M, Bhurki M. Fluoride, Fluoridated Toothpaste Efficacy And Its Safety In Children-Review. *International Journal of Pharmaceutical Research*. 2018 Oct 1;10(04):109-14.
- Soncini JA, Maserejian NN, Trachtenberg F, Tavares M, Hayes C. The longevity of amalgam versus compomer/composite restorations in posterior primary and permanent teeth: findings From the New England Children's Amalgam Trial. *J Am Dent Assoc*. 2007 Jun;138(6):763-72. Pubmed PMID: 17545265.
- Pjör IA. The reasons for replacement and the age of failed restorations in general dental practice. *Acta Odontol Scand*. 1997 Jan;55(1):58-63. Pubmed PMID: 9083578.
- Fors H, Widström E. Reasons for restorative therapy and the longevity of restorations in adults. *Acta Odontol Scand*. 2004 Apr;62(2):82-6. Pubmed PMID: 15198387.
- Wang Y, Li C, Yuan H, Wong MC, Zou J, Shi Z, et al. Rubber dam isolation for restorative treatment in dental patients. *Cochrane Database Syst Rev*. 2016 Sep 20;9(9):CD009858. Pubmed PMID: 27648846.
- Canalda-Sahli C, Pumarola-Suñe J, Espias-Gomez A, Jimenez-Polanco P. Efficacité du stérilisateur à billes de verre sur les instruments endodontiques [Efficacy of the glass bead sterilizer on endodontic instruments]. *Rev Fr Endod*. 1989 Dec;8(4):29-34. French. Pubmed PMID: 2517870.
- Thaminee S, Antony SD, Ashok V. Knowledge, attitude, and practice of using rubber dam in restorative procedure—a survey among dental colleges in Chennai: A short study. *Drug Invention Today*. 2019 Sep 15;12(9).
- Sakaguchi RL, Powers JM. Craig's restorative dental materials-e-book. Elsevier Health Sciences; 2012 Jul 16.
- Pooja S, Delphinepriscilla Antony S. Dentists attitude towards amalgam restoration and its safety measures-KAP survey. *Drug Invent Today*. 2019 Jan 15;12:9-12.
- Paarmann CS, Christie CR. A clinical comparison of amalgam polishing agents. *Dent Hyg (Chic)*. 1986 Jul;60(7):316-21. Pubmed PMID: 3460882.
- Velo MM, Scotti CK, Bastos NA, Furuse AY, Mondelli J. Amalgam restorations and future perspectives. *J Odontol*. 2018;2(102):2.
- Robinson Research Institute (RRI). The Robinson Research Institute.
- Dablanca-Blanco AB, Blanco-Carrión J, Martín-Biedma B, Varela-Patiño P, Bello-Castro A, Castelo-Baz P. Management of large class II lesions in molars: how to restore and when to perform surgical crown lengthening? *Restor*

- Dent Endod. 2017 Aug;42(3):240-252. Pubmed PMID: 28808641.
- [31]. Santos MJ. A restorative approach for class II resin composite restorations: a two-year follow-up. *Oper Dent*. 2015 Jan-Feb;40(1):19-24. Pubmed PMID: 25100407.
- [32]. Morrison A, Conrod S. Dental burs and endodontic files: are routine sterilization procedures effective? *J Can Dent Assoc*. 2009 Feb;75(1):39. Pubmed PMID: 19239741.
- [33]. Kemoli AM, van Amerongen WE, Opinya GN. Short communication: Influence of different isolation methods on the survival of proximal ART restorations in primary molars after two years. *Eur Arch Paediatr Dent*. 2010 Jun;11(3):136-9. Pubmed PMID: 20507811.
- [34]. Menezes-Silva R, Velasco SRM, Bastos RS, Molina G, Honório HM, Frencken JE, et al. Randomized clinical trial of class II restoration in permanent teeth comparing ART with composite resin after 12 months. *Clin Oral Investig*. 2019 Sep;23(9):3623-3635. Pubmed PMID: 30612246.
- [35]. 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):1441-1448. Pubmed PMID: 31257588.
- [36]. J PC, Marimuthu T, C K, Devadoss P, Kumar SM. Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study. *Clin Implant Dent Relat Res*. 2018 Aug;20(4):531-534. Pubmed PMID: 29624863.
- [37]. 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):1241-1248. Pubmed PMID: 30044495.
- [38]. Ramadurai N, Gurunathan D, Samuel AV, Subramanian E, Rodrigues SJL. Effectiveness of 2% Articaine as an anesthetic agent in children: randomized controlled trial. *Clin Oral Investig*. 2019 Sep;23(9):3543-3550. Pubmed PMID: 30552590.
- [39]. Sridharan G, Ramani P, Patankar S, Vijayaraghavan R. Evaluation of salivary metabolomics in oral leukoplakia and oral squamous cell carcinoma. *J Oral Pathol Med*. 2019 Apr;48(4):299-306. Pubmed PMID: 30714209.
- [40]. Mathew MG, Samuel SR, Soni AJ, Roopa KB. Evaluation of adhesion of *Streptococcus mutans*, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary molars: randomized controlled trial. *Clin Oral Investig*. 2020 Sep;24(9):3275-3280. Pubmed PMID: 31955271.
- [41]. Samuel SR. Can 5-year-olds sensibly self-report the impact of developmental enamel defects on their quality of life? *Int J Paediatr Dent*. 2021 Mar;31(2):285-286. Pubmed PMID: 32416620.
- [42]. R H, Ramani P, Ramanathan A, R JM, S G, Ramasubramanian A, et al. CYP2 C9 polymorphism among patients with oral squamous cell carcinoma and its role in altering the metabolism of benzo[a]pyrene. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2020 Sep;130(3):306-312. Pubmed PMID: 32773350.
- [43]. Chandrasekar R, Chandrasekhar S, Sundari KKS, Ravi P. Development and validation of a formula for objective assessment of cervical vertebral bone age. *Prog Orthod*. 2020 Oct 12;21(1):38. Pubmed PMID: 33043408.
- [44]. Vijayashree Priyadharsini J, Smiline Girija AS, Paramasivam A. In silico analysis of virulence genes in an emerging dental pathogen *A. baumannii* and related species. *Arch Oral Biol*. 2018 Oct;94:93-98. Pubmed PMID: 30015217.