

Awareness and Knowledge of Patients About Dental Implants as a Choice to Replace Missing Teeth in King Abdullah Medical City, Makkah, Saudi Arabia

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ABSTRACT

Aim: Assess the knowledge of patients about dental implants as a choice to replace missing teeth, in addition to measuring knowledge regarding contraindications and process of Dental Implants (DI).

Materials and methods: Cross sectional survey on 300 adult patients presenting to the dental and maxillofacial department OPD at KAMC in 2018

Results: 77.7% of participants had knowledge of implants before, with 80.3% agreeing on the importance of replacing missing teeth. 64.7% Preferred implant as prosthesis choice. There was a lack of knowledge among study population regarding process of dental implant insertion with only 39.3% knowing of the process and around half of them not aware of contraindications. Education level had a significant effect on awareness about dental implant.

Conclusion: More than three quarters of the population have some knowledge about dental implants and prosthesis through internet and media but many don't understand the process of procedure itself or the contraindication for it, more education is required for patients by dentist to acquire better knowledge.

Key words: Dental implants, Dental prosthesis, Public survey, Saudi population knowledge, Level of information, Sources of information

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INTRODUCTION

Tooth loss is a complex outcome that reflects an individual's history of dental disease and its treatment by dental services over the life course [1]. Severe periodontitis, which may result in tooth loss, is found in 5–20% of most adult populations worldwide. Effects of tooth loss have a negative impact on patients' quality of life especially if it affects well-being and appearance [2]. Multiple studies dealt with prevalence of tooth loss among Saudi population with result varying between 40.9% [3] to 73.3% [4]. Many countries of Africa, Asia and Latin

America have a shortage of oral health personnel and the capacity of the systems is generally limited to pain relief or emergency care. Public health problems related to tooth loss and impaired oral function are therefore expected to increase in countries more concerned with pain relief and emergency care. Tooth loss in adult life may also be attributable to caries and poor periodontal health [4]. The loss of natural teeth has been associated with functional, cosmetic and psychological problems for patients [5]. Dental implants are Prosthetic material that deals with the placement of artificial metal posts similar in shape to screws in the jaws to replace areas of missing teeth, and allow oral function and esthetics similar to original teeth. When dental implants are placed in the jaw bone, they bond to the natural bone. They become a sturdy base for supporting one or more artificial fixtures called crowns [6]. Dental implants are the only dental restoration option that preserves natural bone, they accomplish this by stimulation bone growth through Osteogenesis and Osseointegration. 1st modern titanium dental implants were placed in 1965

[7] and there has been increase usage of it over the years from (0.5%) in 1999 to (5.7%) in 2016 [8]. With increased implant usage it was important to measure the awareness of it among the world's population. Though there have been multiple international studies in European and American countries, the trend to study it in Saudi Arabia has been scarce and only emerged in the past decade with all studies taking place in the capital city of Riyadh [9-11]. Makkah is the 3rd most populace city in the country and a major part of the Makkah region, to the author's knowledge a study of this kind was never done in the western region of the Saudi Arabia. The Main aim of this study is to assess the knowledge of patients about dental implants as a choice to replace missing teeth, in addition to measuring knowledge regarding contraindications and the process of Dental Implants (DI) in the city of Makkah, Saudi Arabia.

MATERIALS AND METHODS

This cross-sectional study was conducted on 2018, with data being collected from September 2018 to October 2018 by the researchers. Inclusion criteria: Any patient attending KAMC dental and OMF clinics, exclusion criteria: Patients under the age of 18, patients refusing to participate, patient who can't read Arabic. Questionnaire was formulated by researchers based on papers of [9] and adjusted for easier data collection that suits the current population. Questionnaire contained 20 self-explanatory questions that concern demographic data "age, gender, education, smoking status" and information regarding awareness on dental prosthesis, implants, level of acceptance to implants, contraindication, source of information and process. Questionnaire was written in Arabic and was close ended with multiple choice questions. Patients attending the clinics would be asked for permission to participate in the study and read and signed the consent form before any data is collected. Questionnaire was anonymous and filled by participants and each participant was identified by serial study code and initials. These are linked to the patient's name and Medical Record number in a separate identification log sheet which was kept in a locked in an inaccessible unit. After verification, data was transferred to statistical data base. Data analyst was blind to participant's information and identity. A sample size was calculated using Fisher exact test based on previous available research [9,10] which requires a minimal 300 participants. Ethical approval of study was obtained from King Abdullah Medical City Institutional Review Board –IRB for study no. 18-465. An essential element of a chart review is a description of the process by which subjects and their protected health information will be managed and thus confidentiality maintained. The data was entered and analyzed using statistical package for the social science software (SPSS) software version 24. And the statistical significance will be at $p = 0.05$. Numeric data will be presented as Prevalence and percentages and Chi-Square would be used to assess association and significance.

RESULTS

The 300 participant were divided to 3 age groups "18-30", "30-40", "40+" with approximately similar numbers in each group. Demographic data show Majority (70%) had college education and (30%) had secondary or less education. Gender was almost equal with females being (54.3%). (70.7%) never smoked, (5.3%) were previous smokers and 72 participants were current smokers (Table 1). (72 %) of participants had lost a tooth or more previously (Table 2). (77%) of participants had heard of implants before (15%) had implants installed all results were significant (Tables 3 and 4).

When measuring knowledge and awareness, (83.3%) of participants knew about dental prosthesis, and (77.7%) had heard of implants previously. 241 participants knew of the importance of replacing missing teeth, while 16 didn't think it was important and 43 did know the importance of dental prosthetics. Over one third of participants said the dentists didn't inform them of the need for prosthesis post tooth extraction. More than half of participants stated that Dental Implants are the best oral prosthetic choice (64.7%), followed by Fixed prosthesis (38.3%) and finally Removable Dentures (5.7%). 250 Participants said they are willing to have implants if needed. A Large Majority (94.7%) agreed that Dental Implants Require the same Oral care as natural Dentition, all results were significant (Table 3).

The Source of knowledge differed significantly between participants, with internet and social media being a significant major source of information regarding Implants (40.3%), 2nd most common source of knowledge was the dentist with (37.3%) of participants choosing it (Table 5). Only (39.3%) of participants knew the process of dental implants insertion, but more than

Table 1: Characteristics of study population.

	N (%)
Age	
18-30	95 (31.7%)
30-40	105 (35%)
40<	100 (33.3%)
Gender	
Male	137 (45.7%)
Female	163 (54.3%)
Education	
Less than High school	49 (16.3%)
High school	44 (14.7%)
Colleague	207 (69%)
Smoking status	
Yes	72 (24%)
No	212 (70.7%)
Previous Smoker "how long since they quit"	16 (5.3%)
Total	300 (100%)

Table 2: Tooth loss prevalence.

Loss of one tooth or more	N (%)	Chi-Square	P-Value
yes	216 (72%)	58.08	0.000*
No	84(28%)		

*P- value <0.05 is significant

Table 3: Previous Knowledge on missing teeth replacement.

Previous Knowledge on Dental Prosthetics	N (%)	Chi-Square	P-Value
Yes	247 (83.3%)	125.453	0.000*
No	53 (17.7%)		
Previous knowledge on dental implant			
Yes	233 (77.7%)	91.853	0.000*
No	67 (22.3%)		
Previous knowledge on importance of replacing missing teeth			
Important	241 (80.3%)	301.186	0.000*
Not Important	16 (5.3%)		
I don't know	43 (14.3%)		
Were you previously informed by the dentist that prosthesis is needed post tooth loss			
Yes	194 (64.7%)	185.104	0.000*
No	103 (34.3%)		
Best option to replace missing teeth			
Fixed Prosthesis	115 (38.3%)	25.813	0.000*
Dental Implants	194 (64.7%)		
Removable Dentures	17 (5.7%)		
Choosing an implant as a dental prosthetics			
Yes	250 (83.3%)	133.333	0.000*
No	50 (16.7%)		
Do Dental implants requires oral care like natural dentition			
Yes	284 (94.7%)	239.413	0.000*
No	16 (5.3%)		

*P- value <0.05 is significant

Table 4: Previous dental implants in participants.

Previous dental implants	N (%)	Chi-Square	P-value
Yes	45 (15%)	360.38	0.000*
No	250 (85%)		

*P- value <0.05 is significant

Table 5: Source of knowledge on dental implants.

Knowledge about dental Implants	N (%)		P-Value
	Yes	No	
Dentist	112 (37.3%)	188 (62.7%)	0.000*
Family and Friends	106 (35.3%)	194 (64.7%)	
Internet and social Media	121 (40.3%)	179 (59.7%)	
Chi-Square	25.813		

*P- value <0.05 is significant

Table 6: Awareness of the dental implants surgery.

Process of Dental Implants	N (%)	Chi-Square	P-Value
Simple Procedure in Dental Clinic	118 (39.3%)	73.62	0.000*
Procedure requiring General anesthesia	31 (10.3%)		
Don't know	151 (50.3%)		
Implants possess high success rate			
Yes	171 (57%)	128.66	0.000*
No	13 (4.3%)		
I don't know	116 (38.7%)		

*P- value <0.05 is significant

half said it had a high success rate (57%) (Table 6). Those who objected to dental implant had stated fear of surgical procedure as the reason (10.7%), followed by high cost (3.3%) and lack of interest (3%) (Table 7).

Regarding Awareness of Contraindication to usage of dental implants, (47%) said they had no knowledge of

Table 7: Objection to dental implants.

	N (%)	Chi-Square	P-Value
No Objection	249 (83%)	542.747	0.001*
High Cost	10 (3.3%)		
Fear of Surgical procedure	32 (10.7%)		
No Interest in Replacing missing teeth	9 (3%)		

*P- value <0.05 is significant

Table 8: Awareness of contraindication to dental implants.

Aware of any Contraindication On D.I.	N (%)	Chi-Square	P-Value
Yes	108 (36%)	41.46	0.002*
No	51 (17%)		
I don't know	141 (47%)		
Is smoking a contraindication to dental implants			
Yes	101 (33.7%)	63.86	0.000*
No	43 (14.3%)		
I Don't Know	156 (52%)		
Are systematic diseases a contraindication to DI			
Yes	168 (56%)	115.44	0.000*
No	18 (6%)		
I Don't Know	114 (38%)		

*P- value <0.05 is significant

any general contraindication. (33.7%) said smoking is a contraindication with (52%) not knowing if its contraindicated. (56%) said that systematic chronic disease such as hypertension, diabetes and cancer are contraindication for implant placement, all results were significant (Table 8).

When Measuring Confounders, it was found education had a significant effect on knowledge on dental implants,

Table 9: Association between education level and knowledge on dental implants.

Education		Awareness of Dental Implants			Total	Chi-Square	Sig
		Yes	No				
Below HS	N (%)	31 (63.3%)	18 (36.7%)	49 (100%)	7.926	0.019	
High school	N (%)	33 (75%)	11 (25%)	44 (100%)			
College	N (%)	169 (81.6%)	38 (18.4%)	207 (100%)			
Total	N (%)	233 (77.7%)	67 (22.3%)	300 (100%)			

*P-value <0.05 is significant

Table 10: Association between education level and knowledge of importance of replacement of missing teeth.

Education		Importance of replacing Missing Teeth			Total	Chi-Square	Sig
		Important	Not Important	Don't Know			
Below HS	N (%)	37 (75.5%)	3 (6.1%)	9 (18.4%)	49	4.566	0.335
HS	N (%)	32 (72.7%)	2 (4.5%)	10 (22.7%)	44		
College	N (%)	172 (83.1%)	11 (5.3%)	24 (11.6%)	207		
Total	N (%)	241 (80.3%)	16 (5.3%)	43 (14.3%)	300 (100%)		

*P- value <0.05 is significant

Table 11: Association between education level and knowledge of contraindication of systematic diseases effect on implants.

Education		Importance of replacing Missing Teeth			Total	Chi-Square	Sig
		Yes	No	Don't Know			
Below HS	N (%)	26 (53.1%)	3 (6.1%)	20 (40.8%)	49	3.226	0.521
HS	N (%)	22(50%)	5 (11.4%)	17(38.6%)	44		
College	N (%)	120(58%)	10 (4.8%)	77 (37.2%)	207		
Total	N (%)	168 (56%)	18 (6%)	114 (38%)	300 (100%)		

*P- value <0.05 is significant

but it had no effect on knowledge of importance of dental prosthesis and contraindications (Tables 9-11).

DISCUSSION

The present study gives information about subjects' knowledge and their need for more information related to dental implants as an option in replacing missing teeth, in a selected sample of dental patients in KAMC, Makkah, Saudi Arabia. This specific group sample was selected for ease of access and to increase the response rate as they are dental patients who were approached during their regular dental visits in KAMC. Participants were representative of the Saudi gender population with females being around 54%. The age distribution was chosen randomly and it would have been more preferred to have continuous data or more interval categories but for ease of data collection it was limited to 3 age groups. The (72%) prevalence of tooth loss was comparable to study of [3] which was (73.3%). The subjective level of information about dental implants varies, but (77.7%) knew about dental implant as an option in replacing missing teeth. This is not different significantly from the results reported by [9,12,13] which reported the level of awareness as (77%), (70.1%) and (68%), respectively. The Saudi awareness level was far more significant than studies done in India at the same time with awareness level there only being at (17.8%) [14]. In a study done on a larger Saudi population in public locations [11] found that only (56%) of the population knew about implants, which is significantly less than the population taken from dental clinics.

Only (5.7%) of the subjects chose removable prosthesis as the best treatment in replacing missing teeth, which confirms the fact that most patients do not prefer removable prosthesis in replacing their missing teeth regardless of the clinical situation they have. Most of the patients felt that the fixed prosthesis gives a better feeling in the mouth and appears more natural. This result confirmed almost what was concluded by [15] and [9,10,12,14] that fixed prosthesis is esthetically more attractive than removable prosthesis and less annoying in the mouth.

This survey showed that, the main source of information about dental implant was the Internet and social media (40.3%), followed by the dentists (37.3%), and finally family and friends (35.3%). This is different than what were published before. As [9] found the most common information source to be the friends and family (31.5%) followed by the dentists at (28.3%), the difference in amount of knowledge (66.4% vs 77.7%) of method of information acquirement between the 2 Saudi studies might be due to the increased spread of internet use between the to the 2 periods of study. The survey made by [12] showed that, the news media was the main source of information about dental implants. The study also contradicted [10,11], which were the most recent studies done in Riyadh the capital of Saudi Arabia, that found that the dentist was the main source of information about implants with (34-41%) participants getting their knowledge from dentists, followed by family and friends (24-29.9%) and finally the internet at (17-21%).

(83.3%) wanted dental implants in comparison to

(93%) in [14] This study showed that the largest cause of rejecting implant was fear of procedure at (10%), the majority of other studies listed cost as the major reason for not getting implants [9-11,13,14] with cost representing (71%)(46-50%)(74.5%)(76.7%)(85%) of why patient didn't seek implants respectively. Fear was the 2nd most common cause to reject Implant in previous studies with it being a cause (20-46%) of times. This disparity of result between this current study and previous studies might be due to KAMC being a government free care hospital that doesn't charge for implants.

Despite the comparatively high level of awareness of dental implants, only (39.9%) of those questioned correctly knew how implants were placed, and (54%) knew about contraindications which reveals incomplete or incorrect information about dental implants even when being aware of this treatment option similar to [9,13] (54%) of participants in [13] didn't know the success rate of implants compared to (38.7%) in this study.

Association between higher Education and dental implant was significant similarly to [8] Though Multiple studies measured gender effect on awareness and acceptance, this study was unfortunately unable to perform this measurement at this study.

The Strengths of this study include: a good sample size with gender and age distribution being representative of the city the study is based in. The study also updates awareness level in the country and is the 1st study of its kind to be done in Makkah city which is a major city in Saudi Arabia. Limitations include: Convenient sampling from one clinic in Makkah only 2 months' period which is considered short. Demographic data would be more accurate if the questions were open ended instead of categorized. Study failed to account for presence of systematic disease which may account for increased knowledge of implants contraindications; it also failed to account for socio-economic status of visiting patients. Inability to correlate age and gender to awareness and acceptance of Implants and compare it to other studies regarding this area.

Future recommendation include: formulating a larger study on national scale to have more generalizable result on Saudi Arabia different public areas and hospital systems. Having opened ended questionnaire and a pilot study on the questionnaire to validate it.

CONCLUSION

The awareness of dental implants is considered high in the Makkah area among Saudi, however there is gap in the knowledge and misinformation that needs to be corrected by dentists instead of social media outputs. There is a misinformation in the population regarding contraindications and implant insertion procedure that need to be filled. Larger researcher on a national level can help us determine the national awareness

level. Though the majority of patients prefer implant treatment to replace missing teeth, only a fraction have undergone implant treatment previously which might require further study to understand the reason for this large disparity in treatment availability.

The authors declare there is no conflict of interest or financial interest to declare for this research.

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