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ORIGINAL ARTICLE

Awareness and Acceptance of Dental Implants as a Treatment Modality for Replacement of Missing Teeth among Patients in Aseer Region, Kingdom of Saudi Arabia

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ABSTRACT

Aim: The aim of this study was to assess the level, sources of information, awareness, and acceptance of dental implant therapy among dental patients in Aseer region, Kingdom of Saudi Arabia.

Materials and methods: Information on demographic variables, level and sources of information, awareness, and acceptance of dental implant therapy as a treatment modality was obtained by self-explanatory survey containing 17 questions. The data were collected at five government dental health centers at Aseer region. The survey forms were distributed by in-charge dentist to the patients who were on routine visit. A total of 500 questionnaires were distributed out of which 479 were included in the survey.

Results: The survey analysis demonstrated that 87% of participants were aware of dental implant therapy. Participants with high education level showed more awareness compared with lower education level ($p < 0.05$); 22.2% of participants were well informed about dental implants, 59.3% of them were moderately informed, 16.1% of them were poorly informed, and 2.4% were not informed about dental implants. The high cost (41.5%) was the major reason for people not choosing implant therapy followed by other reasons, such as fear of unknown side effects (33.0%), the need for surgery (13.5%), and long duration of treatment (12.0%).

Conclusion: The surveyed participants in Aseer region were well aware about dental implants as a treatment option in replacing missing teeth. However, the dentists should provide accurate information to the patients regarding implant therapy irrespective of the patient's willingness to undergo therapy or not. High treatment cost for dental implant therapy was the main reason for patients refraining from implant therapy.

Keywords: Acceptance, Awareness, Dental implants, Information sources, Knowledge.

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INTRODUCTION

Tooth loss is a common condition which can occur due to dental caries, periodontal disease, facial trauma, endodontic failure, and sometimes by iatrogenic factors.[1] According to the American Association of Oral and Maxillofacial Surgeons, 69% of adults aged 35 to 44 would have lost at least one permanent tooth and adults aged above 70 to 74 years would have lost their entire permanent teeth.[2] The World Health Organization classifies edentulous people as physically impaired due to loss of an important part of their body.[3] The consequences of tooth loss are chewing disability, occlusal problems, temporomandibular disorders, and esthetics which can have negative impacts on social and physical well-being.[4]

Oral rehabilitation of missing teeth involves treatment modalities, such as fixed or removable dentures, tooth-supported prosthesis, and implant-supported prosthesis. However, all the treatment modalities have their own advantages and limitations.[5] Removable complete dentures or partial dentures have been the traditional treatment choice for patients with missing teeth for almost a decade. Although removable dentures have fair-to-good patient acceptance, many patients experience difficulty with speech and mastication, denture instability, and loss of retention, which may lead to further residual alveolar ridge resorption.[6] The use of fixed partial denture (FPD) is limited due to removal of substantial amount of tooth structure which may result in hypersensitivity, inability to maintain a proper oral hygiene, and sometimes may pose increased risk for endodontic treatment.[5]

Implant-supported prosthesis has become a treatment of choice in patients with missing teeth in recent years. Dental implant therapy has met with enormous clinical success and is considered as standard treatment option by some clinicians.[7] The use of dental implant has risen to such an extent that around 100,000 to 300,000 implants

are placed per year, which almost equals the numbers of artificial hip and knee joints placed per year.[8]

Thus said, implant-supported prosthesis seems to be widely accepted as a prosthetic treatment option for patients with complete or partially edentulous jaws because of the advantages they possess.[9] The conservation of abutment tooth structure, peri-implant bone protection from resorption, greater stability, improved masticatory efficiency, and positive impact on the overall oral health quality of life have made dental implant therapy a more preferable option compared with other treatment modalities.[10] However, treatment decisions cannot be performed based on the clinical examination or dentist's opinion alone, but it is mandatory that treatment decisions should be finalized in closed consultation with patients.[11] In several cases, the final decision-making depends on financial status, level of education, awareness, and knowledge about various treatment modalities available to the patients.[12] Also, pain or dental phobia plays a significant role in the final decision-making.[5,13] Several studies have been done in different regions with regard to the knowledge and awareness of dental implant treatment modality.[10,12,14-17] The awareness level of dental implant treatment approach varies among these studies and in different countries. These studies should be performed on a regular basis so as to provide information to the clinicians to assess patient's perception regarding awareness, knowledge, informative sources, and their acceptance level of implant treatment.

Consequently, the aim of the present study was to assess the patient's knowledge, source of information and acceptance level regarding dental implant treatment modality in Aseer region, Kingdom of Saudi Arabia.

MATERIALS AND METHODS

This cross-sectional study was a questionnaire-based survey. Before the start of the survey, ethical permission was sought from the Ethical Research Committee at the Department of Prosthodontics, Riyadh Elm University, Riyadh, Kingdom of Saudi Arabia, with registration number FPGRP/43332002/92. The survey was conducted during the month of August and September 2014 at five government dental centers in Aseer region.

The patient's knowledge, awareness, sources and level of information, and acceptance regarding dental implants treatment modality were assessed using a structured questionnaire based on previous studies.[9,18] The questionnaires were modified according to the study population and translated into local language to obtain more precise information. A pilot study involving 25 patients was conducted to evaluate the adequacy of the questionnaires.

The sound and healthy participants above the age of 15 years who willingly accepted to participate in the survey were included. The questionnaires comprised of 18 closed-ended questions based on three sections, namely (a) demographic data, (b) level and source of information about dental implants, and (c) acceptance of dental implants as a treatment option. The questionnaires were handed by the respective dentists at the dental centers to the patients during their routine dental visits. Any patients who had not heard about dental implants abstained from filling the remaining part of the questionnaire. However, the data were included in the analysis to determine the percentage of individuals who completely lacked knowledge about dental implants.

All the data obtained were analyzed using Statistical Package for the Social Sciences version 20 statistical analysis software. Descriptive statistics were presented as percentages and proportions. Chi-square tests were performed to determine any association between variables. In all the tests, level of statistical significance was set at $p < 0.05$.

RESULTS

Table 1 presents the overall survey data of the participants (n, %).

Demographic Data of Participants and Their Awareness of Dental Implants

A total of 500 survey questionnaires were distributed out of which 479 (95.8%) questionnaires were complete and the remaining 21 (4.2%) questionnaires were excluded due to incomplete data. Among the participants, 157 (32.8%) were in the age group of 15 to 25 years, 140 (29.2%) in the age group of 26 to 35 years, 89 (18.6%) in the age group of 36 to 45 years, 57 (11.9%) in the age group of 46 to 55 years, and 36 (7.5%) were over 55 years of age; 292 (61.0%) participants were males as compared with 187 (39.0%) females. The educational level of 211 (44.1%) participants was high school and below, 103 (21.5%) were diploma holders, and remaining 165 (34.4%) had bachelor degrees and above. Among the participants, 415 (86.6%) of indicated to have heard of dental implants while 64 (13.4%) respondents had not significant association between those who had heard about dental implant and the level of education ($p < 0.05$). Table 2 presents the demographic data of participants and their dental implant awareness.

Level and Source of Information About Dental Implants

The questions related to the level of information they have with regard to dental implant showed that 231 (55.7%) participants thought that they are fixtures in the jawbone, 128 (30.8%) believed that they are posts in the

Table 1: Survey analysis presenting questions and their respective n (%)

Questions	*n (%)*	*Questions*	*n (%)*
(1) Age (in years)		(11) Would you like your dentist to provide implant treatment?	
• 15–25	32.8	• Yes	88.7
• 26–35	29.2	• No, only specialists should insert implants	11.3
• 36–45	18.6	(12) From where have you heard of dental implants?	
• 46–55	11.9	• Newspapers	6.0
• >55	7.5	• Magazines	5.0
(2) Gender		• TV/radio	5.0
• Male	61.0	• Known person with implants	28.9
• Female	39.0	• Dentist	34.7
(3) Level of education		• Internet	20.4
• High school and below	44.1	• Others	0.0
• Diploma	21.5	(13) Would you like to know more about implants?	
• Bachelor and above	34.4	• No	9.9
(4) Have you heard about dental implant		• Yes (from where would you like to get the information)	90.1
• Yes	86.6	– Newspapers/magazines	6.4
• No	13.4	– TV/radio	11.8
(5) What do you think are dental implants?		– Relatives and friends	7.2
• It is a post in the root	30.8	– Dentist	57.8
• It is a fixture in the jawbone	55.7	– Internet	16.8
• It is a natural tooth	13.5	– Others	0.0
(6) Where in the mouth do you think implants are anchored?		(14) Have you lost one or more teeth in the past?	
• In the gum	21.7	• No	38.3
• In the jawbone	56.6	• Yes (If yes, how many)	61.7
• In/on neighboring teeth	6.3	– 1–3	68.8
• Do not know	15.4	– 4–5	19.5
(7) Do you think systemic and oral health of patient is important when considering implant therapy?		– 6–10	6.6
• Yes	84.3	– More than 10	2.0
• No	12.8	– Almost all teeth	3.5
• Do not know	2.9	– All teeth	1.6
(8) What do you think about implants care and hygiene compared with natural teeth?		(15) Did you have your missing teeth replaced?	
• Cleaned like natural teeth	35.7	• No	65.1
• Need less care than natural teeth	58.3	• Yes (If yes, with what treatment options)	34.9
• Need more care than natural teeth	6.0	– Crowns, bridges, adhesive bridges	50.3
(9) How long do you think an implant lasts?		– Metal-based removable dentures	24.8
• Up to 5 years	11.6	– Full-arch dentures	6.9
• Up to 10 years	4.1	– Implant-supported bridges/dentures	17.9
• Up to 20 years	8.4	(16) Assume you would lose some teeth. What kind of treatment do you prefer to replace missing teeth?	
• For a lifetime	37.8	• Removable dentures fixed prosthesis	6.5
• Do not know	38.1	• Teeth-supported fixed prosthesis	27
(10) Do you think your dentist used the most up-to-date implant techniques?		• Implant-supported fixed prosthesis	66.5
• Yes	54.9	(17) What do you think is the most common cause that prevents the patient to replace the missing teeth with dental implant?	
• No	39.3	• High cost	41.5
• Do not know	5.8	• Surgery risk	13.5
		• Long treatment duration	12.0
		• Scared of unknown side effect	33.0

root, and 56 (13.5%) participants thought it is a natural tooth. Participants with diploma and bachelor degrees selected appropriate answers and it was significant ($p < 0.05$) compared with participants with high school education.

For the information regarding dental implant placement, 235 (56.6%) participants answered that the dental implant is placed in the jawbone, while 90 (21.7%) thought it is placed in the gums, 26 (6.3%) in the neighboring teeth, and 64 (15.4%) of the participants did not know where the dental implants are placed. A significant association ($p = 0.025$) between the level of education and the appropriate answer was observed.

In all, 350 (84.3%) of the participants believed that the patients' systemic and oral health was important when considering implant therapy, and 53 (12.8%) were

Table 2: Demographic data of participants and their awareness of dental implants

	All participants (479)		*Awareness of implants (415)*		
Groups	*n*	*%*	*n*	*%*	*p-value*
Sex					
Male	292	61.0	251	86.0	0.680
Female	187	39.0	164	87.7	
Age categories (years)					
15–25	157	32.8	129	82.2	0.100
26–35	140	29.2	126	90.0	
36–45	89	18.6	76	85.4	
46–55	57	11.9	54	94.7	
>55	36	7.5	30	83.3	
Level of education					
High school or below	211	44.1	172	81.5	0.012*
Diploma	103	21.5	92	89.3	
Bachelor and above	165	34.4	151	91.5	

*Significant association between those who had heard about dental implant and the level of education

not aware of such importance. A significant association between the level of education and the appropriate answer was observed ($p < 0.05$).

The information regarding ideal care and hygiene of dental implants showed that 148 (35.7%) participants answered implants should be cleaned similar to natural teeth, 242 (58.3%) answered that implants need more care than natural teeth, while 25 (6.0%) said that it needed less care than natural teeth. Participants with diploma and bachelor degrees thought that dental implants need more care than natural teeth ($p < 0.05$).

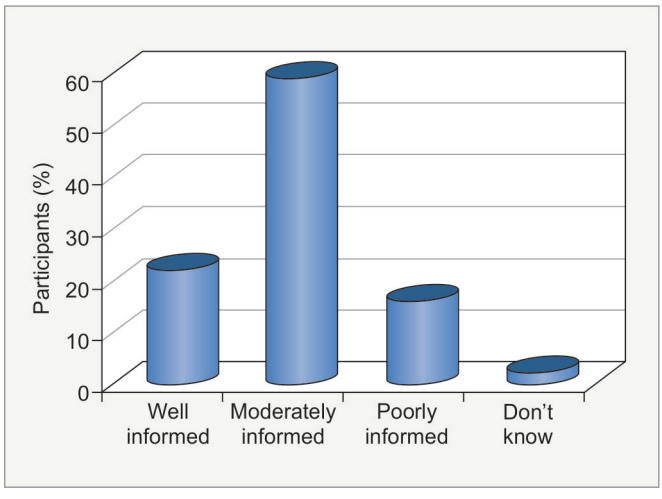
From the questions that assessed the respondents' level of information about dental implant, 92 (22.2%) of those who had heard about dental implants were well informed about dental implants, 246 (59.3%) of them were moderately informed, 67 (16.1%) of them were poorly informed and 10 (2.4%) were not informed about dental implants (Graph 1).

Significant relation was seen between the level of information and the level of education ($p < 0.05$). The level of information increased with the level of education. However, no significant association was observed with the level of information and gender or age groups ($p > 0.05$).

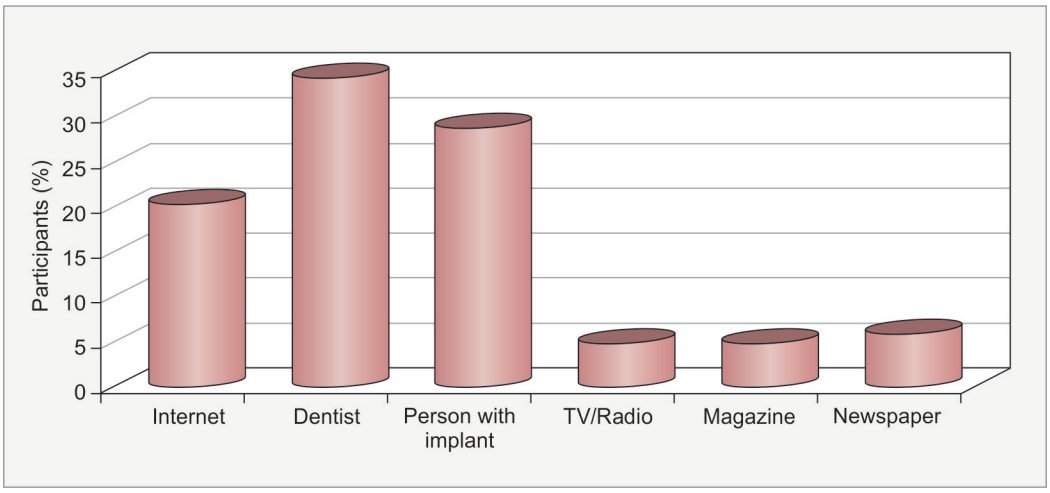
For the information regarding the survival rate of dental implants, 17 (4.1%) participants felt that survival rate is 5 years, 48 (11.6%) up to 10 years, 35 (8.4%) up to 20 years, whereas 157 (37.8%) participants expected implants to last for a lifetime, and 158 (38.1%) participants did not know about the survival rate.

In all, 228 (54.9%) of the participants thought that their dentist used the most up-to-date implant techniques, while 163 (39.3%) of them did not have any idea about the technique. Similarly, 368 (88.7%) participants felt that implants should be inserted by specialists only, while 47 (11.3%) were willing to have their dentists to provide them with dental implant treatment.

The sources of implant information are presented in Graph 2. Dentists were the major source for 144 (34.7%) participant's information, followed by people with



Graph 1: Patients' level of information regarding dental implant



Graph 2: Sources of dental implant information

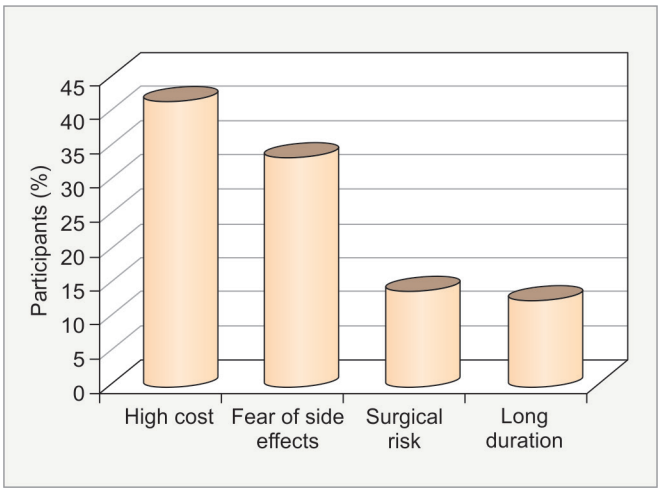
previous implant therapy, 120 (28.9%). About 374 (90.1%) of the surveyed participants were interested in having more information about dental implants.

Patients' Acceptance of Dental Implants

Almost 256 (61.7%) participants had lost at least one tooth and 159 (38.3%) participants had all their teeth intact. No significant difference was seen between male and female participants. However, there was a significant difference between age and level of education ($p < 0.05$). Participants with higher education level had less tooth loss compared with participants with lower education level. Also, older participants had lost their teeth compared with their younger counterparts. Only 145 (34.9%) participants out of 256 had their missing teeth replaced. There was a significant difference between ages of the participants ($p < 0.05$). Patients older than 46 years replaced their missing teeth more often than younger ones.

With regard to the question on replacing missing tooth by prosthesis, 73 (50.3%) participants had tooth-supported fixed prostheses, 36 (24.8%) had removable partial dentures, 10 (6.9%) had complete dentures, and 26 (17.9%) participants had implant-supported prostheses. Majority of the sample population [276 (66.5%)] believed that dental implants are the best treatment choice in replacing missing teeth, while 112 (27.0%) preferred tooth-supported FPD, and 27 (6.5%) of them preferred removable dentures. There was no significant difference between demographic variables.

The reason for abstaining from dental implant therapy showed that 172 (41.5%) participants felt it was costly, followed by fear of unknown side effects in 137 (33%) participants, the need for surgery in 56 (13.5%) participants, and long duration of treatment in 50 (12%) participants (Graph 3). There was no significant difference between demographic variables.



Graph 3: Participants' reason for refraining from dental implant therapy

DISCUSSION

To the best of the author's knowledge, this is the first study to assess patients' awareness and level of information regarding dental implants as an option in replacing missing teeth in Aseer region, Kingdom of Saudi Arabia. Overall, this was the second study in the country, the first being conducted by Al-Johany et al[9] in Riyadh region. The literature search regarding dental implant awareness studies provided a perception of possible disadvantages and limitations of previous studies, which include variable sample size, technique of interviewing the participants, and the selection of participants. In the present study, a hand-out questionnaire was designed and distributed to the patients who were on routine dental visit. This technique increased accessibility and also the rate of participation and response.

The awareness of dental implant therapy among the participants in our study was in close agreement with the previous similar studies by Zimmer et al,[19] Pommer et al,[20] and Al-Dwairi et al,[21] who reported dental implant awareness of 77, 79 and 96%, respectively. However, the present study showed a significantly higher awareness rate compared with other studies by Chowdhary et al,[22] Saha et al,[16] Suprakash et al,[17] and Ozçakır Tomruk et al.[15] The authors reported dental implant awareness rate of 23.24, 41.7, 33.3, and 43.5% respectively. Also, a study by Al-Johany et al[9] in Riyadh, Kingdom of Saudi Arabia, the first in the region, showed a significantly low awareness rate of 66.4% in comparison with our study. The difference in the outcome of our study from those of previous studies could be related to the shortage of implant dentistry in the dental clinics especially in developing areas, a difficulty in having direct access with dentists to have the information or may be the dentists themselves do not have or provide information about dental implants to their patients.[16]

The level of awareness is also influenced by area of residence, age, gender, high income, and level of education. In this study, the demographic variables (age, gender, and level of education) were considered to affect the patients' awareness about dental implants. It was shown that high level of education increased the implant awareness among the participants. The gender did not influence the awareness rate which was similar to that reported by Pommer et al.[20] In contrast, other studies[21,22] have reported increased awareness among female participants, while few studies[16,17] showed increased awareness among male participants.

The information about dental implants can be provided by different sources that may also help to promote implant therapy as a treatment option for replacing of missing teeth.[21] The main source of information for dental implant in this study was dentist, which was also similar

to the previous studies which also reported that most of the population were made aware about implants by the dentists.[9,16,19] However, few studies reported that the main source of dental implant information was media.[23-25] In other study by Akagawa et al,[26] it was reported that source of information from dentist was not more than 20%, in contrast to 34% in our study. The information sources other than dentist may sometimes be contradictory due to incomplete or inaccurate information supplied by media and implant industries, which are mainly market-oriented and does not reflect evidence-based practice.[12]

Among the surveyed participants, more than 90% were interested to have more information about dental implants. Dentists were preferred to provide information about dental implants in about 57.8% participants, which was in agreement with previous reported studies.[9,15,17,21] Regarding the treatment options for replacement of missing teeth, most of the participants (66.5%) preferred treatment by implant therapy which is in agreement with previous studies which reported 61.5%.[9,21] The low preference of the participants (6.5%) for removable prosthesis in this study showed that patients were not reluctant in getting removable appliances for replacing their missing teeth regardless of the clinical situation. Fixed partial dentures were preferred by 27% of the participants in case of missing teeth. This could be due to the high cost of implant therapy as also reported by previous studies.[9,15,17,19,20] Apart from high cost, participants refrained from getting implant therapy due to unknown risk or side effects and surgical need. This issue needs to be addressed by the dental professionals by providing more accurate and specific information regarding dental implants. Also, it is important for the dentists in explaining different treatment options and how quality of life could be improved by dental implant therapy. The high cost of dental implant therapy needs to be considered by dental insurance companies' as well respective health authorities to be included in insurance plan.

CONCLUSION

The majority of the Saudi dental patients in Aseer region of Kingdom of Saudi Arabia had heard about dental implants as an option in replacing missing teeth. A moderate level of information about dental implants was seen for about half of the studied population. However, the dentists should provide accurate information to the patients regarding implant therapy, irrespective of the patients' willingness to undergo therapy or not. High treatment cost for dental implant therapy is the main reason for patients refraining from implant therapy, which needs intervention by insurance companies and respective health authorities.

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