ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at:www.ijdsir.com

Volume – 9, Issue – 2, April – 2026, Page No. : 43 – 51

Knowledge, Perception, and Barriers of Dental Implant Awareness in Rajnandgaon District: A Cross-Sectional Survey

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Citation of this Article: Dr. Isha Dusane, Dr. Anurag Dani, Dr. Shailendra Kumar Sahu, Dr. Manupreet Kaur, Dr. Govind Baheti, Dr. Mahkeet Kaur Bhatia, "Knowledge, Perception, and Barriers of Dental Implant Awareness in Rajnandgaon District: A Cross-Sectional Survey", IJDSIR- April – 2026, Volume – 9, Issue – 2, P. No. 43 – 51.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Dental implants represent a predictable and effective modality for the replacement of missing teeth. Despite their clinical success, their acceptance among the general population in India remains limited.

Aim: To assess patient perception, knowledge, and barriers related to dental implant therapy in the Rajnandgaon district.

Materials and Methods: A cross-sectional questionnaire-based survey was conducted among 410 adult patients attending the Department of Prosthodontics at a tertiary dental institution. A structured, pre-tested questionnaire evaluated sociodemographic characteristics, awareness, knowledge, perception, and barriers related to dental implants. Statistical analysis was performed using descriptive statistics and chi-square tests with a significance level of 5 percent.

Results: Overall awareness of dental implants was 41 percent. Among those aware, knowledge regarding implant function and placement was satisfactory. Dentists were the primary source of information. Positive perceptions were observed regarding safety, function, and aesthetic outcomes. However, high treatment cost, fear of surgery, and lack of knowledge were the most common barriers. Educational level and place of residence showed a statistically significant association with awareness.

Conclusion: Although awareness of dental implants remains limited, patient perception is generally favourable. Financial constraints, inadequate knowledge, and psychological concerns continue to restrict acceptance. Targeted educational strategies and improved patient communication are essential to enhance the adoption of implant therapy.

Keywords: Dental Implants, Education Level, Perception, Willingness

Introduction

Dental implants have transformed contemporary prosthodontic practice by offering a stable, functional, and aesthetic solution for the replacement of missing teeth. Their predictable long-term outcomes and ability to restore oral function have made them a preferred treatment modality in modern dentistry.[1]

Despite these advantages, the acceptance of implant therapy varies significantly across populations. In developing regions, particularly in India, awareness remains inconsistent and often inadequate. Patients frequently rely on conventional prosthetic options, not necessarily due to clinical preference but due to limited knowledge, financial constraints, and apprehension toward surgical procedures.[1,2,3]

Existing literature highlights considerable gaps in awareness, with many individuals relying on informal sources such as family and peers rather than dental professionals. These knowledge gaps are further compounded by socioeconomic disparities and limited access to specialized care.[2,4] Additionally, international data suggest differences in patient perception and awareness when compared to developed healthcare settings.[5]

Given India's diverse population and increasing demand for advanced prosthodontic solutions, understanding patient perception and barriers is critical. The Rajnandgaon district represents a mixed urban, semi-urban, and rural demographic, making it an ideal setting to evaluate these factors.

The present study was therefore designed to assess patient perception and knowledge regarding dental implants and to identify key barriers influencing their acceptance. The findings aim to support the development of targeted educational and clinical strategies to improve patient awareness and treatment uptake.

Materials and Methods

This cross-sectional questionnaire-based study was conducted over a period of six months in the Department of Prosthodontics and Crown and Bridge at Chhattisgarh Dental College and Research Institute, Rajnandgaon.

Ethical Considerations

Ethical clearance was obtained from the Institutional Research Committee and Institutional Ethical Committee prior to the commencement of the study. Informed consent was obtained from all participants.

Sample Size and Sampling

The sample size was calculated using a standard formula assuming a 50 percent prevalence of awareness, yielding a minimum of 385 participants. After adjusting for non-response, the final sample size was set at 410 participants.

A convenient sampling technique was employed to recruit participants.

Inclusion and Exclusion Criteria

Adults aged 18 years and above who were willing to provide informed consent were included. Individuals below 18 years or unwilling to participate were excluded.

Data Collection Tool

A structured questionnaire was developed and divided into five sections:

1. Sociodemographic details
2. Awareness and knowledge
3. Perception toward dental implants
4. Perceived barriers
5. Willingness and preferences

The questionnaire was pretested through a pilot study, and internal consistency was assessed using Cronbach's alpha coefficient.

Study Procedure

Participants visiting the department were invited to complete the questionnaire. Assistance was provided where required, without influencing responses.

Analysis

Data were analyzed using SPSS version 21. Descriptive statistics were used to summarize quantitative data as means and standard deviations, while categorical variables were expressed as proportions and percentages. The chi-square test was applied to evaluate associations between variables such as education, residence, and awareness levels. A confidence interval of 95 percent was used, with statistical significance set at $p < 0.05$. The selected methods were appropriate for categorical survey data and allowed for meaningful comparison between groups.

Results

The study included 410 participants. Table 1 provides the sociodemographic characteristics of study participants. Among the 410 participants, the largest proportion belonged to the 31–45 years age group (35.6%), followed by 18–30 years (31.2%), indicating that the study population predominantly consisted of young and middle-aged adults. Males constituted 54.1% (n = 222) of the sample, while females accounted for 44.9% (n = 184). Educational status showed that 33.2% had secondary education and 33.2% had graduate or postgraduate education combined, reflecting a mixed educational background. In terms of residence, 39.5% of participants were from urban areas, while a substantial proportion resided in semi-urban (36.1%) and rural areas (24.4%), ensuring adequate representation of non-urban populations in Rajnandgaon district.

Table 1: Sociodemographic Characteristics of Study Participants (n = 410)

Variable	Category	n (%)
Age (years)	18–30	128 (31.2)
	31–45	146 (35.6)
	46–60	98 (23.9)
	>60	38 (9.3)
Gender	Male	222 (54.1)
	Female	184 (44.9)
	Other	4 (1.0)

Education level	No formal education	46 (11.2)
	Primary	92 (22.4)
	Secondary	136 (33.2)
	Graduate	102 (24.9)
	Postgraduate	34 (8.3)
Residence	Urban	162 (39.5)
	Semi-urban	148 (36.1)
	Rural	100 (24.4)

Figure 1 provides a composite overview of participants' awareness, knowledge, information sources, and willingness toward dental implants. Overall awareness was limited, with only 168 of 410 participants (41.0%) reporting prior knowledge of implants. However, among those aware (n = 168), knowledge levels were generally satisfactory, as most participants correctly identified implants as fixed teeth placed in bone (73.8%) and were aware of their surgical placement in the jawbone (90.5%). A substantial proportion also recognized their superior longevity compared with dentures (81.0%), although fewer participants perceived implants to provide a natural appearance (48.3%). Dentists emerged as the primary source of information, followed by family or friends, whereas media-based sources played a comparatively smaller role. Despite limited overall awareness, willingness to opt for implants was encouraging at the population level, with 58.0% indicating readiness to choose implants if affordable, suggesting favorable treatment acceptance when financial barriers are minimized.

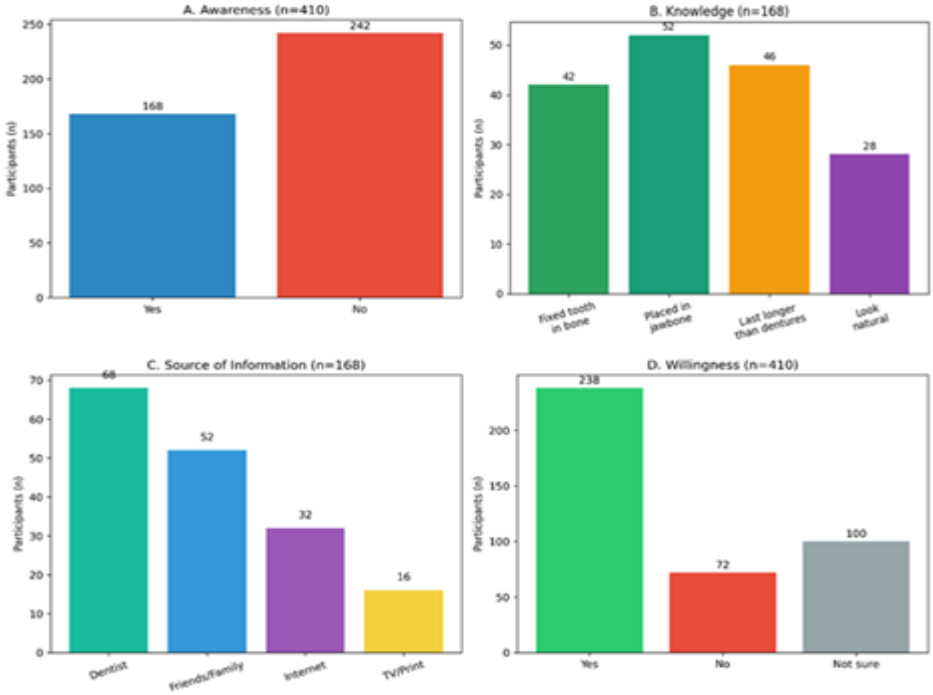

Figure 1: Composite graphical representation of awareness, knowledge, information sources, and willingness toward dental implants

Figure 2 illustrates the distribution of patient perceptions regarding implant therapy using a stacked Likert format. More than half of the participants agreed that implants are safe (52.2%) and function better than conventional dentures (58.0%), reflecting generally positive clinical perceptions. A greater proportion (62.4%) reported that implants could improve self-confidence, indicating perceived psychosocial benefits. However, apprehension related to the surgical nature of implant placement was evident, with 67.8% agreeing that surgery is frightening. Notably, when cost was not considered, a large majority (76.1%) expressed preference for implant therapy. Overall, the figure demonstrates that although fear of surgery persists, participants largely hold favorable attitudes toward the safety, function, and benefits of dental implants.

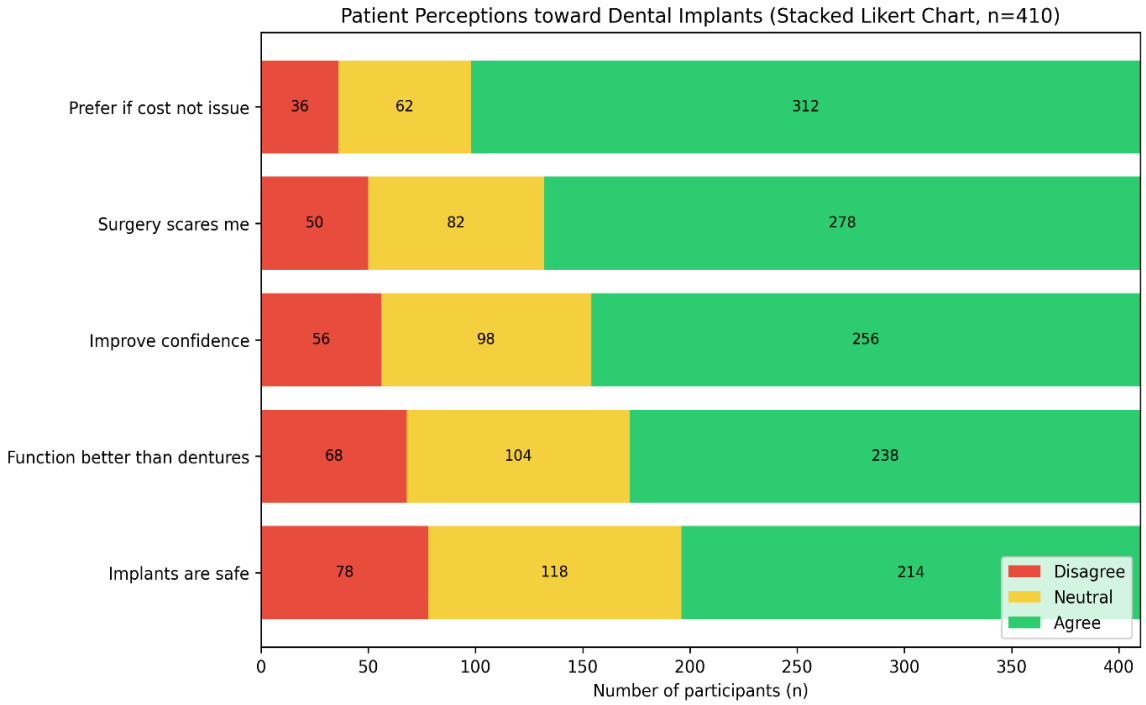

Figure 2: Patient Perception toward Dental Implants (n = 410)

Figure 3 depicts the prevalence of perceived barriers to implant therapy among participants. High treatment cost emerged as the most frequently reported obstacle, affecting nearly four-fifths of respondents (79.5%). Psychological barriers were also prominent, with fear of surgery (67.8%) and lack of knowledge (59.5%) commonly reported. Nearly half of participants indicated that implant therapy had not been discussed by their dentist (45.4%), highlighting a potential communication gap. In contrast, structural and sociocultural barriers such as local unavailability (26.3%) and cultural or religious concerns (5.9%) were less frequently reported. These findings indicate that financial, informational, and psychological factors constitute the primary impediments to implant acceptance.

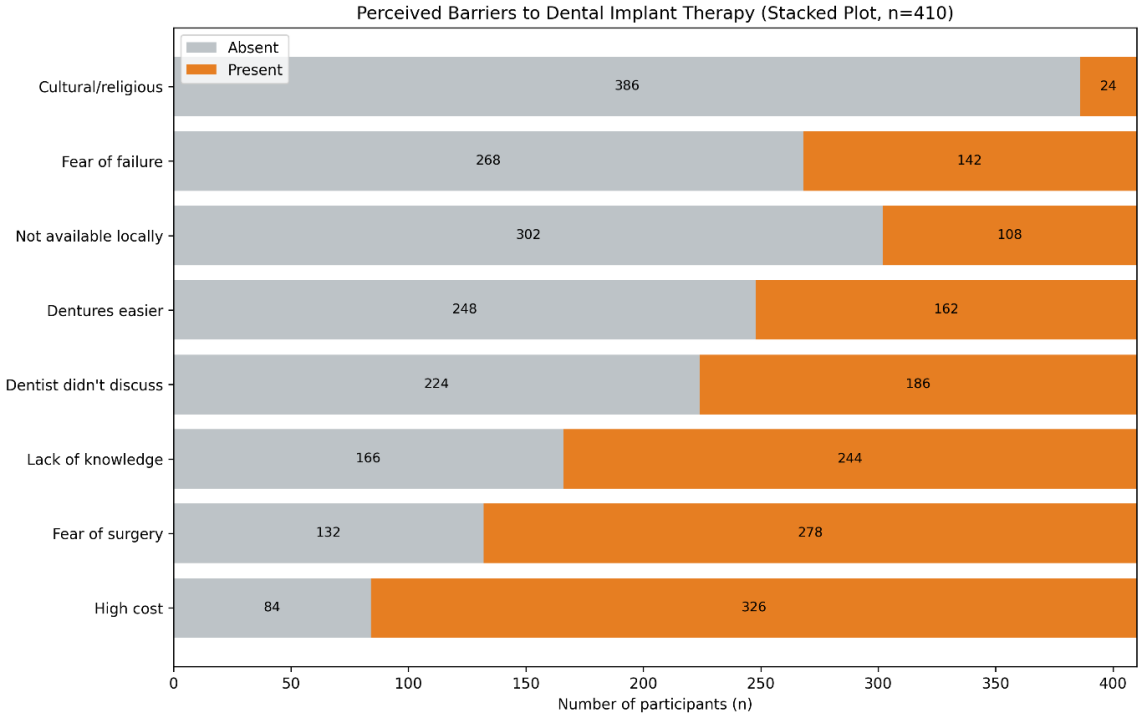

Figure 3: Perceived Barriers to Dental Implant Therapy (n = 410)

A statistically significant association was observed between educational attainment and awareness of dental implants (Chi-square test, $p < 0.001$). Participants with graduate or postgraduate education demonstrated substantially higher awareness, with 60.2% reporting prior knowledge of implants, compared with only 25.4% among those with secondary education or less. Conversely, lack of awareness was markedly greater among the lower education group (74.6%) than among graduates (39.8%). These findings indicate that higher educational status is strongly associated with improved exposure to and understanding of advanced dental treatment options, suggesting that educational level plays a critical role in shaping health information access and awareness.

Table 2: Association between Education Level and Implant Awareness (Chi-square test)

Education	Aware n (%)	Not aware n (%)	p-value
≤Secondary	62 (25.4)	182 (74.6)	<0.001
≥Graduate	106 (60.2)	70 (39.8)	

*Statistically significant (p < 0.05)

Place of residence showed a significant association with implant awareness (Chi-square test, $p < 0.001$). Urban residents exhibited the highest level of awareness (56.8%), followed by semi-urban participants (36.5%), while rural participants demonstrated the lowest awareness (22.0%). In contrast, the proportion of participants unaware of implants increased progressively from urban (43.2%) to semi-urban (63.5%) and rural areas (78.0%). This clear urban–rural gradient highlights disparities in access to dental information and services, indicating that individuals residing in rural and semi-urban settings are less likely to be informed about implant therapy. These findings emphasize the need for targeted outreach programs and educational interventions in underserved areas to bridge the knowledge gap.

Table 3: Association between Residence and Implant Awareness (Chi-square test)

Residence	Aware n (%)	Not aware n (%)	p-value
Urban	92 (56.8)	70 (43.2)	
Semi-urban	54 (36.5)	94 (63.5)	
Rural	22 (22.0)	78 (78.0)	<0.001*

*Statistically significant ($p < 0.05$)

Association Analysis

A statistically significant association was observed between education level and implant awareness ($p < 0.001$). Higher education was associated with greater awareness.

Similarly, place of residence showed a significant relationship with awareness. Urban participants demonstrated higher awareness compared to semi-urban and rural populations, indicating disparities in access to information.

Discussion

The present cross-sectional study evaluated patient awareness, knowledge, perception, and barriers toward dental implant therapy among dental patients in the Rajnandgaon district. Despite the increasing global acceptance of implant-supported rehabilitation, the findings of this study reveal persistently low awareness and substantial knowledge gaps, reinforcing the need for structured patient education and clinician-driven communication strategies in the Indian context.

In the present study, only 41% of participants had heard of dental implants, and an even smaller proportion demonstrated correct knowledge regarding implant placement and function. This finding aligns closely with earlier Indian studies reporting awareness levels ranging from 17.8% to 25% across different regions of the country. [1,2,3,4] Gupta et al. reported that only 21% of adults in Jharkhand were aware of dental implants, while Mayya et al. observed awareness as low as 17.8% in South India. [3,4] These consistently low figures contrast sharply with data from developed nations and underscore the slow penetration of implant-related knowledge into the general Indian population.

When compared with the Japanese study by Ho et al., the disparity becomes more pronounced. Although overall awareness in Japan was modest, 24% of respondents had already undergone implant therapy, reflecting greater exposure and acceptance of implants in clinical practice.[5] In contrast, the present study demonstrates that even among relatively young and educated adults, conceptual understanding of implant therapy remains limited, particularly regarding surgical placement, longevity, and procedural requirements.

A statistically significant association was observed between educational status and implant awareness, with graduates and postgraduates demonstrating substantially higher awareness levels than participants with secondary education or less. Similar trends have been reported consistently in Indian literature, where higher education correlates with improved health literacy and treatment awareness. [1,3,5] These finding highlights education as a key determinant of acceptance of advanced prosthodontic treatment options.

Additionally, urban–rural disparities were evident in the present study, with urban residents exhibiting significantly higher awareness compared to semi-urban and rural populations. This observation is consistent with previous Indian studies and reflects unequal access to dental services, specialist care, and health-related information in rural settings. [2,6] In contrast, Ho et al. reported relatively uniform access to dental services in

Japan due to its universal healthcare infrastructure, although implants remain excluded from insurance coverage.[5]These differences emphasize the compounded challenges faced in India, where both infrastructural limitations and socioeconomic barriers coexist.

However, fear of surgery emerged as a major concern, reported by nearly two-thirds of participants. Similar fears have been documented in Indian studies, where surgical anxiety and misconceptions regarding pain and complications negatively influenced treatment acceptance [1,7]. Ho et al. also reported that implants were perceived as "scary," particularly among patients without implant experience, suggesting that fear is a universal barrier that diminishes once patients receive appropriate counselling and treatment exposure [5].

High treatment cost was identified as the most significant barrier (79.5%), consistent with nearly all Indian and international studies on implant acceptance [1–5,7]. In India, where implant therapy is not covered by insurance and out-of-pocket expenditure predominates, financial constraints play a decisive role in treatment refusal. This mirrors the Japanese scenario described by Ho et al., where implants are excluded from national insurance coverage and are perceived as expensive, particularly by elderly patients.[5]

Importantly, lack of knowledge and inadequate dentist–patient communication were also prominent barriers in the present study. Nearly half of the respondents reported that their dentist had not discussed implants as a treatment option. This finding is clinically significant and echoes previous Indian studies emphasizing the pivotal role of dentists as the primary and most trusted source of implant-related information [2,4,6]. In contrast, Ho et al. demonstrated that patients who had undergone implant therapy primarily obtained information directly from their dentists and were significantly more likely to recommend implants to others. [5] This highlights the critical responsibility of dental professionals in initiating conversations about implant therapy, particularly in settings where awareness is low.

A noteworthy finding of the present study is that 76.1% of participants expressed willingness to choose implants if cost was not a limiting factor. This suggests that resistance to implant therapy is not rooted in negative attitudes but rather in modifiable barriers such as affordability, fear, and insufficient information. Similar trends were reported by Hosadurga et al., who demonstrated that professionally delivered education significantly improved patient attitudes and acceptance of implant therapy. [6]

Taken together, the findings of the present study, emphasize that education and communication—not attitude—are the primary limiting factors in implant acceptance.

Limitations

The study was conducted at a single centre using a convenience sampling method, which may limit generalizability. Self-reported data may also introduce response bias.

Future Directions

Future studies should include multicentric designs and explore the impact of structured educational interventions. Incorporating digital platforms and community-based awareness programs may further enhance patient understanding and acceptance.

Conclusion

Within the limitations of this cross-sectional study, patient awareness and knowledge regarding dental implants in Central India (Rajnandgaon region) were found to be inadequate. Financial constraints, fear of surgical procedures, and insufficient knowledge emerged as the principal barriers to acceptance.

Implications

These findings highlight the need for structured patient education programs, improved dentist-patient communication, and policy-level interventions aimed at enhancing affordability and accessibility of implant therapy. Addressing these factors may facilitate greater acceptance and utilization of dental implants, ultimately improving oral health outcomes in this population.

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