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Knowledge and attitude toward replacing missing teeth with dental implants among the Saudi population

Hisham Abdullah Mously, Bayan Jamal Badeeb¹, Nora Ahmed Bahbishi¹,
Waad Mohammed Mzain¹, Ghada Hussein Naguib^{2,3} and Mohamed Tharwat Hamed^{4,5}

Department of Oral and Maxillofacial Prosthodontics, ¹Dental Intern, Internship Training Program, Departments of ²Restorative Dentistry and ⁴Oral and Maxillofacial Prosthodontics, King Abdulaziz University Faculty of Dentistry, Jeddah, Saudi Arabia, Departments of ³Oral Biology and ⁵Fixed Prosthodontics, Cairo University Faculty of Dentistry, Cairo, Egypt

Address for correspondence:

Dr. Mohamed Tharwat Hamed,
Department of Oral and Maxillofacial Prosthodontics,
King Abdulaziz University Faculty of Dentistry,
Jeddah, Saudi Arabia.
Department of Fixed Prosthodontics, Cairo University Faculty of Dentistry, Cairo, Egypt.
P. O Box 80209, Jeddah 21589, Saudi Arabia.
E-mail: mohsarwat62@gmail.com

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Abstract:

OBJECTIVES: To assess the knowledge level and attitude of the Saudi population about the use of a dental implant as a treatment option for replacing the missing teeth.

MATERIALS AND METHODS: This cross-sectional study adopted a quantitative approach and used an online questionnaire to collect data. Nine hundred and five participants were recruited as per the inclusion criteria (above 18 years of age, know how to read and write, and technology literate). The collected data were analyzed statistically using IBM Statistical Package for Social Sciences (SPSS) software.

RESULTS: A low level of knowledge about teeth replacement methods (56%) was recorded among the participant, while 44.4% of them had heard about implant, bridges, and dentures. The oral hygiene of the participants was considered good (59.3%). The main source of information, reported by the participants, was the dentist (53.4%). The knowledge about dental implants was found to be significantly the highest ($P = 0.02$) among the highly educated participant who had completed postgraduate studies.

CONCLUSION: There is a need for introducing comprehensive orientation programs, conducted by dentists, to communicate knowledge about dental implants. The social campaigns and official information programs should be instigated for improving the knowledge of the patients. Structured programs should be also introduced at an academic level, for enhancing the knowledge related to replacing missing teeth and dental implants.

Keywords:

Dental implants, knowledge and attitude, replacing missing teeth, Saudi Arabia

Introduction

Prosthetic dentistry plays an important role in a patient's life. It improves the patient's aesthetic and functional comfort by replacing missing teeth with different methods.^[1] Implant dentistry is the best procedure to replace missing teeth giving hope to those who lost their teeth to live a better life without further complications.^[2] Annually, the inclination of

the patients toward dental implants ranges from 100,000–300,000.^[3] Alajlan *et al.*^[4] have reasoned that the increased preference for a dental implant is because the loss of teeth affects an individual's routine life, activities such as talking, eating, socializing. Multiple studies have reported the efficacy of dental implants in the long run for replacing missing teeth.^[5,6]

Although dental implantation for missing teeth has increased, a study has reported that patient acceptance of this treatment depends on his/her knowledge about it

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and overall education.⁵ Gupta *et al.*^[7] stated that because prosthetic treatment planning, has increased, the need for understanding the knowledge and attitude of the patients concerning prosthetic replacement before the treatment is necessary.

A few research works confirmed that dental patients generally acknowledge dental implants.^[1,2,8] Zimmer *et al.*'s^[9] study on American patients showed increased knowledge about implant; however, different outcomes have been reported for Finnish (about 29%) and Australian patients (about 64%).^[10] Similarly, factors of public awareness, positive attitude, and dental implants acceptance in developing nations like India were reported to be low,^[11] while in Malaysia, they were moderate.^[5,12]

This research evolved from the recent findings in the developing countries, whereas, considering the knowledge and attitude of the Saudi populations, a gap has prevailed. Mostly, researchers have focused on a particular region and did not undergo a nation-wide study. For e.g., Al-Rafee's study was restricted to Riyadh, Areashi study to Asser, and Alajlan's study to Al-Qassim.^[4,11,13] Therefore, this study was conducted to assess the level of knowledge and attitude among the Saudi population regarding dental implants, dental care, and replacing the missing teeth.

Subjects and Methods

Study design and participants

A cross-sectional design was used for examining the attitude and knowledge of the individuals in Saudi Arabia using a quantitative approach.

The inclusion criteria for the study were:

- Literacy- Being able to read and write
- Technology literacy- Having the ability to effectively use technology tools to access information
- Nationality- Being a Saudi
- Age- Being 18 years or older.

Data collection

In this study, an online Arabic questionnaire was prepared and used for collecting data. The Saudi Dental Society database was used to access and collect all the names, emails and phone numbers of all dentists registered in this database. All names collected were used as participants for this study. Using social media platforms, such as WhatsApp and Twitter, the questionnaire link was shared electronically with all the participants. Since arabic was the first language of the participants, the questionnaire was formulated and prepared and sent to all participants in Arabic.

Study instrument

The questionnaire used in this study included four sections. The first section included questions about the participant's personal information, sociodemographics and socio economics including; age, gender, educational level, income, and geographic region. The second section included questions about the self-reported description of oral health and oral hygiene, dental information including the frequency of dental visits and oral hygiene (dental care and brushing), participant's experience about losing teeth and replacement, as well as his/her knowledge about the teeth replacement options. The fourth section of the questionnaire asked general information about "dental implant as an option for teeth replacement." A scoring system was used for calculating the participant response (Poor = 0, Average = 1, and Good = 3).

Ethical consideration

Before conducting this study, ethical approval was obtained from King Abdulaziz University's ethical committee. The researcher communicated the study aim and scope, along with confidential and anonymous handling of the data. Filling the questionnaire was considered an implicit agreement to participate in the study.

Data analysis

The statistical analysis was conducted using IBM's Statistical Package for Social Sciences (SPSS) software, version 20. The descriptive analysis of the categorical variables was presented in the form of frequency and percentage. The bivariate association between the dependent variables (attitude toward oral hygiene, knowledge about replacing missing teeth, and knowledge regarding dental implants) and other variables was done using the independent *t*-test for the difference between two means or one-way analysis of variance (ANOVA) for the difference between more than two means. Linear regression is used to identify the predictors of the dependent variables. $P < 0.05$ was considered statistically significant, with a 95% confidence interval (CI).

Results

Demographic characteristic

This study included 905 participants from different areas of the Kingdom of Saudi Arabia (KSA). Most (around 87%) of them were from the Western region. About 26% of the participants were between the ages of 40 and 50 years, and about 75% of them were females. Around 47% of the participant had a bachelor's degree and more than half of them had a postgraduate degree. Approximately 30% of the study participants had an income of Saudi Riyal (SAR) 10,000 to 20,000, which equates to \$2,666 to \$5,333 per month [Table 1].

Self-reported description of oral health and hygiene

About 47% of participants described their oral hygiene as good and about 47% of them brushed their teeth twice daily. Most (about 80%) of the participants visited their dentist only when they felt pain [Table 2].

Experience and knowledge about tooth loss, replacement, and its impact

About two-thirds of the participants had lost a permanent tooth, and only 34.8% had replaced their missing teeth. A dental bridge was the most common (about 22%) replacement method used by the participants, followed by dental implants (about 13%) [Figure 1a].

Regarding the knowledge of the participants on the impact of teeth loss, it was found that the most common impact was an ugly look (59%), followed by difficulty in eating (52%). [Figure 1b] According to the participants, the most important issues while choosing the method for replacing the missing teeth were beauty (5.7%), the ability to eat and chew (4.5%), and both (89.7%).

The most common method of teeth replacement as per the participants was dental implant (about 76%0), then bridges (about 46%) and removable dentures (40%). [Figure 1c] The main sources of participants' information were the dentist (about 53%), family and friends (about 43%), and social media (about 19%) [Figure 1d].

General knowledge about dental Implant

Most (about 95%) of the participants had heard about dental implants, and about 56% considered implant as a treatment in case a tooth was lost. The two most common negative issues about the implant reported

Table 1: Sociodemographic characteristics and background of the study participants

Variables	Frequency (n=905)	Percentage
Region		
West Region	791	87.4
East Region	29	3.2
South Region	27	3
North Region	17	1.9
Middle Region	41	4.5
Age (Years)		
<20	41	4.5
≥20-<30	223	24.6
≥30-<40	221	24.4
≥40-<50	234	25.9
≥50-<60	163	18
≥60	23	2.5
Gender		
Male	219	24.2
Female	686	75.8
Educational Level		
Read and Write	18	2
Graduate	422	46.6
Postgraduate	465	51.4
Income (SAR)		
≤3,000	129	14.3
>3,000-≤6,000	196	21.7
>6,000-≤10,000	236	26.1
>10,000-≤20,000	267	29.5
>20,000	77	8.5

SAR=Saudi Riyal

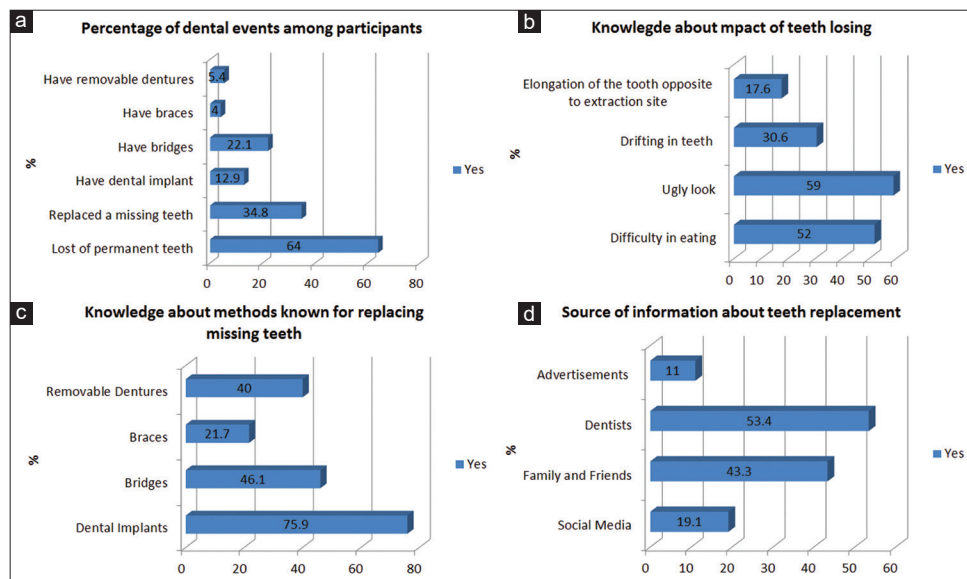


Figure 1: Percentage of dental events among participants (a), Knowledge about the impact of teeth losing (b), Knowledge about methods for replacing missing teeth (c), The source of information about teeth replacement (d) (Results are shown as a percentage)

by the participant were the high cost (72%) and fear of surgery (44%). About 50% of the participants thought that a dental implant was a solution for a lost tooth [Table 3].

Most (about 70%) of the participants were not sure about implant failure. They gained their knowledge about implants mainly from family and friends (about 43%) or dentist (about 42%). See [Table 3]. Regarding the participants' knowledge about the indication of the dental implant, it was a surprise to find that about 40% of them did not know the indication. On the other hand, about 34% of them thought that the implant is indicated for multiple separate missing teeth, followed by single missing teeth (about 23%) [Figure 2a].

When it came to the knowledge about the implant contraindication, around 48% of the participants did not know, whereas lost jawbone (31.6%), diabetes mellitus (DM; about 28%), and gingival recession (27%) came next [Figure 2b].

Table 2: Attitude toward oral health and hygiene among the study participants

Variables	Frequency (n=905)	Percentage
Description of Dental Care		
Excellent	110	12.2
Good	427	47.2
Moderate	294	32.5
Poor	74	8.2
Frequency of Brushing Teeth Per Day		
Never	33	3.6
Once	311	34.4
Twice	423	46.7
Thrice	100	11
More than three times	38	4.2
Frequency of Dental Visits Per Year		
Never	61	6.7
Every 6 months	103	11.4
When in Pain	722	79.8
Once a Year	10	1.1
Monthly visit	9	1

Table 3: General knowledge about dental implants among the study participants

Variables	Frequency (n=905)	Percentage
Heard about dental implant		
Yes	856	94.6
The most negative things about dental implant		
Treatment Time		
Yes	165	18.2
Fear of Surgery		
Yes	402	44.4
High Cost		
Yes	652	72
Ignorance		
Yes	176	19.4
Prefer Another Way		
Yes	49	5.4
Other		
Yes	0	0
Will You have an Implant if you Lost a Permanent Tooth?		
Yes	510	56.4
No	92	10.2
Maybe	303	33.5
Possibility of Implant Failure		
Yes	155	17.1
No	111	12.3
Maybe	639	70.6
Dental Implant is a Solution for Lost Teeth		
Yes	443	49
No	87	9.6
Maybe	375	41.4
Source of Information		
Social Media		
Yes	237	26.2
Family and Friends		
Yes	387	42.8
Dentists		
Yes	383	42.3
Advertisement		
Yes	130	14.4
Self-learning		
Yes	25	2.8

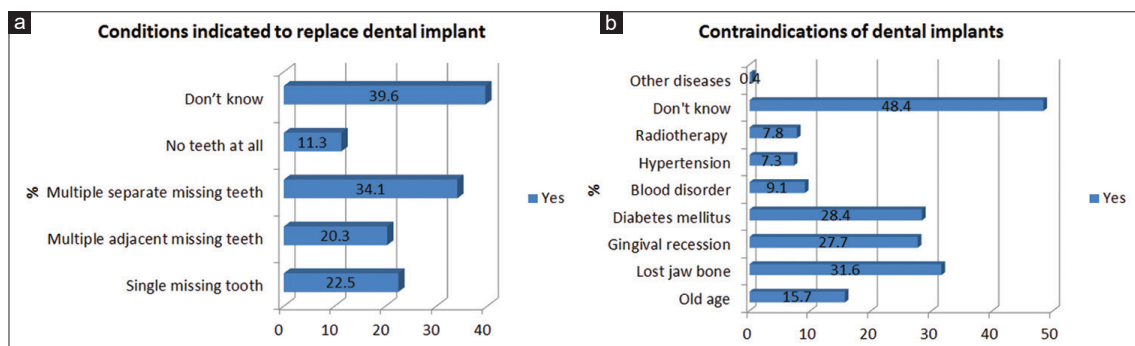


Figure 2: Conditions indicated to replace dental implant (a), Contraindications of dental implants (b) (Results are shown as a percentage)

Table 4: Distribution of mean attitude score toward dental care among the study participants

Variables	Mean (\pm SD)	P
Region		
West Region	0.76 (0.43)	0.02*
East Region	0.62 (0.49)	
South Region	0.59 (0.50)	
North Region	0.53 (0.51)	
Middle Region	0.66 (0.48)	
Age (Years)		
<20	0.68 (0.47)	0.11*
≥ 20 -< 30	0.71 (0.46)	
≥ 30 -<40	0.71 (0.46)	
≥ 40 -<50	0.76 (0.43)	
≥ 50 -<60	0.79 (0.41)	
≥ 60	0.91 (0.29)	
Gender		
Male	0.68 (0.47)	<0.001**
Female	0.76 (0.43)	
Educational Level		
Read and Write	0.61 (0.50)	0.4*
Graduate	0.74 (0.44)	
Postgraduate	0.75 (0.43)	
Income (SAR)		
$\leq 3,000$	0.61 (0.49)	<0.001*
>3,000- $\leq 6,000$	0.71 (0.46)	
>6,000- $\leq 10,000$	0.75 (0.44)	
>10,000- $\leq 20,000$	0.82 (0.38)	
>20,000	0.74 (0.44)	

*F test (one way analysis of variance). **Student's t-test. SAR=Saudi Riyal, SD=Standard deviation

Depending upon the region, the attitude toward dental care varied significantly ($P = 0.02$), where it was found that the Western region had the highest mean attitude score of 0.76 ± 0.43 compared with others. The age group between 20 and 30 years had the highest significant mean attitude score of 0.65 ± 0.48 compared with others. Female participants had a significantly higher mean score ($P < 0.001$) in attitude toward dental care as compared with men. Furthermore, participants with low income ($P < 0.001$) of \leq SAR 3000 demonstrated a significant low mean attitude score of 0.61 ± 0.49 to others [Table 4].

Moreover, participants that lived in the middle region and those with a postgraduate degree displayed a high score of knowledge regarding the loss and replacement of teeth. On the other hand, participants >60 years of age showed a low mean knowledge score of 0.26 ± 0.44 ($P < 0.001$) [Table 5].

Finally, when assessing knowledge on the dental implant with other study variables, it was noticed that only the education level had a significant high mean score ($P = 0.03$) of 0.55 ± 0.50 for postgraduate degree participants [Table 6].

Table 5: Distribution of mean knowledge score about the replacement of lost teeth among the study participants

Variables	Mean (\pm SD)	P
Region		
West Region	0.53 (0.50)	0.03*
East Region	0.24 (0.44)	
South Region	0.48 (0.51)	
North Region	0.41 (0.51)	
Middle Region	0.56 (0.50)	
Age (Years)		
<20	0.49 (0.50)	<0.001*
≥ 20 -<30	0.65 (0.48)	
≥ 30 -<40	0.57 (0.50)	
≥ 40 -<50	0.45 (0.50)	
≥ 50 -<60	0.41 (0.49)	
≥ 60	0.26 (0.44)	
Gender		
Male	0.53 (0.50)	0.48**
Female	0.52 (0.50)	
Educational Level		
Read and Write	0.33 (0.49)	0.003*
Graduate	0.47 (0.50)	
Postgraduate	0.57 (0.50)	
Income (SAR)		
$\leq 3,000$	0.53 (0.50)	0.88*
>3,000- $\leq 6,000$	0.51 (0.50)	
>6,000- $\leq 10,000$	0.51 (0.50)	
>10,000- $\leq 20,000$	0.54 (0.50)	
>20,000	0.48 (0.50)	

*F test (one way analysis of variance). **Student's t-test. SAR=Saudi Riyal, SD=Standard deviation

Discussion

This study aimed to assess the level of knowledge and attitude about dental implants, care, and replacing missing teeth among the Saudi population. The rationale for the selection of cross-sectional study design was based on its efficacy for deriving conclusive results as established in other similar studies.^[14,15] However, the present study is different from them based on its scope, objectives, sample, and region.

The study showed that more than 50% of the participants, knowledgeable about implants, had higher than a bachelor's degree. This was significantly higher than those who can only read and write or only those having a bachelor's degree. This is corroborated by similar studies conducted in India and Jordan.^[1,2]

Also, the current study findings reveal that the main source of implant knowledge was family and friends, followed by dentists, which are similar to the other studies,^[16] and opposite to the result of the classical study of Zimmer *et al.*^[9] This highlights the role of the newspaper, official websites, and social campaigns in

Table 6: Distribution of mean knowledge score about dental implant among the study participants

Variables	Mean (\pm SD)	P
Region		
West Region	0.50 (0.50)	0.22*
East Region	0.66 (0.48)	
South Region	0.41 (0.50)	
North Region	0.59 (0.51)	
Middle Region	0.61 (0.49)	
Age (Years)		
<20	0.56 (0.50)	0.09*
≥ 20 -<30	0.59 (0.49)	
≥ 30 -<40	0.51 (0.50)	
≥ 40 -<50	0.46 (0.50)	
≥ 50 -<60	0.47 (0.50)	
≥ 60	0.57 (0.51)	
Gender		
Male	0.53 (0.50)	0.33**
Female	0.51 (0.50)	
Educational level		
Read and Write	0.33 (0.49)	0.03*
Graduate	0.48 (0.50)	
Post graduate	0.55 (0.50)	
Income (SAR)		
≤ 3000	0.49 (0.50)	0.69*
>3000 - ≤ 6000	0.48 (0.36)	
>6000 - ≤ 10000	0.53 (0.33)	
$>10\ 000$ - $\leq 20,000$	0.52 (0.31)	
$>20,000$	0.56 (0.57)	

*F test (one way analysis of variance). **Student's t-test. SAR=Saudi Riyal, SD=Standard deviation

providing circular authentic sources of information to improve knowledge and spread awareness about dental implants.

The results of the present study also showed that social media is the third source of implant knowledge among the participants, which is consistent with other studies.^[9] This is because the use of social media platforms has escalated within the region, which serves as a continuous source of information. However, these results are similar to the results in the Western countries, where the individual's primary source of information was dentists rather than the web services, while contrary to certain studies in the developing countries.^[14,17] This difference might be attributed to the differences in the culture and norms prevalent in the region.

The findings of this study show that individuals had low awareness levels concerning dental implants, although their source of information was generally family members, dentists, media channels, and social gatherings, which is contrary to the findings of Pommer *et al.*^[18] and Al-Johany *et al.*^[19]

These findings draw attention to the transmission of information from a valid and authentic source of information that should be improved in the region. The results state that the dental professionals and practitioners should play a proactive role in improving public awareness, sensitizing the population on its possible benefits, and sharing relevant information instead of relying on the information delivered to them through social media, family members, or in social gatherings. The professionals should improve their efforts in communicating the potential benefits of treatment through implantation.

The study has certain limitations. One of the limitations of this study was the relatively small sample size, being restricted to only one country in the Arabic and Gulf region, and adopting only a quantitative approach based on the questionnaire. These issues limited the generalizability of the results based on the different sociodemographic conditions in other regions. Furthermore, future research efforts should be directed to adopt the same research objective and use a qualitative study approach for drawing more comprehensive results.

Accordingly, this study represented that high cost was the major negative issue reported by the participants about the dental implant. This is in-line with the other studies that coincide with study results in India and Turkey.^[2,4,20] These findings point to the importance of working toward reducing the cost of a dental implants, which might be achieved through increasing governmental funding and financial support to dental hospitals.

Conclusion

The present study revealed that there is deficit of knowledge concerning replacement methods of lost teeth and dental implants as an option for teeth replacement. It showed that although a high percentage of participants were educated, the information they had was obtained primarily from their family members, dentists, and social media. This indicates a need for raising the level of knowledge and awareness among the educated and noneducated individuals through a variety of orientation methods that suit each of them.

It is recommended to engage the dental care experts and specialists more in the patients' orientation about dental implants and their potential benefits as they represent the trusted and authentic source for that information.

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Conflicts of interest

There are no conflicts of interest.

References

- Jayasinghe RM, Perera J, Jayasinghe V, Thilakumara IP, Rasnayaka S. Awareness, attitudes, need, and demand on replacement of missing teeth among a group of partially dentate patients attending a University Dental Hospital. *BMC Res Notes* 2017;10:334.
- Al-dwairi ZN, Mohammed B, Masoud E, Al-Afifi SA, Borzabadi-farahani A, Ed MRCS, *et al.* Awareness, attitude, and expectations toward dental implants among removable prostheses wearers. *J Prosthodont* 2014;23:192-7.
- Rahman FB, Jain AR. Knowledge, attitude, and practice of various impression techniques available for dental implants among dental students and dental practitioners-A survey. *Drug Invention Today* 2018;10(3):611-20.
- Alajlan A, Alhoumaidan A, Ettesh A, Doumani, M. Assessing knowledge and attitude of dental patients regarding the use of dental implants: A survey-based research. *International J Dent* 2019;1-5. doi: 10.1155/2019/5792072.
- Kohli S, Bhatia S, Kaur A, Rathakrishnan T. Patients awareness and attitude towards dental implants. *Indian J Dent* 2015;6:167-71.
- Gbadebo OS, Lawal FB, Sulaiman AO, Ajayi DM. Dental implant as an option for tooth replacement: The awareness of patients at a tertiary hospital in a developing country. *Contemp Clin Dent* 2014;5:302-6.
- Gupta S, Mantri SS, Bhasin A. Knowledge and attitude towards prosthodontic rehabilitation and utilization of dental services by central India population of Jabalpur city, India. *Ann Med Health Sci Res* 2018;8:12-5.
- Azzazy HM, Mohamed HF. Effect of educational intervention on knowledge and attitude of nursing students regarding stem cells therapy. *IOSR J Nurs Health Sci* 2016;5:75-80.
- Zinmor CM, Zimmer WM, Williams J, Liesener J. Public awareness and acceptance of dental implants. *Implant Dent* 2006;2:54-5.
- Al-Rafee M, Adam HI, Alharbi TS, Almojel AA. Public awareness and knowledge of dental implants in Riyadh, Saudi Arabia. *Saudi J Oral Sci* 2018;5:110.
- Mayya A, D'souza J, George AM, Shenoy K, Jodalli P, Mayya SS. Knowledge and awareness of dental implants as a treatment choice in adult population in South India: A hospital-based study. *Indian J Dent Res* 2018;29:263.
- Jee Leng LY, Lean Keng SO, Wan Amir Nizam WA, Suat Cheng TA. Knowledge and attitude about stem cells and their application in medicine among nursing students in Universiti Sains Malaysia, Malaysia. *Malays J Med Sci* 2015;22:23-31.
- Areashi A, Algarni K, Alwadie M. Knowledge and attitude of patients toward dental implant in Asser Region, Saudi Arabia: A cross-sectional comparative study among patients with and without implants. *E.C. Dent Sci* 2017;13:222-7.
- Yaghini J, Naghsh N, Allameh M, Mohseni N. A cross sectional study on knowledge and attitude level of patients demanding implants in Isfahan, Iran, 2016. *J Oral Health Oral Epidemiol* 2018;7:99-106.
- Nagpal D, Prakash S, Kalra DD, Singh G. Knowledge, attitude, and practice of dental implants among dental postgraduates and practitioners in Davangere City, Karnataka: A cross-sectional study. *Indian J Dent Res* 2018;29:575.
- Siddique EA, Bhat PR, Kulkarni SS, Trasad VA, Thakur SL. Public awareness, knowledge, attitude and acceptance of dental implants as a treatment modality among patients visiting SDM College of Dental Sciences and Hospital, Dharwad. *J Indian Soc Periodontol* 2019;23:58.
- Al-Musawi A, Sharma P, Maslamani M, Dashti M. Public awareness and perception of dental implants in randomly selected sample in Kuwait. *J Med Implants Surg* 2017;2:1-5.
- Pommer B, Zechner W, Watzak G, Ulm C, Watzek G, Tepper G. Progress and trends in patients' mindset on dental implants. I: Level of information, sources of information and need for patient information. *Clin Oral Implants Res* 2011;22:223-9.
- Al-Johany S, Al Zoman HA, Al Juhaini M, Al Refeai M. Dental patients' awareness and knowledge in using dental implants as an option in replacing missing teeth: A survey in Riyadh, Saudi Arabia. *Saudi Dent J* 2010;22:183-8.
- Sakshi, Makkar P, Yadav A, Bajaj P, Sharma K. Knowledge and awareness of dental implants among undergraduate dental students. I.P. *Ann Prosthodont Restor Dent* 2018;4:6-8. doi: 10.18231/2455-8486.2018.0003.