



Awareness and knowledge of the general public at southern region of Saudi Arabia regarding dental implants

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Abstract:

Aims: To assess the awareness, knowledge, and information sources regarding dental implants as an option of treatment to replace missing teeth among patients in Jazan Province, Saudi Arabia.

Materials and methods: The current study consisted of 14 questions used to assess the patients' awareness, expectations and level of knowledge of dental implants. Three categories of questions were used, with the first one related to the patients' knowledge and options for replacement of missing teeth, the second about dental implants and their providers, and the third on the techniques, materials, care, and durability of dental implants. The collected data was analyzed using Chi-square tests, and P values less than 0.005 were considered significant. **Results:** A total of 380 subjects were divided into two groups, medical (40.3%) or non-medical (59.7%) related. We found that 85% and 71.0% of the medical and non-medical subjects, respectively know the importance of replacement of missing teeth, while 50% had known the different types of dental implants with no significance ($P < .001$) between the two groups. Dentists were the sources of the information (43.3% and 34.8% for the medical and non-medical groups respectively). Around 50% of the medical subjects thought that dental implants came with a screw compared with 36.6% of non-medical subjects with value of $P .025$. In total, 60%-70% of respondents from both groups answered that dental implants should be provided by specialists only. Around 29% of all patients cited "lifetime" as the survival period of implants. Also, 52%-77% of the respondents related the implant site to the "the jaw bone," with significant difference of $P .000$.

Conclusions: The awareness and knowledge of the subjects were acceptable with higher percentage among respondents in the medical group. Dentists followed by friends were the main sources of information for dental implants. Dental implants are considered as the best choice for replacement of missing teeth with excellent durability and need of much more special care than natural teeth.

Key words: awareness, dental implants, knowledge, treatment options, tooth replacement

Introduction:

For many years, the most commonly used prosthetic option to replace missing tooth was fixed dental prostheses (FDPs). However, the preparation of the two abutment teeth causes unnecessary hard tissue loss. Subsequently, implant-supported FDPs have been developed as an effective solution for this situation.^{1,2} For practicing dentists, it is imperative to know whether patients today are aware of dental implants as a treatment option and whether the information that they have is close to reality. Awareness among patients regarding the procedure can help in

eliminating any negative image of the procedure that may have been caused due to the lack of adequate communication.³

Previous local studies found that the level of knowledge and awareness of individuals about dental implants was low in the Assier regions (21.7%) and Sudan (28.5%) and high in Alkharj towns (77.7%) and Kuwait (96.4%).⁴⁻¹¹ In different countries, the awareness was 60.9% in Turkey, 39.8% in Pakistan, 52.6% in Nepal, 85% in America, and 79% in Austria.¹²⁻¹⁶ In India, different surveys resulted in different percentages (25%–33%).¹⁷⁻¹⁹ In a single study among health workers in Nigeria, only 7.2% of the

subjects had knowledge and awareness about dental implants as a choice for replacement of missing teeth.²⁰ Majority of the previous studies mentioned that dentists are the major sources of information regarding dental implants, followed by friends.^{4-8, 10, 12-19} Few studies investigated the knowledge of patients about the survival rate and the durability^{5,6,15,17} and the site of dental implants.^{6,14} Hence, the present study aimed to assess the awareness, knowledge, and information sources of dental implants as an option of treatment to replace missing teeth among patients in Jazan Province, Saudi Arabia (SA).

Materials and Methods:

The current cross-sectional study was conducted in full accordance with the World Medical Association Declaration of Helsinki. The Ethics Committee of the Director of Health Affairs in Jazan Region approved the study proposal. A standardized questionnaire with 14 questions was developed to assess the patients' awareness, expectations, and level of knowledge regarding dental implants. The survey was conducted between March and April 2018 among patients at the governmental dental clinics in the Jazan region. The questionnaire was adapted from previous studies^{12,15,16} conducted with some modifications and includes demographic data such as job (medical and non-medical related), gender, age and education level. It consisted of three categories: the first was the subjects' knowledge about dental situations and options for the replacement of missing teeth, the second was about information on provider and dental implants, while the third was information about techniques, materials, care, and durability of dental implants. Each category consisted of groups of questions. The patients answered the questionnaires after signing the written consent form. The questionnaires were handed to the patients by a dentist during

their regular dental visits. The collected data was analyzed by using SPSS version 20.1 for Windows (SPSS IBM, Inc., Chicago, Illinois, USA). Descriptive statistics and Chi-square test were performed, and P values less than 0.05 were considered significant.

Results:

A total of 380 respondents answered the questionnaires during the study period. **Table I** summarizes the demographic data of the subjects, of which 291 were males (76.6%) and 89 were females (23.4%) with mean age of 30.5 years and standard deviation of 8.62. The respondents were grouped according to whether they have a medical-related job (153; 40.3%) or a non-medical-related job (227; 59.7%). Three groups were recorded according to age, which are 18-30, 31-44, and ≥ 45 years old. Five subgroups were registered according to level of educational attainment: under secondary school, secondary school, higher diploma, bachelor's degree, and post-graduate degree.

A total of 130 respondents from the medical group (85%) and 161 from the non-medical group (71.0%) considered replacing missing teeth as "very important," whereas only 14 respondents from the medical group (9.1%) and 59 respondents from the non-medical group (25.9%) reported teeth replacement as "not important at all." In terms of the respondents' level of information of different options to replace missing teeth, around 50% from the medical and non-medical groups knew the options with no significant differences $P .466$. Over 30% of the interviewed subjects among the medical and non-medical groups knew the advantages of removable and non-removable prostheses. This percentage increased to over 40% or more when asked whether they would be as good as their own teeth in terms of function. Between

42% and 58% of the respondents knew well the differences between the effects of implant treatments in comparison with common prostheses, whereas only 26%-30% said that they had no idea, with statistical differences $P < .005$ (**Table II**).

In terms of the information level of respondents on dental implants and their provider, around 80% or more of respondents from both groups subjectively reported that they were very well informed about dental implants, whereas only 13% and 21.1% of the medical and non-medical subjects, respectively, answered "no." The information sources of respondents from medical and non-medical groups, 43.3% and 34.8%, respectively, were from the dentist ; 25.5% and 35.2% of the respondents from medical and non-medical groups, respectively, obtained information from their friends and acquaintances, and more than 20% of respondents from both groups had the internet as their source. Only 5%-7% from both medical and non-medical groups obtained information from social media. Around 50% of the respondents from the medical group thought that dental implants came in as a screw compared with 36.6%

of respondents from the non-medical group. Less than 30% of respondents from both groups heard about implants but could not explain them. Respondents in the medical group were more likely to report that their dentist should be qualified (78.4%) compared with 54.1% of respondents from the non-medical group. Non-medical group respondents (34.4%) said that dental implants need specialists compared with 17.6% in the medical group. Around 60%-70% of respondents from both groups reported that dental implants should be provided by specialists only. No significant differences were observed between all factors except, in the response where respondents said that dentists who provide implant treatment were better qualified $P < .005$ (**Table III**).

In relation to the technique, materials, and durability of dental implants (**Table-IV**), the interviewees were asked how long they expect the implant would last. Around 29% of medical and non-medical group respondents cited that implants would last for a 'lifetime,' 17%-19% reported "between 5 and 10 years," and 32%-36% reported 'not sure'.

Table I: Demographic data of the subjects

Factors		Number	Percentage
Gender	Male	291	76.6
	Female	89	23.4
Job	Medical	153	40.3
	Non-medical	227	59.7
Age in years	18-30	225	59.2
	31-44	127	33.4
	≥45	28	7.4
Education	Under secondary school	26	6.8
	Secondary school	61	16.1
	Higher diploma	57	15.0
	Bachelor's degree	226	59.5
	Post-graduate	10	2.6

Table II: Dental situation and options for replacement of missing teeth

Parameter/question	Medical	Non-medical	'P' value	
Do you think the replacement of missing teeth is important?				
	Very important	130 (85.0%)	161 (71.0%)	.000*
	Somewhat important	9 (5.9%)	2 (0.9%)	
	Neither important nor unimportant	0 (0.0%)	5 (2.2%)	
	Not important at all	14 (9.1%)	59 (25.9%)	
Do you know the different ways of replacing missing teeth?				
	Yes	77 (50.3%)	112 (49.3%)	.466
	No	76 (49.7%)	115 (50.7%)	
In your view, what are the advantages of non-removable versus removable dentures?				
	Less annoying in the mouth	54 (35.3%)	56 (24.7%)	.000*
	Aesthetic (looks nicer)	19 (12.4%)	60 (26.4%)	
	As good as one's own teeth in function	70 (45.8%)	73 (32.2%)	
	Doesn't feel like a foreign body	10 (6.5%)	38 (16.7%)	
How do the effects of implant treatment compare with those of common prostheses treatment?				
	More	88 (57.5%)	94 (41.4%)	.000*
	Similar	8 (5.2%)	50 (22.0%)	
	Less	16 (10.5%)	14 (6.2%)	
	No idea	41 (26.8%)	69 (30.4%)	

Table III: Questions on information about provider and dental implants

Parameter/question	Medical	Non-medical	'P' value	
Have you ever heard about dental implants?				
	Yes	133 (87.0%)	179 (78.9%)	.029
	No	20 (13.0%)	48 (21.1%)	
If yes, where did you get the information about implants?				
	Dentists	67 (43.8%)	79 (34.8%)	.176
	Friends and acquaintances	39 (25.5%)	80 (35.2%)	
	Internet sources	39 (25.5%)	52 (22.9%)	
	Radio or TV (social media)	8 (5.2%)	16 (7.1%)	
How would you describe a dental implant?				
	Screw	76 (49.7%)	83 (36.6%)	.025
	Piece of metal	21 (13.7%)	39 (17.2%)	
	Heard about it, but cannot explain it	40 (26.1%)	65 (28.6%)	
	Never heard about it	16 (10.5%)	40 (17.6%)	
Do you think that a dentist who provides implant treatment is better qualified than his/her colleagues who do not?				
	Yes	120 (78.4%)	123 (54.1%)	.000*
	Need specialist	27 (17.6%)	78 (34.4%)	
	Do not know	6 (4.0%)	26 (11.5%)	
Would you like your dentist to provide dental implants?				
	No answer	14 (9.2%)	58 (25.5%)	.001
	Only by specialists	111 (72.5%)	134 (59.0%)	
	Yes	28 (18.3%)	35 (15.5%)	

Table IV: Information about techniques, materials, care and durability of dental implants

Parameter/question	Medical	Non-medical	'P' value
How long do you think a dental implant lasts?			
Lifetime	44 (28.8%)	66 (29.1%)	.564
Between 5 and 10 years	30 (19.5%)	39 (17.2%)	
More than 10 years	24 (15.7%)	48 (21.1%)	
Not sure	55 (36.0%)	74 (32.6%)	
Where do you think dental implants are placed?			
In the bone	117 (76.5%)	117 (51.5%)	.000*
In the gums	23 (15.0%)	71 (31.3%)	
Within neighboring teeth	3 (2.0%)	19 (8.4%)	
The neighboring teeth	10 (6.5%)	20 (8.8%)	
Do you think dental implants need special care and hygiene compared with natural teeth?			
Much more than natural teeth	76 (49.7%)	83 (36.6%)	.063
Same as natural teeth	21 (13.7%)	38 (16.7%)	
Very little care is required	39 (25.5%)	66 (29.1%)	
No special care is required	17 (11.1%)	40 (17.6%)	
What materials are dental implants made from?			
Porcelain	43 (28.1%)	66 (29.0%)	.455
Stainless steel	31 (20.2%)	36 (15.9%)	
Titanium	24 (15.7%)	51 (22.6%)	
Ceramic	55 (36.0%)	74 (32.5%)	
Do you think your dentist uses up-to-date implant techniques?			
Yes	45 (29.4%)	76 (33.5%)	.628
No	23 (15.0%)	36 (15.8%)	
Do not know	85 (55.6%)	115 (50.7%)	

When the subjects were asked on where the implants were placed, 52%-77% said 'the jaw bone', 15%-30% reported "the gums," and 2%-9% thought 'within or in the neighboring teeth'. Results indicate that among interviewees with medical and non-medical related jobs, 49.7% and 36.6% considered that implants needed a much more special care than natural teeth, 25.5% and 29.1% answered that implants needed little care, and 11.1% and 17.6% reported that no special care of implants was needed, respectively. Respondents in the medical group identified porcelain (28.1%) and ceramic (36.0%) as the materials used in manufacturing dental implants compared with 29.0% and 32.5% among respondents from the non-medical group ($P < .0001$). Only between 15% and 20% had selected stainless steel or titanium as the materials of choice for

dental implants among both groups ($P < .0001$). Over 50% from both groups did not know whether their dentist used up-to-date implant techniques, while 29.4% of respondents from the medical group and 33.5% respondents from the non-medical group answered that their dentist used up-to-date implant techniques. No significant correlations were observed between all factors except the question regarding the position of the dental implants, which was significant $P.005$.

Discussion:

The positive outcomes of dental implants have been confirmed by various studies conducted ever since dental implants were introduced. Thus, it is important to know the knowledge and awareness of patients toward the use of dental implants as a choice for treatment of extracted teeth.

This survey was conducted among respondents from Jazan town with medical and non-medical related jobs to assess their knowledge, awareness, and sources of information about dental implants. The survey was carried out by using a simple questionnaire given to patients attending different types of dental clinics. **Table I** shows that the current study had more male than female respondents. This coincided with the findings of many previous studies^{4-6,12,17}. Also, most of the respondents (60%) had bachelor's degrees, and similar percentages were recorded in other studies conducted in SA.^{4,6}

In developing countries, people's awareness and knowledge about different options for replacement of missing teeth is still growing, and this was confirmed by the result of this survey (**Table II**). Replacing missing teeth is important in around 80% of our subjects, and only 50% of them know the different types of prostheses used for replacing missing teeth. These percentages have been recorded in other studies in SA.⁴⁻⁸ Similar results were obtained in different studies, in which they registered high percentages of respondents who said that non-removable prostheses have better aesthetics and function compared with removable ones^{5,8,17}. Also, 41.4%-75.7% of the respondents felt comfortable with the idea of using implanted prostheses comparing with other types, which was in good relation to the respondents' level of education. A high educational attainment resulted in more knowledge about dental implants.^{4,6,15,18,20}

In this study, the patients were examined face to face by our investigators, and hence the results were more accurate as compared with other methods of data collection, such as using mails, handouts, or phone interviews. The percentage of the subjects was high and represented more than 80% regarding the knowledge about dental implants as treatment option for the replacement of missing teeth among both

groups. This is close to the percentages obtained in many studies.^{4,5,10,11,15,16} However, it was higher than the results obtained in studies conducted in SA⁶⁻⁹ and in India¹⁷⁻¹⁹ and much higher than a single study conducted in Nigeria, which registered only 9.7% of health-worker respondents who have knowledge of dental implants. This can be explained by the socio-economic status and monthly income of the respondents (**Table III**).

Regarding the source of information about dental implants, the findings of this study were higher compared with the other studies conducted in SA or other places, in which dentists and friends are still the major sources of information about dental implants irrespective of the internet and social media.^{4-8,10, 12-19} The current study suggests that a low percentage of people (30%) are aware that implants should be provided only by specialists, and the results between the medical and non-medical groups are not significant, indicating the need for greater education of the general public. Other studies registered two-fold higher percentage compared with our findings,^{8,15} while similar percentage was obtained in¹⁴ 32.6% (**Table III**).

Table IV shows the survey results about the materials, care, and durability of dental implants. In the current study, 30% of subjects in Jazan from both groups answered that implant-retained restorations have a lifetime durability. This is close to the percentage registered in Riyadh, SA (30%), and America (40%)^{6,15} but lesser than the percentages registered in Turkey (60%) and Riyadh, SA (51.3%)^{12,5} and higher than in studies conducted in Austria (24%) and India(15%)^{16,17}. In the current study, 76.5% of the subjects from the medical group and 51.5% from the non-medical group answered that the jaw bone is the site of the dental implant, which is a realistic answer, and the percentage was near to that obtained among subjects in Riyadh, SA (80%) and higher than the

results obtained in studies in Turkey (52.5%) and Nepal (24.5%).^{12,14}

The oral maintenance of healthy tissue around the dental implants is a key factor to obtaining long-term success. Dental hygiene and care including using soft toothbrushes, interproximal brushes, specially designed cleaning instruments made from hard plastics, and mouth rinses help to prevent peri-implant disease. In the current study, 49.7% of subjects in the medical and 36.6% in non-medical groups reported that implants require more care, and only 13.7%-16.7% would clean their implants similar to natural teeth. These findings were consistent with the results obtained from Nepali patients (31.3%) and lower than the percentage (92%) obtained from American patients.¹⁵ This can be explained by the education level of the respondents and the high cost of dental services in their country. Dental hygienists and oral hygiene providers should explain to their patients the importance of dental hygiene and care before implant therapy and educate and motivate them to provide sufficient dental care for the maintenance of implants. In a previous study, the respondents were asked regarding the materials used for the construction of dental implants, and their answers and their frequency were as follows: porcelain (37%), titanium (43%), stainless steel (11.5%), and ceramic (5.5%).¹⁵ These percentages were lesser than our findings for porcelain and titanium (28.5% and 5.5%) but higher in stainless steel and ceramic (18% and 34.3%), respectively. In another study, 32.3% of the respondents answered about using up-to-date techniques¹⁴, which was close to the result obtained in the current study (31.5%). One of the limitations of the current study is the small sample size, which is not the representative sample of the population of the Jazan region. As our aim was to assess the awareness of the patients visiting the public clinics, this limitation could be ignored. Another factor that could have

affected the results is that this study was conducted among free polyclinics of the government, which are non-private dental hospitals, and a majority of the subjects belong to the middle and low-income population.

Conclusion: From the results of this study, we conclude an acceptable level of awareness and knowledge (50%) about dental implants as a choice for replacement of missing teeth among both groups, with 40% of the respondents who know the advantages of the different types of implants for replacing loosened teeth. Between 35% and 44% of respondents from both groups reported that dentists were the sources of information followed by friends (30%). Around 60%-70% of respondents from both groups reported that dental implants should be provided by specialists only. Around 29% of medical and non-medical subjects cited "lifetime" as the expected durability of the implants, and between 52% and 77% mentioned that the jaw is the site for the dental implant. Around 40% of the subjects considered that implants need much more special care than natural teeth. The amount of information provided by general dental practitioners to the patients was very limited. Therefore, they should emphasize the importance of dental implants as a choice of treatment of missing teeth. Further surveys involving a larger study group and more parameters are needed to increase awareness and knowledge of patients toward dental implants.

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