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Original Research Paper

# Qualitative Analysis of Procedures in Conservative Dentistry: A QUESTIONNAIRE BASED SURVEY

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**ABSTRACT**:
**Aim:** The aim of this study is to analyse the quality of procedure in conservative dentistry using various material and method.
**Objective:**
- Analyse the current practices and trends in conservative dentistry among undergraduate students.
- Identify the most commonly used procedures and materials.
- Evaluate the integration of modern techniques and adherence to procedural standards.
- Recommend improvements in education and training for better clinical outcomes.

The present study was done among the undergraduate dental students of Gujarat to get an idea about the different approaches in procedure of conservative dentistry.
**Materials and methods:** It is a descriptive cross-sectional questionnaire based study, conducted in Gujarat. Around 213 undergraduate students responded to it.
**Result and discussion:** Result shows that still majority of people use only probe to diagnose the carious lesion, GIC is being used maximum in pedodontic and hypersensitivity cases. Only 33% of dental students use composite and 53% use G.I.C based restoration for post endodontic, and 25% of dental students don't take post-operative radiographs.
**Conclusion:** We can conclude that while newer methods and technologies are being adopted in various dental colleges in Gujarat, there is still a significant presence of traditional techniques in clinical practice. This suggests a gradual transition towards more modern and conservative approaches to dental care, but also highlights the need for continued education and training in the latest methods and materials. We can conclude that while newer methods and technologies are being adopted in various dental colleges in Gujarat, there is still a significant presence of traditional techniques in clinical practice. This suggests a gradual transition towards more modern and conservative approaches to dental care, but also highlights the need for continued education and training in the latest methods and materials.

***Keywords: Conservative dentistry, pedodontic, dentistry***

## INTRODUCTION:

Conservative dentistry bridges the gap between tradition and innovation, blending time-honored techniques with cutting-edge technology to restore and preserve. In a world where every tooth matters, conservative dentistry stands as the guardian of natural beauty and oral health. From rudimentary visual inspections to advanced digital imaging, the journey of diagnostic tools in conservative dentistry has paved the way for earlier and more accurate detection of dental pathologies. The quality of a dental procedure in conservative dentistry often hinges on proper isolation. Effective isolation is the bedrock of successful procedures in conservative dentistry, ensuring a sterile environment that enhances precision, improves material adhesion, and protects both the tooth and the patient.

## MATERIALS AND METHODS:

A sample of 214 dental students were interviewed through a questionnaire. Those interviewed include an equal number of interns and students from third & final year of different colleges. A questionnaire was made on a software named Google Form. The pro-

form comprises two sections. The first section collected demographic details of the participants like Name, Email Id, college name & in which year they're studying in and second part comprised 23 questions.

**1. How do you diagnose carious lesion?**

- By visual
- By probe
- With dyes
- FOTI/DIFOTI
- Radiograph

**2. Do you perform pulp vitality test in deep carious lesion?**

- Yes
- No
- sometime

**3. For restoration, which isolation technique are you using?**

- Rubber dam
- Cotton roll / Wafers
- Saliva ejection / High volume evacuation
- Other

**4. In which cases do you prefer wedge?**

- Class 2
- Class 3
- Class 4
- All the above

**5. Which type of wedge do you prefer for class 2 cavity?**

- Wooden round wedge
- Wooden triangular wedge
- Plastic triangular
- Light transmitting plastic
- Silicon wedge
- Other

**6. Which matrices do you prefer for class 2 MO/DO case?**

- Ivory no.1
- Sectional matrix
- Copper band
- Saddle matrix
- Ivory no.8

**7. How many cavity preparation and restoration have you conducted?**

- 0-10
- 11-20
- 20-30
- >30

**8. What is Rx of choice for class 5 hypersensitivity cases?**

- GIC / Composite
- Apply bond
- Application of fluoride / Varnish
- Desensitizing toothpaste

**9. Which restorative material do you prefer in management of pedo patient?**

- GIC
- Composite
- Amalgam
- Other

**10. Do you do surface conditioning for GIC restoration?**

- Yes
- No

**11. If yes then which agent do you use?**

- 10% citric acid
- 10% polyacrylic acid
- 25% tannic acid
- 3% $H_2O_2$

**12. How do you manage deep carious lesion?**

- IPC + Ca2
- IPC + MTA
- IPC + GIC

**13. Which combination of material do you prefer for sandwich technique?**

- GIC +Composite
- Miracle mix + Composite
- Flowable & Packable Composite
- Other

**14. What is line of treatment for pulp protection in shallow cavity having RDT 2mm in amalgam restoration?**

- Liner
- Varnish
- Dentin bonding
- Do not use

**15. What is line of treatment for pulp protection in deep cavity having RDT- 0.5mm in amalgam restoration?**

- Ca(OH)2 liner
- Ca(OH)2 base
- Varnish
- Do not use

**16. How do you manage to remove gingival overgrowth in deep carious lesion?**

- Cautery
- By bur
- Laser
- Nothing

**17. Which type of bevel do you give in composite restoration?**

- Long bevel
- Short bevel
- Infinite bevel
- Do not give any bevel

**18. Which incremental technique for composite are you using?**

- Horizontal layering technique
- Oblique layering technique
- Vertical layering technique
- Centripetal buildup technique
- Successive cusp buildup technique

**19. What is time period for polishing composite restoration?**

- Immediately
- 12 hrs
- 18 hrs
- 24 hrs

**20. How do you polish your composite?**

- Hand polishing strips
- Polishing Cup + disc
- Abrasives disc + strips
- Finishing bur

**21. How do you check high points?**

- Articulating paper
- Carbon paper
- Visually
- Clenching / Ask patient to clench mouth

**22. Which material are you using for post endodontics cavity filling?**

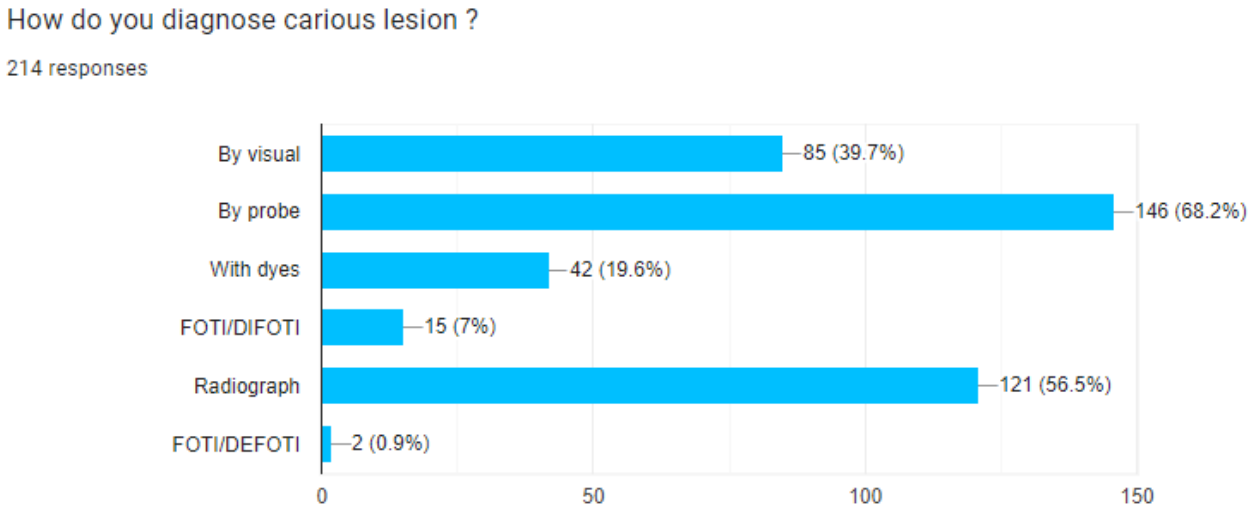
- GIC
- Miracle mix
- Composite
- Amalgam
- Other

**23. Do you take x-ray after restoration?**

- Yes
- No

## RESULTS:

**Chart 1:**



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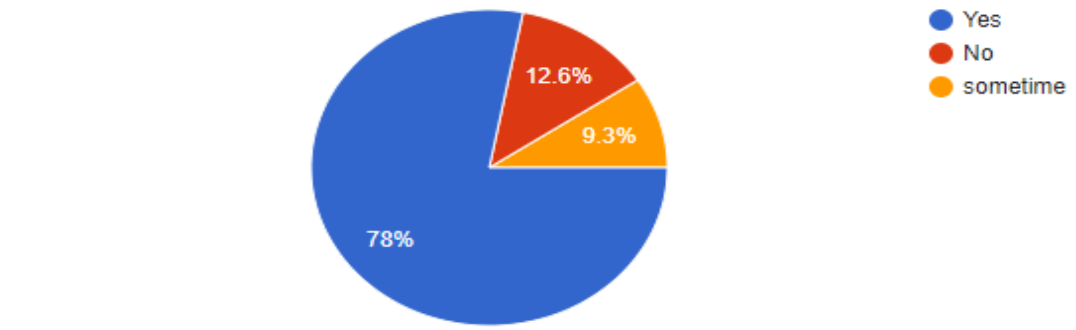


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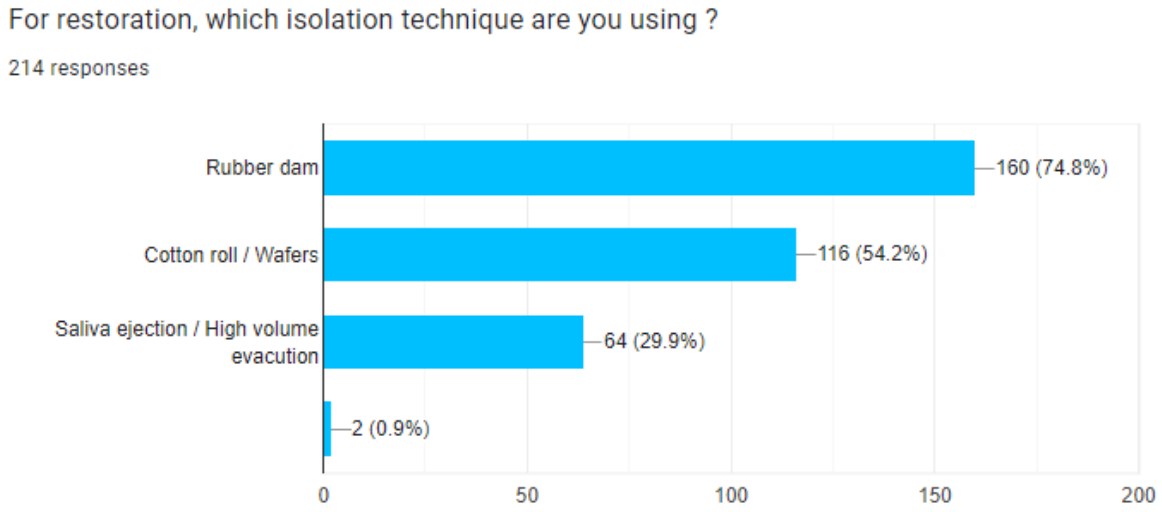


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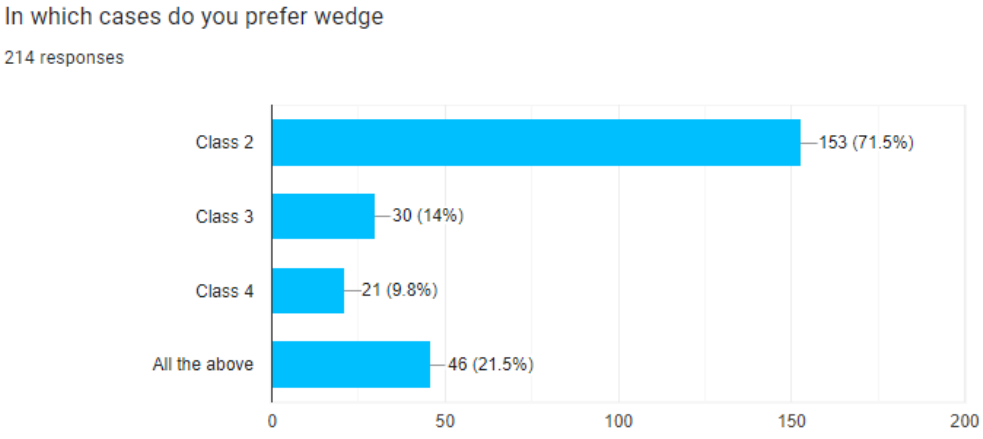

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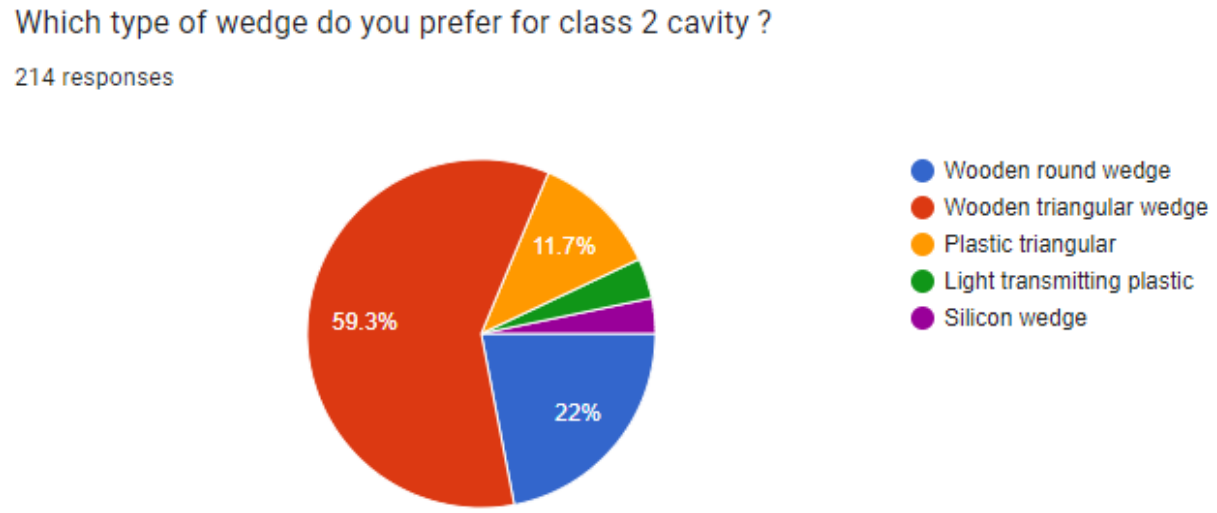


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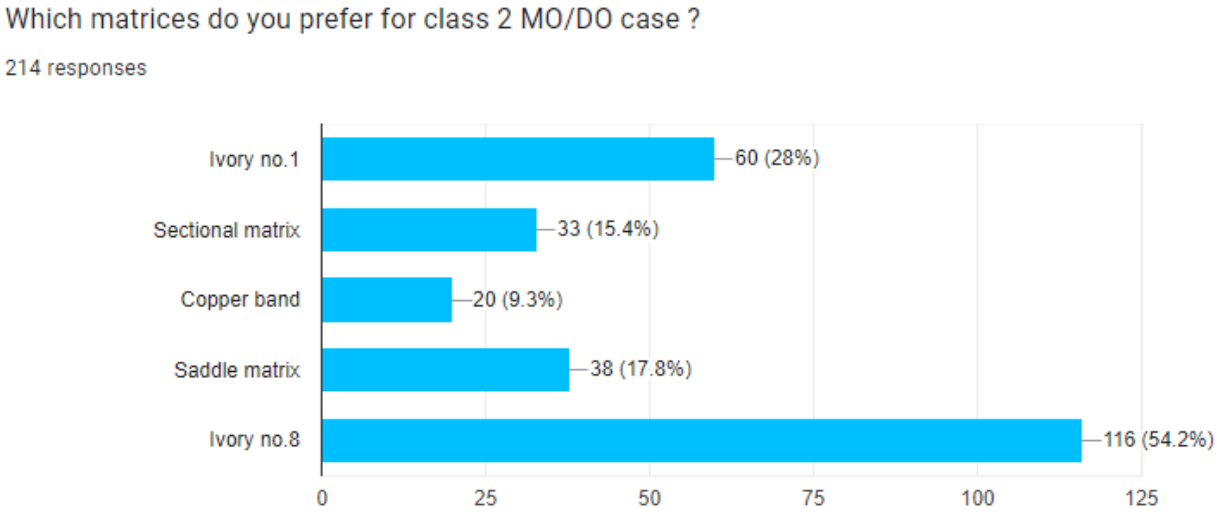


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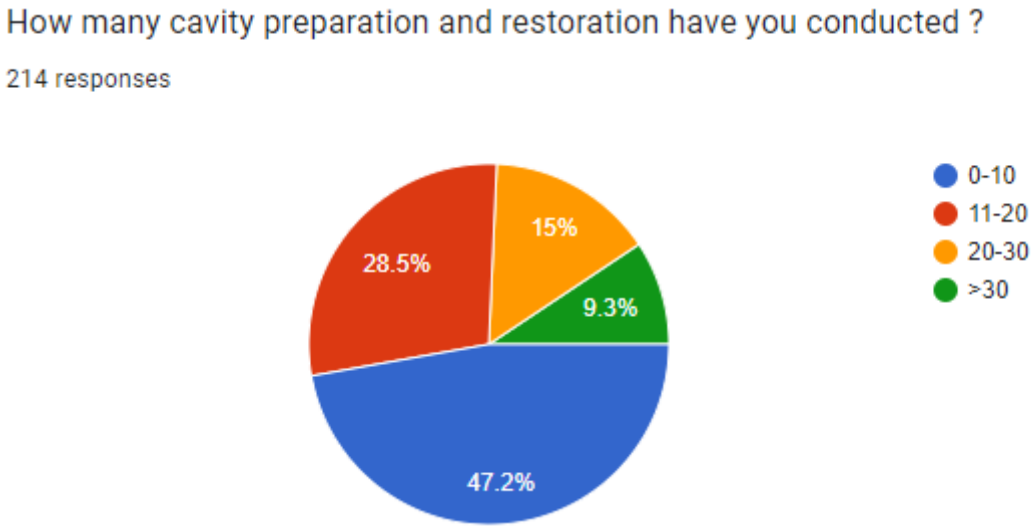

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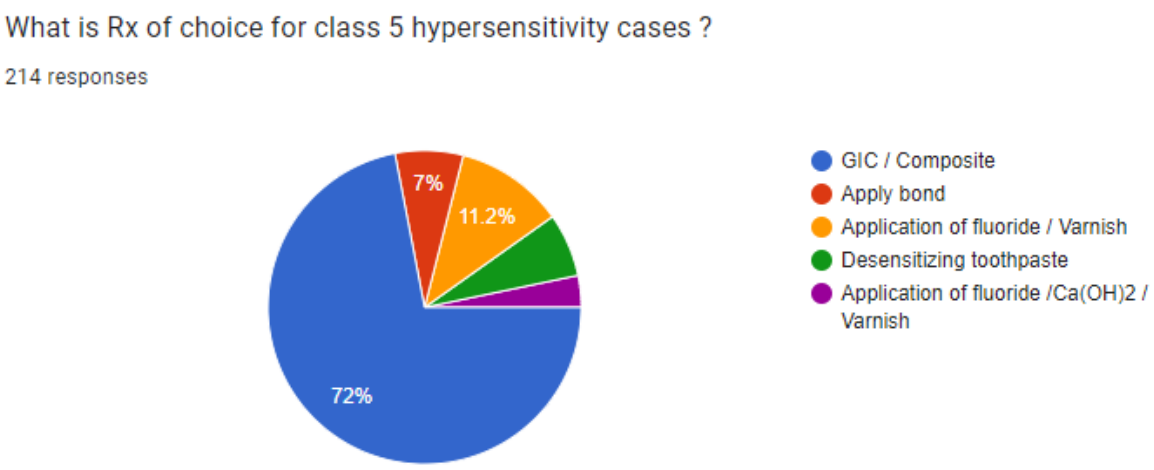


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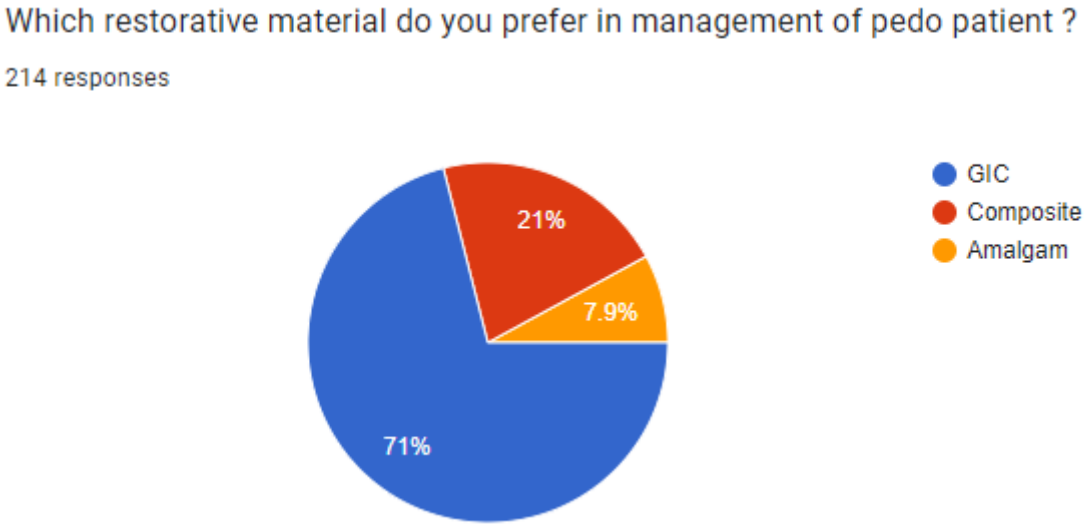


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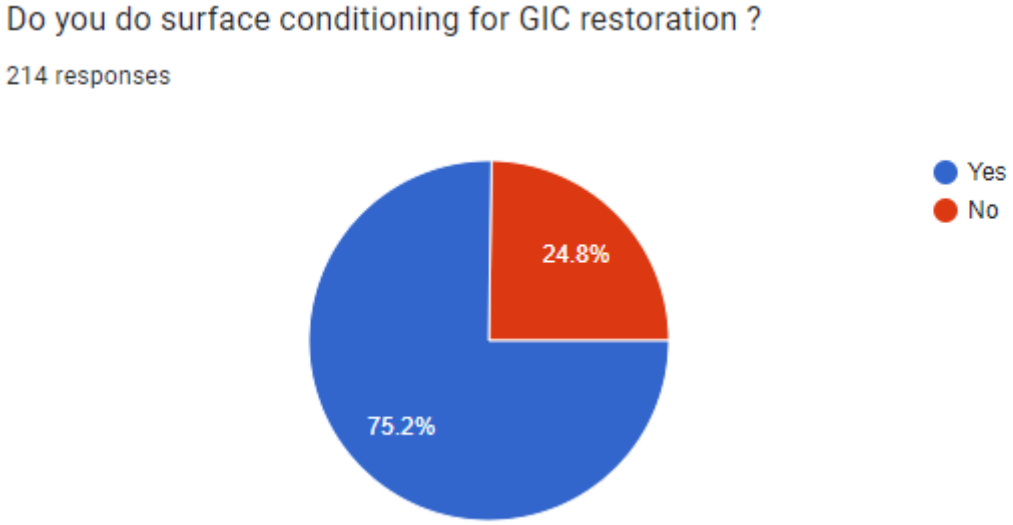

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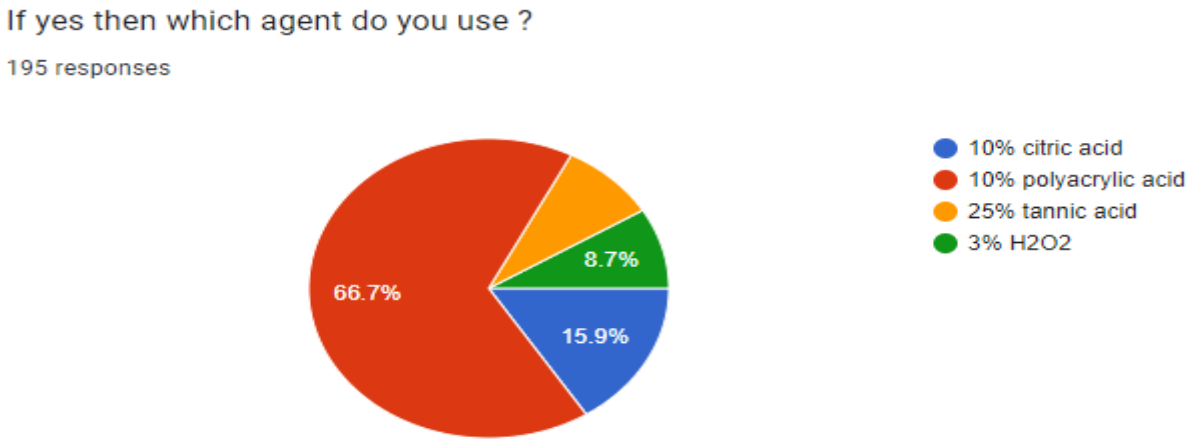


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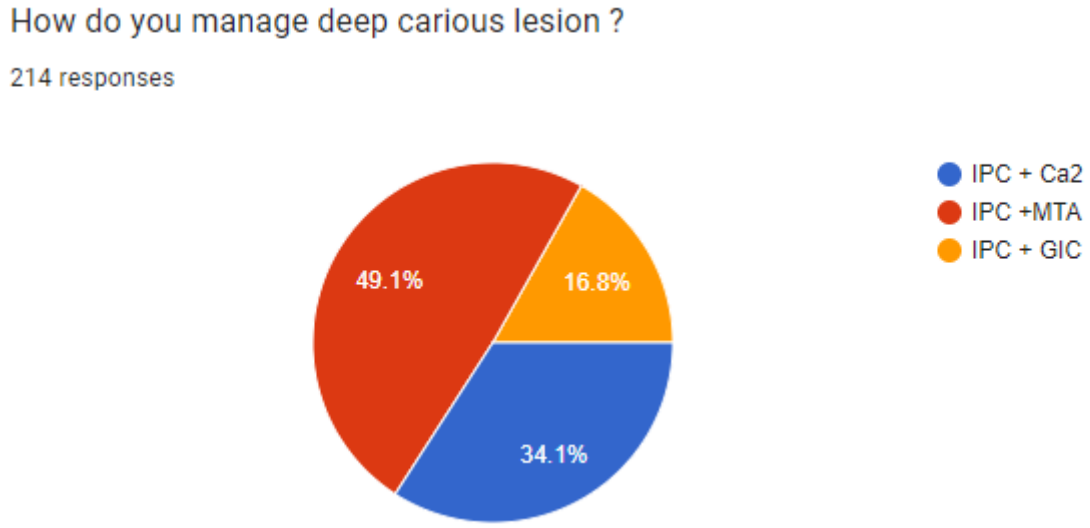


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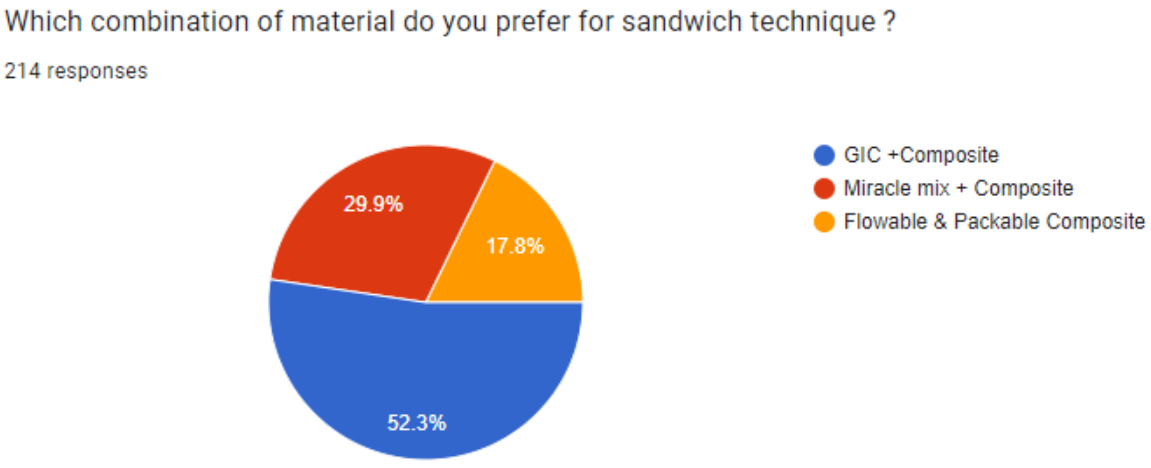


**Chart 14:**

What is line of treatment for pulp protection in shallow cavity having RDT - 2mm in amalgam restoration ?

214 responses

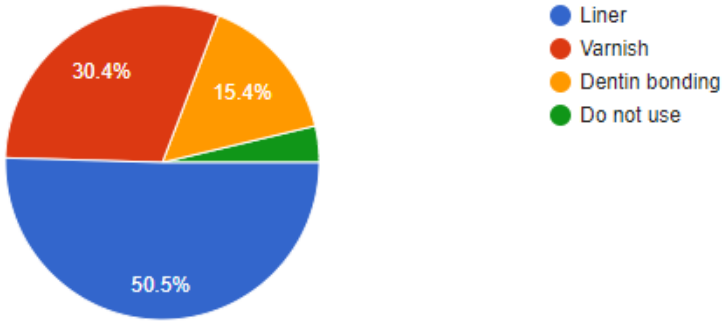



**Chart 15:**

What is line of treatment for pulp protection in deep cavity having RDT- 0.5mm in amalgam restoration ?

214 responses

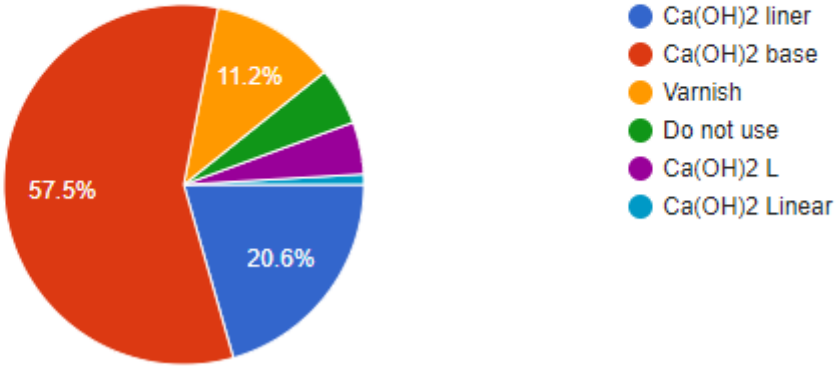
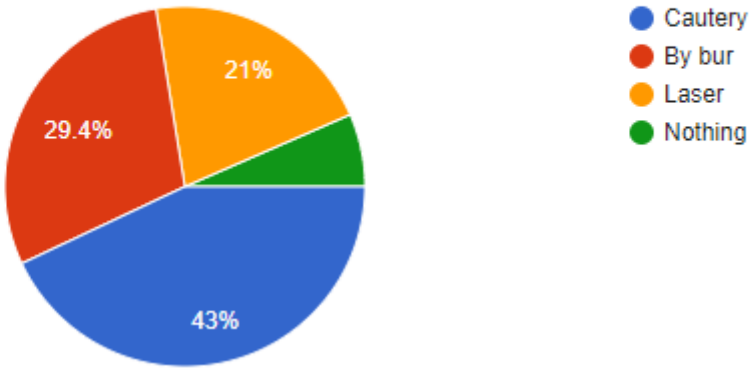



**Chart 16:**

How do you manage to remove gingival overgrowth in deep carious lesion ?

214 responses



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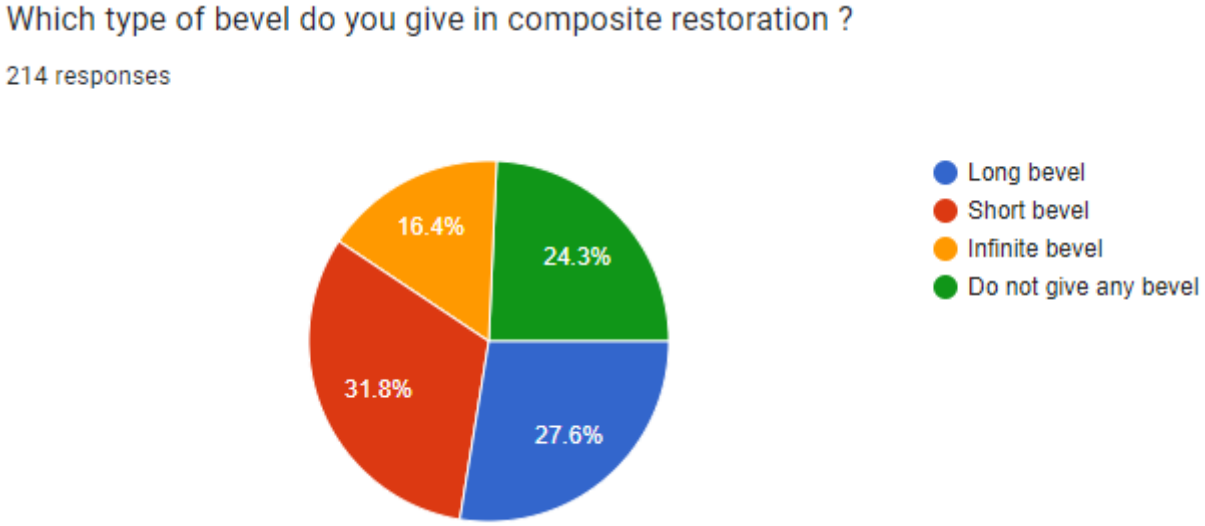


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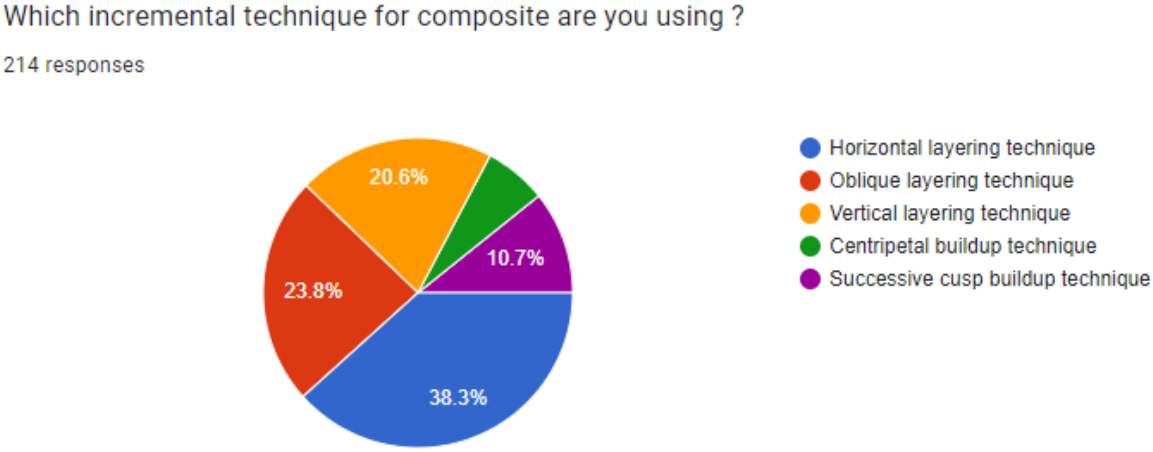


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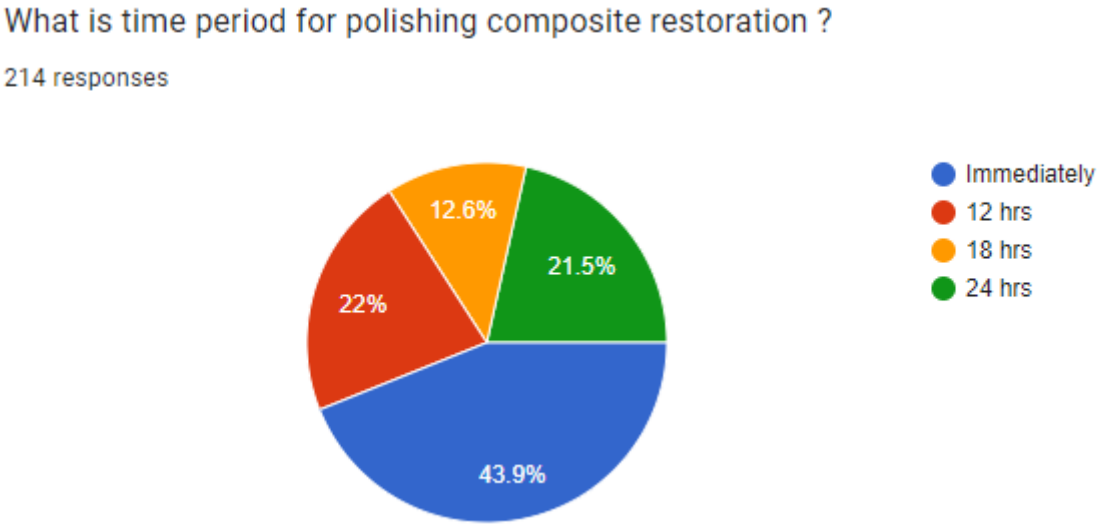

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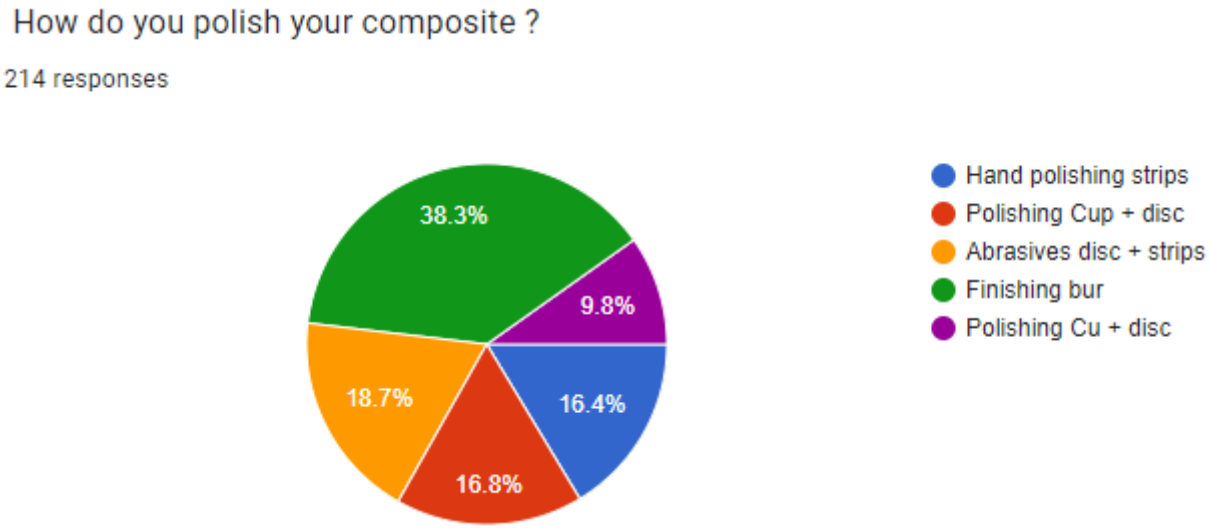


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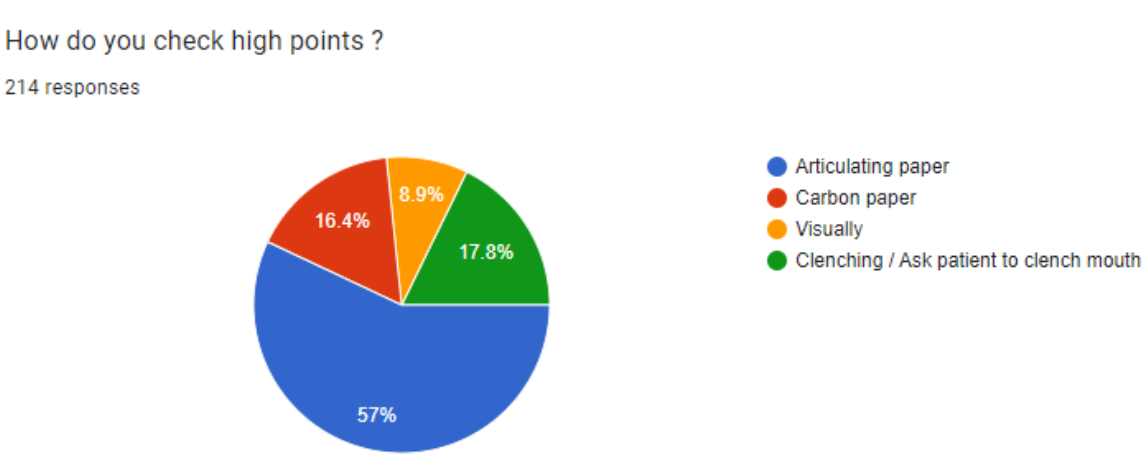


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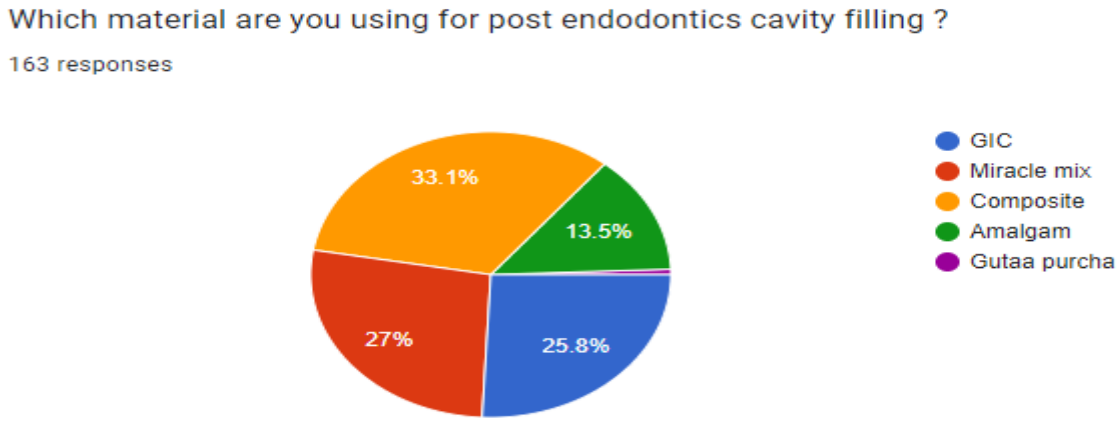

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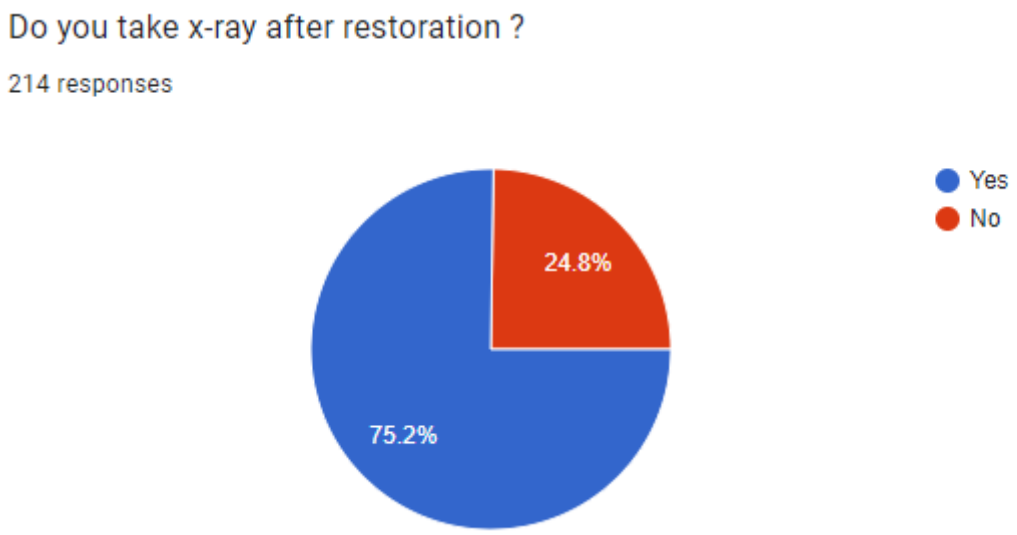


**DISCUSSION**:

Operative dentistry is the art and science of the diagnosis, treatment, and prognosis of defects of teeth that do not require full coverage restorations for correction. The purpose of this study is to analyse procedures in conservative dentistry. This questionnaire was circulated among the undergraduate students of different colleges of Gujarat for examining current practices and trends. It shows that 39.7% of the students using the visual method and 56.5% of the students using radiographs for the diagnosis of the carious lesion. Visual method is commonly applied and the teeth should be clean, dry and well illuminated. Black/brown discolorations are not reliable for definitive diagnosis of Occlusal caries, only enamel opacities may be more useful for determination of caries with visual examination[1] . Caries is diagnosed if tooth meets the ADA criteria of softened enamel that catches an explorer and resists its removal or allows the explorer to penetrate proximal surface under moderate to firm probing pressure. Radiograph is follow up step after visual examination. Without radiograph, case selection, diagnosis, and treatment would be impossible as it helps in the examination of lesion that unseen by the naked eye[12]. Conventional radiographic techniques is used by the UG students of Gujarat like Intraoral periapical and Bitewing radiograph. Other Conventional techniques are important but rarely used for caries detection due to its artifacts. Digital radiograph is involving to overcome this artifacts that includes radiovisiography which capable of rapidly displaying a digital radiographic image on a monitor which results in lower patient radiation[27]. 19.6% of students using Dyes, it detect caries in questionable areas that is soft dentin, it also differentiate mineralized from demineralized dentin. Studies shows that Dye stains are about 85% effective in detecting all caries in a tooth[11]. 7.9% of students using FOTI/DIFOTI, FOTI works due to differences in normal enamel and dentin light transmission compared with caries. DIFOTI system was designed to overcome the limitations of FOTI by providing digital image capture. Such images can be stored in digitized form and compared with previously acquired images. It is non-invasive and no hazards of radiation. It is simple and comfortable for the patient. Lesions, which can not be diagnosed radiographically, can be diagnosed by this method and it is not time consuming[3] [25]. DIAGNOdent aid diagnosis of Occlusal caries in adjunct to visual and radiograph examination. DIAGNOdent pen is advancement made in DIAGNOdent technology. It is perfect tool to detect fissure and smooth surface caries accurately[14] This device could be used as an alternative to the radiographic method to aid the dentist in the decision making process after visual inspection. After the diagnosis the important step in a procedure is isolating an operative field. The proper handling of the material and adequate isolation is important in the long-term success of the restoration. Contaminants such as saliva, blood, and sulcular fluid seem to influence the restoration and require proper isolation technique[21] [22]. In our study 74.8% students uses rubber dam. Rubber dam is one of the most commonly employed methods for performing isolation[15] [16], because it provides dry, clean operative field, accessibility, visibility and protection of patient and operator, and no contamination. Although rubber dams are highly effective, they do present certain limitations that should be considered. With the available literature, it can be suggested that most of the students do not perform rubber dam isolation because of disadvantages such as technical difficulty and patient discomfort[20],[10]. 54.2% students uses cotton roll/wafers. Due to the difficulty of placing a rubber dam on posterior teeth, malposition or partially erupted teeth, and in patients who are mouth breathers or have a latex allergy, the students opted for paper, cotton rolls, and paper saliva ejectors because of their ease of placement. Cotton rolls can become saturated quickly, leading to

insufficient moisture control and requiring frequent repositioning or replacement due to their tendency to shift or move during procedures. This can interfere with the effectiveness of the procedure and may necessitate additional adjustments. Recent advancements in rubber dams focus on improving functionality and user experience. Newer rubber dams are made from advanced latex or non-latex materials that offer better flexibility, durability, and resistance to tears. Ex- 1.Derma dam(ultradent products. Inc,USA), 2.Flexi dam (Coltene/Whaledent). Now coming on restoration, Glass ionomer cement (GIC) is also known as man-made dentin because it simulates dentin in terms of modulus of elasticity, resilience, coefficient of thermal expansion, and thermal conductivity. GIC chemically adheres to the tooth structure, is biologically compatible, and has fluoride-releasing properties[26] [23]. GICs are the materials of choice in restoring carious teeth in high-risk patients. Because of the ease of placement and snap set property, light-cured GICs are the material of choice for restoration in children[19]. Thanks to its easy placement and better marginal adaptation, glass ionomer cement is popularly used in paediatric restorations. GIC is also indicated for restoring permanent teeth in low stress-bearing areas like class III and V lesions and is the material of choice in patients with a high risk of caries due to the release of fluoride[7]. When it comes to cervical lesion ,GICs are very durable in it and compete with the composites, particularly where bonding to cervical dentin is required. Sclerosed dentin remains the greatest obstacle to obtain good bonding with dentinal bonding agents, and failure at the cervical margin, as a result of micro leakage, is not always easily detected5. GICs maintain the adhesion for long periods and are the materials of choice to be used in the cervical area of teeth where no cavity preparation is contemplated. It is also important to consider that adhesion to dentin is enhanced by surface conditioning with a 25% solution of polyacrylic acid for 10 s conditioning of tooth[4]: after rinsing and drying the tooth, 10% polyacrylic acid is applied for 10 seconds to increase the surface energy and wettability of the tooth, which improves chemical bonding[6]. After the root canal treatment, the dentist has the task to restore the tooth and to return its form, function, and aesthetics. The restoration must have adequate retention without promoting damage to the remaining dental tissue. In addition, it must prevent bacterial micro leakage and possible root fractures[13]. The amount of remaining structure, position of the tooth in the arch, functional and esthetic demands should guide the appropriate choice of the post-endodontic treatment, since the primary cause of its failure is inadequate restorative therapy[17]. Restorative material replace part of tooth structure and they should provide sufficient strength to resist intraoral compressive and tensile forces that are produced in function and parafunction. Flexural strength is used to evaluate the strength of the material and the amount of the distortion expected under bending stress[2]. Several dental restorative materials have been used for restoration procedures like GIC, amalgam, composite since many years[24]. In our Result shows only 33.1% students using composite ,52.8% students using GIC based restoration and 13.5% students using amalgam for post endodontic cavity filling. The glass ionomer cements developed by Wilson and Kent have several advantages such as fluoride release, adhesion to mineralized dental tissues and a coefficient of thermal expansion similar to that of tooth structure[8]. In spite of so many favourable properties, its poor mechanical properties, limited indication range (unsuitable for stress bearing situations) and low aesthetic value led to the further development of resin-based composites[18]. Resin based composite restorative materials are widely used for posterior direct restorations due to their excellent aesthetics, minimal tooth preparation, strong bonding, and good retention. Advances in composites and adhesives have enhanced aesthetics and supported minimally invasive dentistry. However, they are often seen as expensive, time-consuming, and technique-sensitive. compressive strength in composite was significantly higher than cention N, GIC and slightly higher than that of silver amalgam, which was similar to the results of a study done by Cohen et al[9] and also flexural strength in composite was significantly higher than GIC and amalgam. Therefore composite is more reliable for restoration. Just as we emphasized the critical role of preoperative radiographs in diagnosis, Postoperative radiographs are essential for verifying the success of dental procedures, ensuring accurate placement of restorations, and detecting any complications early. They provide a clear image of the treatment outcome, helping to confirm proper healing and alignment. Additionally, these radiographs serve as valuable records for future reference and on going patient care. It's encouraging to note that 75% of students are routinely taking postoperative radiographs, which is a positive trend toward maintaining high standards in patient care.

## **CONCLUSION**:

The conclusion of the study highlights significant findings regarding the current practices in conservative dentistry among undergraduate students in Gujarat. Despite advancements in dental technology, the majority of students still rely on traditional diagnostic tools such as the probe for detecting carious lesions. Glass Ionomer Cement (GIC) is predominantly used for pediatric and hypersensitivity cases, while only a small proportion (33%) utilize composite for restorative procedures. A notable 53% of students use GIC for post endodontic restorations, and concerningly, 25% do not take post-operative radiographs, indicating a potential gap in adherence to complete procedural protocols. The study suggests a need for improved education and training in the use of

advanced materials like composites and stresses the importance of post-operative radiographs to ensure optimal patient care. This calls for curriculum updates and further emphasis on modern diagnostic and restorative techniques in conservative dentistry across dental colleges in Gujarat.

**Conflicts of Interest**: NIL

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