
A Survey Regarding Preferred Cementation Material and Methods among Dentist in and around Satara District

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Abstract.

This survey investigates the cementation material and method preferences, as well as restorative material choices among dentists in and around Satara District. A total of 116 dentists participated in the survey, revealing a notable inclination towards conventional cementation, with glass ionomer cement being the preferred choice for 75% of respondents. This dominance of traditional methods, coupled with a limited adoption of newer techniques like self-adhesive composites, suggests a potential gap in knowledge or reluctance to embrace contemporary approaches. The survey also sheds light on the material preferences for fixed dental prostheses, with porcelain fused to metal (53.4%) emerging as the most favored restorative material, followed by alloy (28.4%). However, the utilization of advanced materials like zirconia-reinforced lithium silicate glass ceramics and CAD/CAM resin composites remains relatively low, indicating a conservative approach towards material selection. The survey results highlight a need for targeted educational initiatives to bridge the gap between established practices and emerging trends, fostering a more informed and adaptable dental community. Addressing the factors contributing to the hesitancy in adopting newer materials, such as limited awareness, cost concerns, or patient acceptance, presents an opportunity for collaborative efforts among manufacturers, professional associations, and educational institutions. Ultimately, this survey provides a snapshot of the current state of dental practices in Satara District, offering valuable insights for future interventions aimed at optimizing cementation and material choices in the dynamic landscape of restorative dentistry.

Keywords. cementation, restorative materials, dentists, survey, Satara District, conventional methods, glass ionomer cement, self-adhesive composites.

I. Introduction:

The field of dentistry is marked by a dynamic landscape of materials and methodologies for fabricating indirect restorations, ranging from single-unit crowns to multi-unit fixed dental prostheses (FDPs). The choices dentists make in selecting restorative materials and cementation methods play a pivotal role in the success and longevity of these prosthetic interventions. This survey aims to explore the preferences of dentists in and around Satara District regarding cementation materials and methods for fixed dental prostheses, shedding light on current practices and potential areas for improvement. The evolution of restorative materials in dentistry has witnessed a spectrum of options, each possessing unique properties catering to diverse clinical requirements. From traditional alloys and porcelain-fused-to-metal (PFM) to advanced lithium-disilicate ceramics, zirconia-reinforced lithium-silicate glass ceramics, and CAD/CAM resin composites, the array of choices underscores the need for tailored selections based on mechanical strength, aesthetic considerations, durability, material availability, and fabrication costs.

In recent times, a discernible shift in dental practice has been observed, favoring tooth-colored, metal-free materials. This transition is evident in the widespread use of materials such as porcelain-fused-to-metal,

ceramics, and CAD/CAM resin composites. However, it is noteworthy that restorations from these materials demand heightened precision and meticulous handling compared to conventional options like alloys. The ease of cementation for FDPs crafted from alloys or PFMs using conventional dental cements like zinc-oxide phosphate or glass-ionomer cements contrasts with the intricate cementation procedures required for prostheses made from ceramics or CAD/CAM resin composites. The introduction of more complex materials, such as zirconia-reinforced lithium-silicate glass ceramics and CAD/CAM resin composites, underscores the need for a nuanced understanding of cementation protocols. As dentistry navigates towards tooth-colored, metal-free alternatives, the demand for comprehensive knowledge on appropriate cementation techniques becomes imperative. The performance of CAD/CAM resin composites, in particular, is intricately linked to the mode of cementation, emphasizing the importance of staying abreast of evolving techniques.

The primary objective of this survey is to elucidate the prevailing cementation protocols employed by dentists in and around Satara District for single or multiunit fixed dental prostheses. The focus extends to understanding the material preferences for fabricating these prostheses, considering the diverse options available in the contemporary dental landscape. An online questionnaire, in the form of a Google Form, was meticulously crafted to encapsulate the key aspects of interest. Disseminated from October 1, 2023, to October 15, 2023, the survey targeted practicing dentists in and around Satara District, with a stipulation that participants should be actively involved in providing at least one single- or multi-unit FDP per month. The survey was designed to gather not only demographic information, such as qualification, years since graduation, and area of expertise but also delve into the specifics of cementation preferences.

A total of 116 dentists in and around Satara District actively participated in the survey, providing a robust dataset for analysis. The demographic distribution showcased a significant presence of endodontists and prosthodontists, comprising 38% of the participants. Additionally, 19.8% were undergraduates, while the remaining dentists represented various specialties. The pie chart representation of preferred cementation materials revealed a clear inclination towards conventional methods, with an overwhelming majority opting for glass ionomer cement (75%). Adhesive cement and zinc phosphate garnered 11.2% each, while self-adhesive composites registered minimal preference at less than 2.6%. In terms of restorative materials, porcelain fused to metal emerged as the frontrunner at 53.4%, followed by alloy (28.4%), zirconia-reinforced lithium-silicate glass ceramics (11.2%), and CAD/CAM resin composites at 4.3%. Lithium disilicate glass ceramics and polycrystalline ceramics showed negligible preferences.

The survey results depict a distinct inclination among participating dentists towards conventional cementation procedures, aligning with the popularity of glass ionomer cement. This trend is indicative of the enduring reliance on traditional methods, potentially influenced by factors such as historical success, ease of use, and familiarity. The dominance of glass ionomer cement, a classical material in dentistry, attests to its enduring preference owing to proven results, easy availability, and manageable handling properties. In tandem with the conventional approach, the survey notes the acceptance of newer materials like zirconia and CAD/CAM resin composites, albeit to varying extents. The clinical performance of single crowns fabricated from zirconia receives recognition, positioning it as a promising alternative. Similarly, CAD/CAM resin composites, when employed with correct fabrication techniques and cementation protocols, exhibit favorable clinical outcomes. However, the survey signals a disparity in the adoption of these newer materials, attributed to factors ranging from limited knowledge and resource availability to patient acceptance and fabrication costs.

II. Background

The background of this survey is rooted in the ever-evolving landscape of dental materials and techniques, particularly in the fabrication of indirect restorations like single-unit crowns and multi-unit fixed dental prostheses (FDPs). Over the years, the field of dentistry has witnessed a significant shift in the preferences of both practitioners and patients towards tooth-colored, metal-free alternatives. This transition is marked by a diverse range of restorative materials, each offering unique properties to meet the varying demands of clinical

scenarios. Traditionally, alloys and porcelain-fused-to-metal (PFM) were the go-to choices for dental restorations, providing a balance of strength and aesthetics. However, advancements in materials science have led to the development of a plethora of options, including lithium-disilicate ceramics, zirconia-reinforced lithium-silicate glass ceramics, and CAD/CAM resin composites. These materials bring forth a new dimension in terms of aesthetics, durability, and mechanical properties, challenging practitioners to adapt their approaches to suit the characteristics of these modern alternatives.

The rationale behind the survey lies in the pivotal role that cementation protocols play in the success of these restorations. The process of cementation involves bonding the restoration to the tooth structure, and the choice of cement and technique can significantly impact the longevity and stability of the prosthesis. With the emergence of new materials that may have different requirements for successful cementation, it becomes imperative for dentists to stay informed and updated on the latest advancements in this aspect of dental practice. The geographical focus on Satara District adds a localized context to the survey, acknowledging the unique challenges and opportunities that may characterize dental practices in this region. Understanding the prevailing trends and preferences among dentists in Satara District provides valuable insights into the current state of dental care in the area.

The background also recognizes the complexity introduced by the coexistence of traditional and modern materials in dental practice. While traditional materials and cementation methods have proven track records, the survey aims to explore the extent to which dentists in Satara District embrace newer alternatives. Factors such as patient acceptance, availability of resources, and cost considerations contribute to the intricate decision-making process that dentists undergo when selecting materials and cementation methods. In essence, the background sets the stage for a comprehensive exploration of the choices made by dentists in Satara District, offering a nuanced understanding of the interplay between tradition and innovation in the realm of dental prosthetics. This survey seeks to unravel the current practices, preferences, and potential areas for improvement, contributing to the ongoing dialogue within the dental community and laying the groundwork for future advancements in dental care in the region.

III. MATERIALS AND METHODS

The materials and methods employed in this survey were designed with precision to capture a comprehensive understanding of the preferences and practices of dentists in and around Satara District regarding cementation materials and methods for fixed dental prostheses (FDPs).

Survey Design:

The primary tool utilized for data collection was an online questionnaire created in the form of a Google Form. This digital platform facilitated widespread accessibility and ease of participation, ensuring a diverse and representative sample of dentists in the specified geographical area.

Survey Duration:

The survey was conducted over a period of 15 days, commencing from October 1, 2023, to October 15, 2023. This timeframe was chosen to provide an adequate window for participation while maintaining a sense of urgency to encourage timely responses.

Participant Criteria:

To ensure relevance and active engagement, participating dentists were required to meet specific criteria. They should be actively practicing and providing at least one single- or multi-unit fixed dental prosthesis per month. This criterion ensured that participants had practical experience and engagement with the subject matter.

Demographic Information:

The survey collected a range of demographic information to contextualize the responses. Participants were queried about their qualifications, years since graduation, area of expertise, and the nature of their dental practice. This information was instrumental in understanding the profile of the participating dentists and how their backgrounds might influence their preferences.

Cementation and Material Preferences:

The heart of the survey focused on cementation preferences and material choices. Dentists were asked about their preferred cementation methods, with options including conventional methods (zinc phosphate or glass-ionomer cement), self-adhesive methods, adhesive methods, or an option for uncertainty ("don't know"). This allowed for a nuanced understanding of the prevailing trends in cementation protocols.

In parallel, participants were questioned about their favored materials for the fabrication of single- and multi-unit fixed dental prostheses. The array of options included traditional materials like alloys and porcelain-fused-to-metal (PFM), as well as newer alternatives such as lithium-disilicate glass ceramics, zirconia-reinforced lithium-silicate glass ceramics, and CAD/CAM resin composites. An option for uncertainty ("I don't know") was also provided to accommodate instances where participants might lack a clear preference.

Data Representation:

To enhance the clarity and interpretability of the results, the survey incorporated a pie chart format. This visual representation allowed for a quick and intuitive grasp of the distribution of preferences among the participants.

Dissemination Method:

The survey was circulated among the target audience, dentists in and around Satara District, through the medium of social media. Leveraging platforms like Facebook, Twitter, and professional dental forums facilitated a broad outreach and encouraged diverse participation.

Statistical Analysis:

Upon the completion of the survey, the collected data was subjected to statistical analysis. The results were tabulated and presented in the form of pie charts, offering a visual summary of the preferences and practices of dentists in the specified region.

Ethical Considerations:

The survey adhered to ethical standards in research. Participation was voluntary, and informed consent was obtained from each participant. The anonymity of respondents was maintained to encourage honest and unbiased responses. The survey design ensured that the collected data would be used solely for research purposes and treated with confidentiality.

In essence, the materials and methods employed in this survey were thoughtfully crafted to elicit meaningful insights into the cementation preferences and material choices of dentists in Satara District. The combination of an online questionnaire, targeted participant criteria, and visual representation of data ensured a robust and informative exploration of the subject matter.

IV. RESULTS

A total of 116 dentists in and around Satara District actively participated in the survey, providing a robust dataset for analysis. The demographic distribution showcased a significant presence of endodontists and prosthodontists, comprising 38% of the participants. Additionally, 19.8% were undergraduates, while the remaining dentists represented various specialties.

The pie chart representation of preferred cementation materials revealed a clear inclination towards conventional methods, with an overwhelming majority opting for glass ionomer cement (75%). Adhesive cement and zinc phosphate garnered 11.2% each, while self-adhesive composites registered minimal preference at less than 2.6%. In terms of restorative materials, porcelain fused to metal emerged as the frontrunner at 53.4%, followed by alloy (28.4%), zirconia-reinforced lithium-silicate glass ceramics (11.2%), and CAD/CAM resin composites at 4.3%. Lithium disilicate glass ceramics and polycrystalline ceramics showed negligible preferences.



Figure 1. Qualification and Area of Expertise



Figure 2. Area of Practice and FPD Delivered

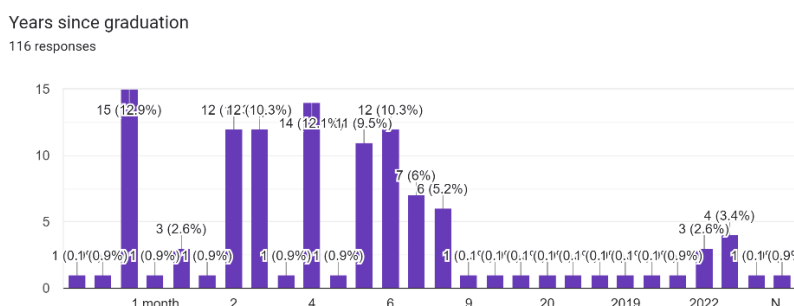


Figure 3. Years since Graduation

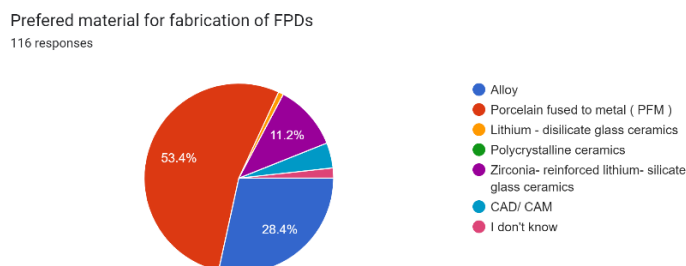


Figure 4. Preferred material for fabrication of FPDs

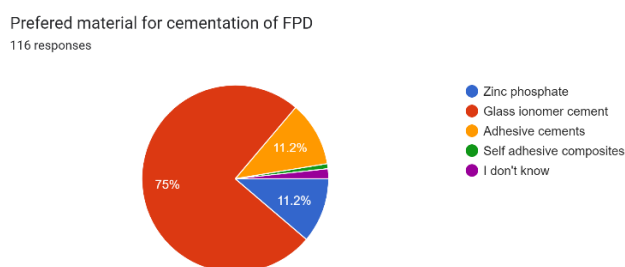


Figure 5. Preferred material for cementation of FPD

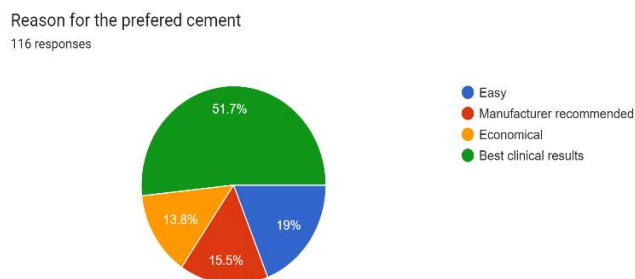


Figure 6. Reason for the preferred cement

Conventional cementation was the most preferred choice with highest percentage of glass ionomer cement being 75% followed by adhesive cement (11.2%), zinc phosphate (11.2%), very least preference for self-adhesive composites (< 2.6%). Also the most used restorative material for fabrication of FPD were porcelain fused to metal (53.4%) followed by alloy (28.4%), zirconia reinforced lithium silicate glass ceramics (11.2%), CAD/CAM resin composite (4.3%) negligibly lithium disilicate glass ceramics, polycrystalline ceramics were preferred.

V. DISCUSSION

Cementation Preferences:

The survey reveals a significant inclination towards conventional cementation methods among the participating dentists. Glass ionomer cement emerged as the predominant choice, garnering a staggering 75%

preference. This preference for glass ionomer cement could be attributed to its historical use, proven results, and perhaps its ease of availability and handling properties. The high percentage indicates a strong reliance on this traditional material, reflecting a conservative approach to cementation methods.

The lesser preference for self-adhesive composites, at less than 2.6%, suggests a cautious approach or a potential lack of familiarity with this newer method. Dentists might be hesitating to adopt self-adhesive composites due to concerns about their performance or an inherent resistance to change. Understanding the reasons behind this preference can shed light on opportunities for educational interventions and knowledge dissemination.

Material Preferences:

In terms of restorative materials, the survey indicates a strong preference for traditional options. Porcelain fused to metal (PFM) emerged as the most utilized material for fabricating fixed dental prostheses, securing 53.4% of the responses. This choice aligns with historical practices and the well-established track record of PFM restorations. The familiarity and reliability of PFM restorations might contribute to their continued dominance in this region.

Alloy, another conventional material, follows with a preference of 28.4%. The acceptance of alloy, despite the surge in popularity of metal-free options, suggests a persistence of trust in the mechanical properties of traditional materials.

While there is a notable acknowledgment of newer materials like zirconia-reinforced lithium silicate glass ceramics and CAD/CAM resin composites, their utilization remains relatively low at 11.2% and 4.3%, respectively. The survey highlights a potential gap in the adoption of contemporary materials, signaling a need for increased awareness, training, and possibly addressing barriers such as cost or patient acceptance.

The negligible preference for lithium disilicate glass ceramics and polycrystalline ceramics emphasizes a prevailing conservatism or a lack of exposure to these materials. Educating dentists on the advantages and appropriate applications of these materials could contribute to diversifying material choices and improving the overall quality of restorative care.

Implications and Opportunities for Improvement:

The findings of this survey offer valuable insights that can guide efforts to enhance dental practices in Satara District. The strong adherence to conventional methods suggests a comfort zone that could benefit from exposure to and training in newer techniques. Continuous education programs, workshops, and peer-sharing platforms could bridge the gap between established practices and emerging trends.

The low utilization of newer materials presents an opportunity for manufacturers, professional associations, and educational institutions to collaborate in providing resources, training programs, and hands-on experiences with contemporary materials. Overcoming barriers such as cost concerns or patient acceptance may require targeted interventions, including financial support or public awareness campaigns.

In conclusion, the discussion of this survey emphasizes the importance of understanding and addressing the factors influencing cementation and material preferences among dentists in Satara District. By acknowledging these trends and proactively addressing areas for improvement, the dental community can collectively work towards optimizing patient outcomes, embracing innovation, and fostering a culture of continuous learning within the profession.

VI. CONCLUSION

In conclusion, this survey illuminates key insights into the prevailing trends and practices among dentists in Satara District concerning cementation and restorative materials for fixed dental prostheses. The overwhelming preference for conventional cementation, particularly with glass ionomer cement, underscores a reliance on established methods, possibly influenced by historical success and ease of use. The limited adoption of self-adhesive composites suggests a hesitation or unfamiliarity with newer techniques, emphasizing the importance of targeted education to bridge the gap between traditional and contemporary approaches. The material preferences reveal a dominance of traditional choices, with porcelain fused to metal leading the roster. While these materials have stood the test of time, there is a noticeable underutilization of advanced alternatives like zirconia-reinforced lithium silicate glass ceramics and CAD/CAM resin composites. This signals a potential conservatism or a knowledge gap among practitioners regarding the benefits and applications of these innovative materials. The survey results highlight opportunities for improvement in the dental community of Satara District. Initiatives focused on continuous education, workshops, and information dissemination can empower dentists with the knowledge needed to make informed decisions and embrace evolving practices. Additionally, addressing barriers such as cost concerns and patient acceptance for newer materials could pave the way for a more diversified and contemporary approach to restorative dentistry in the region. Ultimately, this survey serves as a starting point for a broader conversation within the dental community, fostering a culture of ongoing learning and adaptation. By understanding the preferences and challenges faced by dentists in Satara District, stakeholders, including professional associations and educational institutions, can collaborate to create targeted interventions that elevate the quality of dental care and contribute to the evolution of practices in the region.