ORIGINAL ARTICLE

Evaluating Adult Patients' Knowledge, Attitude, and Perception of Dental Implants as a Treatment Modality for Missing Teeth

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Abstract

Introduction: Tooth loss negatively impacts oral function and quality of life, often leading to psychological and physical issues. Multiple treatment options exist, including fixed prostheses, removable prostheses, and overdentures. Dental implants provide superior functionality and long-term success compared to other alternatives. Despite their advantages and increasing clinical use, public awareness and acceptance remain limited. **Objectives:** The objective of the study was to assess the knowledge, attitude, and perception of individuals with missing teeth toward dental implants, and to explore the influencing factors for accepting dental implants over other prosthetic treatment options. **Materials and Methods:** This cross-sectional study was conducted between July and December 2025. A diverse sample of Saudi participants aged 18 and above from all provinces was included. Individuals under 18 and dental professionals were excluded from the study. The minimum sample size of 384 was determined using Raosoft software, with a 95% confidence level and 5% margin of error. **Results:** A total of 784 participants completed the survey. The majority were female (75.9%), with a mean age of 35.9 years. Despite 97.6% reporting awareness of dental implants, only 11.6% demonstrated high knowledge. The most significant sources of information were dentists (50.4%) and social media (17.7%). The primary barriers to choosing implants included cost (6.5%), fear of surgery (6.5%), and lack of knowledge (55.1% could not identify implant material). Statistically significant associations were found between knowledge and age, marital status, residential area, education, and occupation (all $P < 0.05$). Attitudes toward implants were generally low, and only 16.6% of participants had received an implant. **Conclusion:** While awareness of dental implants is high among Saudi adults, gaps in detailed knowledge and attitude persist. Financial barriers, insufficient education, and uncertainty about procedure and longevity impede implant acceptance. Comprehensive patient education and addressing socioeconomic barriers are recommended to enhance informed decision-making regarding tooth replacement.

Key words: Attitude, awareness, dental implants, influencing factors, knowledge, Saudi Arabia

INTRODUCTION

Tooth loss is a critical life event that affects essential oral functions. It often leads to various psychological and physical challenges, impacting multiple aspects of oral health-related quality of life.[1] The primary reasons for missing teeth are periodontal diseases and dental caries. In addition, some individuals may have congenitally absent teeth

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or experience tooth loss as a result of trauma.[2] Several treatment options are available, including fixed prostheses, removable prostheses, and overdentures. Dental implants offer superior longevity and functionality compared to these alternatives.[3] Their high success rates have increased their use in clinical practices.[4] Approximately 300,000 dental implants were placed globally in the 1980s. As a result, implant dentistry has grown in significance in oral reconstruction.[5] The adult population in Saudi Arabia has a very high prevalence of missing teeth; according to research, 69% of the population has one or more missing teeth, and 2.6% of them are entirely edentulous.[6] Patients' beliefs and preferences, such as aesthetics and functional requirements, should be considered while restoring lost teeth.[7] However, few patients choose this therapy approach. A survey found that 79.2% of respondents were interested in learning more about dental implants, and 96.4% of respondents had heard of them.[8] Although the use of dental implants is growing over time, little is known about how the general public feels about them. Patients must therefore be informed about dental implants for them to select the best course of treatment.[9] A study conducted in Riyadh region in 2023 found that around 56.3% of the participants were aware of dental implants as a treatment option.[10] In 2023, a study showed that 63.6% of participants chose fixed partial dentures (FPDs) over implants, with financial constraints and length of treatment being the main reasons.[11] 68.3% of respondents to another survey were found to be aware of the various prosthodontic replacements or dental implants. Most respondents indicated that the benefits included the feel and appearance of natural teeth.[12] Since previous studies included specific regions in Saudi Arabia, such as Riyadh, and the number of samples was limited across Saudi Arabia, we aim to expand and update the research to cover all regions of Saudi Arabia to assess knowledge, attitudes, and perceptions regarding dental implants and to identify the factors influencing their acceptance and preference compared to other prosthetic alternatives.

Objectives

The objective of the study was to assess the knowledge, attitude, and perception of individuals regarding dental implants as a treatment option for the replacement of missing teeth, and to identify factors influencing their acceptance and preference compared to other prosthetic alternatives.

MATERIALS AND METHODS

Study design and setting

This is a cross-sectional study conducted between July 2025 and December 2025, which enabled the concurrent collection of data on knowledge, attitudes, and perceptions from participants. The diverse participant pool will help ensure a representative sample. Overall, this approach facilitates a thorough assessment of the population's perspectives on dental implants.

Sample size

The sample size required for this study was calculated using (Raosoft, Inc., Seattle, WA, USA), targeting a 95% confidence level. With a maximum permissible margin of error set at 0.05 and a standard deviation of 1.96, the calculation indicated that a minimum of 384 participants is necessary for the study.

Inclusion and exclusion criteria

The study included Saudi individuals with missing teeth of both genders, aged 18 and above, from all provinces of the Kingdom of Saudi Arabia, and who agreed to participate in our study. Excluded criteria from the study were individuals under 18 years old and dental professionals.

Method for data collection, instrument

In this research, the study tool used was a structured online questionnaire developed using Google Forms. The questionnaire was adapted from previously validated instruments found in the literature assessing knowledge, awareness, and attitudes toward dental implants, with modifications to suit the Saudi cultural context and reviewed by a prosthodontic expert for face validity.[10] The final version consisted of three main sections with a total of 28 questions. Section one began with a summary of the study and a consent question, followed by demographic, social, and economic data such as age, gender, educational level, nationality, profession, and insurance coverage. Section two included knowledge-based questions about dental implants, alternative treatment options, materials used, longevity, cost, and insurance coverage. Section three assessed participants' attitudes and willingness to learn, including questions on fear, anxiety, and perceptions toward dental implants. In the knowledge section, each correct answer was awarded 1 point, while incorrect or "Don't know" responses received 0, yielding a total possible score of 0–15. In the attitude and willingness to learn section, positive responses were scored as 1 and negative/neutral responses as 0, with a total possible score of 0–4.

Scoring system

In total, 28 statements were included to assess the participants' knowledge, attitudes, and awareness regarding dental implants. The questionnaire comprised nine demographic items (not scored), 15 knowledge-based items, and four attitudes and their willingness to learn items. Knowledge, Attitude, and Willingness to Learn Section. The knowledge domain included 15 items, each designed to evaluate

awareness and understanding of basic concepts related to dental implants, such as definition, placement, materials, longevity, and associated risks. Each correct answer was awarded 1 point, while incorrect or "Don't know" responses received 0 points, resulting in a total possible knowledge score ranging from 0 to 15. Scores were interpreted using percentage-based classification as follows: Low knowledge: 0–8 points (≤ 59%), Moderate knowledge: 9–11 points (60–79%), and High knowledge: 12–15 points (≥80%).

The attitude and willingness to learn domain consisted of 4 items assessing participants' beliefs about the importance of replacing missing teeth, the level of care required for implants, their primary source of information, and their interest in learning more. Each item was scored in a binary format: Positive or favorable response = 1 point, and Negative, uncertain, or neutral response = 0 points.

The total score ranged from 0 to 4, and was also classified based on percentage: Low attitude: 0–2 points (≤59%), moderate attitude: 3 points (60–79%), and high attitude: 4 points (≥80%).

This simplified scoring approach provided a clear measure of participants' knowledge and receptiveness toward dental implant treatment.

Pilot test

The questionnaire was distributed to 20 participants to examine its simplicity and to assess the feasibility of conducting the study. The data obtained from this pilot test were excluded from the main study analysis.

Analyzes and entry method

The collected data were first entered using Microsoft Excel (2024) for Windows. Afterward, the data were transferred to the Statistical Package for the Social Sciences software, version 25, for statistical analysis. Descriptive statistics were used to summarize the numerical variables for baseline characteristics. For categorical variables, frequencies and percentages were calculated. The Chi-square test was used to determine the associations between categorical variables.

RESULTS

Table 1 displays various demographic parameters of the participants with a total number of (784). A significant percentage of the sample belonged to younger adults, 24.1 was 23 years and below, and 23.1 years and above 40–49 years; 18.2 years and above were 50 years and above. The sample was comprised of female respondents who were 75.9%. Most of the participants were married (59.8 %), and a significant number of them lived in the southern (42.3 %)

Table 1: Sociodemographic characteristics of participants (*n*=784)

Parameter	No.	Percentage
Age (Mean: 35.9, STD: 12.7)		
23 or less	189	24.1
24–27	107	13.6
28–39	164	20.9
40–49	181	23.1
50 or more	143	18.2
Gender		
Female	595	75.9
Male	189	24.1
Marital status		
Single	279	35.6
Married	469	59.8
Divorced	27	3.4
Widowed	9	1.1
Residential area		
Northern region	9	1.1
Southern region	332	42.3
Central region	165	21.0
Eastern region	31	4.0
Western region	247	31.5
Educational level		
No formal education	3	0.4
Primary school	6	0.8
Middle school	21	2.7
High school	145	18.5
Diploma	78	9.9
Bachelor's degree	468	59.7
Postgrads	63	8.0
Income		
<1000 Saudi riyal	134	17.1
1000–5000	169	21.6
5001–10000	130	16.6
10001–15000	119	15.2
More than 15000 Saudi riyal	117	14.9
No income	115	14.7
Do you have insurance?		
No	576	73.5
Yes	208	26.5
Nationality		
Saudi	767	97.8
Non-Saudi	17	2.2
Employment status		
Student	151	19.3

(*Contd*...)

Table 1: (*Continued*)

Parameter	No.	Percentage
Government employee	237	30.2
Private sector	111	14.2
Self-employed	22	2.8
Retired	72	9.2
Unemployed	191	24.4

and the western (31.5 %) regions. The level of education was also high; 59.7% of the population had a bachelor's degree, and only 0.4% of the population had not received any formal education. The distribution of income was very wide; however, 17.1% had <1000 SAR, and 14.7% did not have any income. It is worth noting that 73.5% of the people interviewed were uninsured. The employment was different, with 30.2% of the population working in government jobs and 24.4% of the population not working.

As shown in Figure 1, 77.8% of participants preferred dental implants for replacing missing teeth. While other options like removable appliances (5.2%) and fixed options (6.1%) were chosen less frequently, while 6.9% chose not to replace missing teeth, and 4.0% were not applicable.

In Table 2, 97.6% of the participants mentioned that they heard about implants and 75.9% knew the options of treatment. Interestingly, 63.4% had lost permanent teeth before, and this could be a factor as to why they are conversant with replacement modalities. The preference of dental implants (77.8%) was overwhelming, but only 16.6% had received one. The most prevalent barriers among people who did not select implants were cost and fear of surgery (6.5, 6.5, respectively). The knowledge was not high: 71.8% of the respondents correctly named the jawbone as the location where the implants are placed, over half (55.1) of the participants were not aware of what the implants are made of, and 33% did not know what section of a tooth was replaced by the implants. The attitudes toward longevity were ambivalent, 26.9% were not sure. Almost a half (49.6) considered that the failure of implants depends on the type and quality of the implants. Granting of provider qualification had a low awareness with 24.6% not knowing. The level of insurance-related knowledge was also low particularly among the 43% who were not covered.

Figure 2 shows that dentists are the primary information source on dental implants (50.4%). Social media (17.7%) and friends or relatives (13.5%) follow. Internet sources account for 11.4%, while newspapers, television, and other sources contribute minimally.

Table 3 demonstrates the attitude to dental implants as 78.1% of the surveyed people regard tooth replacement as highly important. Majority of participants (59.3%) were aware of the maintenance requirements by most of them (59.3%).

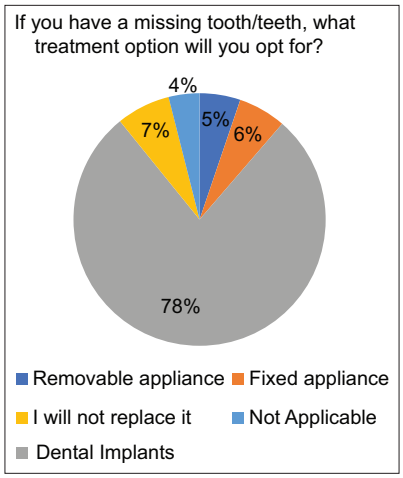

Figure 1: Illustrates treatment options for a missing tooth among participants

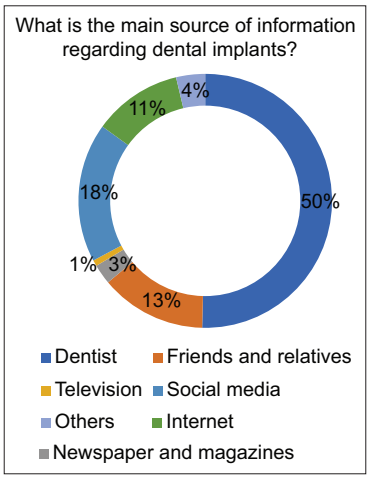

Figure 2: Main source of information regarding dental implants among participants

The most significant sources of information were dentists (50.4%), social media (17.7%), and it can be noted that professional advice and online platforms are effective. The desire to know more was high as 49.1% of the respondents were categorically willing to learn more and another 18.8% willing probably to learn more.

Table 4 indicates that participants generally demonstrated limited knowledge about dental implants, with 47.6% showing low knowledge and only 11.6% achieving a high level. Most respondents (40.8%) had a moderate understanding.

Table 5 shows generally unfavorable attitudes toward dental implants, with 61.1% demonstrating low attitude scores. Only 6.4% showed high attitude levels, while 32.5% were moderate.

Table 6 shows that knowledge about dental implants has a statistically significant relation to age ($P = 0.0001$), marital status ($P = 0.0001$), residential area ($P = 0.0001$), educational level ($P = 0.024$), and occupational status ($P = 0.003$). It also

Table 2: Parameters related to knowledge and perception of dental implants as a treatment for missing teeth (*n*=784)

Parameter	No.	Percentage
Have you lost one or more permanent teeth before?		
No	287	36.6
Yes	497	63.4
Are you aware that various treatment options are available for replacement of missing teeth like removable appliance, fixed appliance and dental implants?		
No	189	24.1
Yes	595	75.9
Have you ever heard about dental implants?		
No	19	2.4
Yes	765	97.6
If you have a missing tooth/teeth, what treatment option will you opt for?		
Removable appliance	41	5.2
Fixed appliance	48	6.1
Dental Implants	610	77.8
I will not replace it	54	6.9
Not Applicable	31	4.0
If you didn't choose dental implants as a first choice, what's the main reason?		
I choose dental implants	610	77.8
High cost	51	6.5
Fear of surgery	51	6.5
Fear of a foreign body in the jaw	21	2.7
Complicated treatment	7	0.9
Time consuming	12	1.5
Others	32	4.1
Have you ever had a dental implant?		
No	654	83.4
Yes	130	16.6
According to you what is a dental implant?		
Screw	388	49.5
Piece of metal	102	13.0
Heard about it, but cannot explain it	190	24.2
Never heard about it	29	3.7
I don't know	75	9.6
Where do you think implant is placed?		
Jawbone	563	71.8
Gum	122	15.6
Neighboring teeth	12	1.5
I don't know	87	11.1
What material is dental implant made of?		
Ceramic	55	7.0
Stainless Steel	116	14.8
Titanium	103	13.1
Porcelain	78	9.9
I don't know	432	55.1
What do you think dental implant placement means it replaces which part of teeth?		
Crown	51	6.5
Root	131	16.7
Both crown and root	332	42.3
None	11	1.4
I don't know	259	33.0
How long do you think does dental implant last?		
<5 years	44	5.6
5–10 years	178	22.7
10–20 years	142	18.1
More than 20 years	209	26.7
I don't know	211	26.9
Why do you think dental implants fail?		
Due to patient	49	6.3
Due to dentists	102	13.0
Due to poor oral hygiene	71	9.1
Due to implant type and quality	389	49.6
I don't know	173	22.1
Do you know whether your dentist provides implants?		
No	421	53.7
Yes	363	46.3
Who among the following are the most qualified to place dental implants?		
Oral surgeon	297	37.9
Prosthodontist	173	22.1
Periodontist	30	3.8
General practitioner	10	1.3
All of the above	81	10.3
Don't know	193	24.6
Are you aware, if dental implant treatment can be covered by your insurance?		
No	152	19.4
Yes	125	15.9
I don't know	170	21.7
I don't have insurance	337	43.0

shows a statistically insignificant relation to gender, income, insurance, and nationality.

Table 7 shows that attitude about dental implants has a statistically significant relation to age (P = 0.002) and

Table 3: Participants' attitude of dental implants as a treatment for missing teeth (*n*=784)

Parameter	No.	Percentage
Do you think the replacement of missing teeth is important?		
Very important	612	78.1
Somewhat important	132	16.8
Neither important nor unimportant	27	3.4
Not important at all	13	1.7
Do you think dental implants need special care and hygiene as compared to natural teeth?		
Much more than natural teeth	465	59.3
Same as natural teeth	208	26.5
Very little care is required	33	4.2
No special care is required	7	0.9
I don't know	71	9.1
What is the main source of information regarding dental implants?		
Dentist	395	50.4
Friends and relatives	106	13.5
Newspaper and magazines	20	2.6
Television	6	0.8
Social media	139	17.7
Internet	89	11.4
Others	29	3.7
Would you like to know more about dental implants?		
Yes	385	49.1
Likely	147	18.8
Maybe	189	24.1
Definitely not	63	8.0

Table 4: Shows knowledge about dental implants score results

Knowledge level	Frequency	Percentage
High knowledge level	91	11.6
Moderate knowledge	320	40.8
Low knowledge level	373	47.6
Total	784	100.0

Table 5: Attitude about dental implants score results

Attitude level	Frequency	Percentage
High attitude	50	6.4
Moderate attitude	255	32.5
Low attitude	479	61.1
Total	784	100.0

occupational status ($P = 0.005$). It also shows a statistically insignificant relation to gender, marital status, residential area, educational level, income, insurance, and nationality.

DISCUSSION

This cross-sectional study assessed the knowledge, attitude, and acceptance of dental implants as a treatment option for replacing missing teeth among the general population ($n = 784$). The aim of the present study was to evaluate how demographic factors, educational status, and socioeconomic parameters influence public perception and understanding of dental implants in the Saudi Arabian context, a region where edentulism remains a significant public health concern.

The findings of this study revealed several important patterns regarding implant awareness and perception. Notably, 97.6% of participants reported having heard about dental implants, and 75.9% were aware of various treatment options for replacing missing teeth, including implants, removable appliances, and fixed prostheses. This high level of general awareness is consistent with results from previous investigations in the Middle Eastern and South Asian regions.[13] A comparable study conducted among dental patients in Riyadh, Saudi Arabia, found that the majority of surveyed subjects were aware of using dental implants as an option for replacing missing teeth, though this awareness did not always translate to accurate knowledge about specific implant characteristics.[14] The present study's finding that 77.8% of participants expressed a preference for dental implants when presented with treatment options demonstrates strong patient interest in this modality, indicating that implants are perceived as an attractive prosthetic solution by the general population.

However, the translation of awareness into comprehensive knowledge remains problematic. Although nearly all participants had heard of implants, only 11.6% demonstrated high-level knowledge, with 47.6% showing low knowledge scores. This substantial knowledge gap is particularly evident in specific domains. When asked about implant composition, 55.1% of participants could not correctly identify titanium or other implant materials, aligning with findings from Al-Johany *et al*. (2010), who reported that despite high awareness levels, only a portion of surveyed patients in Riyadh could correctly identify the jawbone as the implant placement site.[14] Furthermore, only 71.8% of the present sample correctly identified the jawbone as the location where implants are placed, while 15.6% believed implants were placed in the gums. In addition, 33% of participants did not understand which tooth component (crown, root, or both) is replaced by implant placement, indicating fundamental misconceptions about implant anatomy and function.

Barriers to implant selection identified in this study align substantially with the international literature on prosthetic rehabilitation preferences. The most significant deterrents were cost (6.5% cited this as the primary reason for not choosing implants) and fear of surgery (also 6.5%), followed by fear of a foreign body in the jaw (2.7%), time-consuming treatment (1.5%), and complicated treatment

Table 6: Relation between knowledge about dental implants and sociodemographic characteristics

Parameters	Knowledge level		Total (*n*=784)	*P*-value
	High or moderate knowledge	Low knowledge level		
Gender				
Female	318	277	595	0.309
	77.4%	74.3%	75.9%	
Male	93	96	189	
	22.6%	25.7%	24.1%	
Age				
23 or less	75	114	189	0.0001
	18.2%	30.6%	24.1%	
24–27	46	61	107	
	11.2%	16.4%	13.6%	
28–39	83	81	164	
	20.2%	21.7%	20.9%	
40–49	118	63	181	
	28.7%	16.9%	23.1%	
50 or more	89	54	143	
	21.7%	14.5%	18.2%	
Marital status				
Single	114	165	279	0.0001
	27.7%	44.2%	35.6%	
Married	274	195	469	
	66.7%	52.3%	59.8%	
Divorced	19	8	27	
	4.6%	2.1%	3.4%	
Widowed	4	5	9	
	1.0%	1.3%	1.1%	
Residential area				
Northern region	5	4	9	0.0001
	1.2%	1.1%	1.1%	
Southern region	201	131	332	
	48.9%	35.1%	42.3%	
Central region	73	92	165	
	17.8%	24.7%	21.0%	
Eastern region	21	10	31	
	5.1%	2.7%	4.0%	
Western region	111	136	247	
	27.0%	36.5%	31.5%	
Educational level				
No formal education	2	1	3	0.024
	0.5%	0.3%	0.4%	
Primary school	4	2	6	
	1.0%	0.5%	0.8%	
Middle school	10	11	21	
	2.4%	2.9%	2.7%	

(*Contd*...)

Table 6: (*Continued*)

Parameters	Knowledge level		Total (*n*=784)	*P*-value
	High or moderate knowledge	Low knowledge level		
High school	58	87	145	
	14.1%	23.3%	18.5%	
Diploma	49	29	78	
	11.9%	7.8%	9.9%	
Bachelor's degree	251	217	468	
	61.1%	58.2%	59.7%	
Postgrads	37	26	63	
	9.0%	7.0%	8.0%	
Income				
<1000 Saudi riyal	64	70	134	0.166
	15.6%	18.8%	17.1%	
1000–5000	88	81	169	
	21.4%	21.7%	21.6%	
5001–10000	68	62	130	
	16.5%	16.6%	16.6%	
10001–15000	68	51	119	
	16.5%	13.7%	15.2%	
More than 15000 Saudi riyal	71	46	117	
	17.3%	12.3%	14.9%	
No income	52	63	115	
	12.7%	16.9%	14.7%	
Insurance				
No	293	283	576	0.147
	71.3%	75.9%	73.5%	
Yes	118	90	208	
	28.7%	24.1%	26.5%	
Nationality				
Saudi	403	364	767	0.654
	98.1%	97.6%	97.8%	
Non-Saudi	8	9	17	
	1.9%	2.4%	2.2%	
Occupational status				
Student	59	92	151	0.003
	14.4%	24.7%	19.3%	
Government employee	141	96	237	
	34.3%	25.7%	30.2%	
Private sector	59	52	111	
	14.4%	13.9%	14.2%	
Self-employed	10	12	22	
	2.4%	3.2%	2.8%	
Retired	44	28	72	
	10.7%	7.5%	9.2%	
Unemployed	98	93	191	
	23.8%	24.9%	24.4%	

*P value was considered significant if ≤ 0.05

Table 7: Attitude about dental implants in association with sociodemographic characteristics

Parameters	Attitude level		Total (*n*=784)	*P*-value
	High or moderate attitude	Low attitude		
Gender				
Female	238	357	595	0.264
	78.0%	74.5%	75.9%	
Male	67	122	189	
	22.0%	25.5%	24.1%	
Age				
23 or less	59	130	189	0.002
	19.3%	27.1%	24.1%	
24–27	40	67	107	
	13.1%	14.0%	13.6%	
28–39	57	107	164	
	18.7%	22.3%	20.9%	
40–49	74	107	181	
	24.3%	22.3%	23.1%	
50 or more	75	68	143	
	24.6%	14.2%	18.2%	
Marital status				
Single	103	176	279	0.445
	33.8%	36.7%	35.6%	
Married	187	282	469	
	61.3%	58.9%	59.8%	
Divorced	13	14	27	
	4.3%	2.9%	3.4%	
Widowed	2	7	9	
	0.7%	1.5%	1.1%	
Residential area				
Northern region	5	4	9	0.671
	1.6%	0.8%	1.1%	
Southern region	129	203	332	
	42.3%	42.4%	42.3%	
Central region	65	100	165	
	21.3%	20.9%	21.0%	
Eastern region	9	22	31	
	3.0%	4.6%	4.0%	
Western region	97	150	247	
	31.8%	31.3%	31.5%	
Educational level				
No formal education	1	2	3	0.395
	0.3%	0.4%	0.4%	
Primary school	2	4	6	
	0.7%	0.8%	0.8%	
Middle school	6	15	21	
	2.0%	3.1%	2.7%	

(*Contd*...)

Table 7: (*Continued*)

Parameters	Attitude level		Total (*n*=784)	*P*-value
	High or moderate attitude	Low attitude		
High school	52	93	145	
	17.0%	19.4%	18.5%	
Diploma	37	41	78	
	12.1%	8.6%	9.9%	
Bachelor's degree	177	291	468	
	58.0%	60.8%	59.7%	
Postgrads	30	33	63	
	9.8%	6.9%	8.0%	
Income				
<1000 Saudi riyal	47	87	134	0.603
	15.4%	18.2%	17.1%	
1000–5000	67	102	169	
	22.0%	21.3%	21.6%	
5001–10000	54	76	130	
	17.7%	15.9%	16.6%	
10001–15000	45	74	119	
	14.8%	15.4%	15.2%	
More than 15000 Saudi riyal	52	65	117	
	17.0%	13.6%	14.9%	
No income	40	75	115	
	13.1%	15.7%	14.7%	
Insurance				
No	215	361	576	0.132
	70.5%	75.4%	73.5%	
Yes	90	118	208	
	29.5%	24.6%	26.5%	
Nationality				
Saudi	298	469	767	0.846
	97.7%	97.9%	97.8%	
Non-Saudi	7	10	17	
	2.3%	2.1%	2.2%	
Occupational status				
Student	56	95	151	0.005
	18.4%	19.8%	19.3%	
Government employee	90	147	237	
	29.5%	30.7%	30.2%	
Private sector	52	59	111	
	17.0%	12.3%	14.2%	
Self-employed	7	15	22	
	2.3%	3.1%	2.8%	
Retired	40	32	72	
	13.1%	6.7%	9.2%	
Unemployed	60	131	191	
	19.7%	27.3%	24.4%	

*P value was considered significant if ≤ 0.05

procedures (0.9%). These barriers are consistently reported across multiple populations. A study in India by Sharma *et al.* assessing knowledge and acceptance of dental implants found that high cost was cited as the main barrier in 54.2% of respondents, followed by concerns about the surgical procedure and extended treatment duration.[15] Similarly, in a comprehensive survey in Northern West Bengal, India, high cost accounted for 32.76% of reasons for rejecting implant therapy.[16] In the western region of Saudi Arabia, cost was identified as a critical limiting factor preventing patients from selecting implant treatment.[17] This consistency suggests that financial accessibility represents a universal challenge in implant dentistry across diverse populations and economic contexts.

The present study found that only 16.6% of participants had actually received a dental implant despite the overwhelming preference for this treatment modality (77.8%). This substantial discrepancy between preference and actual treatment uptake underscores the significant impact of the identified barriers, particularly cost. This observation is consistent with research from Turkey by Aydin *et al*., demonstrating that despite an acceptable level of awareness about implant treatment, the high cost remained the major reason for rejection.[13] The relatively low acceptance of implant treatment in actual practice, compared to theoretical preference, indicates that while patients desire this solution, practical constraints prevent implementation.

Regarding attitudes toward implant maintenance and longevity, this study found that 26.9% of participants expressed uncertainty about implant longevity, while 49.6% correctly attributed implant failure to implant type and quality. However, 26.9% did not know what determines implant longevity, indicating an incomplete understanding of factors influencing long-term success. These findings are noteworthy because patient understanding of maintenance requirements and realistic longevity expectations are crucial for treatment compliance and satisfaction. A study from India similarly reported that maintaining appropriate oral hygiene and understanding implant-specific care requirements presented significant knowledge gaps among the surveyed population.[18]

The present investigation demonstrated important associations between demographic factors and implant knowledge and attitudes. Knowledge about dental implants showed statistically significant relationships with age ($P = 0.0001$), marital status ($P = 0.0001$), residential area ($P = 0.0001$), educational level ($P = 0.024$), and occupational status ($P = 0.003$), while showing no significant association with gender, income, insurance status, or nationality. These findings parallel results from previous studies in the region. The southern region of Saudi Arabia study demonstrated that knowledge scores were directly related to the education and professional status of participants.[19] Older adults in the present study (50 years and above) demonstrated higher knowledge levels compared to younger participants (23 years and below), who constituted 30.6% of the low knowledge group compared to 18.2% of the high or moderate knowledge group. Educational status emerged as an important predictor, with those possessing bachelor's degrees representing 61.1% of the high/moderate knowledge group. Marital status showed a significant relationship, with married individuals (66.7%) more likely to possess high or moderate knowledge compared to single individuals (27.7%), suggesting that life experience and family responsibilities may correlate with health information seeking and assimilation.

Attitudes regarding dental implants were generally unfavorable, with 61.1% of participants demonstrating low attitude scores, and only 6.4% showing high attitude levels. This disparity between preference for implants when presented as a treatment option (77.8%) and actual attitudes toward implants (6.4% high attitude) represents an important distinction in the data. Attitude scores showed statistically significant associations with age ($P = 0.002$) and occupational status ($P = 0.005$), but not with gender, marital status, residential area, educational level, income, insurance status, or nationality. Individuals aged 50 years and above demonstrated more favorable attitudes (24.6%) compared to those 23 years of age or younger (19.3%), though the difference was less pronounced than observed in knowledge assessments.

Information sources play a crucial role in shaping patient perceptions and knowledge. In the present study, dentists represented the primary information source (50.4%), followed by social media (17.7%), friends and relatives (13.5%), and the internet (11.4%). This distribution highlights the continued significance of direct professional consultation in patient education, despite the growing influence of digital media. Previous investigations in the region confirm this pattern. A Riyadh-based study found that the major sources of information about dental implants were internet, television, or newspapers for 57.7% of respondents, though dentist consultation remains critical.[13] The substantial role of social media (17.7% in the present study) reflects evolving information-seeking behaviors and may represent both an educational opportunity and a challenge, as the quality and accuracy of social media content regarding implants may be variable.

Regarding awareness of specialist qualifications for implant placement, 37.9% correctly identified oral surgeons as qualified providers, 22.1% identified prosthodontists, and 24.6% reported not knowing which specialists were qualified. This incomplete awareness of professional qualifications may impact patient decision-making and could influence treatment planning discussions. Comparable knowledge deficits regarding provider qualifications have been noted in other populations, including in a study from the eastern province of Saudi Arabia.[20]

Insurance-related knowledge was particularly low, with only 15.9% aware that implant treatment could be covered by insurance, while 43% reported not having insurance coverage. This finding is consistent with the observation that 73.5% of the present sample had no dental insurance, underscoring the financial barrier to treatment in a region where implant therapy carries substantial out-of-pocket costs for the majority of the population. The lack of insurance coverage and limited awareness of potential coverage options represent critical barriers to treatment accessibility.

CONCLUSION

This cross-sectional study reveals that although general awareness of dental implants is widespread among Saudi adults, only a minority possess detailed knowledge or exhibit a positive attitude toward implant therapy. Cost, limited understanding, and fear of surgery were the most commonly reported barriers impacting treatment acceptance. Significant associations were found between knowledge/attitude and several demographic factors, highlighting the influence of education, occupation, and age on patient perspectives. Most participants relied on dentists and social media as their primary sources of implant-related information, indicating the need for reliable, accessible patient education. Efforts to improve awareness and address economic challenges are crucial for promoting dental implant acceptance and ensuring patients make well-informed choices regarding the replacement of missing teeth.

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ETHICAL APPROVAL

The study was fully explained to all participants, and it was emphasized that participation was voluntary. Written informed consent was obtained from each participant before enrollment. All collected information was securely stored and used exclusively for research purposes.

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INFORMED CONSENT

Written informed consent was obtained from all study participants.

DATA AND MATERIALS AVAILABILITY

All data generated or analyzed during this study are included in this published article.

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