



Perception And Knowledge Of Dental Implant Complications Among Dental Professionals Practicing Implant Dentistry: A Questionnaire-Based Study.

Dr. Lisa Chacko¹, Dr. Anisha Suntosh Dighe², Dr. Purushottam Rakhewar³, Dr. Saurabh Patil⁴,
Dr. Ekata Jaindesarda²

¹ Professor and PG Guide, ²PG student, ³ HOD; Professor and PG Guide, ⁴Reader and PG Guide
¹Dept. of Periodontology and Oral Implantology,

SMBT Dental College and Hospital, Sangamner, Maharashtra, India.

Corresponding Author: Dr. Anisha Suntosh Dighe, PG Student, Dept. of Periodontology and Oral Implantology, SMBT Dental College and Hospital, Sangamner, Maharashtra, India.

Abstract:

INTRODUCTION: As implant dentistry becomes a popular treatment option for missing teeth, it is crucial to evaluate the level of awareness and understanding among dental professionals regarding the potential complications that can arise. Despite the high success rate and durability of dental implants, the associated complications can compromise patient care which highlights the need for dental professionals to have knowledge and awareness of these issues.

AIM: This study aimed to assess the level of knowledge and awareness of dental professionals regarding dental implant complications.

METHODOLOGY: This study utilized a self-structured questionnaire to assess the level of knowledge among dental professionals regarding dental implant complications. The list of variables included factors that contribute to complications, early and delayed, mechanical, soft and hard tissue, aesthetic, and reversible complications. The questionnaire was circulated using Google forms and the collected data will be subjected to descriptive statistics.

RESULTS: The study surveyed 144 dental professionals actively practicing implant dentistry, comprising 60 males and 84 females. The majority (89.5%) demonstrated moderate knowledge of dental implant complications. Postgraduate professionals showed significantly higher knowledge than general dentists. No significant gender-based differences were found. Most participants (72%) had less than 2 years of implant dentistry experience. Common complications identified included postoperative infection, screw loosening, soft tissue complications, and aesthetic issues. Knowledge variations were observed based on educational levels and institutions. Reversible complications were poorly understood by 77% of participants. Overall, the study highlights knowledge gaps and variations among dental professionals in implant dentistry.

CONCLUSION: This study sheds light on the knowledge landscape among dental professionals engaged in implant dentistry. While a majority demonstrated a moderate understanding of complications, significant knowledge gaps were identified, particularly in reversible complications. Educational levels and institutional differences played a role in the variability of knowledge. These findings underscore the importance of targeted educational interventions to enhance the understanding of dental implant complications among practitioners, ultimately contributing to improved patient care and treatment outcomes in the field of implant dentistry.

Keywords: - Dental Implant complications, dental professionals, knowledge

INTRODUCTION

Implant dentistry has gained significant popularity as an effective treatment option for individuals with missing teeth, providing improved aesthetics, function, and long-term durability. As more dental professionals incorporate implant dentistry into their practice, it becomes imperative to assess their level of awareness and understanding of potential complications that may arise during or after the placement of dental implants [1]. Although dental implants have demonstrated high success rates, complications can occur, potentially impacting patient care and treatment outcomes.

The success of dental implant procedures relies not only on technical proficiency but also on comprehensive knowledge and awareness of potential complications. Understanding and anticipating these complications allows dental professionals to provide

appropriate preventive measures, accurate diagnosis, and effective management strategies, ensuring optimal patient care throughout the treatment process.^[2]

Complications associated with dental implants can manifest in various forms, such as infection, implant failure, nerve injury, peri-implantitis, implant malposition, and prosthesis-related issues. These complications may result from a range of factors including inadequate treatment planning, surgical errors, systemic health conditions, or patient-related factors. Prompt recognition and appropriate management of complications are essential to minimize adverse outcomes and improve patient satisfaction.^[3] Given the dynamic nature of the dental field, it is crucial for dental professionals practicing implant dentistry to remain up to date with the latest advancements, evidence-based protocols, and emerging complications. Continual professional development, comprehensive training, and access to relevant resources play a vital role in enhancing the understanding of dental implant complications and improving patient outcomes.^[4]

Therefore, this study aims to evaluate the level of awareness and understanding of dental implant complications among dental professionals practicing implant dentistry. By assessing their perception and knowledge through a questionnaire-based survey, valuable insights can be gained regarding potential areas of improvement in dental education, training programs, and professional development initiatives. Ultimately, enhancing the awareness and knowledge of dental implant complications among dental professionals will contribute to improved patient care, treatment success, and overall satisfaction in implant dentistry.^[5]

METHODOLOGY:

Study Design and Period:

This study utilized a self-structured questionnaire-based pilot design to assess the knowledge and awareness of dental professionals regarding dental implant complications. The questionnaire comprised 12 carefully formulated questions aimed at assessing the participant's understanding of dental implant complications. The study was conducted over a specified period from February 2023 to June 2023.

Participant Selection:

The participants consisted of dental professionals, including general dentists and specialists in prosthodontics, oral surgery, or periodontics, who were practicing implant dentistry. Convenience sampling was employed to recruit participants from various dental institutions or professional networks.

Questionnaire Design:

A web-based questionnaire was developed specifically for this study. The questionnaire included multiple-choice questions and closed-ended questions to assess participant's knowledge and awareness of dental implant complications. The questionnaire items covered various aspects, such as factors contributing to complications, early and delayed complications, mechanical complications, soft and hard tissue complications, aesthetic concerns, and reversible complications associated with dental implants.

The questionnaire was circulated among a total of 144 dental professionals practicing implant dentistry through Google Forms. A and collected data were then put to statistical analysis.

Data Collection:

The questionnaire was hosted on a web-based platform, such as Google Forms, to facilitate data collection. The link to the questionnaire was distributed to potential participants via email, professional networks, or social media platforms. Proper consent was taken, participants were provided with clear instructions on how to complete the questionnaire and were given a designated period to respond.

Data Analysis:

The collected data was analysed using appropriate statistical methods. Descriptive statistics, such as frequencies and percentages, were used to summarize the responses to the multiple-choice and closed-ended questions. The data analysis aimed to identify trends, patterns, and gaps in knowledge and awareness of dental implant complications among the participants.

Limitations:

It is essential to acknowledge certain limitations inherent in the study. These might include potential biases due to the sampling method, the self-reported nature of the questionnaire, and the limited scope of questions, which might not fully encompass all aspects of knowledge regarding dental implant complications among dental professionals.

RESULTS:

Dental practitioners practicing implant dentistry—general dentists, prosthodontists, oral surgeons and periodontists—provided 144 responses. Most participants 89.5% (n = 129) were moderately educated about dental implant complications, with 25% (n = 36) of them highly familiar and 64.5% (n = 93) relatively familiar. Of the total number of participants, 64 were postgraduates in prosthodontics, oral surgery, or periodontics and 80 were general dentists. Additionally, there were substantial ($p < 0.001$) disparities in dental implant knowledge among institutions and educational levels. However, gender did not significantly affect knowledge.

PARTICIPANTS	MALE	FEMALE
144	60	84
PARTICIPANTS	POSTGRADUATES	GENERAL DENTISTS
144	64	80

Of the total participants, 33.3 percent (n = 48) of participants said postoperative infection is the most prevalent dental implant complication, while 66.7% (n = 96) reported a lack of knowledge. However, 48% (n = 69) said postoperative infection was the most prevalent early dental implant issue, and 52% (n = 75) were unaware. On the other hand, 64.5% (n = 93) of participants identified considerable bone loss due to implant failure as the most common late complication of dental implants, while 35.5% (n = 51) were unaware. The most common late dental implant complication differed dramatically (Chi square test = 4.057, p = 0.015*) between people with different education levels. Data analysis revealed significant differences among participants (Chi square test = 3.573, p<0.05), but no gender differences were found.

While 37.5 % (n=54) of participants identified screw loosening as the most common mechanical complication of dental implants, 62.5% (n=90) lacked sufficient information about it. Participants at different educational levels showed significantly higher differences in knowledge regarding mechanical complications (Chi square test = 3.184, p<0.001).

43.7 % (n=63) of participants correctly identified infection as the most prevalent soft tissue complication. The remaining 56.3% (n=81) said nerve damage and wound dehiscence were the most prevalent soft tissue problems. Significant variations in knowledge concerning soft tissue complications linked with dental implants were identified among participants (Chi square test = 1.723, p<0.001). However, 43.7% (n=63) believed that lack of implant stability was the most prevalent hard tissue complication of dental implants, while 56.3% (n=81) were unaware.

Regarding knowledge of aesthetic complications associated with dental implants, 14.5% (n=21), 28.5 % (n=60), 30% (n=60) and 27% (n=56) of participants responded similarly that gingival recession, loss of the interdental papilla, exposure of the implant margin and poor emergence, respectively, were the most common aesthetic complications. Moreover, significantly higher (Chi square test = 27.81, p<0.001) differences in knowledge about aesthetic complications associated with dental implants were observed among participants at different educational levels and between genders.

Of the total participants, 23% (n=33) answered that immediate/early postoperative complications were the most common reversible complications associated with dental implants, whereas 77% (n=111) expressed poor knowledge regarding these complications. Moreover, significantly higher (Chi square test = 12.7, p<0.001) differences in knowledge about reversible complications associated with dental implants were observed.

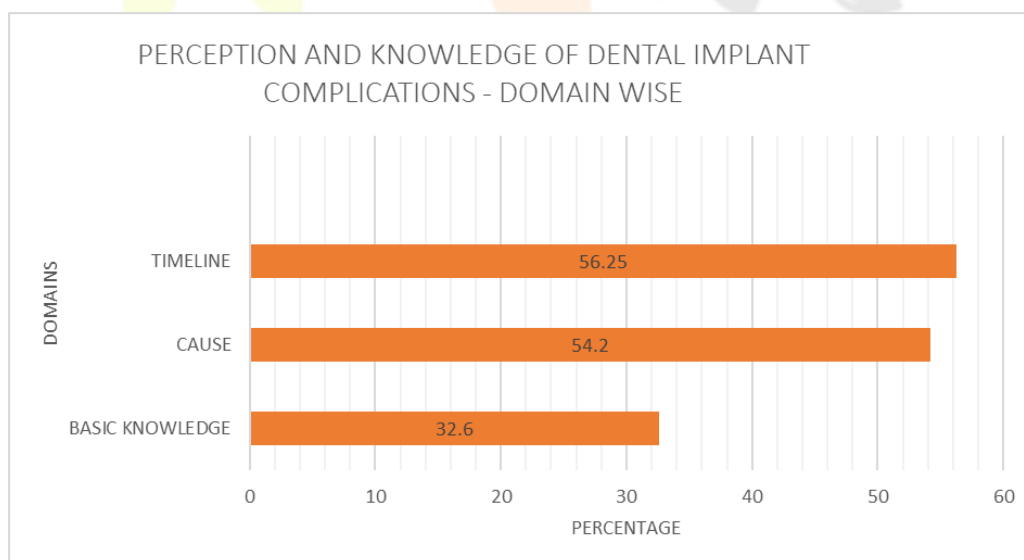


Figure: Overall graph depicting domain wise perception and knowledge of dental implant complications among dental professionals practicing implant dentistry

Table: Analysis of each of the questions along with its correct answer

QUESTIONS	CORRECTLY IDENTIFIED n/N (%)	Chi square test	P value, Significance
Most common complication associated with dental implants	48/144 (33.3%)	4.057	P= 0.015* (statistical significantly incorrectly answered)
Early complications associated with dental implants	69/144 (48%)	0.983	P=0.452 (no statistical significance)
Late complications associated with dental implants	93/144 (64.5%)	3.573	p = 0.032* (statistical significantly correctly answered)
Mechanical complications associated with dental implants	54/144 (37.5%)	3.184	p = 0.046* (statistical significantly incorrectly answered)
Soft tissue complications associated with dental implants	63/144 (43.7%)	1.723	p = 0.693 (no statistical significance)
Hard tissue complications associated with dental implants	63/144 (43.7%)	1.723	p = 0.693 (no statistical significance)
Aesthetic complications associated with dental implants	21/144 (14.5%)	27.81	p< 0.001** (highly statistical significantly incorrect answered)
Reversible complications associated with dental implants	33/144 (23%)	12.7	p = 0.008* (statistical significantly incorrect answered)

DISCUSSION

Implant dentistry's popularity in treating missing teeth emphasizes the need for dental professionals to understand potential complications, as these issues can compromise patient care. The study used a self-structured questionnaire to evaluate dental professionals' knowledge about dental implant complications, focusing on factors contributing to early and delayed issues, mechanical, soft, and hard tissue issues. This study involved 144 dental professionals who provided their insights and perspectives, which were then analysed through statistical methods.

This study found that a significant 56% of dental practitioners in Maharashtra who specialise in implant dentistry, including general dentists, prosthodontists, oral surgeons, and periodontists, were aware of the potential complications related to timeline considerations in the practice of implant dentistry. The presence of a heterogeneous population contributes to a broad spectrum of experiences and competence, leading to variations in knowledge and abilities pertaining to implant procedures. While some practitioners exhibited advanced proficiency, others showed gaps in their understanding and practical capabilities. Educational challenges among this diverse group may lead to differences in the quality of care provided to patients.

Furthermore, based on our observation, about 54.2% of dental practitioners demonstrated knowledge of the aetiology of dental implant complications. This may be attributed to the inclusion of both specialists and general dentists in our study. Given this circumstance, a discrepancy in knowledge between the two groups is likely to occur, which could plausibly explain this observation. Our data also revealed that a mere 32.6% of dentists have knowledge regarding the fundamental aspects of complications that arise following dental implant surgery. Multiple factors could potentially contribute to the observed disparities in knowledge. The majority of responses were obtained from general dentists, which may be attributed to their limited understanding of dental implants and their associated complications. Insufficient clinical experience in implant dentistry and managing associated complications can be viewed as a potential reason. While general dentists can perform implant surgeries effectively, specialists are typically responsible for managing complications. This may explain their potentially limited knowledge and experience in such cases.

Only 48% of patients in our study recognised postoperative infection as the most common early consequence, with 23.61% indicating an unfavourable implant placement that jeopardised prosthetic rehabilitation.^[5,6] The majority identified severe bone loss due to implant failure as the most common late consequence. A 2020 study looked at the effect of dynamic cyclic loading on screw loosening in both narrow and regular implants, and found that narrow implants had a greater incidence.^[7] A prior comprehensive analysis of single implant-supported restorations found a cumulative incidence of 12.7% for screw loosening after 5 years and 5.5% for loss of retention due to cement fracture, which is consistent with our findings^[8]. Another study, however, found that abutment screw loosening in single-implant restoration is uncommon, regardless of implant-abutment connection geometry, provided suitable anti-rotational features and torque are used.^[9]

In advanced treatment approaches like immediate placement and loading, primary stability is crucial to implant success, our findings align with studies conducted by Duyck and Esposito, revealing that a lack of primary stability stands out as the most prevalent hard tissue complication associated with dental implants.^[10,11] Infection was the most common soft tissue consequence for 43.7% of our

research participants, even though peri-implant inflammation and infection may not cause all implant failures^[1]. Fewer subjects experienced nerve damage, haemorrhage, and wound dehiscence. In our study, aesthetic complications included interdental papilla loss, gingival recession, implant margin exposure, and poor emergence profile. Recent literature supports similar findings, with aesthetic complications accounting for 4-16% of anterior maxilla single implant crown failures. Gingival recession, poor shade selection, and loss of interdental papilla contribute to aesthetic failures^[11,12,13], aligning with our study's outcomes.

Reversible complications might occur intraoperatively, early or late postoperatively, and during prosthetic reconstruction or after functional loading. In 2005, Park and Wang proposed a classification system and corresponding treatments for common reversible complications encountered in routine implant-related procedures^[14]. Subsequent studies emphasized the importance of meticulous clinical and radiographic examinations, precise procedural planning, proper surgical techniques, and appropriate instruments to prevent such complications^[15,16]. Despite its importance, 77% of participants demonstrated poor knowledge of these reversible complications, suggesting a potential unfamiliarity with this classification among the participants.

Several limitations must be considered in interpreting our study's findings. The sample is predominantly from Maharashtra, limiting the generalizability of the results. The reliance on self-reported data introduces potential bias, and the cross-sectional design restricts the ability to analyse trends over time. Ambiguities in the questionnaire may have affected the accuracy of responses, and the dynamic nature of implant dentistry implies that our findings may not entirely reflect current practices and knowledge.

CONCLUSION

The findings revealed from our research suggests that although most dentists and specialists are not aware of basic knowledge regarding dental implant placement and its related complications, they are well aware of its cause and timeline of occurring complications. These findings underscore the significance of addressing these knowledge gaps within the dental community. It is evident that there exists substantial variation among practitioners, emphasizing the necessity for a comprehensive review and standardization of dental implant curricula across diverse institutions.

REFERENCES:

- Esposito, M., Hirsch, J. M., & Lekholm, U. (2012). Biological factors contributing to failures of osseointegrated oral implants. (I). Success criteria and epidemiology. *European Journal of Oral Sciences*, 106(1), 527–551.
- Jokstad, A., Carr, A. B., & Albertsson, T. (2016). *An introduction to dental implantology*. John Wiley & Sons.
- Koutouzis, T., Huynh-Ba, G., & Esposito, M. (2017). Test your knowledge. Peri-implantitis—diagnosis and treatment. *European Journal of Oral Implantology*, 10(Suppl 1), S121–S131.
- Mattheos, N., Alizadeh, H., Mollov, N. D., & Calvo-Guirado, J. L. (2018). Knowledge and competencies for management of implant complications: A Delphi study. *European Journal of Dental Education*, 22(4), e759–e765.
- Figueiredo R, Camps-Font O, Valmaseda-Castellón E, Gay-Escoda C. Risk factors for postoperative infections after dental implant placement: a case-control study. *Journal of Oral and Maxillofacial Surgery*. 2015 Dec 1;73(12):2312-8.
- Tabrizi R, Zarchini R, Ozkan BT, Majdi S. Dental implant survival after postoperative infection. *Journal of Maxillofacial and Oral Surgery*. 2022 Sep:1-6.
- Attiah EMN, AlGendy AA, Mostafa TMN. Effect of dynamic cyclic loading on screw loosening of retightened versus new abutment screw in both narrow and standard implants (in-vitro study). *Int J Implant Dent*. 2020; 6:30
- Jung RE, Pjetursson BE, Glauser R, Zembic A, Zwahlen M, Lang NP. A systematic review of the 5-year survival and complication rates of implant supported single crowns. *Clin Oral Implants Res*. 2008; 19:119–30
- Theoharidou A, Petridis HP, Tzannas K, Garefs P. Abutment screw loosening in single-implant restorations: a systematic review. *Int J Oral Maxillofac Implants*. 2008; 23:681–90.
- Duyck J, Naert I. Failure of oral implants: aetiology, symptoms and influencing factors. *Clin Oral Investig*. 1998; 2:102–14. 44.
- Gamborena I, Avila-Ortiz G. Peri-implant marginal mucosa defects: classification and clinical management. *J Periodontol*. 2020. <https://doi.org/10.1002/JPER.20-0519>.
- Rad SAB, Forouzanfar A, Banihashemrad SA. Comparison of interdental papillae around single implants in the tissue-level (TL) and bone-level (BL) implants: a clinical trial. *J Adv Periodontol Amp Implant Dent*. 2020; 12:31–7.
- Boon L, Mars GD, Favril C, Duyck J, Quirynen M, Vandamme K. Esthetic evaluation of single implant restorations, adjacent single implant restorations, and implant-supported fixed partial dentures: a 1-year prospective study. *Clin Implant Dent Relat Res*. 2020; 22:128–37
- Park S-H, Wang H-L. Implant reversible complications: classification and treatments. *Implant Dent*. 2005; 14:211–20.
- Al-Sabbagh M. Complications in implant dentistry. *Dent Clin N Am*. 2015;59: xiii–xv.
- Annibaldi S, Ripari M, La Monaca G, Tonoli F, Cristalli MP. Local complications in dental implant surgery: prevention and treatment. *Oral Implantol*. 2008; 1:21–33.