

# Hesitance in acceptance of dental implants as a treatment modality amongst adult population of Jazan region - A single-center study

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## ABSTRACT

### Objective

The present survey was aimed to evaluate and assess the patient's knowledge and hesitance regarding implant treatment as an alternative to the fixed dental prosthesis in the Jazan region, Saudi Arabia.

### Materials and methods

This self-explanatory cross-sectional survey was completed over two months. A questionnaire was designed, and a pilot study was performed with 20 participants to assess the reliability and validity of the questions. Finally, 149 participants took part in the survey. The questions were divided into two sections. Section I: inquiries related to the demographic status, and section II: evaluate knowledge and hesitance to opt for implant therapy as a treatment option. A significant association between the variables was measured by employing a one-way ANOVA test. A *p*-value of < 0.05 has been considered a statistically significant level.

### Results and discussion

149 participants, with 104 (69.8%) males and 45 (30.2%) females, answered the questionnaire. About 79 (53.3%) participants had adequate knowledge about implant therapy. The majority of participants, 104 (73.8%), thought implant-supported dentures required meticulous care. The reason for abstaining from implant denture as a substitute for missing teeth showed that 111 (74.5%) patients felt the treatment was costly, followed by fear of unknown side effects (56.6%) participants, fear of pain 55.7% of participants, increased in the duration of therapy (46.3%) patients and requirement for surgery. No statistical significance was measured between the variables (*p*<0.05).

### Conclusion

This survey concluded that the selected dental patients had adequate knowledge and awareness regarding dental implant treatment. However, cost and meticulous care seem to be major constrain for implant treatment.

### Keywords

hesitance; knowledge; dental implants; tooth loss.

## INTRODUCTION

Tooth decay, periodontitis, facial trauma, root canal failure, and iatrogenic factors are prevalent causes of tooth loss. The American Association of Oral Surgeons report mentioned that 70 to 80% of individuals aged 30 to 40 years lost at least one permanent tooth, and adults aged 70 to 75 lost almost all their permanent teeth<sup>1</sup>. According to the World health organization (WHO), partially or completely edentulous patients serve as

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physically impaired since the tooth is considered one of the essential parts of the body<sup>2</sup>. Loss of teeth can lead to TMJ disorders, difficulties chewing food, and aesthetic issues that can impact one's physical and social well-being<sup>3</sup>.

Among the treatment options for missing teeth are implant-supported prostheses, fixed and removable dentures, and tooth-supported prostheses<sup>4</sup>. These oral rehabilitation techniques do have certain benefits and downsides, though. For replacing lost teeth, fixed and removable partial dentures are the recommended choice of treatment<sup>5</sup>. While patients accept removable partial dentures relatively well, mastication, denture instability, and loss of retention, which increases the risk of alveolar ridge erosion, are the drawbacks of this technique<sup>6</sup>. Fixed partial dentures (FPDs) are not regarded as a treatment option by many practitioners since they result in a large percentage of tooth structure being lost, which causes hypersensitivity. Patients often experience trouble maintaining proper oral hygiene, which increases the risk of endodontic treatments<sup>5-7</sup>.

The necessity to replace missing teeth with normal substitutes has prompted significant growth in the field of dental implants. Recently, implant-supported dentures have become the standard treatment modality for complete or partially edentulous patients<sup>8,9</sup>. Improved denture stability, retention, masticatory efficiency, and a favorable impact on the quality of life related to oral health are the benefits associated with this treatment<sup>4,10</sup>. Even though implant therapy is thought of as a conventional treatment option in the majority of edentulous instances, patients should be given full information about both this and alternative treatments to help them make the best decision<sup>12,13</sup>. Most of the time, a patient's choice is determined by their financial situation, level of information, and awareness of alternative treatments<sup>14,15</sup>. A number of factors, including pain, visits, and concern about potential adverse effects, influence the final treatment decision<sup>16</sup>.

The global economic crisis and intense rivalry among companies are currently making the dental services market more competitive. Additionally, it has altered how patients view dental care, particularly in the case of pricey procedures like implant installation. In addition, people are inundated with information about all kinds of dental care due to the rise of social media. Hence,

it is the responsibility of dentists and dental authorities to guide patients comprehensively on implant treatment and post-operative care.

Numerous researches have been performed regarding the knowledge, awareness, and acceptance of dental implants as treatment options around the globe<sup>13,14,17-20</sup>. Moreover, different approaches to evaluate the knowledge and understanding of the patient were performed to get evidence-based results worldwide. To this day, many researches are published on the knowledge and awareness of patients about dental implants. However, few articles have emphasized patients' reluctance toward this treatment modality. Furthermore, no study has been done on the local adult population of the Jazan region to evaluate reasons for patients' hesitance in accepting implant treatment as a treatment modality. The present survey aimed to evaluate and assess the patient's knowledge and hesitance regarding implant treatment in the Jazan region, Saudi Arabia.

## MATERIALS AND METHODS

This observational questionnaire-based survey was conducted among patients in the College of Dentistry's outpatient department and dental clinics. Ethical approval was taken from the standing committee of scientific research, College of Dentistry, Jazan University, Jazan, Saudi Arabia (Ref No. REC-43/10/210) before commencement of the survey. The survey was conducted from February to June 2022 at the Department of Prosthetic Dental Science.

**Patient selection:** Initial data were collected from R4 software for all the patients who had at least one missing tooth, wanted a replacement, and were treated with the fixed dental prosthesis in the dental clinics in the year 2021. Patients were contacted telephonically and were asked if they wanted to participate in the survey. On acceptance, verbal consent was taken from all the willing participants, the questionnaire was read out in the native language, and the responses were marked. Some patients were busy, provided other suitable times for contacting them, and the responses were recorded.

**Questionnaire:** A comprehensive questionnaire based on prior research was used and modified to assess the participant's understanding, knowledge, belief, and perception of the level of acceptance of dental implants as a treatment modality<sup>17,21</sup>. It was mainly focused on knowing the reasons for their hesitance to

opt for implants as a treatment modality. The first draft of the questionnaire was designed in English and had 23 questions. It was distributed amongst the clinicians and students to be reviewed, and their suggestions and responses were welcomed. After piloting in an initial twenty participants for validity and reliability, the questionnaire was modified and finalized. After a complete evaluation, the culture-specific Arabic version of the questionnaire was designed to acquire precise information from common people. This questionnaire was checked for its relevance and accuracy by native speakers.

A structured close-ended self-explanatory questionnaire (Table 1) having 18 questions was utilized to collect the data and was based on two structured sections, namely;

**Section I:** Demographic data comprises age, gender, marital status, monthly income, and educational levels.

**Section II:** To evaluate the knowledge, understanding, and perception about dental implants, including alternative treatment options, merits of dental implants, the duration of dental implant surgery, treatment costs, implant limitations, etc.

All the responses in the second section were recorded systematically in a Microsoft Excel spreadsheet (Microsoft Corporation, USA) for all the patients on a three-point Likert scale with options Agree, Disagree, and Neutral/don't know.

**Statistical analysis:** Descriptive statistics were performed using the Statistical Package for Social Sciences (SPSS version 23 IBM, USA). Data were represented as Frequency, Percentage, Mean and Standard Deviation. The One-Way ANOVA Test calculated the association between sociodemographic variables and mean score. A  $p$ -value less than 0.05 was taken as statistically significant, and  $p < 0.001$  were highly significant.

## RESULTS

The present survey result provides comprehension of the knowledge, awareness, perception, and reasons for hesitance towards opting for the dental implant as a treatment substitute over fixed partial dentures among the sample population of Southern Saudi Arabia.

A total of one hundred forty-nine participants, with 104 (69.8%) males and 45 (30.2%) females, answered the questionnaire. The highest number of participants were from the age group of 21-30 years (59.7%), followed

**Table 1.** Close-ended self-explanatory questionnaire to evaluate knowledge, understanding, and reasons for the hesitance of dental implants as a treatment modality

Questionnaire	
Section I	Sociodemographic data <ul style="list-style-type: none"> <li>• Age</li> <li>• Gender</li> <li>• Marital status</li> <li>• Monthly income (SR)</li> <li>• Education</li> </ul>
Section II	Q1. I have modest knowledge and understanding of implants as a treatment option Q2. I am very old for receiving an implant as a treatment option Q3. I have health issues (medical problems) that prohibit me from undertaking implant surgical procedure Q4. I am afraid of surgical procedure Q5. I am afraid of pain related to the implant procedure Q6. I am afraid of complications that may arise postoperatively Q7. I think the number of visits required for implant placement is more Q8. I think time required for implant treatment is more Q9. Lack of good bone quality prevents me from accepting implant treatment Q10. Lack of good bone quantity and non-acceptance of bone grafting procedures Q11. There were difficulties faced by family and friends who underwent implant treatment that prevented me from accepting implant treatment. Q12. I think implants and the supported prosthesis demand meticulous care Q13. History of radiation therapy received preventing from implant treatment. Q14. I am presently on medications that prevent implant treatment Q15. I think there should be further detailed awareness programs about implant procedures Q16. I think cost of implant treatment is too high Q17. I feel my previous Fixed Dental prosthesis worked well Q18. I am convinced about conventional fixed prostheses from the experience of family and friends

by less than 20 years (20.1%), 31-40 years (10.7%), and the least patients were above 40 years (9.4%) of age. Participants with an educational qualification of bachelor, up to high school, and post-graduation were approximately equally distributed with a maximum of 35.6%, 32.9%, and 30.9%, respectively. At the same time, only 0.7% of the participants were uneducated.

Occupation-wise, about 30.2% of participants were employed, followed by unemployed (24.8%), student (23.5%), professional (18.1%), and retired (3.4%). Based on monthly income, the maximum number of participants (56.4%) earned less than five thousand riyals, whereas only 7.4% had more than fifteen thousand riyals. Figure 1 summarizes the socio-demographic data of the participants.

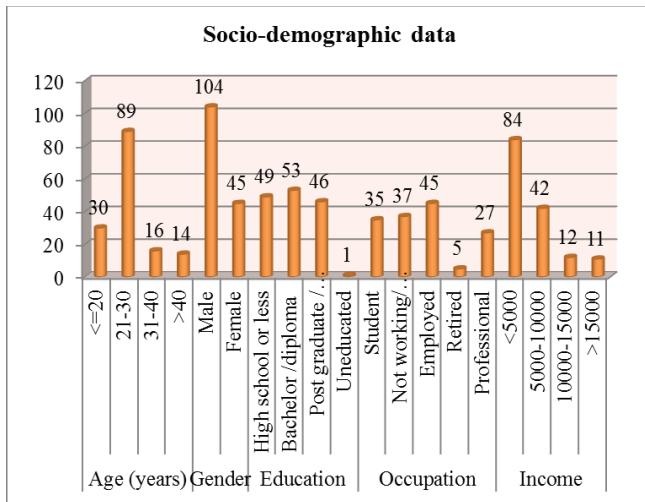


Figure 1. Socio-demographic data of the participants

### Knowledge, understanding, and Awareness of Dental Implants

Figure 2 represents the distribution of questions and responses related to participants' knowledge and perception in opting for the implant as a treatment modality. Among 149 participants, 79 (53%) had adequate knowledge and understanding of implant therapy as a treatment option. However, 47% of the

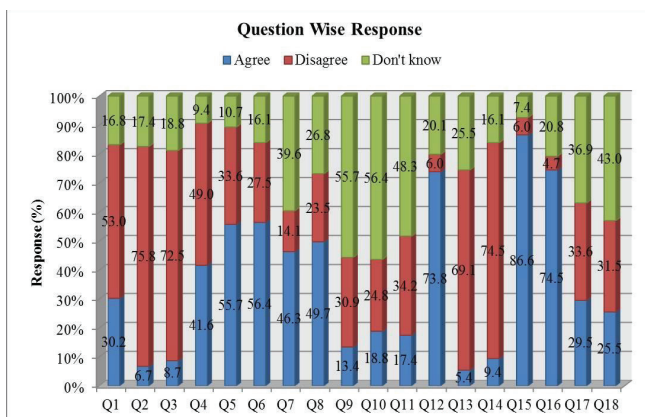


Figure 2. Question wise response of participants (n%)

participants had either poor knowledge or could not recollect about implants.

When asked about their perception of being old to receive dental implants, 75.8% of participants disagreed and did not consider that a factor. 72.5% of participants had no medical problems, and 74.5% were not on any medications that prohibited them from taking implant treatment. Even 49% disagreed when asked if they were frightened about the surgical procedure.

However, participants needed clarification about the knowledge related to fixed partial denture prosthesis and could not connect to the experience of their family and friends (43%). However, 25.5% of them were convinced and went with their experience. Only 29.5% of the participants had a previous satisfactory experience with the fixed partial denture.

Most participants had no knowledge or disagreed when asked about the presence or lack of good bone quantity, non-acceptance of bone grafting procedures, or any history of radiation preventing them from opting for implants. Even 86.6% thought there should be further detailed awareness programs about implant procedures.

### Reasons for hesitance in opting for dental implants

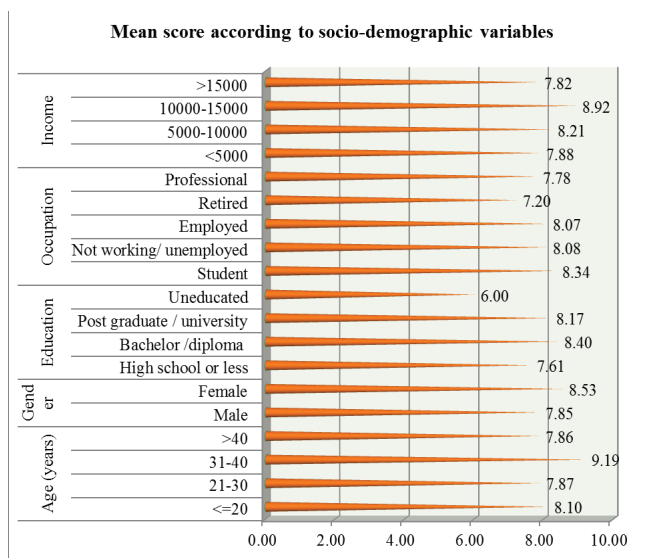
The reasons for abstaining from implant prosthesis as a substitute for missing teeth revealed that 111 (74.5%) participants felt the implant treatment was costly, followed by 110 (73.8%) who thought Implants and the supported prosthesis demanded meticulous care, fear of unknown complications that may arise postoperatively (84, 56.6%), fear of pain (83, 55.7%), time taken for implant procedure (74, 49.7%), increased number of visits for implant treatment (69, 46.3%) and afraid from the surgical procedure (61, 41.6%).

When asked about the difficulties faced by family and friends who underwent implant treatment, the majority (48.3%) of the participants did not have any knowledge, and 38.2% disagreed; however, only 17.4 % found this as a reason that prevented them from accepting implants.

One-way ANOVA statistical test was employed to check the association between age, gender, education, occupation, and income, and the mean score about knowledge and awareness of implant procedure resulted in no statistically significant difference (Figure 3, Table 2).

**Table 2.** Association between socio-demographic variables and mean score using One-way ANOVA Test

Variable	Category	Score		P value
		Mean	± SD	
Age (years)	≤20	8.10	2.784	0.463; NS
	21-30	7.87	3.184	
	31-40	9.19	3.229	
	>40	7.86	2.685	
Gender	Male	7.85	3.219	0.210; NS
	Female	8.53	2.651	
Education	High school or less	7.61	3.668	0.537; NS
	Bachelor /diploma	8.40	2.699	
	Post graduate / university	8.17	2.775	
	Uneducated	6.00	-	
Occupation	Student	8.34	3.334	0.924; NS
	Not working/ unemployed	8.08	2.228	
	Employed	8.07	3.695	
	Retired	7.20	1.789	
	Professional	7.78	2.860	
Income	<5000	7.88	2.996	0.710; NS
	5000-10000	8.21	3.538	
	10000-15000	8.92	2.843	
	>15000	7.82	1.779	



**Figure 3.** Mean Score according to various socio-demographic variables

## DISCUSSION

The current survey aimed to evaluate the factors associated with the hesitance of patients to opt for dental implants as a treatment modality for missing teeth. Despite adequate knowledge about dental implants, various reasons for their reluctance of not choosing dental implants were extracted. Majority of the participants were not sure to opt for implant treatment due to the high cost and requirement of meticulous care, even though this survey reported that participants were keen to

learn about implant treatment modalities and desired awareness programs.

The current survey reported that the majority of participants had adequate knowledge about dental implants, but a detailed description of implant procedures, such as time, adequate bone quality, etc., remained a challenge for 56.7% of participants. Similar findings were reported in a study by Al-Johany *et al.*, in the Riyadh region of Saudi Arabia, with 66.4% of participants having adequate knowledge of implant therapy<sup>12</sup>. In contrast, the study by Almalki and Al Bandary amongst the Saudi population reported that 82.5% of responders had heard about dental implants<sup>17</sup>. In another study by Suprakash *et al.*, and Chowdhary *et al.*, on the Indian population, only 33% and 23.24% of participants residing in urban areas were knowledgeable about implant surgery<sup>18,22</sup>. However, in the Turkish population study, Özçakır *et al.*, reported that most participants had no knowledge or had never heard about dental implants<sup>19</sup>. These disparities may arise from surveys conducted on distinct populations and from differences in dental implant initiatives and programs across different parts of the world.

Participants in this survey reported that the reasons for the reluctance to opt for dental implants were high cost (74.5%), fear of postoperative complications (56.6%), treatment duration (49.7%), and the number of visits (46.3%). These findings are in accordance with the survey conducted by Satpathy *et al.*, Prashanti *et al.*, Bhat *et al.*, and Narby *et al.*<sup>21,23-25</sup>. However, these surveys had not reported post-operative pain as one of the factors associated with ignorance of implant surgery.

Several studies including this survey, have said the expenditure related to implant treatment is a substantial hurdle in opting for this treatment<sup>10,14,16,19,20</sup>. In their survey, Zimmer *et al.*, reported that even though esthetics

was one of the motivating factors in opting for implant treatment, expenses related to implants were the topic of argument<sup>26</sup>. Similarly, in studies done by Satpathy *et al.*, and Radhika *et al.*, around 31% of patients reported cost as one of the major factors in the opting dental implant as a treatment modality for the replacement of missing teeth<sup>21,27</sup>. These consistent findings indicate that dental professionals should reduce patients' anxiety about implant treatments by thoroughly discussing the entire process and keeping the patient's financial needs. Dental professionals must also educate patients about their many treatment options and the value of an implant-supported prosthesis, which enhances the quality of life associated with oral health and implant treatment. In the long run, this can assist patients in making specific selections about tooth replacement.

In the current survey, 73.8% of patients contemplate that dental implants require more care, and only 6% of respondents believed that less maintenance is needed for implants. Similarly, the findings in the survey by Rustmeyer and Bermerich showed that only 7% of patients believed implants required low maintenance<sup>28</sup>. Many patients need to be made aware of the conceptualization, implementation, and aftercare of implant-supported dentures, although the notion that implants require less care than natural teeth is not ubiquitous. Hence, it is the primary responsibility of the dental surgeon to explain to patients the post-operative care and functional performance of dental implants.

Post-operative pain (55.7%) related to implant surgery was mentioned as one of the factors for reluctance in this survey. Similarly, in the study by Ellis *et al.*, the fright of pain associated with implant surgery was reported as one of the significant hindrances<sup>29</sup>. Even though other studies have proven that implant placement surgeries cause lower pain than impaction or apicectomy, persistent pain and edema have been considered as one of the major reasons for the reluctance of implant surgery<sup>30</sup>.

Of 149 participants, most were young and could imagine receiving implant treatment. Compared with similar studies on the elderly cohort, the acceptance of implant treatment was much lower than in the young cohort<sup>13</sup>. In the study by Zimmer *et al.*, on the American population, a clear correlation between age and implant acceptance was found<sup>26</sup>. They reported that young participants favored implant treatment more than older individuals. In a survey by Berge in Nigeria, 57% of

adults around the age group of 40-50 years accepted the implant treatment, while 23% were unwilling due to age constraints<sup>31</sup>. In the current survey, the maximum of the population was under the age of 40 years, and they were ready to accept implants as a treatment. However, according to the statistics of other studies, it could be inferred that with increasing age, the perception of oral health-related quality of life is overshadowed by other systemic problems. A breakup analysis of this finding showed no statistical difference among the groups (age, gender, educational status, and occupation).

In this survey, around 86.6% of participants were interested in having detailed awareness programs about dental implants. The results were consistent with the study by Satpathy *et al.*, where 89% of participants were keen to learn about implant treatment<sup>21</sup>. Overall this survey infers that dental surgeons and health care regulating bodies should focus more on general information about implants and implant-related procedures. More programs should be planned at the center and community levels to impart knowledge and create awareness amongst the general population. As per the survey, high cost and maintenance procedures were the significant drawbacks of implant treatment. Although many people believed dental implants were expensive, they were keen to learn more about implant and implant-related procedures. Overall, participants in this study lacked knowledge about the ideal requirements to undergo implant surgery. Hence, they demanded to learn more about the different treatment options available in the form of detailed awareness programs to replace missing teeth in partially edentulous arches.

To enhance the quality of life related to oral health, one must possess the necessary information and awareness about oral health care especially considering the periodontal status. Numerous researches have demonstrated a connection between better oral health and an increased quality of life<sup>10,32</sup>. In order to help patients make an informed decision regarding the replacement of missing teeth, comprehensive information regarding implant treatment and alternative therapies must be supplied. Furthermore, patients typically receive incomplete information from friends or family on a variety of topics related to implant surgery.

The major limitation of this survey was that it was a single-center study with a limited number of participants. Hence, the finding of this survey cannot be generalized. Another constraint was the self-

administered questionnaire. Although the questionnaire was verified beforehand on a small group, validity should be checked on a larger sample size. To reproduce more evidence-based results, multicenter research should be planned to cover a region or national level to have in-depth knowledge about the associated factors with the hesitance to opt for the dental implant as a treatment option. This will help the governmental organizations plan awareness programs and policies, which will help health insurance companies and practitioners, provide cost-effective treatment modalities to the general population.

## CONCLUSION

In the survey population, knowledge and awareness of dental implant treatment are adequate, and the rate of objection to treatment is low. High cost, meticulous care, fear of complications, and treatment time were the most substantial reason for reluctance. The statistical analysis reported no significant association between the socio-demographic variables and the mean score. However, the acceptance rate of implant treatment can be increased by conducting awareness programs and emphasizing oral health-related quality of life. In conclusion, with the proper information and promotion of oral health-related quality of life, it is possible to increase the acceptance of implant treatment in the general population. Reduction in cost and minimally

invasive therapy should be developed. So that patients can positively opt for implant treatment on priority basis as an alternative to missing teeth.

**Acknowledgments:** We appreciate the help provided by the Research Unit in the collection of Data.

**Funding:** This research received no external funding.

**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## AUTHOR CONTRIBUTIONS

**Conceptualization:** K.R.N, A.P;

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**Data gathering:** A.A.M, M.B.H, Y.A.M, M.N.A, T.A.H;

**software:** K.R.N;

**validation:** A.P, V.B;

**Data curation:** A.P, V.B;

**writing-original draft preparation:** A.P, R.R.N, V.B;

**writing-review and editing:** K.R.N, R.R.N;

**Editing and approval of final draft:** A.P, K.R.N, V.B.

All authors have read and hereby agree to the submitted version of the manuscript.

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