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Original Article

Dentistry Section

Public Knowledge and Awareness Regarding the Use of Dental Implants for Replacing Missing Teeth: A Questionnaire-based Survey in Riyadh, Saudi Arabia

NOUF AL-SHIBANI[1], REEM AL-KATTAN[2], NAWAF LABBAN[3], MAZEN KHALID ALNUWAISER[4], MALEK HAMMAM ELDESOUKY[5]

ABSTRACT

Introduction: In recent years, dental implants have become a viable option for replacement of missing teeth in completely or partially edentulous patients. However, due to inadequate knowledge or information many patients do not prefer implant therapy.

Aim: The main study objective was to evaluate the knowledge and awareness regarding dental implants as an option of treatment among dental patients according to their level of education in Riyadh, Saudi Arabia.

Materials and Methods: The knowledge and awareness of patients regarding the use of dental implants for substituting missing teeth were assessed with the help of a cross-sectional study from January 2018 to June 2018 utilising standardised self-explanatory questionnaire that were circulated at two places in Riyadh: dental patients visiting the college of dentistry, King Saud University and outpatients visiting King Khalid University Hospital. Patients were provided with the questionnaires during their routine visits to the dental clinics. A total of 1471 subjects participated in this study. Chi-square test was performed to find association between education level of study subjects and their knowledge on various aspects of dental implants, and a p-value <0.05 was considered as statistically significant. The statistical analysis was performed using IBM's Statistical Package for Social Sciences (SPSS) software, version 20.

Results: This study results revealed that 67% of the patients were aware regarding the dental implants and 467 (31.7%) hadn't heard of dental implants. Among the participants who were aware of dental implants, 555 (37.7%) had college level education and this association was statistically significant (χ^2=64.18; p<0.001). The main information source regarding dental implants was dentists and friends. There was a significant association between source of information and education (χ^2=122.53; p<0.001). Among the subjects, 386 (26.2%) subjects were aware that oral surgeons are the most qualified to place dental implants followed by periodontist-314 (21.3%) and prosthodontist-174 (11.8%). High expenses (53%) and fear of surgery (21%) was the main reasons for not availing implants among the study subjects. Our data depicted that deficits in knowledge are distributed widely across education.

Conclusion: A significant education level influenced knowledge deficit in almost all the aspects of dental implants. There is a need for awareness programmes from dental care experts and specialists to raise the knowledge and awareness level of the public regarding the use of dental implant as a replacement option for missing tooth.

Keywords: Dental care, Oral hygiene, Periodontal disease, Tooth replacement

INTRODUCTION

Despite the advancement in dental health care, millions of people still suffer from tooth loss, mainly because of tooth decay, periodontal disease, or injury. For many years, bridges and dentures were the only available treatment options for the people with missing teeth. However, in recent years, dental implants have become a viable option. Dental implants are an artificial root implanted in order to support complete denture or replace maxillofacial or single prosthesis. Implants are made to match natural teeth that offer a solid foundation for detachable replacement or fixed permanent teeth [1]. The implant therapy's efficiency is confirmed through long term clinical studies [2-7]. Originally, dental implants were used for treating edentulous subjects to improve stability, denture retention, functional efficacy and quality of life [2,5-8]. In recent years, dental implants are widely accepted for prosthetic treatment of partially or completely edentulous subjects [9,10]. Dental implants for missing teeth have appeared as a very predictable procedure. However, in developing countries, limited number of people opt for dental implants. The preference of dental implants as a treatment option in these countries is influenced by many factors [11]. Some of the authors have documented and reported that there is a deficit of knowledge in the population, whereas few authors opined that there is a deficit in the level of awareness in the population [12-15].

Awareness, knowledge, and attitude survey are the most commonly employed tools for collecting both quantitative and qualitative information [16]. There are roughly around 6000 citations found in a literature review of publications on dental implants, reflecting comprehensive basic and clinical research on a broad variety of topics. However, the public opinion regarding dental implants was largely ignored [14]. Among numerous studies carried out in different countries, the awareness level regarding dental implant treatment differed [13,17-20]. There is a constant change in the definition of successful implants. At present, the successful implant treatment is assessed by subjects in terms of psychosocial and functional acceptability [21]. These patient-centred methods for assessing the efficacy of treatment seems to be more practical compared to physician centred method [22,23]. Personality profiles affect periodontal and implant health [22,24]. If patient-centred approach is considered as the norm for defining success, then it is vital that the clinicians should be informed of the multi-dimensional aspects of patient satisfaction including personality profile.

Consequently, the aim of the present questionnaire based survey was to evaluate the knowledge and awareness regarding dental implants as a treatment option for replacing missing teeth compared with the conventional treatment modalities among dental patients according to their level of education in Riyadh, Saudi Arabia.

MATERIALS AND METHODS

A cross-sectional study was conducted from January 2018 to June 2018 to assess the knowledge and awareness of the public regarding the use of dental implants as an option for replacing missing teeth. The public opinions were assessed using a standardised self-explanatory questionnaire circulated in two places of Riyadh city: outpatients visiting King Khalid University Hospital and dental patients visiting the College of Dentistry, King Saud University. The questionnaire was developed by two authors separately then the questions from both the authors were merged to formulate the questionnaire. Later, the questionnaire was sent to senior professors at the community dentistry department for their inputs and revisions. Face validity of the questionnaire was performed by conducting a committee involving five researchers including experts in the field to assess each question separately and reviewing if the question asked what it is was intended to measure. Reliability of the questionnaire was performed with a pilot study where 35 questionnaires were distributed in different regions in Riyadh to target a heterogeneous sample.

The questionnaire was primarily developed in English, and was later translated to Arabic for distribution. The questionnaire was distributed to a sample of ten bilingual respondents who answered the questionnaires in both English and Arabic languages to assess the correct translation, following which it were sent to language experts for additional revision.

Face validity of the questionnaires was analysed using Cohen's Kappa Index which showed a Kappa (κ) of >0.8 Content Validity Ratio (CVR), indicating good agreement. The reliability of the questionnaires were analysed using Cronbach's Alpha analysis which showed a value of 0.8, indicating good reliability of the questionnaires.

The institutional review board approved the study protocol (E-17-27-44) which was in accordance with the Helsinki Declaration. In this survey, a total of 1471 subjects were enrolled. The sample size was calculated with the help of the statistician on the basis of other studies in the region. According to statistics, at the level of significance (alpha) 0.05, power of 0.9, and estimated prevalence of 0.55 [25], the sample size required at least 513 participants.

The inclusion criteria for the study were subjects aged 18 years or older, and level of literacy being able to read and write. **The exclusion criteria** for the study included; Subjects with professional dental knowledge or background, and patients not willing to participate in the study. The subjects were provided with the questionnaires during their routine dental visits and the data was collected. The questionnaire used in this survey included three parts. The first part included questions regarding the participant's information on socio demographic details viz., location, gender, nationality, age, marital status and educational level. The second section contained four questions related to the awareness of dental implants viz., whether they had ever heard about dental implants, if they ever had dental implants placed, source of information of implants and if they had missing teeth what would be the choice in restoring the missing space. The third section contained six questions related to the knowledge about where the location of implant placement, the material used in implants, different aspects dissuading them from opting implants in replacing the missing teeth if they don't choose dental implants as a first choice, response on the awareness level about who places the implants, about the durability of implants and awareness on requirement of brushing and flossing as natural teeth for dental implants. The participants were explained about the study objectives, and after obtaining informed consent, they were given the questionnaires which were distributed by students in a hard copy form and a pen to fill it. The students would wait until the participant finished filling the questionnaire and collect it. Participants who required help in reading or writing were assisted by the students. The hard copies were then collected and the data was entered into an excel sheet.

STATISTICAL ANALYSIS

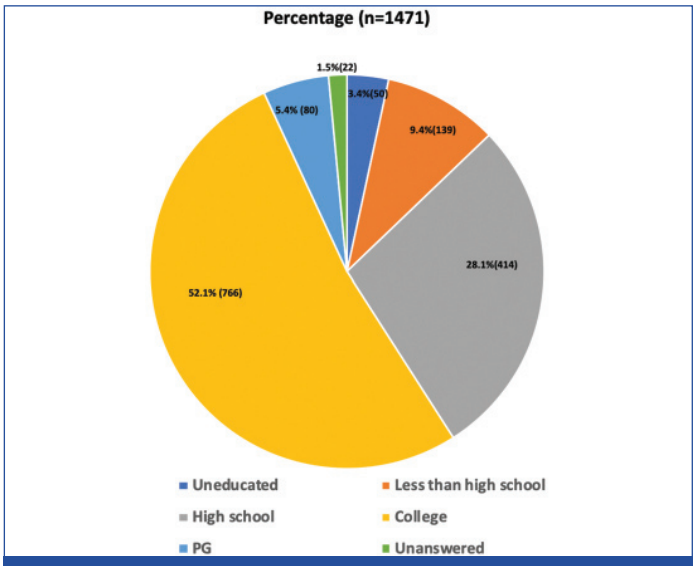
The statistical analysis was performed using IBM's SPSS software, version 20. The descriptive analysis of the categorical variables was presented in the form of frequency and percentage. Chi-square test was performed to find association between education level of study subjects and their knowledge on various aspects of dental implants, and p-value ≤0.05 was considered as statistically significant.

RESULTS

The participants' demographic details are shown in [Table/Fig-1]. Majority of the enrolled subjects were located in private hospital (50.4%) and with a female predominance (55.2%). Among the study subjects, 83.6% were natives of Saudi Arabia and most of them were in the age range of 26 to 35 years (28%) followed by 36 to 45 years (26.7%) in which most of them were married (52.7%). In this study, most of the study participants were graduates (52.1%) [Table/Fig-2].

Variables	Frequency (n=1471)	Percentage
Location		
Public hospital	730	49.6
Private hospital	741	50.4
Gender		
Males	659	44.8
Females	812	55.2
Nationality		
Saudi	1230	83.6
Non-Saudi	241	16.4
Age (years)		
18-25	342	23.2
26-35	412	28.0
36-45	393	26.7
46-55	207	14.1
56-65	85	5.8
>65	27	1.8
Unanswered	5	0.4
Marital status		
Single	444	30.2
Married	775	52.7
Divorced	133	9.0
Widow	83	5.6
Unanswered	36	2.5

[Table/Fig-1]: Distribution of subjects based on sociodemographic background.



[Table/Fig-2]: Distribution of subjects based on educational background.

Chi-square test was used to find the association of awareness on dental implants with education. Out of 1471 (100%) subjects, 986 (67%) had heard about dental implants out of which 555 (37.7%) had college level education and 467 (31.7%) had not heard of dental implants (χ^2=64.18; p<0.001) [Table/Fig-3].

Out of 1471 (100%) subjects, 208 (14.1%) had dental implant placed out of which maximum had completed graduation i.e., 74 (5%) whereas 1263 (85.9%) had not placed implant (χ^2=54.67; p<0.001) [Table/Fig-4].

Among the participants, 361 had received information regarding dental implants from dentists, followed by friends 294/1471 (20%) and others- 194/1471 (13.2%). There was a significant association (χ^2=122.53; p<0.001) between source of information with education [Table/Fig-5].

Most of subjects i.e., 750/1471 (51%) reckoned dental implant would be the choice in restoring the missing space for most of the subjects followed by Fixed Partial Denture (FPD) 444/1471 (30.2%). However, 155/1471 (10.5%) subjects claimed that they will not replace the missing tooth (χ^2=96.90; p<0.001) [Table/Fig-6].

Majority of subjects i.e., 697/1471 (47.4%), answered that dental implants are placed in the jaw bone, while 269/1471 (18.3%) subjects answered that dental implants are placed on gingiva, whereas, 413/1471 (28.1%) subjects didn't know where dental implants are placed. Chi-square test revealed significant association between dental implants placement and education level of subjects (χ^2=86.46; p<0.001) [Table/Fig-7].

Out of 1471 subjects, 347 (23.6%), 227 (15.4%), and 140 (95%) subjects answered that dental implant is made of titanium, ceramic and porcelain material respectively (χ^2=135.14; p<0.001) [Table/Fig-8].

		Education						
		Uneducated	Less than high school	High school	College	Post graduate	Unanswered	Total
Yes	Count	21	69	263	555	63	15	986
	% of Total	1.4%	4.7%	17.9%	37.7%	4.3%	1.0%	67.0%
No	Count	29	69	148	201	14	6	467
	% of Total	2.0%	4.7%	10.1%	13.7%	1.0%	0.4%	31.7%
Unanswered	Count	0	1	3	10	3	1	18
	% of Total	0	0.1%	0.2%	0.7%	0.2%	0.1%	1.2%
Total	Count	50	139	414	766	80	22	1471
	% of Total	3.4%	9.4%	28.1%	52.1%	5.4%	1.5%	100.0%
Chi-square value- 64.18								
p-value <0.001**								

[Table/Fig-3]: Have you ever heard about dental implants?
**Significant

	Education	Uneducated	Less than high school	High school	College	Post graduate	Unanswered	Total
Yes	Count	16	34	68	74	7	9	208
	% of Total	1.1%	2.3%	4.6%	5.0%	0.5%	0.6%	14.1%
No	Count	34	105	346	692	73	13	1263
	% of Total	2.3%	7.1%	23.5%	47.0%	5.0%	0.9%	85.9%
Total	Count	50	139	414	766	80	22	1471
	% of Total	3.4%	9.4%	28.1%	52.1%	5.4%	1.5%	100.0%
Chi-square value- 54.67								
p-value <0.001**								

[Table/Fig-4]: Have you ever had a dental implant placed?
**Significant

	Education	Uneducated	Less than high school	High school	College	Post graduate	Unanswered	Total
Don't know	Count	28	59	128	150	7	4	376
	% of Total	1.9%	4.0%	8.7%	10.2%	0.5%	0.3%	25.6%
Media	Count	6	8	65	123	6	3	211
	% of Total	0.4%	0.5%	4.4%	8.4%	0.4%	0.2%	14.3%
Dentists	Count	10	26	84	191	43	7	361
	% of Total	0.7%	1.8%	5.7%	13.0%	2.9%	0.5%	24.5%
Friends	Count	5	29	78	161	15	6	294
	% of Total	0.3%	2.0%	5.3%	10.9%	1.0%	0.4%	20.0%
Others	Count	1	13	52	119	7	2	194
	% of Total	0.1%	0.9%	3.5%	8.1%	0.5%	0.1%	13.2%
Unanswered	Count	0	4	7	22	2	0	35
	% of Total	0%	0.3%	0.5%	1.5%	0.1%	0.0%	2.4%
Total	Count	50	139	414	766	80	22	1471
	% of Total	3.4%	9.4%	28.1%	52.1%	5.4%	1.5%	100.0%
Chi-square value- 122.53								
p-value <0.001**								

[Table/Fig-5]: What is your main source of information regarding dental implants?
**Significant

	Education	Uneducated	Less than high school	High school	College	Post graduate	Unanswered	Total
Dental implant	Count	16	51	196	443	35	9	750
	% of Total	1.1%	3.5%	13.3%	30.1%	2.4%	0.6%	51.0%
Fixed Partial Denture (FPD)	Count	11	40	143	216	28	6	444
	% of Total	0.7%	2.7%	9.7%	14.7%	1.9%	0.4%	30.2%
Removal Partial Denture (RPD)	Count	6	19	40	40	3	5	113
	% of Total	0.4%	1.3%	2.7%	2.7%	0.2%	0.3%	7.7%
I will not replace it	Count	17	27	34	62	13	2	155
	% of Total	1.2%	1.8%	2.3%	4.2%	0.9%	0.1%	10.5%
Unanswered	Count	0	2	1	5	1	0	9
	% of Total	0%	0.1%	0.1%	0.3%	0.1%	0.0%	0.6%
Total	Count	50	139	414	766	80	22	1471
	% of Total	3.4%	9.4%	28.1%	52.1%	5.4%	1.5%	100.0%
Chi-square value- 96.90								
p-value <0.001**								

[Table/Fig-6]: If you had a missing tooth, what would be the choice in restoring the missing space?
**Significant

	Education	Uneducated	Less than high school	High school	College	Post graduate	Unanswered	Total
Jaw bone	Count	13	33	194	397	44	16	697
	% of Total	0.9%	2.2%	13.2%	27.0%	3.0%	1.1%	47.4%
Gingiva	Count	3	30	80	142	12	2	269
	% of Total	0.2%	2.0%	5.4%	9.7%	0.8%	0.1%	18.3%
Neighbouring teeth	Count	2	11	27	33	4	1	78
	% of Total	0.1%	0.7%	1.8%	2.2%	0.3%	0.1%	5.3%
Don't know	Count	32	63	111	185	19	3	413
	% of Total	2.2%	4.3%	7.5%	12.6%	1.3%	0.2%	28.1%
Unanswered	Count	0	2	2	9	1	0	14
	% of Total	0%	0.1%	0.1%	0.6%	0.1%	0.0%	1.0%
Total	Count	50	139	414	766	80	22	1471
	% of Total	3.4%	9.4%	28.1%	52.1%	5.4%	1.5%	100.0%
Chi-square value- 86.46								
p-value <0.001**								

[Table/Fig-7]: Where are dental implants placed?
**Significant

	Education	Uneducated	Less than high school	High school	College	Post graduate	Unanswered	Total
Ceramic	Count	2	6	57	144	14	4	227
	% of Total	0.1%	0.4%	3.9%	9.8%	1.0%	0.3%	15.4%
Stainless steel	Count	0	6	38	66	2	3	115
	% of Total	0	0.4%	2.6%	4.5%	0.1%	0.2%	7.8%
Titanium	Count	0	27	77	199	40	4	347
	% of Total	0	1.8%	5.2%	13.5%	2.7%	0.3%	23.6%
Porcelain	Count	8	9	50	67	6	0	140
	% of Total	0.5%	0.6%	3.4%	4.6%	0.4%	0	9.5%
Don't know	Count	40	90	186	283	17	11	627
	% of Total	2.7%	6.1%	12.6%	19.2%	1.2%	0.7%	42.6%
Unanswered	Count	0	1	6	7	1	0	15
	% of Total	0	0.1%	0.4%	0.5%	0.1%	0	1.0%
Total	Count	50	139	414	766	80	22	1471
	% of Total	3.4%	9.4%	28.1%	52.1%	5.4%	1.5%	100.0%
Chi-square value- 135.14								
p-value <0.001**								

[Table/Fig-8]: What material is dental implant made of?
**Significant

More than half of the subjects i.e., 779/1471 (53%) did not choose dental implants as first choice because of the high cost followed by 309/1471 (21%) subjects did not choose because of fear of the surgery; while 128/1471 (8.7%) subjects replied its time consuming and 103/1471 (7%) reckoned its complicated treatment. Chi-square test revealed no significant association (χ^2=34.09; p=0.277) with education [Table/Fig-9].

	Education	Uneducated	Less than high school	High school	College	Post graduate	Unanswered	Total
High cost	Count	17	83	216	402	47	14	779
	% of Total	1.2%	5.6%	14.7%	27.3%	3.2%	1.0%	53.0%
Fear of surgery	Count	15	27	89	168	8	2	309
	% of Total	1.0%	1.8%	6.1%	11.4%	0.5%	0.1%	21.0%
Foreign body in the jaw	Count	3	8	27	36	5	2	81
	% of Total	0.2%	0.5%	1.8%	2.4%	0.3%	0.1%	5.5%
Complicated treatment	Count	3	6	34	53	5	2	103
	% of Total	0.2%	0.4%	2.3%	3.6%	0.3%	0.1%	7.0%
Time consuming	Count	7	9	28	72	10	2	128
	% of Total	0.5%	0.6%	1.9%	4.9%	0.7%	0.1%	8.7%
Others	Count	4	3	11	25	2	0	45
	% of Total	0.3%	0.2%	0.7%	1.7%	0.1%	0	3.1%
Unanswered	Count	1	3	9	10	3	0	26
	% of Total	0.1%	0.2%	0.6%	0.7%	0.2%	0	1.8%
Total	Count	50	139	414	766	80	22	1471
	% of Total	3.4%	9.4%	28.1%	52.1%	5.4%	1.5%	100.0%
Chi-square value- 34.09								
p-value -0.277								

[Table/Fig-9]: If you did not choose dental implant as a first choice, what is the main reason?

Out of 1471 (100%) subjects, 386 (26.2%) subjects were aware that oral surgeons are the most qualified to place dental implants followed by periodontist-314 (21.3%); prosthodontist-174 (11.8%). Chi-square test showed significant association (χ^2=256.61; p<0.001) with education [Table/Fig-10].

Approximately, 1/4th of the subjects i.e., 346 (23.5%) answered that dental implants have a life of more than 20 years followed by 225/1471 (15.3%), and 58 (3.9%) subjects felt that dental implant stay for 10 to 20 years and less than 5 years respectively. (χ^2=82.29; p<0.001) [Table/Fig-11].

Majority of subjects i.e., 676/1471 (46%) felt that implants need the same brushing and flossing as natural teeth. Chi-square test revealed significant association (χ^2=35.41; p=0.018) with education [Table/Fig-12].

DISCUSSION

The present questionnaire based cross-sectional study assessed the influence of educational level on knowledge, source of information, and level of awareness regarding dental implants as a treatment option for replacing missing teeth. The outcome of the study demonstrated that the level of awareness on dental implants was statistically higher in subjects with better educational background (p<0.001). This can be explained by the fact that people with higher qualifications and net monthly family income have greater access to specialised oral health services, and are thus more concerned with their oral health [12]. Furthermore, it has been hypothesised that higher educational qualifications of an individual enhances the metacognitive awareness which may contribute to the better knowledge level about implants [26]. These findings were

	Education	Uneducated	Less than high school	High school	College	Post graduate	Unanswered	Total
Oral surgeon	Count	4	23	81	248	25	5	386
	% of Total	0.3%	1.6%	5.5%	16.9%	1.7%	0.3%	26.2%
Prosthodontist	Count	2	17	41	98	14	2	174
	% of Total	0.1%	1.2%	2.8%	6.7%	1.0%	0.1%	11.8%
Periodontist	Count	6	23	97	167	18	3	314
	% of Total	0.4%	1.6%	6.6%	11.4%	1.2%	0.2%	21.3%
General practitioner	Count	0	5	18	17	2	3	45
	% of Total	0	0.3%	1.2%	1.2%	0.1%	0.2%	3.1%
All of the above	Count	4	26	103	106	12	2	253
	% of Total	0.3%	1.8%	7.0%	7.2%	0.8%	0.1%	17.2%
Don't know	Count	23	40	64	121	4	7	259
	% of Total	1.6%	2.7%	4.4%	8.2%	0.3%	0.5%	17.6%
Others	Count	10	2	3	3	4	0	22
	% of Total	0.7%	0.1%	0.2%	0.2%	0.3%	0	1.5%
Unanswered	Count	1	3	7	6	1	0	18
	% of Total	0.1%	0.2%	0.5%	0.4%	0.1%	0	1.2%
Total	Count	50	139	414	766	80	22	1471
	% of Total	3.4%	9.4%	28.1%	52.1%	5.4%	1.5%	100.0%
Chi-square value- 256.61								
p-value <0.001**								

[Table/Fig-10]: Who among the following are most qualified to place dental implants?
**Significant

	Education	Uneducated	Less than high school	High school	College	Post graduate	Unanswered	Total
Less than 5 years	Count	2	10	20	20	5	1	58
	% of Total	0.1%	0.7%	1.4%	1.4%	0.3%	0.1%	3.9%
5 to 10 years	Count	0	6	26	78	6	3	119
	% of Total	0	0.4%	1.8%	5.3%	0.4%	0.2%	8.1%
10 to 20 years	Count	3	13	60	136	12	1	225
	% of Total	0.2%	0.9%	4.1%	9.2%	0.8%	0.1%	15.3%
More than 20 years	Count	5	32	82	189	34	4	346
	% of Total	0.3%	2.2%	5.6%	12.8%	2.3%	0.3%	23.5%
Don't know	Count	40	76	218	339	22	13	708
	% of Total	2.7%	5.2%	14.8%	23.0%	1.5%	0.9%	48.1%
Unanswered	Count	0	2	8	4	1	0	15
	% of Total	0	0.1%	0.5%	0.3%	0.1%	0	1.0%
Total	Count	50	139	414	766	80	22	1471
	% of Total	3.4%	9.4%	28.1%	52.1%	5.4%	1.5%	100.0%
Chi-square value- 82.29								
p-value <0.001**								

[Table/Fig-11]: How long does dental implants last?
**Significant

	Education	Uneducated	Less than high school	High school	College	Post graduate	Unanswered	Total
Yes	Count	15	61	180	355	56	9	676
	% of Total	1.0%	4.1%	12.3%	24.1%	3.8%	0.6%	46%
No	Count	15	27	73	130	10	5	260
	% of Total	1.0%	1.8%	5.0%	8.8%	0.7%	0.3%	17.7%
Don't know	Count	20	50	156	278	13	8	525
	% of Total	1.4%	3.4%	10.6%	18.9%	0.9%	0.5%	35.7%
Unanswered	Count	0	1	5	3	1	0	10
	% of Total	0	0.1%	0.3%	0.2%	0.1%	0	0.7%
Total	Count	50	139	414	766	80	22	1471
	% of Total	3.4%	9.4%	28.1%	52.1%	5.4%	1.5%	100.0%
Chi-square value- 35.41								
p-value -0.018**								

[Table/Fig-12]: Do implants require the same brushing and flossing as natural teeth?
**Significant

in concurrence with published reports in literature by various other researchers [27,28]. Present study data revealed that knowledge deficits were distributed widely across education level of subjects. Similar findings have also been reported by Deinzer R et al., wherein the authors observed broad deficits across all gender, educational, and age groups, while greatest deficits were seen among less educated, followed by old and very young people [29].

In the present questionnaire based survey, majority of the subjects (85.9%) had never had dental implants while only 14.1% subjects had dental implants. The source of knowledge of dental implants had a deep impact on the awareness level (p<0.001). Regarding the source of information, 24.5% of the subjects felt that dentists were their key information source followed by media (14.3%) and friends (20.0%). This outcome was in disagreement with the findings of a previous study where the authors concluded that the main source of information was the participants' friends and relatives, followed by dentists [30]. On the contrary, few studies have also reported that media was the key source of information [13,31]. This describes the importance of the newspaper, official websites, and social campaigns in catering authentic sources of information to enhance dental implant knowledge and awareness among patients.

The subjects' awareness level regarding dental implants in the current study differed to a great extent (p<0.001); 51% were aware of dental implant as an alternative replacement for missing teeth followed by 30.2% and 7.7% of the participants who answered FPD and RPD, respectively. The awareness level was low compared to previous studies by Zimmer CM et al., (1992), Tepper G et al., (2003a) and Berge TI (2000) who reported implant awareness level of 77%, 70.1% and 72%, correspondingly [13,14,31]. This question also revealed that in substituting their missing teeth, only 7.7% of the patients opt for detachable prosthesis (RPD) as the best treatment, hence confirming the fact that detachable prosthesis was not preferred among most subjects as a substitute for their missing teeth irrespective of their clinical condition. Most subjects had the understanding that fixed prosthesis felt better in the mouth and looked more natural. As per the conclusion of Tepper G et al., and Zimmer CM et al., these findings confirmed almost a similar outcome that aesthetically, fixed prosthesis is more attractive compared to removable prosthesis and is also less uncomfortable in the mouth [13,14].

Present study revealed that majority of the subjects i.e., 47.4% knew about the proper location of the dental implant, which is similar to the research conducted by Tepper G et al., Al-Johany S et al., Pommer B et al., reporting the percentage as (39%), (50.1%), and (35%), respectively [14,15,32]. Regarding the knowledge of the material used in manufacture of dental implants, 42.6% of present study subjects had no idea about the material used for the manufacture of dental implants, whereas, 23.6%, 9.5%, 15.4% of subjects were aware of the information that dental implants are made up of titanium, porcelain and stainless steel, respectively. In a study conducted by Deeb G et al., 60-70% of subjects were

aware of the fact that dental implants are made up of titanium and porcelain, respectively [33].

When asked about the possible barriers in considering dental implant as a treatment choice, the participants in the present study stated that high costs and fear of surgery were the key reasons for not preferring implant therapy. The same barriers were also reported by Kent in his systematic review published in early 1990's. The author also stated that long duration of postsurgery recovery was also a potential barrier in preventing the patients from opting dental implant therapy [34]. According to Muller F et al., the need for rigorous oral hygiene following implant therapy was also a possible barrier for patient opting out of implant therapy [35]. The outcome of the current study was also in accordance with the previous studies conducted on Indian and Turkish population [30,36,37]. This highlights the necessity of working towards cost reduction of dental implants, which could be accomplished through government funding and financial support for dental hospitals. Only 21.3% of the individuals in this study knew that their prosthodontist practiced implantology, whereas 26.2% said it was the oral surgeon who places it which was similar to the outcome of a study by Satpathy A et al., [11].

A relevant observation was made when subjects were questioned about their expectation of a dental implant's lifespan, nearly 23.5% of subjects believed expected durability of implants is more than 20 years. Parallel outcomes were also observed in a study by Tepper G et al., wherein 54% percent of patients believed that implant's expected mean durability was 10 to 20 years. The majority of the subject's i.e., 48.1% were not aware regarding the dental implants' durability. With exceedingly high unrealistic expectations from the subject, the necessity for subject education arises [14]. About 28% patients from Japan had a belief that their implants would last forever [20]. Needless to say, such misconceptions about dental implants' durability would suggest inaccurate or incomplete knowledge of the public in terms of disparity in information [32]. Among 1471 subjects, 46% felt that implants required same brushing and flossing as natural teeth for dental implants. In a subject awareness survey conducted in Khamam, Andhra Pradesh, most of the patients opined that no further care is required but a few patients opined that equal amount of care is required for both natural teeth and implants [38]. Tepper G et al., reported in their study that around 44% of study subjects opined special oral hygiene is required for dental implants [19].

Current study results do provide some insight on subject's knowledge and awareness on various aspects of dental implant treatment modality that could influence their choice of treatment.

Limitation(s)

This study was conducted for only six months duration at two centres with a limited sample size which was available in this part of region. Thus, there is a huge scope for future research if it is conducted as a multicentre study on a larger sample size in different regions of the country. This will augment to find out more evidences on this research.

CONCLUSION(S)

Within the limitations of the study, a significant educational background influenced knowledge deficit in almost all the aspects of dental implants was observed. There is a need for awareness programmes from dental care experts and specialists to raise the knowledge and awareness level of the public regarding the use of dental implant as are placement option for missing tooth.

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PARTICULARS OF CONTRIBUTORS:
1. Associate Professor, Department of Periodontics and Community Dentistry, King Saud University, Riyadh, Saudi Arabia.
2. Assistant Professor, Department of Periodontics and Community Dentistry, King Saud University, Riyadh, Saudi Arabia.
3. Associate Professor, Department of Prosthetic Dental Sciences, King Saud University, Riyadh, Saudi Arabia.
4. Intern, Department of Periodontics and Community Dentistry, King Saud University, Riyadh, Saudi Arabia.
5. Intern, Department of Periodontics and Community Dentistry, King Saud University, Riyadh, Saudi Arabia.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Nawaf Labban,
Riyadh-11433 Saudi Arabia.
E-mail: Nalabban@ksu.edu.sa

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