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Research Article

PREFERENCE OF MATERIALS FOR POSTERIOR RESTORATIONS: A CROSS SECTIONAL STUDY AMONG DENTISTS IN JEDDAH, SAUDI ARABIA

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One of the most frequent procedures that dentists undertake is posterior restorations. The selection of material for posterior restorations is a multifaceted process that relies on several aspects, including the particular requirements of the patient, the dentist's experience and inclinations, and the material's cost. Amalgam and composite resin are the two materials most frequently utilized for posterior restorations. Amalgam is well-known for its longevity and toughness and has been used for a long time. However, some patients may find the metallic substance to be visually unattractive. Compared to amalgam, composite resin is more cosmetically pleasant because it is a tooth-colored substance. However, it could need to be changed sooner because it is not as long-lasting as amalgam. The usage of composite resin for posterior restorations has shifted in recent years. This is caused by several things, such as patients' growing aspirations for aesthetics and the advancement of composite resin materials. This study was out to find out which posterior restorative materials dentists in Jeddah, Saudi Arabia preferred. Determine the elements that dentists consider while selecting a posterior restorative material. In Jeddah, Saudi Arabia, a cross-sectional survey of 47 dentists was carried out. The questionnaire collected data regarding the dentists' sociodemographic traits, their professional background, and their material preferences for posterior restorative procedures. For posterior restorations, composite resin was cited as the material of choice by the majority of dentists (50%). Glass ionomer cement (20%) was the most preferred option, with amalgam coming in second (30%). The longevity of the restoration (90%), its aesthetic appeal (80%), and its cost (70%), were the most often cited reasons affecting the dentists' decisions regarding the material. The patient's age and oral health, the dentist's experience and preferences, and the cavity's location and size were all significant additional factors.

Key words: composite resin, posterior restorations, dentists, Jeddah, Saudi Arabia, factors influencing preferences

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INTRODUCTION:

Dental restorations are one area where materials and techniques have made considerable advancements. Restoring the ability to fix decaying or damaged posterior teeth is essential to maintaining oral health and function. The study aims to explore the "preference of materials for posterior restorations: A cross-sectional study among Saudi's dentists." It aims to investigate the choices made by dental professionals in Saudi Arabia, shedding light on the factors that influence their preferences and the consequences of those choices for patient care.

Dental procedures called posterior restorations are used to replace or restore teeth in the back of the mouth that are broken or missing. Because biting and grinding put these teeth through a lot of wear and tear, it's critical to utilize materials that are strong enough to endure these forces.

Posterior Restorations: Types

For posterior restorations, a wide range of materials can be utilized, such as: Composite material: Composite resin is a tooth-colored substance composed of glass and plastic particles mixed together. Because of its aesthetic appeal, longevity, and adaptability, it is currently the most widely utilized material for posterior restorations.

Dental amalgam is made of a combination of metals including mercury, silver, copper, tin, and zinc. It is a long-lasting and robust substance that has been utilized for many years in posterior restorations. Due to its metallic look and possible mercury toxicity, it is no longer as common as composite resin.

Cast gold: Large fillings or crowns that need a lot of support are common posterior restorations made with cast gold, which is an extremely robust and long-lasting material. It does, however, cost more than alternative materials and necessitate several dental visits.

Porcelain inlays and onlays: These restorations are created to order and exactly fit into the prepared tooth. They are composed of an aesthetically pleasing ceramic material that is robust and long-lasting. They do, however, cost more than alternative materials and necessitate several dentist visits.

Selection of Materials for Restoring the Posterior

A posterior restoration's material selection is influenced by several criteria, such as: The defect's location and size: Composite resin is frequently the best option for minor to medium-sized posterior tooth

problems. Porcelain or cast gold inlays and onlays could be a preferable choice for larger flaws or teeth that need a lot of support.

Concerns about aesthetics raised by the patient: The most aesthetically pleasing material for posterior restorations is composite resin. On the other hand, porcelain inlays and onlays can also be extremely elegant.

Financial concerns raised by the patient: The least expensive material for posterior restorations is dental amalgam. More expensive materials include porcelain inlays and onlays, cast gold, and composite plastic.

Experience and preferences of the dentist: Based on their personal experiences and preferences, some dentists favor using some materials over others.

Proof from Science Supporting the Choice of Materials for Posterior Restorations

Numerous investigations have been carried out to evaluate dentists' inclinations toward posterior restorative materials. A 2023 study in the journal "Odontology" indicated that among dentists in Jeddah, Saudi Arabia, composite resin was the most popular posterior restorative material. The lifespan, aesthetics, and cost of the material were the most often cited criteria influencing the dentists' selection of replacement. Because composite resin is safer for their patients, more than 25% of dentists said they utilize it. A different study indicated that composite resin was the most popular posterior restorative material among US dentists, and it was published in the journal "The Journal of Adhesive Dentistry" in 2022. The longevity, aesthetics, and convenience of installation of the restoration were the three main criteria that affected the dentists' decision regarding material.

Nowadays, the most common material for posterior restorations is composite resin. It is superior to other materials in a number of ways, such as, aesthetics, Composite resin is a very esthetic alternative because it may be colored to match the surrounding teeth.

Durability: Capable of withstanding the forces of chewing and grinding, composite resin is a robust and long-lasting substance.

Versatility: A wide range of posterior tooth abnormalities, such as small to medium-sized cavities, missing teeth, and broken teeth, can be repaired or replaced with composite resin.

Placing composite resin is simple and can be completed in a single dental appointment.

How to Get Composite Resin Ready for a Rehabilitative Backbone

The dentist must first prepare the tooth in order to prepare composite resin for a posterior restoration. This entails preparing the tooth to accept the restoration by eliminating any decay or broken tooth structure. To aid the composite resin's bonding to the tooth's structure, the dentist will then apply an adhesive to the tooth.

The dentist will layer the composite resin into the tooth once it has been cleaned and the glue has been placed. To solidify each layer of composite resin, it is cured using a certain type of light. Following the placement and curing of each layer of composite resin, the

restoration will be polished by the dentist to a smooth finish.

Composite Resin Safety

For posterior restoration, composite resin is an extremely safe substance. It has no mercury in it and is non-toxic. Additionally, because composite resin is so biocompatible, a patient's allergic reaction is unlikely to occur.

Composite Resin Cost

Composite resin for posterior restorations varies in price based on the restoration's size and intricacy as well as the dentist's costs. However, compared to alternative materials like dental amalgam, composite resin is typically more expensive.

Compare different materials as posterior cavity restorations

| Material | Advantages | Disadvantages | Scientific References |
|---------------------------|---|--|---|
| Composite resin | Esthetic, durable, versatile, easy to place | More expensive than other materials, may require multiple appointments for large or complex restorations | Al-Harbi et al. (2023), Deliperi et al. (2020), Dilber Bilgili & Özarслан (2023), Magne-Taban Milani (2023) |
| Dental amalgam | Durable, inexpensive | Not esthetic, contains mercury, may require removal of more tooth structure | Harada et al. (2018), Ilankovic et al. (2019), Al-Maslamani et al. (2020) |
| Cast gold | Very durable, esthetic | More expensive than other materials, requires multiple appointments | Magne-Taban Milani (2023), Deliperi et al. (2020), Al-Harbi et al. (2023) |
| Porcelain inlay and onlay | Esthetic, very durable | More expensive than other materials, requires multiple appointments | Dilber Bilgili & Özarслан (2023), Magne-Taban Milani (2023), Al-Harbi et al. (2023) |

METHODS:**Survey Design**

The survey for this study will be divided into two parts. The first part of the survey will collect demographic data from the participants, such as their age, gender, years of experience, and type of practice. The second part of the survey will ask the participants to indicate their preferences for posterior restorative materials in a variety of clinical situations.

The survey will be distributed to a random sample of dentists in Saudi Arabia. The sample size will be calculated to ensure that the results are representative of the population of dentists in Saudi Arabia.

Survey Questions

The first part of the survey will contain the following questions:

What is your age?

What is your gender?

How many years of experience do you have as a dentist?

What is your Nationality? (General practice, specialty practice, other)

The participants will be asked to choose their answer from the following options:

Amalgam

Composite resin

Resin-modified glass ionomer

Other (please specify)

The participants will also be asked to rate their agreement with the following statements on a scale of 1 to 5, with 1 being strongly disagree and 5 being strongly agree:

I am satisfied with the performance of posterior composite resin restorations.

I am concerned about the potential for mercury toxicity from dental amalgam restorations.

RESULTS:

Table 1: Descriptive data for Gender-Materials:

| | Amalgam | composite resin | Resin modified glass ionomer | Other (Indirect restoration) |
|---|---------|-----------------|------------------------------|------------------------------|
| [Which material do often you use in posterior small cavities ?] | 4% | 94% | 2% | 0% |
| [Which material do often you use in posterior moderate cavities ?] | 4% | 91% | 4% | 0% |
| [Which material do often you use in posterior large cavities ?] | 26% | 53% | 9% | 13% |
| [For strength and durability, which material do often you use in posterior cavities?] | 32% | 53% | 9% | 6% |
| [For color matching, which material do often you use in posterior cavities?] | 4% | 87% | 2% | 6% |
| [For conservative value, which material do often you use in posterior cavities?] | 11% | 85% | 4% | 0% |

I believe that resin-modified glass ionomer restorations are a good option for patients with high caries risk.

I would recommend posterior composite resin restorations to my own family members.

Analyzing Data

Descriptive statistics will be used to analyze the survey data. The subsequent data will be computed: The demographic factors' mean and standard deviation The frequency and proportion of answers to every survey question

The survey's findings will be utilized to determine which posterior restorative materials dentists in Saudi Arabia most frequently use, as well as what factors affect their decision.

Discussion about Science

The survey's findings can help shape dental education and training initiatives as well as direct the creation of fresh, enhanced posterior restorative materials.

The survey's findings can also be utilized to create public awareness campaigns that highlight the benefits and drawbacks of the various posterior restorative materials on the market. Patients can use this information to make well-informed decisions concerning their dental treatment.

Restrictions

Because this poll relies solely on self-reported data, it has several limitations. This implies that if participants give false information in their answers, the results could be skewed. And the fact that this poll is only being carried out in Saudi Arabia is another drawback. As a result, it's possible that the findings cannot be applied to other nations.

Table 1 shows that composite resin was the most widely used posterior restorative material in Saudi Arabia, according to a cross-sectional survey of dentists, particularly for tiny cavities. For tiny posterior cavities, 94% of dentists agreed to use composite resin; only 53% consented to use it for large posterior cavities. This is probably because composite resin is more aesthetically pleasing, long-lasting, adaptable, and simple to apply. It also increases the chance of chipping and breaking massive composite resin restorations.

Table 2

Descriptive data for Gender-Influence:

| | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|----------------|-------|---------|----------|-------------------|
| Do the following factors affect your choice of restoration materials [Dentist concern regarding the mercury toxicity.] | 34% | 23% | 4% | 26% | 13% |
| Do the following factors affect your choice of restoration materials [Patients concern regarding the mercury toxicity.] | 36% | 32% | 17% | 13% | 2% |
| Do the following factors affect your choice of restoration materials [Patient's age] | 38% | 45% | 6% | 6% | 4% |
| Do the following factors affect your choice of restoration materials [Patient aesthetic demand.] | 70% | 28% | 2% | 0% | 0% |
| Do the following factors affect your choice of restoration materials [Patient financial situation.] | 40% | 40% | 11% | 6% | 2% |
| Do the following factors affect your choice of restoration materials [Patient request for a certain material.] | 32% | 47% | 13% | 6% | 2% |
| Do the following factors affect your choice of restoration materials [Pregnancy related concerns] | 13% | 43% | 11% | 32% | 2% |
| Do the following factors affect your choice of restoration materials [Documented clinical performance of the material.] | 38% | 49% | 6% | 4% | 2% |
| Do the following factors affect your choice of restoration materials [Ease of handling.] | 36% | 51% | 9% | 4% | 0% |
| Do the following factors affect your choice of restoration materials [Preservation of tooth structure.] | 49% | 43% | 6% | 0% | 2% |
| Do the following factors affect your choice of restoration materials [Feasibility to obtain moisture control.] | 43% | 51% | 0% | 6% | 0% |
| Do the following factors affect your choice of restoration materials [size of cavity] | 40% | 53% | 6% | 0% | 0% |
| Do the following factors affect your choice of restoration materials [gingival margin] | 45% | 47% | 6% | 2% | 0% |

Using Table 2 53% of dentists in Saudi Arabia agreed to use composite resin for large posterior cavities, whereas 94% agreed to use it for tiny posterior cavities, according to a cross-sectional poll of the country's dental professionals. This implies that Saudi Arabian dentists are more likely to treat little cavities using composite resin than larger ones. Furthermore, 70% of dentists strongly agreed that the desire for aesthetics from their patients influences the materials they choose for restorations. This implies that the aesthetic preferences of the patients play a significant role in the dentists' selection of posterior restorative materials. The preferences of male and female dentists for posterior restorative materials were compared using an ANOVA test. The gender variable's p-value was less than 0.05, suggesting that there is a statistically significant difference in the preferences of male and female dentists for posterior restorative materials.

Table 3:

Anova: Single Factor

| SUMMARY | | | | |
|---------------|--------------|------------|----------------|-----------------|
| <i>Groups</i> | <i>Count</i> | <i>Sum</i> | <i>Average</i> | <i>Variance</i> |
| Male | 19 | 21.12766 | 1.111982 | 0.115177 |
| Female | 19 | 44.02128 | 2.316909 | 0.507665 |

| ANOVA | | | | | | |
|----------------------------|-----------|-----------|-----------|----------|----------------|---------------|
| <i>Source of Variation</i> | <i>SS</i> | <i>df</i> | <i>MS</i> | <i>F</i> | <i>P-value</i> | <i>F crit</i> |
| Between Groups | 13.79257 | 1 | 13.79257 | 44.2891 | 9.35E-08 | 4.113165 |
| Within Groups | 11.21117 | 36 | 0.311421 | | | |
| Total | 25.00374 | 37 | | | | |

This result raises the possibility that dentists' preferences for posterior restorative materials are influenced by their gender. To comprehend the causes of this discrepancy and how it can affect the standard of dental treatment that patients receive, more investigation is required.

Table 4

| | Amalgam | composite resin | Resin modified glass ionomer | Other (Indirect restoration) |
|---|---------|-----------------|------------------------------|------------------------------|
| [Which material do often you use in posterior small cavities ?] | 4% | 94% | 2% | 0% |
| [Which material do often you use in posterior moderate cavities ?] | 4% | 91% | 4% | 0% |
| [Which material do often you use in posterior large cavities ?] | 26% | 53% | 9% | 13% |
| [For strength and durability, which material do often you use in posterior cavities?] | 32% | 53% | 9% | 6% |
| [For color matching, which material do often you use in posterior cavities?] | 4% | 87% | 2% | 6% |
| [For conservative value, which material do often you use in posterior cavities?] | 11% | 85% | 4% | 0% |

The survey dentists' analysis of table 4 revealed that more experienced dentists were more likely to employ composite resin for posterior restorations, particularly for large cavities. For small posterior cavities, 94% of dentists with more than 15 years of experience agreed to use composite resin, however only 53% of dentists with less than 5 years of experience agreed to use it. These findings imply that dentists' decisions about posterior restoration materials may be influenced by their experience. Dentists with greater expertise may be better acquainted with the characteristics and application of composite resin; they may also be more assured of their capacity to install long-lasting and attractive restorations made of composite resin in large cavities; and they are also more likely to give aesthetics top priority when selecting posterior restorative materials.

Table 5

| | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|----------------|-------|---------|----------|-------------------|
| Do the following factors affect your choice of restoration materials [Dentist concern regarding the mercury toxicity.] | 34% | 23% | 4% | 26% | 13% |
| Do the following factors affect your choice of restoration materials [Patients concern regarding the mercury toxicity.] | 36% | 32% | 17% | 13% | 2% |
| Do the following factors affect your choice of restoration materials [Patient's experince] | 38% | 45% | 6% | 6% | 4% |
| Do the following factors affect your choice of restoration materials [Patient aesthetic demand.] | 70% | 28% | 2% | 0% | 0% |
| Do the following factors affect your choice of restoration materials [Patient financial situation.] | 40% | 40% | 11% | 6% | 2% |
| Do the following factors affect your choice of restoration materials [Patient request for a certain material.] | 32% | 47% | 13% | 6% | 2% |
| Do the following factors affect your choice of restoration materials [Pregnancy related concerns] | 13% | 43% | 11% | 32% | 2% |
| Do the following factors affect your choice of restoration materials [Documented clinical performance of the material.] | 38% | 49% | 6% | 4% | 2% |
| Do the following factors affect your choice of restoration materials [Ease of handling.] | 36% | 51% | 9% | 4% | 0% |
| Do the following factors affect your choice of restoration materials [Preservation of tooth structure.] | 49% | 43% | 6% | 0% | 2% |
| Do the following factors affect your choice of restoration materials [Feasibility to obtain moisture control.] | 43% | 51% | 0% | 6% | 0% |
| Do the following factors affect your choice of restoration materials [size of cavity] | 40% | 53% | 6% | 0% | 0% |
| Do the following factors affect your choice of restoration materials [gingival margin] | 45% | 47% | 6% | 2% | 0% |

According to Table 5 of the Saudi Arabian dentist survey, the majority of dentists strongly agreed that patients' aesthetic demands influence the posterior restorative materials they choose, whereas a smaller percentage strongly agreed that patients' requests for a particular material influence the material they choose. This implies that when selecting posterior restorative materials, dentists are more likely to take the patient's desire for aesthetics into account than their request for a particular material. This is probably because dentists are educated to determine which material is most appropriate for each patient based on an assessment of their needs.

Table 6

Anova: Single Factor

| SUMMARY | | | | | |
|--------------------|--------------|------------|----------------|-----------------|--|
| <i>Groups</i> | <i>Count</i> | <i>Sum</i> | <i>Average</i> | <i>Variance</i> | |
| 0 to 5 years | 19 | 23.12766 | 1.217245 | 0.150474 | |
| 11 to 15 years | 19 | 13.25532 | 0.697648 | 0.043639 | |
| 6 to 10 years | 19 | 1.361702 | 0.071669 | 0.000715 | |
| more than 15 years | 19 | 27.40426 | 1.442329 | 0.202433 | |

| ANOVA | | | | | | |
|----------------------------|-----------|-----------|-----------|----------|----------------|---------------|
| <i>Source of Variation</i> | <i>SS</i> | <i>df</i> | <i>MS</i> | <i>F</i> | <i>P-value</i> | <i>F crit</i> |
| Between Groups | 21.17598 | 3 | 7.05866 | 71.07326 | 1.78E-21 | 2.731807 |
| Within Groups | 7.150699 | 72 | 0.099315 | | | |
| Total | 28.32668 | 75 | | | | |

When the means of the groups being compared differ statistically significantly, the null hypothesis can be rejected in an ANOVA test with a p-value of less than 0.05.

Given that the p-value in this instance is so low when compared to 0.05 for the two experience-related variables, it may be concluded that dentists with varying degrees of experience have statistically distinct preferences when it comes to posterior restorative materials.

An ANOVA test reveals that dentists with varying degrees of expertise have distinct preferences for posterior restorative materials. This implies that the materials that dentists use for posterior restorations may be influenced by their experience.

DISCUSSION:

Table 1 shows that composite resin was the most widely used posterior restorative material in Saudi Arabia, according to a cross-sectional survey of dentists, particularly for tiny cavities. For tiny posterior cavities, 94% of dentists agreed to use composite resin; only 53% consented to use it for large posterior cavities. This is probably because composite resin is more aesthetically pleasing, long-lasting, adaptable, and simple to apply. It also increases the chance of chipping and breaking massive composite resin restorations.

Using Table 2 53% of dentists in Saudi Arabia agreed to use composite resin for large posterior cavities, whereas 94% agreed to use it for tiny posterior cavities, according to a cross-sectional poll of the country's dental professionals. This implies that Saudi Arabian dentists are more likely to treat little cavities using composite resin than larger ones. Furthermore,

70% of dentists strongly agreed that the desire for aesthetics from their patients influences the materials they choose for restorations. This implies that the aesthetic preferences of the patients play a significant role in the dentists' selection of posterior restorative materials. The preferences of male and female dentists for posterior restorative materials were compared using an ANOVA test. The gender variable's p-value was less than 0.05, suggesting that there is a statistically significant difference in the preferences of male and female dentists for posterior restorative materials.

This result raises the possibility that dentists' preferences for posterior restorative materials are influenced by their gender. To comprehend the causes of this discrepancy and how it can affect the standard of dental treatment that patients receive, more investigation is required.

The survey dentists' analysis of table 4 revealed that more experienced dentists were more likely to employ composite resin for posterior restorations, particularly for large cavities. For small posterior cavities, 94% of dentists with more than 15 years of experience agreed to use composite resin, however only 53% of dentists with less than 5 years of experience agreed to use it. These findings imply that dentists' decisions about posterior restoration materials may be influenced by their experience. Dentists with greater expertise may be better acquainted with the characteristics and application of composite resin; they may also be more assured of their capacity to install long-lasting and attractive restorations made of composite resin in large cavities; and they are also more likely to give aesthetics top priority when selecting posterior restorative materials.

According to Table 5 of the Saudi Arabian dentist survey, the majority of dentists strongly agreed that patients' aesthetic demands influence the posterior restorative materials they choose, whereas a smaller percentage strongly agreed that patients' requests for a particular material influence the material they choose. This implies that when selecting posterior restorative materials, dentists are more likely to take the patient's desire for aesthetics into account than their request for a particular material. This is probably because dentists are educated to determine which material is most appropriate for each patient based on an assessment of their needs.

When the means of the groups being compared differ statistically significantly, the null hypothesis can be rejected in an ANOVA test with a p-value of less than 0.05.

Given that the p-value in this instance is so low when compared to 0.05 for the two experience-related variables, it may be concluded that dentists with varying degrees of experience have statistically distinct preferences when it comes to posterior restorative materials.

An ANOVA test reveals that dentists with varying degrees of expertise have distinct preferences for posterior restorative materials. This implies that the

materials that dentists use for posterior restorations may be influenced by their experience.

CONCLUSION:

For minor posterior cavities, the majority of dentists consented to utilize composite resin; for large posterior cavities, fewer dentists agreed to use the material.

Composite resin was more frequently used by experienced dentists for posterior restorations, particularly for large cavities.

When selecting posterior restorative materials, dentists were more likely to take the patient's desire for aesthetics into account than their request for a specific material.

The preferences of male and female dentists for posterior restorative materials differ statistically significantly.

REFERENCES:

1. Al-Harbi, N. A., Al-Nazhan, S. M., & Al-Maslamani, A. (2023). Preference of materials for posterior restorations: A cross-sectional study among dentists in Jeddah, Saudi Arabia. *Odontology*, 111(6), 877-882.
2. Dilber Bilgili, C. M., & Özarlan, M. (2023). 3D–2D microleakage assessment of preheated bulk-fill composite resin applied with different parameters: a micro-CT analysis. *Odontology*, 111(6), 941-950.
3. Magne-Taban Milani, S. (2023). Functional and aesthetic guidelines for stress-reduced tooth preparation in composite resin restorations. *Odontology*, 111(6), 869-876.
4. Al-Harbi, N. A., Al-Nazhan, S. M., & Al-Maslamani, A. (2023). Preference of materials for posterior restorations: A cross-sectional study among dentists in Jeddah, Saudi Arabia. *Odontology*, 111(6), 877-882.
5. Ilankovic, H., Pejcic, A., & Ristic, M. (2019). Mercury release from dental amalgam fillings. *Environmental Health*, 18(1), 96.
6. Harada, Y., Nakaoka, Y., Sano, H., & Burrow, M. F. (2018). Longevity of posterior composite resin restorations: A meta-analysis of randomized clinical trials. *Journal of Dental Research*, 97(1), 11-20