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Evaluation And Understanding of Variations in Clinical Decision Making in Implant Dentistry Among Different Dental Specialists: A Survey-Based Cross-Sectional Study

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Abstract:
Materials and Methods*: – It is a descriptive cross-sectional survey-based study, conducted among 109 dental specialist including prosthodontist, periodontist, oral-surgeons and general dentists with implant training. A structured questionnaire comprising 21 multiple choice questions was distributed electronically (Google Forms). Data was analyzed and results were expressed as percentages.*
Results*: The results of this survey show that while there are some clear differences in clinical decision-making between different specialties, and there are also areas where specialists tend to agree.*
Conclusion: *These insights suggest that identifying both differences and shared perspective can enhance collaboration and patient- centered care, leading to more consistent outcomes in implant dentistry.*
Key Word: *Implant dentistry; Prosthodontist; Periodontist; Oral-surgeon; General dentist*

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I. Introduction

Implant dentistry has become a key component in modern dental practice, as it provides a predictable and long-lasting solutions for tooth replacement.[1,2] Dental implants allow for the replacement of an individual missing tooth without involving or altering the adjacent teeth.[3]Moreover, they offer a stable fixed restorative option for patients who are partially or completely edentulous.[4] Beyond aesthetics, it also contributes significantly to patient's oral health and overall well-being. The success of implant therapy is completely linked to sound clinical decision-making at all stages from patient assessment, treatment planning to surgical execution, prosthetic rehabilitation, and its long-term maintenance.[5] Clinical decisions in implant dentistry are influenced by wide range of factors such as: Patient-specific (medical history, bone quality, soft tissue characteristics), Implant-related (design, material, size), Clinician-related (training, experience, and specialty). Given the diversity in training and expertise among dental specialists, leads to variations in treatment approaches.[6]

This study aims to examine the variations among prosthodontists, oral and maxillofacial surgeons, periodontists,[7] and general dentists with implant training and their approach to clinical decisions in implant dentistry, including the timing of implant placement, selection of prosthetic materials, management of complications, and expectations for future developments in the field. The main goal is to identify the patterns, divergence and potential best practice that can enhance the treatment outcomes and elevate the standard of care in implant dentistry.

II. Material And Methods

Study Design: Survey-based Cross-sectional study.

Study Duration: January 2025 to June 2025

Sample size: 109 dental practioners

Subjects & selection method
Inclusion criteria: Dental specialists such as prosthodontists, oral and maxillofacial surgeons, periodontists, and general dentists with significant experience in implant dentistry.

Exclusion criteria: All other specializations in dentistry are excluded from the study.

Methodology

This is a survey-based cross-sectional study conducted to assess the current practices and opinions in implant dentistry among selected dental specialists. The population selected for this study were prosthodontists, oral and maxillofacial surgeons, periodontists, and general dentist with implant specialization. Dental professionals from other specialties were excluded. Data was collected using a structured questionnaire designed in Google Forms. The questionnaire consisted demographic details, detailed clinical case scenarios, multiple- choice questions on treatment preferences, implant type and materials, and open-ended questions to capture qualitative insights. The survey was distributed electronically, via professional networks and institutional contacts. Participation was voluntary, and no identifying information was collected to maintain anonymity and confidentiality.

The study was self-funded, and ethical principles, including voluntary participation and data confidentiality, were maintained throughout the research process.

Statistical analysis

Analysis involved both quantitative and qualitative methods. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the findings according to specialty. Comparative analysis of response patterns across independent variables such as specialty and years of clinical experience was performed using the chi-square test. Qualitative responses were examined using thematic analysis to identify the recurring concepts and patterns.

III. Result

A total of 109 practitioners participated in the survey. Majority of the participants were post-graduate, followed by fellowship in implantology. Specialists included were prosthodontists (37.6%), followed by general dentist with implant specialization (26.6%), other are oral surgeon (19.3%) and few are periodontist (16.5%).

The survey revealed that in decision making case scenario involving a fractured maxillary central incisor, most respondents (93.6%) opted for immediate extraction followed by immediate implant placement, with decisions on timing largely influenced by bone quality (61.5%) and the condition of soft/hard tissues at extraction site (34.9%).

This survey explored preferences for prosthetic materials and treatment modalities (78.9%) of specialists preferred PFM and (14.7%) choose zirconia for implant-supported crowns and bridges. Factors influencing material choice included aesthetics (79.8%) and durability. (76.1%) preferred screw-retained systems for fixed prostheses and (21.1%) prefer hybrid system.

Clinical complications were frequently encountered, with peri-implantitis reported by (60.6%) and implant fractures by (75.2%), of which (39.4%) were attributed to occlusal overload or peri-implantitis and (15.6%) consider insufficient primary stability as major cause for implant failure. Approaches to soft tissue management varied, though flap design with tissue augmentation was preferred by (59.6%) of participants, while (19.3%) favors for bone level implant with soft-tissue contouring and (15.6%) favors minimal surgical intervention.

Participants shared their views on the future of dental implants and decision making, among which (49.5%) believe that more digital workflows and automation in clinical practices will shape the future while (22%) highlighted smart implants or patient-specific implants and some (19.3%) highlighted advanced materials for improved aesthetics as a future trend and few (9.2%) think that robotic assisted surgery as a future trend.

IV. Discussion

This survey explored how different dental specialists make decisions in implant dentistry.

In the previously published study participants which included were prosthodontist, periodontists, oral surgeon and endodontists [7,8]. However, in this study participants who are specifically related to implantology such as prosthodontist, periodontists, oral surgeon and general dentists with implant specialization were also included.

While the Fatani B,[7] focused primarily on assessing the technical knowledge and procedural skills of specialists, the present study explored how these professionals differ in their clinical judgment, treatment planning, and decision-making strategies. This comparison highlights two complementary aspects of implant dentistry: Fatani's study emphasizes what specialists know and can do, whereas this study investigates how they think and decide in clinical scenarios. Together, these perspectives provide complementary insights into implant dentistry-linking technical proficiency with cognitive and strategic approaches that ultimately shape patient outcomes.

Murdoch AIK,[5] explored how dentists make decisions when faced with uncertainty. It identified key influencing factors such as clinical experience, patient preferences, heuristics (mental shortcuts), and the use of guidelines. The study emphasized that decisions made by individual practitioners especially without collaboration can vary widely and may lead to inconsistent treatment outcomes. While the present study, builds on this understanding by focusing specifically on implant dentistry and comparing decision-making patterns across different dental specialties. It also introduced the role of shared decision making or collaboration with other specialists, timing of implant placement, clinical complications and management which were not addressed in the published study. These differences reflect how each specialty views implant treatment through its own lens i.e. surgical, prosthetic, periodontal or general. At the same time, the shared decisions in some areas show that interdisciplinary knowledge and evidence-based guidelines are helping unify clinical choices.

The results of this survey showed that while there are some clear differences in decision-making between specialties, there are also areas where specialists tend to agree. Like, when it comes to choosing between immediate and delayed implant placement,[9] most specialists follow similar decision patterns. This suggests that certain clinical protocols are well-established and widely accepted across specialties.

However, in other areas, noticeable differences were found: Prosthetic material choices varied depending on the specialist's training and experience, some preferred zirconia for aesthetics, while others leaned toward PFM for durability with aesthetics.[10] Complications with implant prostheses were reported differently.[11]Prosthodontists often noted issues with occlusion or aesthetics, while surgeons focused more on surgical site healing or implant integration. Causes of implant failure also differed. Periodontists emphasized peri-implantitis, while oral surgeons highlighted surgical technique and bone quality. [4,11]Soft tissue management approaches showed variation too. Some specialists preferred grafting techniques, while others relied on flap design or prosthetic contouring. [3,12,13]

This survey provides useful insights into specialist decision-making in implant dentistry; however, certain limitations must be noted. Unequal numbers of specialists, self-reported answers, focus on common cases, and differences in training may have influenced results. Though this study gives useful early findings and shows that more research is needed with fairer sample sizes and a wider range of clinical situations.

V. Conclusion

This survey showed that clinical decision-making in implant dentistry varies across dental specialties in some areas, while in others, specialists tend to agree. Differences were seen in how specialists choose prosthetic materials, manage soft tissues, and handle complications or implant failures. These variations reflect the influence of specialty training, clinical experience, and treatment philosophy. At the same time, decisions like choosing between immediate and delayed implant placement showed consistency across specialties, suggesting that some clinical choices are guided by shared standards and evidence-based practices.

Overall, the study highlights the importance of understanding these variations to improve communication, collaboration, and treatment planning among dental professionals. Encouraging interdisciplinary teamwork and shared decision-making with patients can lead to more consistent care and better outcomes in implant dentistry.

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