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Original Article

Patient Awareness and Expectations Toward Dental Implants at Peshawar Dental College and Hospital, Peshawar

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Abstract

Background: Dental implants (DIs) are a well-established treatment modality for the replacement of missing teeth. Despite their increasing use, patient awareness and expectations regarding dental implants vary considerably, often influenced by educational background, access to care, and socio-demographic factors.

Objective: To evaluate the level of awareness and expectations regarding dental implants among patients seeking replacement for missing teeth.

Methodology: This cross-sectional descriptive study employed purposive non-probability sampling and included 227 partially or fully edentulous individuals in good general health. Data were collected using a self-administered questionnaire comprising sixteen validated questions adapted from AL-Dwairi et al. (2014) and Chowdhary et al. (2010).

Results: Of the participants, 55.5% were female (n=126) and 44.5% male (n=101), with a mean age of 43.54 ± 13.65 years. Nearly half of the respondents (n=111; 48.9%) demonstrated low awareness of dental implants, while 26.9% (n=61) had moderate awareness and only 15% (n=34) showed high awareness. Gender and educational status were significantly associated with awareness levels ($P < 0.05$). In terms of expectations, 32.6% of participants had high and often unrealistic expectations about dental implants, with gender and education again showing a statistically significant association ($P < 0.05$).

Conclusion: Overall awareness of dental implants among patients was low, and both gender and education played significant roles in shaping awareness and expectations. These findings underscore the need for targeted educational initiatives to improve informed decision-making regarding dental implant treatment.

Keywords: Attitudes, Dental Implants, Health Knowledge, Patient Education, Patient Satisfaction.

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Introduction

The prosthodontic replacement of missing teeth has become increasingly prevalent to restore essential oral functions such as mastication, phonation, and esthetics [1]. Various treatment modalities exist for tooth replacement, including removable dentures, conventional fixed dental prostheses (FDPs), and fiber-reinforced composite FDPs [2]. Another widely adopted modality involves the use of fixed prostheses supported by dental implants, which offers a major advantage by preserving the natural tooth structure, unlike conventional FDPs that require the preparation of abutment teeth [3].

Dental implants (DIs) were initially introduced to improve retention, stability, and functional efficiency of mandibular complete dentures in edentulous patients by anchoring them directly to the jawbone [4]. Implant-supported or implant-retained prostheses are now considered one of the most effective options for replacing missing teeth particularly in cases where anatomical and financial constraints are not limiting. These prostheses offer numerous advantages including improved masticatory efficiency, preservation of alveolar bone, enhanced function, better phonetics, and superior esthetics [5–7].

The prognosis of prosthodontic treatments significantly depends on patients' awareness, expectations, and willingness to undergo the proposed intervention [8]. Factors such as age, educational level, and socioeconomic status greatly influence the patient's knowledge and understanding of available treatment options [7, 9]. Based on this knowledge, patient "demands" are defined as specific treatment requests, while "expectations" refer to their pre-treatment assumptions or beliefs about the likely outcomes—expectations which may be realistic, attainable, or entirely unrealistic [10].

Understanding these parameters is crucial for dental practitioners in order to align treatment goals with patient perceptions and enhance clinical outcomes [11]. Awareness of dental implants among different populations varies widely. Reported levels of awareness include 29% in Finland, 64% in Australia, 72% in Austria, 23.24% in urban Indian populations, 77% in the United States, 66.4% in Saudi Arabia, and only 9.7% among healthcare workers in Nigeria [12–17]. However, there remains a lack of data concerning patient expectations, especially in local contexts.

Given this knowledge gap, the current study aims to evaluate both the awareness and expectations of patients regarding dental implants at the Prosthodontics Department of Saidu College of Dentistry (PDC) and Hospital. The findings are expected to guide clinicians in planning prosthodontic treatments that are not only prognostically favorable but also aligned with patients' expectations. Furthermore, this study seeks to raise awareness of dental implants as a superior and modern treatment option for tooth replacement.

Methodology

Study Design

This was a descriptive, cross-sectional survey conducted to evaluate patients' awareness and expectations regarding dental implants. The study design was chosen to capture a snapshot of perceptions among patients at a single point in time, without manipulation of variables.

Ethics

Ethical approval for the study was obtained from the Ethical Review Committee of Peshawar Dental College & Hospital (Approval No. PDC/PPL/652, dated 18/05/2023). Written informed consent was obtained from all participants after explaining the nature, purpose, and confidentiality of the study. Participation was voluntary, and patients were assured that their decision to participate or decline would not affect their treatment.

Setting

The study was conducted at the Department of Prosthodontics, Peshawar Dental College and

Hospital, Peshawar. Data collection spanned eight months, from June 22, 2024, to February 21, 2025.

Participants

A total of 227 patients were recruited using a non-probability purposive sampling technique. Eligible participants included partially dentate or completely edentulous individuals aged between 15 and 80 years, of both genders, who reported to the department for replacement of missing teeth. Patients who were severely ill, physically handicapped, or uncooperative were excluded from the study.

Variables

The primary variables of interest were patient awareness and expectations regarding dental implants. Demographic variables such as age and gender were also recorded. Awareness was defined as the patient's knowledge about the purpose, function, and procedure of dental implants, while expectations were defined as patients' beliefs regarding the functional and esthetic outcomes and longevity of implants.

Data Sources/Measurement

Data were collected using a structured, self-explanatory questionnaire comprising 16 questions. The tool was adapted from previously validated instruments used by Al-Dwairi et al. and Chowdhary et al. [5,14]. The questionnaire was administered through interviews conducted by trained personnel. Demographic information including age and gender was recorded in the first section, while the second section explored awareness and expectations regarding dental implants. For participants requiring assistance, the questions were read aloud and explained in the local language, with responses recorded using a Likert scale.

Patient awareness was assessed through 11 questions; each scored on a four-point Likert scale. The cumulative scores ranged from 0 to 18 and were categorized as follows: 0 = No Awareness, 1–6 = Low Awareness, 7–12 = Moderate Awareness, and 13–18 = High Awareness [11]. Similarly, patient expectations were evaluated using five questions, also scored on a four-point Likert scale, resulting in a total possible score of 15. Expectation levels were classified as: 0 = No Expectations, 1–5 = Low Expectations, 6–10 = High Expectations, and 11–15 = Unrealistic Expectations.

Bias

To minimize interviewer bias, a single trained interviewer conducted all sessions. Social desirability bias was addressed by assuring participants of anonymity and the non-judgmental nature of their responses. However, since purposive sampling was used, selection bias remains a potential limitation.

Study Size

The sample size was calculated as 227 participants using an online calculator based on a 95% confidence interval, 5% margin of error, and an estimated awareness prevalence of 18% in similar populations.

Quantitative Variables

Quantitative data such as age were summarized using means and standard deviations. Categorical variables like gender, levels of awareness, and expectations were summarized using frequencies and percentages.

Statistical Methods

All data were analyzed using IBM SPSS Statistics version 23. Descriptive statistics were used to summarize demographic characteristics and questionnaire responses. Chi-square tests were applied to assess associations between demographic variables (such as gender and age) and levels of awareness and expectations. A p-value of <0.05 was considered statistically significant. Results were presented in the form of tables and graphs for clarity.

Results

Participants

A total of 227 patients participated in the study. The gender distribution showed a predominance of females (n = 126, 55.5%) compared to males (n = 101, 44.5%). The mean age of participants was 43.54 ± 13.65 years, ranging from 15 to 70 years.

Descriptive Data

The most common age group was 31–40 years (n = 65, 28.6%), followed by the 51–60 (n = 47, 20.7%) and 41–50 (n = 46, 20.3%) year groups. Participants aged 61–70 years comprised the smallest proportion (n = 28, 12.3%).

In terms of education, most participants had a graduation-level education (n = 64, 28.2%), followed by uneducated individuals (n = 57, 25.1%). Matriculated (n = 43, 18.9%) and postgraduate participants (n = 42, 18.5%) made up a significant portion, while a small number (n = 21, 9.3%) had only primary education.

When asked about the source of information regarding dental implants, the majority of respondents (n = 151, 66.5%) reported no prior knowledge. Among those who had heard of dental implants, the most common sources were dentists (n = 63, 27.8%) and friends (n = 11, 4.8%). Media accounted for only a minor source (n = 2, 0.9%).

Awareness levels were generally low among participants. Nearly half of the sample (n = 111, 48.9%) exhibited low awareness, while 26.9% (n = 61) demonstrated moderate awareness, and only 15% (n = 34) had high awareness. A small proportion (n = 21, 9.3%) reported no awareness at all (Table 1).

Outcome Data

A statistically significant association was observed between gender and awareness levels ($p < 0.001$). Among males, 14.5% demonstrated high awareness, whereas only 0.4% of females did. Moderate awareness was higher in females (18.9%) compared to males (7.9%). Low awareness levels were especially pronounced among females (33.9%) versus males (15.0%) (Table 2).

Education also showed a strong correlation with awareness levels ($p < 0.001$). Uneducated participants had the highest frequency of low awareness (17.2%), while participants with postgraduate education showed the highest rate of high awareness (9.3%).

Main Results

Regarding expectations about dental implants, the most common response categories were high expectations (n = 74, 32.6%) and unrealistic expectations (n = 74, 32.6%), followed by low expectations (n = 68, 30%). Only a few respondents had no expectations (n = 11, 4.8%) (Figure 1).

Gender differences were statistically significant ($p < 0.001$). While 28.6% of females had unrealistic expectations, only 4.0% of males did. Conversely, males exhibited a more balanced distribution across expectation levels, with higher frequencies in the "low" (18.5%) and "high" (17.6%) categories compared to females (11.5% and 15.0%, respectively).

Education level also significantly influenced expectations ($p = 0.002$). Uneducated participants had predominantly low (10.6%) and unrealistic (8.4%) expectations. Graduates demonstrated the highest levels of both high (12.8%) and unrealistic expectations (8.4%). Postgraduates showed a more even distribution across all expectation categories (Table 3).

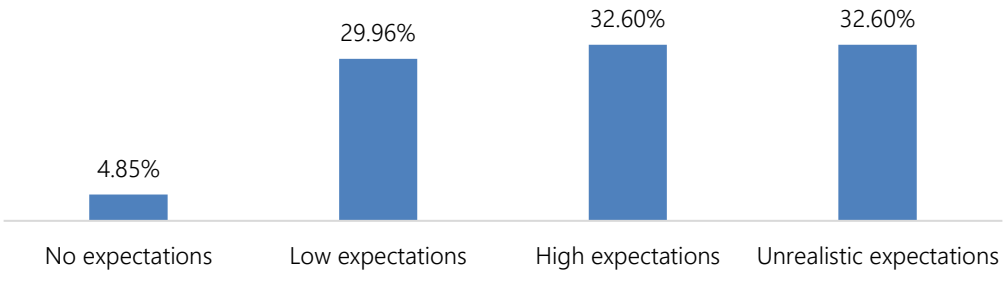


Figure 1: Frequency of Participant Expectation Levels Regarding Dental Implants

Table 1: **Participant Demographics, Educational Background, Source of Knowledge, and Awareness Level about Dental Implants (n = 227).**

Variables		n (%)
Age Group (years)	15–30	41 (18.1)
	31–40	65 (28.6)
	41–50	46 (20.3)
	51–60	47 (20.7)
	61–70	28 (12.3)
Educational Level	Uneducated	57 (25.1)
	Primary	21 (9.3)
	Matric	43 (18.9)
	Graduation	64 (28.2)
	Post-graduation	42 (18.5)
Source of Knowledge	Don't know	151 (66.5)
	Dentist	63 (27.8)
	Friends	11 (4.8)
	Media	2 (0.9)
Level of Awareness	No Awareness	21 (9.3)
	Low Awareness	111 (48.9)
	Moderate Awareness	61 (26.9)
	High Awareness	34 (15.0)

Table 2: **Level of Awareness About Dental Implants by Gender and Educational Level**

Variables	Characteristic	No Awareness	Low	Moderate	High	p-value
Gender	Male	16 (7.0)	34 (15.0)	18 (7.9)	33 (14.5)	< 0.001*
	Female	5 (2.2)	77 (33.9)	43 (18.9)	1 (0.4)	
Educational Level	Uneducated	9 (4.0)	39 (17.2)	8 (3.5)	1 (0.4)	< 0.001*
	Primary	2 (0.9)	13 (5.7)	4 (1.8)	2 (0.9)	
	Matric	5 (2.2)	8 (3.5)	30 (13.2)	0 (0.0)	
	Graduation	3 (1.3)	25 (11.0)	26 (11.5)	10 (4.4)	
	Post-graduation	2 (0.9)	4 (1.8)	15 (6.6)	21 (9.3)	

Fisher exact test, *p<0.05 is considered statistically significant

Table 3: Expectations Regarding Dental Implants Stratified by Gender and Educational Level

Variable		No Expectations	Low	High	Unrealistic	p-value
Gender	Male	10 (4.4)	42 (18.5)	40 (17.6)	9 (4.0)	< 0.001*
	Female	1 (0.4)	26 (11.5)	34 (15.0)	65 (28.6)	
Educational Level	Uneducated	5 (2.2)	24 (10.6)	9 (4.0)	19 (8.4)	0.002*
	Primary	2 (0.9)	5 (2.2)	7 (3.1)	7 (3.1)	
	Matric	3 (1.3)	21 (9.3)	13 (5.7)	6 (2.6)	
	Graduation	1 (0.4)	15 (6.6)	29 (12.8)	19 (8.4)	
	Post-graduation	0 (0.0)	18 (7.9)	16 (7.0)	8 (3.5)	

Fisher exact test, *p<0.05 is considered statistically significant

Discussion

In the present study, female participants outnumbered males. Since the study was conducted among patients reporting for dental treatment, this trend may reflect a greater awareness or concern among females regarding oral function and esthetics, prompting more frequent dental consultations. Similar gender-based findings were reported by Ghani et al. in Islamabad in a study on patients' awareness of implant-supported prostheses, where females slightly outnumbered males [18]. These results align with our findings. Comparable gender distributions were observed in studies conducted by Al-Musawi et al. in Kuwait [19] and by Areashi et al. in Saudi Arabia [20].

The mean age of participants in our study was 43.54 ± 13.65 years, with an age range from 15 to 70 years. Participants younger than 15 years were excluded, considering that tooth loss is uncommon in this age group and that permanent dentition typically erupts after 12 years of age. Additionally, individuals under 15 may lack the cognitive maturity to fully appreciate implant-based treatments. Al-Musawi et al. [19] reported a slightly younger mean age of 35.3 ± 11.3 years in their study, which could be attributed to differences in population demographics or sampling techniques. The age range in the study by Ghani et al. [18] was similar to ours (11 to 70 years), although their most frequent age groups were the second and third decades. Awooda et al. [21], in their study on the Sudanese population, reported that the third decade was the most common age group, which supports our findings.

Despite the highest number of participants in our sample holding a graduation-level education, a considerable proportion (25.1%) was uneducated. This reflects the ongoing literacy challenges in the region. A similar pattern was seen in the study by Ghani et al. [18]. In contrast, Suprakash et al. [22] found that most Indian participants had a secondary-level education, suggesting regional differences in educational attainment.

A notable finding in our study was that the majority of participants did not know their source of knowledge about dental implants. Among those who did, dentists and friends were the most commonly cited sources. The lack of knowledge about the source may stem from limited educational backgrounds, which could hinder memory recall or understanding. Ghani et al. [18] also identified dentists as the main source of implant information, although their methodology differed slightly—they asked who should be responsible for providing this information, and most participants responded "dentist." Similarly, Suprakash et al. [22] also found that dentists were the primary source of implant information in India. The discrepancies could be attributed to differences in education levels between the populations studied.

Our study showed that while patients had good awareness of the various treatment options available for missing teeth, their awareness about the most common causes of implant failure was poor. This gap might be due to patients' general exposure to multiple clinicians and lay sources (e.g., media, friends) for general information, while technical details such as implant failure are more complex and require a basic understanding of dental science.

Interestingly, age above 15 years did not significantly impact awareness of dental implants in our study. In contrast, Suprakash et al. [22] reported a statistically significant association between age and awareness, possibly due to ethnic differences and variations in sample sizes. However, Qayum et al. [23], in a local study, reported similar findings to ours, noting that age had no significant effect on implant awareness.

In terms of gender differences, females exhibited higher low-to-moderate awareness, whereas males showed higher rates of high awareness. This may be attributed to greater exposure among males to media and professional settings, allowing for more comprehensive information acquisition. Suprakash et al. [22] also reported similar gender-based differences in implant awareness.

Education was strongly associated with awareness in our study; higher levels of education corresponded with higher awareness levels. Participants with graduation or post-graduation degrees demonstrated moderate to high awareness about dental implants. These results are consistent with prior studies that have shown a direct correlation between educational status and health literacy [22, 24].

A concerning finding of the present study was that most participants had either high or unrealistic expectations about dental implants. About one-third (30%) of the participants had low expectations, but unrealistic hopes were just as prevalent. This observation echoes the findings of Yao et al. [25], who, in a systematic review, concluded that patients often have unrealistic expectations regarding dental implant therapy. Similarly, Abrahamsson et al. [26] found that many patients hold unrealistically high expectations, underscoring the need for patient-centered communication. These findings emphasize the importance of aligning patient expectations with clinical realities through thorough education and counseling, ensuring that treatment decisions consider not only the dentist's expertise but also the patient's values, preferences, and life circumstances.

Limitations

Despite its valuable findings, this study has certain limitations. Firstly, it was conducted at a single center, which limits the generalizability of the results to the broader Khyber Pakhtunkhwa (KPK) region. Secondly, the observational cross-sectional design precludes the establishment of causal relationships. Thirdly, the study was confined to a hospital-based population rather than a community sample, limiting external validity. Additionally, randomization was not applied to key variables such as age, gender, and educational level, which may have introduced selection bias. These limitations should be taken into account when interpreting and applying the study's outcomes.

Conclusion

The study revealed that the majority of participants demonstrated a low level of awareness regarding dental implants. Additionally, a considerable proportion held high and often unrealistic expectations about implant-based treatments, with this trend being more pronounced among female participants. The findings also highlighted the significant impact of gender and educational level on both awareness and expectations. These insights emphasize the need for targeted educational initiatives and patient-centered communication to align expectations with clinical realities and improve informed decision-making regarding dental implant therapy.

Authors' Contributions

All authors meet the ICMJE criteria for authorship. They have reviewed and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Author 1: Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 2: Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 3: Analysis and interpretation of data, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 4: Analysis and interpretation of data, critical revision, final approval, agreed to be accountable for all the work.
Author 5: Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 6: Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work.

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