

ASSESSMENT OF THE EXTENT AND QUALITY OF PATIENT KNOWLEDGE ABOUT DENTAL IMPLANTS, IMMEDIATE IMPLANTS, AND BONE GRAFTING PROCEDURES

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ABSTRACT

Dental implants are a preferred treatment option for replacing missing teeth around the world. However, in Pakistan, implants are given less preference due to a lack of patient awareness and information about the procedure. To assess this, a study was conducted at a hospital in Islamabad, to measure patients' knowledge of dental implants, immediate implants, and bone grafting procedures. A structured questionnaire was used to conduct this cross-sectional qualitative research. The study employed a convenient sample technique and recruited 100 participants (41 males and 59 females) aged 18 and above. Data was obtained over nine months and analyzed using SPSS v. 23.0. The results showed that 40% of participants had some knowledge about dental implants, while 15% had a thorough understanding of the procedures. The most common motivation for seeking dental implant treatment was the desire for better eating ability (26%), followed by a preference for a fixed and permanent solution over dentures (38%).

Regarding bone grafting, 41% of participants were aware of its potential necessity while placing an implant. Among these participants, 45% expressed a preference for alternative treatment options due to cost considerations and fear of surgical procedures. Furthermore, 44% of the participants believed dental implants could be placed immediately after tooth extraction. This study aims to fill the research gap in understanding the perceptions and knowledge of patients about implants. Patient misconceptions about implants can lead to unreasonable expectations, insufficient post-operative care, and ultimately influence treatment outcomes and patient satisfaction.

Key Words: *Dental Implants, Immediate Dental Implant Loading, Bone Grafting, Patient Education, Treatment Outcomes.*

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INTRODUCTION

Implant dentistry has gained recognition as the preferred method for oral rehabilitation since the introduction of titanium implants in the late 1950s.¹ Initially, dental implants were viewed with skepticism due to uncertain prognosis and inadequate scientific backing.¹ They were primarily employed for patients who had no teeth or were uncomfortable with traditional removable dentures and bridge prostheses, as

these alternatives involved removing or damaging adjacent teeth.² Over time, dental implantology has evolved into an established dental specialty that is recognized worldwide. Due to their better functional, phonetic, and cosmetic benefits, implants have overtaken other alternatives such as removable dentures and bridges. Although crowns and bridges can produce acceptable aesthetic results at a cheaper cost, they damage neighboring teeth and are more prone to gum disease than dental implants.³ With an estimated one million implants being placed annually worldwide, the success and predictability of implant treatment have prompted more patients to choose implants over other prostheses.⁴⁻⁶

Patient education and awareness are imperative for successful dental implant procedures. Academics, the implant industry, insurance companies, and dental professionals, all focus on evidence-based research thus

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improving treatment quality.⁷ However, marketing-oriented research can be misleading.⁸ Patients' exposure to such content has a considerable effect on their perceptions and treatment choices.⁹ Reliable evidence-based education is essential for informed decisions and successful outcomes in dental implantology.

The importance of quality of patient education about implant treatment in developing countries like Pakistan cannot be overemphasized, where patient awareness is even more limited regarding various risks and benefits of different treatment options.^{9,10} The decision to place an implant as a treatment option relies on the knowledge and expertise of the treating dentist.⁹ Thus, providing comprehensive information about the implant treatment and alternatives to patients becomes vital in guiding them toward the most appropriate option.¹⁰ The quality of patient knowledge about dental implants depends upon the accuracy of available public information which can be obtained from multiple sources like media healthcare programs, social media testimonials, dentists, friends, and acquaintances. However, evidence suggests that sources like social media, friends, and acquaintances are the less reliable sources of information as compared to dental practitioners.⁸ A study conducted at Rawal Institute of Health Sciences, Islamabad, revealed that 46% of the total 160 participants, gained awareness regarding dental implants from their dentists, friends, and family members.¹¹ MM Khan et al, reported that 26% of the total 288 participants were well informed regarding dental implants where social media was chosen as a source of information by 50.6%, followed by friends who had an implant (21.4%), friends/relatives, and television.¹²

In Pakistan, dental implantology faces many challenges in gaining popularity primarily due to its higher cost compared to the other alternatives, negative perceptions such as surgical trauma, and potential complications such as bone damage and infections.¹¹ Limited literature is available on patients' knowledge and awareness about dental implants in Pakistan.

Immediate implant loading is a modern dental implant technique that has gained popularity over the years. Unlike conventional implants, they are placed in the oral cavity immediately after a tooth extraction thereby preserving the bone structure and saves precious time. However, patients lack awareness about this procedure and should understand its advantages and potential risks associated with the procedure to make informed decisions for their oral health needs.¹³ Bone grafting is a crucial component of implant dentistry, especially for patients who have lost bone volume due to tooth loss or other oral health issues. It entails adding bone material, either from the patient's body

or from synthetic sources, into regions where the bone is insufficient to support a dental implant. It is frequently employed not only for severe defects left by curative procedures but also for periodontal⁽¹⁴⁾ and implant surgery.^{15,16} Despite its relevance, patients frequently underestimate its significance, leading to misconceptions and hesitation. Educating patients about its advantages can dispel myths and increase acceptance, resulting in more predictable and effective implant outcomes.¹⁷

Despite the growing popularity of dental implants in Pakistan, there is a noteworthy lack of patient understanding and awareness of critical areas of dental implantology, such as immediate implants and bone grafting treatments. This information gap is significant because it can lead to misconceptions, unreasonable expectations, and insufficient post-operative care, ultimately influencing treatment outcomes and patient satisfaction. This study's rationale lies in the significance of patient knowledge and understanding in the success of dental implant procedures. By assessing the extent and quality of patient awareness about dental implants, immediate implant loading, and bone grafting, we can establish targeted educational initiatives, enhance doctor-patient communication, and improve overall treatment outcomes. Ultimately, this research aims to bridge the knowledge gap, empower patients to make informed decisions, and contribute to the advancement of dental implant practice in Pakistan.

MATERIALS AND METHODS

This cross-sectional qualitative research was conducted in the Oral and Maxillofacial Surgery Department of Islamic International Dental College and Hospital (IIDC&H) Islamabad, during a period of nine months, from 1st Sept 2022 to 30th June 2023. The main aim of this study was to assess the knowledge and awareness about dental implants of patients seeking rehabilitation of missing teeth at the hospital. Ethical approval was obtained from the ethical review board of IIDC&H.

The inclusion criteria were any patient, male or female, of age 18 years or above, who sought to replace their missing teeth. Any patient with a prior dental implant was excluded from the study. We used a pre-structured questionnaire as a tool for assessing patients' knowledge and awareness of dental implants, immediate implant loading, and bone grafting. Section A of the questionnaire consisted of nine structured questions about knowledge of dental implants based on the questionnaire adapted by Tepper et al⁽¹⁸⁾, however, the questionnaire was modified to make it more comprehensive. The modification involved two additional questions assessing the knowledge of patients about immediate implants and bone grafting. Section

B consisted of the personal information of the participants including name, age, gender, occupation, and address. The questionnaire was piloted on 7 patients before the study (other than the participants) and was validated. The questionnaire was translated into the local language and was filled out by the investigators by interviewing the participants. The participants were assured of privacy and confidentiality and were fully informed of the aim of the study. Written informed consent was taken from the participants before the interview. There were no monetary benefits offered for the participation in the study.

A total of 100 participants were included in the study using a convenient sampling technique. The data was coded for unique identifiers to ensure the confidentiality and privacy of the participants and analyzed in SPSS version 23.0.

RESULTS

Out of a total of 100 participants, 41 were males (41%) and 59 were females (59%) (Figure 1), with ages ranging between 18 to 71 years. 19% of the participants belonged to the old age group between 51-71 years, 45% belonged to the age group 31 to 50 years, and 36% belonged to the 18 to 30 years' age group (Table 1). Participants were also categorized according to their occupation including students (24%), housewives (23%), and teachers (10%), with smaller percentages in various other occupations.

45% of the total 100 participants had only heard the name of a dental implant, 40% had some idea about the dental implant treatment, and 15% of participants completely understood the procedure of dental implants. About 46% of the participants had heard about dental implants from hospital-based dentists, followed by 29% who had learned about dental implants from family and friends, and only 11% of participants had learned about dental implants through electronic media or social media platforms.

38% of the participants preferred dental implants to dental bridges or removable prostheses, while the other 45% of patients preferred other treatment options than dental implants, mainly attributed to the cost of implants (41%) and fear of the surgical procedure (33%). Out of the total 100 participants, 15% perceived superior esthetics, while 26% perceived better function to be the primary reason for opting for dental implants as compared to removable and fixed prostheses.

A total of 44% of participants perceived that dental implants could be placed immediately following tooth extraction, while 41% thought that bone grafting was sometimes required before the placement of dental implants.

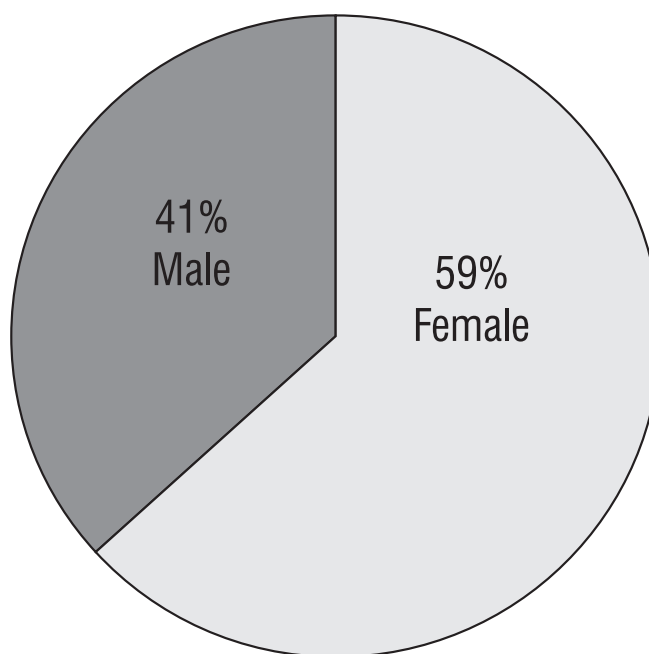


Fig 1: shows the Gender Distribution of the Participants

TABLE 1: SHOWS THE AGE DISTRIBUTION OF THE PARTICIPANTS

Age Group (years)	Number of Participants (N)	Percentage
18-30	36	36%
31-50	45	45%
Above 50	19	19%

DISCUSSION

Dental implants have become a treatment of choice for the rehabilitation of missing teeth worldwide, with around 5.5–6 million dental implants placed annually.¹⁹ However, in developing countries like Pakistan, lack of awareness is attributed to inadequate education and socioeconomic status.¹¹

While there is substantial literature on the awareness of patients regarding dental implants in developed countries, the evidence from Pakistan is still limited. Continuous research is needed to produce up-to-date evidence in various study settings to gain a broader and deeper insight into this area. Our study aims to contribute to this knowledge, by providing insights into the extent of knowledge and perceptions of dental implants, immediate implants, and bone grafting among patients presenting to the Oral and Maxillofacial Department of Islamic International Dental Hospital, Islamabad.

The results reveal that 45% of the total 100 partic-

ipants had only heard the name of a dental implant, 40% had some idea about the dental implant treatment, and 15% of participants completely understood the procedure. The results of this study are quite comparable to Malik et al, who reported about 60% of the patients were aware of dental implants as a treatment modality for missing teeth.²⁰ However, our results differ from the results of a similar study conducted in the Department of Prosthodontics of Islamic International Dental Hospital, which reported that only 16.6% of the patients were aware of dental implants.²¹

Another study conducted in Karachi reported 28%, while a study at Rawal Institute of Health Sciences, Islamabad reported 38% of the patients were aware of dental implants²², which was lower than our results. This shows that the awareness of dental implants among patients varies in different setups in the same city, and there is room for generalized research to establish rigorous evidence.

Choosing dental implants as a treatment modality depends significantly on the quality of knowledge of the patient, which in turn depends on the source of knowledge. The most reliable source is the dental practitioner as compared to family, friends, or media.¹⁸ Our results revealed that 46% of the participants had obtained knowledge of dental implants from a dental practitioner, 29% from family and friends, and 11% from social media. This aligns with findings from a study conducted at Rawal Institute of Health Sciences, Islamabad, which reported that 44% of the participants had learned about dental implants from a dental practitioner.²² Research conducted by Afridi AM et al reported that dentists were the major source of information about dental implants (65.2%).²³ This supports our argument that measures should be taken to introduce dental implant education by dental practitioners through other means of communication like social media, in-clinic education sessions, TV, radio, etc. On the contrary, the percentage of patients learning from dental practitioners varies in different setups. For example, a study conducted at the Armed Forces Institute of Dentistry, Rawalpindi, reported that 60% of the patients had learned about implants from dental practitioners.²⁰ Other studies by Ghani et al, and Sohail et al, reported even lower percentages, 31.42%, and 15% respectively,^{21,24} indicating a significant variation in the knowledge sources across different settings and varying levels of awareness and quality of patient knowledge. Perceived high cost of treatment and fear of surgical complications are factors owing to the low popularity of dental implants in Pakistan as compared to the developed countries. The lack of knowledge about dental implants contributes to this situation. However, after providing information, 38% of the 100 participants in our study preferred dental implants to other treatment options for replacing

missing teeth. This preference was driven by perceived superior esthetics (15%), better function (26%), lower maintenance compared to removable prostheses (38%), and avoidance of adjacent teeth preparation for fixed dental bridge (13%). The results were consistent with a study conducted by Ghani et al, who reported that 55% of the total 210 participants preferred dental implants to other rehabilitation modalities.²¹

The chief limitation of dental implant therapy is its high cost. In our study, 45% of the patients rejected dental implants as a treatment of choice for replacing missing teeth. Among them, 33% had pointed out fear of the surgical procedure followed by 41% who cited financial unaffordability due to high cost as the main reason for their reluctance. The results differ from Ghani et al, and Kamran et al who reported that 85% and 65% of the patients respectively had rejected the idea of dental implants because of the high cost of treatment.²¹ This was supported by Tepper et al, who indicated the high cost to be the main inhibiting factor (76%) for the choice of a dental implant as treatment.¹⁸ Sohail et al, however, reported that only 9% of the patients had pointed cost as the main reason for rejecting implants.²⁴

This study differed from the other comparable studies as it incorporated additional questions about knowledge of immediate implants after extraction and bone grafting procedures. Our survey revealed that only 44% of participants believed that dental implants could be placed immediately after tooth extraction highlighting a lack of awareness among a majority of respondents about this procedure and its potential benefits. On the other hand, 41% of participants were aware that bone grafting might be necessary for dental implant placement. The remaining 59%, however, were unaware of this facet of dental implant treatment.

Immediate implants involve placing a dental implant immediately after extraction of a decayed or damaged tooth. This technique offers numerous advantages including reduced treatment time, preservation of bone and soft tissue, and enhanced aesthetic outcomes.¹³ However, the limited awareness regarding immediate implants observed in our study, suggests that patients may not be fully informed about this treatment option and its potential benefits. A study done at Hamdard University Dental Hospital, Karachi reported only 4% of patients out of 201 in the study sample were aware of dental implant treatment and immediate implant loading.²⁵ Another study carried out by Giri D et al mentions the numerous benefits of inserting dental implants directly into extracted tooth sockets for both patients and dentists. While some early implant practitioners believed that long-term implant success relied on positioning them in fully healed alveolar

ridges, a substantial amount of evidence affirms that placing implants immediately after extraction leads to outstanding and reliable outcomes.²⁶

Bone grafting plays a crucial role in dental implant treatments as it helps supplement deficient bone mass in the jaw, ensuring successful implant placement.⁽¹⁵⁾ Dental implants may fail to osseointegrate effectively if there is insufficient bone support, resulting in treatment failure. The lack of knowledge of bone grafting points to a possible gap in patient education on the comprehensive nature of dental implant therapies. A study on awareness and preference for bone grafts used in oral surgery, conducted at CMH Lahore, found that 14 (9.2%) of the total 160 participants had some knowledge of bone grafts used in oral surgery and 127 (83.6%) were interested in learning more about the various bone grafting options available.²⁷

Our study also highlighted the significance of tailored communication strategies based on patient demographics. Age and occupation, as identified in our study can influence patients' awareness and understanding of dental implant treatments. Dental practitioners must also consider these factors when designing patient education materials and communication tools to effectively reach and inform diverse patient populations.

The disparity in the evidence can be attributed to the fact that the literature published between 2015 and 2022, coincided with an increase in public awareness and knowledge of dental implants. This suggests that there is a dire need for constant and continuous qualitative studies that produce robust evidence in this regard so that enough measures are taken to improve and enhance patient knowledge and awareness of dental implants. This will empower patients to make informed dental health choices and is expected to build up confidence between patients and dental practitioners, in turn enhancing patient-centered care. The difference in results of similar studies in the same city warrants generalized and rigorous research of patient awareness of dental implants in an attempt to lay down empirical evidence in Pakistan.

CONCLUSION

The study suggests that the awareness about dental implants in patients is increasing and most of the patients have heard about the implants. According to our study, the main source of information about the dental implant is dental practitioners followed by family and friends. A good number of patients prefer dental implants to other treatment options because of better esthetics and function. A few patients who are reluctant to implant therapy either experience a fear of the surgical procedure or consider it to be unaffordable due to its high cost. Most of the patients are aware of

immediate implants following tooth extractions and the need for bone grafting before implant therapy. Hence by fostering a better-informed patient population, dental practitioners can improve treatment outcomes and enhance the overall success and satisfaction of dental implant procedures.

LIMITATION

The sample is obtained from only one department of a dental hospital; therefore, the results cannot be generalized.

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