

Awareness of Dental Implants and Acceptance of Dental Implants as A Treatment Option Among General Public and Other Special Groups

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Abstract:

Background: Among the various treatment options available for replacing missing teeth dental implants have become one of the promising tooth replacement option nowadays. Success of the implant treatment depend upon knowledge and expectation of the patient.

Materials and methods: A cross sectional study was conducted among four groups (Group 1- bystanders of the patient reporting to dental college, Group 2- medical professionals, Group 3- Govt staff and Group 4- school teachers) of participants with a sample size of 150 in each group. Data regarding demographic details, awareness, source of information, knowledge and acceptance about dental implants were collected using a self-explanatory questionnaire. The completed questionnaires were coded and data were entered and analyzed using SPSS software.

Results: Out of 600 participants, 270 (45%) participants were aware about dental implants as a treatment option for replacement of missing teeth. Among the aware participants major source of information was dentist. Socioeconomic status had a role in awareness and acceptance of dental implants treatment. Majority of the participants said high cost as the main disadvantage.

Conclusion: More than half of the participants were unaware of dental implants. This shows that there is a need for providing more information about dental implants especially among lower middle class and lower class. More dental education programmes are necessary to develop a positive attitude towards dental implant treatment.

Key Word: missing teeth; dental implants; patient awareness; questionnaire

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I. Introduction

In this fast-developing modern era, loss of any part of the body of an individual results in a feeling of being handicapped and the affected person feels disabled and helpless due to loss of ability and confidence to perform certain functions. Coming to teeth loss, the aesthetic, functional, psychological and social impacts in affected person is remarkably high which can reduce the person's social interaction due to the embarrassment^{1,2}.

Among the various treatment modalities for replacing the missing teeth, the conventional removable denture and fixed bridges were the most commonly accepted options by the patients. As the era changes and world develops, patient requirements and expectations were also changing³.

The intra oral use of titanium dental implants was suggested in the late 1950s⁴. Implants are becoming common in dental practice as the "gold standard" for replacing the missing teeth^{5,6}. Conservation of adjacent tooth and psychological comfort are the main advantages of implant treatment and other advantages include maintenance of bone, increased masticatory efficiency, improved esthetics and phonetics and reduced treatment morbidity.

All these advantages led to widespread acceptance of dental implants among the dental professional community. But the awareness and acceptance of implant treatment among the patient community overall the globe is still unclear. A study conducted in the united states showed that even though majority of questioned subjects knew about dental implants, their main source of information was from media and not from dental professionals⁷. In another survey conducted by Berge in Norway, mass media such as TV broadcasts and periodicals or journals provided mostly negative information about dental implant treatment⁸. Monika Saini in her study conducted in 2016 found that socioeconomic status has a direct relationship with awareness and acceptance of implant treatment⁹. Yukawa Ken in his study in 2016 concluded that male subjects opt dental implant for more

stability and they exhibit insufficient knowledge of proper implant care while female subjects opted for dental implants to avoid removable prosthesis and they had a lot of anxiety regarding surgery¹⁰.

Even though lot of studies have been conducted elsewhere to assess the awareness among the general public, more conclusive evidence is required locally and rural areas and also to find out the role of socioeconomic status on the treatment preference of dental implant over other alternatives.

The main aim of the study was to evaluate the level of awareness and to assess the acceptance of the participants towards dental implant treatment among general public, medical professionals, Govt. employees and school teachers.

II. Material and Methods:

Study design and study population: Study adopted a cross-sectional survey design using self-explanatory questionnaire to assess the awareness and knowledge regarding dental implants. Target population for this study was divided into four groups- bystanders of the patients coming to Govt. Dental college, medical professionals, Govt. employees and school teachers. Sample size calculated using formula $n=4pq/d^2$. 150 samples were interviewed per group. The study was conducted after receiving approval from the institutional ethics committee. Consent was taken from each and every participant.

The questionnaire: A total of 17 questions were selected for the study. The questionnaire records demographic information and responses for questions. The questionnaire was prepared in both English and Malayalam and handed to the participants of all groups.

Questionnaire comprises of questions mainly to assess the following aspects

- Awareness of dental implant treatment
- Source of information about dental implant treatment
- Acceptance of implant treatment
- Attitude and knowledge about implant treatment

1. *Do you think missing teeth should be replaced?*

1. *Yes*
2. *No*

2. *What do you think is the need for replacing missing tooth?*

1. *Appearance*
2. *Function*
3. *Both of the above*

3. *Which of the following prosthesis do you know for replacement of teeth?*

1. *Removable prosthesis*
2. *Fixed prosthesis*
3. *Implant prosthesis*
4. *All the above*

4. *Do you know that implants are a fixed type of prosthesis that can be used for replacement of Missing teeth?*

1. *Yes*
2. *No*

If answer to question no. 4 is 'yes', continue with PART A questions, if 'no' continue with PART B questions.

PART A

5. *What were your first sources of information about implants?*

1. *Newspaper*
2. *Television*
3. *Dentist*
4. *Friend and relatives.*
5. *Journals*

6. *Where do you think dental implants are placed?*

1. *Gums*
2. *Bone*
3. *Neighboring teeth*
4. *No idea.*

7. *What do you think the effectiveness of implants over other alternatives?*

1. *More*

2. Equal
 3. Less
 4. Don't know
8. What do you think about the dental hygiene care for implant prosthesis compared with natural teeth?
1. More
 2. Similar
 3. Less
 4. No idea.
9. What do you estimate as the functional life of an implant (years)?
1. <10
 2. 10-20
 3. >25
 4. Lifelong
 5. No idea
10. Do you know that implants can be used for multiple tooth replacement?
1. Yes
 2. No
11. Would you like to get implant treatment if needed?
1. Yes
 2. No
12. If 'yes', Reasons willing to have implant?
1. Aesthetics
 2. Function
 3. Avoidance of damaging adjacent teeth.
13. Reason preventing from opting dental implant
1. High cost
 2. Fear of surgery
 3. Surgical risks
 4. Others
14. Would you like to know about dental implants?
1. Yes
 2. No

PART B

15. Would you like to get implant treatment if needed?
1. Yes
 2. No
16. If 'yes', Reasons willing to have implant?
1. Aesthetics
 2. Function
 3. Avoidance of damaging adjacent teeth.
17. Reason preventing from opting dental implant
1. High cost
 2. Fear of surgery
 3. Surgical risks
 4. Others

Socioeconomic status of individuals was calculated using Kuppaswamy scale. Educational qualification, occupation and monthly income of each participant was recorded and scored according to the scale. Socioeconomic scale was calculated by adding 3 scores.

By using Kuppaswamy scale, study population was divided into 5 classes, upper class, upper middle, lower middle, upper lower and lower. A pilot study was performed to evaluate the validity of the questions. The final questionnaire was divided into 3 parts. 1st part comprises of questions about participant's need for replacement of missing teeth and about the awareness of dental implant. 2nd part comprises of questions for the participants who are aware of implant treatment. 3rd part is filled by participants (who are unaware of implant) following the awareness programme.

Statistical analysis

The completed questionnaire was coded and data was entered in the excel sheet and analyzed using SPSS software. Descriptive statistics were generated to summarize the response. For qualitative variables like gender and knowledge, frequency and percentage were calculated and for qualitative variables like age, mean +/- SD was used. Chi square test was used to compare two categorical data in contingency table.

III. Results

Out of 600 study samples, 289 male subjects and 311 female subjects participated in the study. The study population aged between 20 and 60 years are selected for ease of assessment. 48% of participants belong to upper middle class, 26% belong to lower middle class, 12.8% belong to upper class and 12% belong to upper lower class. Around 41.2% of participants comes under the age group between 31-40 years, 20.8% participants between 20-30 years, 29.2% between 41-50 years and 8.8% between 51-60 years. Table 1 shows the statistics of demographic data and Table 2 shows survey data.

Table no 1 : Demographic data

Demographic Data	Frequency	Percentage
Gender	Male	289 (48.2%)
	Female	311 (51.8%)
Age	20-30	125 (20.8%)
	31-40	247 (41.2%)
	41-50	175 (29.2%)
	51-60	53 (8.8%)
Socioeconomic status	Upper class	77 (12.8%)
	Upper middle	292 (48.7%)
	Lower middle	159 (26.5%)
	Upper lower	72 (12%)

Table no 2 : Survey Data

1. Do you think missing teeth should be replaced	Yes	600
	No	0
2. What do you think is the need for replacing missing teeth	Appearance	13
	Function	15
	Both	572
3. Which of the following prosthesis do you know for replacement of Teeth	Removable prosthesis	226
	Fixed prosthesis	104
	Implant prosthesis	2
	All the above	268
4. Do you know that implants are a fixed type of prosthesis that can be used for replacement of missing teeth	Yes	270
	No	330
5. What were your first sources of information about dental implants	Dentist	145
	Friends and relatives	56
	Journals	61
	Others	8
6. Where do you think the dental implants are placed	Gums	62
	Bone	151
	Neighboring teeth	21
	No idea	36
7. What do you think the effectiveness of dental implants over other Alternatives	More	144
	Equal	40
	Less	7
	Don't know	79
8. What do you think dental hygiene care for dental implants compared to natural teeth	More	119
	Similar	59
	Less	37
	No idea	55
9. What do you think the estimated functional life of dental implants	<10 years	15
	10-20 years	37
	>25 years	73
	Life long	112
	No idea	33
10. Do you know that dental implants can be used for multiple tooth Replacement	Yes	177
	No	93
11. Would you like to get implant treatment if needed	Yes	247
	No	23

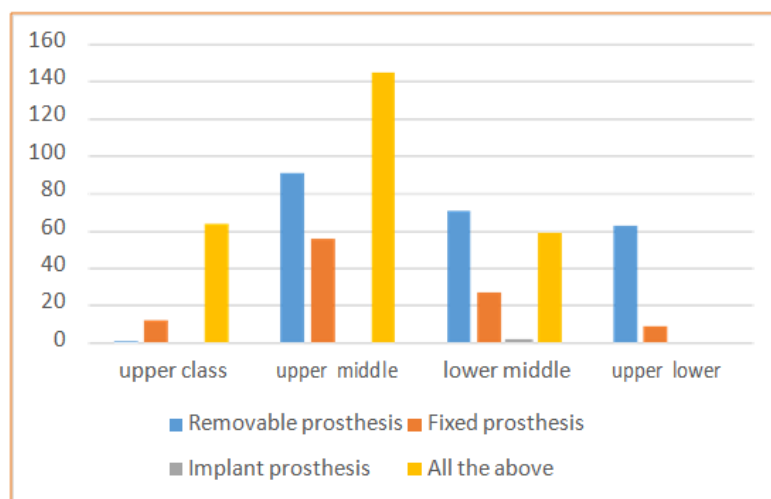
12. If yes, reason willing to have implants	Aesthetics	79
	Function	42
	Avoidance of damaging adjacent teeth	126
13. Reason preventing from opting dental implants	High cost	152
	Fear of surgery	51
	Surgical risk	67
14. Want to know more about dental implants	Yes	575
	No	25
15. Would you like to get implant treatment if needed	Yes	309
	No	15
16. If yes, reason for acceptance (after awareness programme)	Aesthetics	54
	Function	34
	Avoidance of damaging adjacent teeth	221
17. Reason preventing from opting dental implants (after awareness programme)	High cost	262
	Fear of surgery	49
	Surgical risk	13

All the subjects participated in the study agreed that the missing teeth should be replaced. Among 600 participants surveyed, 2.2% of participants wants teeth replacement for appearance, 2.5% wants teeth replacement for function and 95.3% participants wants teeth replacement for both appearance and function. 226(37.7%) participants knew about removable prosthesis, 104(17.3%) participants knew about fixed type but were not aware about implant prosthesis. 2(0.3%) participants knew only about dental implants while 268(44.7%) knew about all the three types of replacement options. 140 males and 130 females were aware about implants.

Association between socio economic status and knowledge regarding various treatment options for teeth replacement shows high statistical significance with P value <0.05

Table no 3: Teeth replacement options according to socioeconomic status

Socioeconomic status	Treatment options				P value
	Removable prosthesis	Fixed prosthesis	Implant prosthesis	All the above	
Upper class	1	12	0	64	.000
Upper middle	91	56	0	145	
Lower middle	71	27	2	59	
Upper lower	63	9	0	0	



When asked about the sources of information about dental implants, about 53.7% responded that the main sources of information were from dentists. 22.6% got information from journals and 20.7% got information from relatives and friends, 3% of the subjects got information about dental implants from other sources like YouTube, Facebook etc.

Secondary source of information about dental implants for both medical professionals and school teachers were obtained from various publications followed by friends and relatives. In case of Govt. employees' secondary source of information was friends and relatives followed by different journals

Out of 270 participants, who were aware of dental implant treatment, for the site of implant placement, 151 participants responded as bones, 62 participants as gums, 21 as neighboring teeth and 36 had no idea. Association between source of information about dental implants and site of implant placement showed high statistical significance with P value <.05.

Table no 4 : Relation between source of information and site of implant placement.

Source of information	Site of placement				P value
	Gums	Bones	Neighboring teeth	No idea	
dentist	16	104	9	16	.000
friends and relatives	22	20	5	9	
journals	21	23	7	10	
others	3	4	0	1	

Also 53.3% considered implant treatment to be superior compared with other alternative options, 14.8% considered implant equally effective as other options, 2.6% considered implant treatment as less effective while 29.3% had no idea.

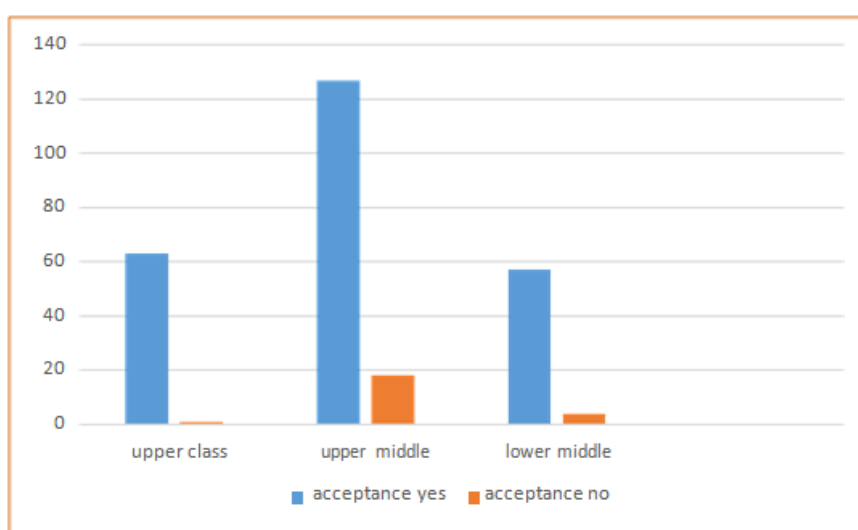
When asked about the dental hygiene care for dental implants compared to natural teeth 44.1% had a perception that implant teeth required more oral hygiene care when compared to natural teeth. 21.9% considered oral hygiene care as same for both natural and implant teeth. 13.7% considered less hygiene care for dental implants and 20.4% had no idea regarding this.

41.5% believed that implants would last for their life time, 27% believed that implants would last for more than 25 years, 13.7% believed that implant lasts for 10 to 20 years, 5.6 % thought that life is less than 10 years while 12.2% had no idea about the implant life.

247(91.5%) participants were ready to accept the implant treatment option if needed for replacing any missing teeth, 8.5% participants were not willing to accept dental implants if needed. Association between socio economic status and implant treatment acceptance shows a statistical significance with P value < .05.

Table no 5: Association between socio-economic status and treatment acceptance

Socioeconomic status	Acceptance		P value
	Yes	No	
upper class	63	1	.029
upper middle	127	18	
lower middle	57	4	



Reason for favoring implant treatment was to avoid damage of adjacent teeth(51.0%) followed by esthetics(31.7%) and function(17.3%) while the main barrier for selecting dental implants for replacing missing teeth was high cost (56.3%) followed by surgical risk(24.8%) and fear for surgery(18.9%).

Among 270 aware participants, 251 want to know more about implants and 19 didn't want to know about it. Among 330 unaware patients 6 of them don't want to know about implants while rest all want to know about it. Participant's response towards securing knowledge about dental implants was statistically significant (p value <0.05).309 participants accepted to opt for implant while 15 opted it out after the awareness programme.

Table no 6: Response of participants to know more about dental implants

Awareness	Response		P value
	Yes	No	
Yes	251	19	.001
No	324	6	

IV. Discussion

The main aim of modern dentistry is to restore esthetics, function as well as the oral health of the patient and thereby improving the overall health¹¹. Loss of teeth due to any reason like dental caries, gingival and osseous disease or any trauma and iatrogenic procedures can affect the apparent status of person and their self confidence¹². Day to day personal life, professional life and social life of an individual can be affected by loss of one or multiple teeth. Prosthetic replacement is used when the function and esthetics are compromised and traditional removable and conventional fixed bridges are commonly adopted treated modalities¹¹. However, as the society develops in this modern era, implants are becoming more popular because of its aesthetics, functional efficacy, prevention of bone loss, avoiding damage of adjacent tooth etc¹³.

Studies conducted to assess the awareness about implants in different populations and the result was varying from high to low awareness and this depends upon education, socioeconomic status and location of the population studied^{12,14,15,16}. Even though implant popularity increased as ages, ordinary people are unaware about this and it can be due to their lack of knowledge, poor economic status, fear of surgical procedures and certain religious causes.

The current study focused on the level of awareness and acceptance of dental implants as a treatment option for replacing missing teeth among four groups of participants which includes bystanders of patients reporting to govt. dental college Kozhikode, medical professionals, Govt. staff and school teachers. 600 subjects participated with 150 participants in each group. Data was collected using a self-explanatory questionnaire which has 3 parts.

Attitude towards tooth replacement and dental implant treatment:

95.3% of participants want teeth replacement for esthetics and improving masticatory efficiency. About different tooth replacement option, more than half(55%) had heard about removable and fixed type of prosthesis, but haven't heard about implants. This result was similar with the studies conducted by Kireb J et al¹⁵, Mgbeokwere et al¹⁷ and Olaide Shakeerah et al¹⁸. Their findings were lower when compared with the studies conducted by Zimmer et al¹⁹, Berge⁷, Tepper at al²⁰.

Socio economic status and treatment option:

Socio economic status of the participants was calculated using Kuppaswamy scale²¹. The scale divides the socioeconomic status based on 3 variables, education, occupation and income. In this study, majority of the participants comes under upper middle class(48.7%). None of the study participants belongs to lower class. Upper lower class and lower middle class know about the removable and fixed treatments while upper and upper middle class knew all types of treatment options including implant treatment. Considering the influence of socio-economic status on awareness of dental implants and treatment preference, significant difference was obtained between high and low socio-economic status participants and it was found that awareness and preference of subject increases with increase in socio economic status.

Source of information:

Information regarding dental implants can be obtained from various sources like journals, dentist, internet, friends and relatives etc. In this study the main source of information was from dental professionals. The secondary source in this study was journals followed by friends and relatives.

Several other studies conducted by Jolanta Szymanska et al²². Mohammed et al²³, Pragati et al²⁴, Awais Shabbir et al²⁵ shows same result that is, dentist as the main source of information about dental implants. The

study conducted by Brekhna qayum et al¹⁴, Elhadi awooda et al¹³, Sulieman et al²⁶ reported relatives and friends as the main source of information.

With regard to the site of implant placement, more than half of the participants opted bone as the site for implant placement. Some of the participants believed gums and adjacent teeth as the site for implant placement. This was similar with the result of study by Jaber Yaghini et al¹¹. More than half of the participants, who are aware of implants, thought that implants are more effective than other alternative treatment methods. In this study around 44.1% of participants who are aware of dental implants had a perception that implant required more oral hygiene care when compared to natural teeth. 21.9% said that oral hygiene care is same as that of natural teeth. This result was almost similar with the result of study conducted by Madhurya et al to assess the oral hygiene awareness for implants. Tapper et al in his study reported that 4% of patients believes using of implants need less care, 46% believed more care and 44% thought equal care

Response:

95.8% of participants wants to know more about implants. This shows a positive response of the participants to acquire knowledge regarding dental implants.

Barrier for selecting implant treatment:

Among the aware participants, 91.5% are ready to accept the treatment if needed and 50.8% opted this treatment to avoid damage of adjacent teeth. 32.3% give more priority for dental implants for esthetics and 16.9% for function. For the unaware group, after the awareness programme, around 95.4% were ready to accept the treatment. Studies conducted by different authors reported high cost as the main limiting factor for replacing missing teeth^{4,6,8,20,26,27}. Earlier study conducted by Gerry Kent²⁸ reported that there was significant fear of surgery which discourage patients from choosing implant treatment.

Further studies are needed on a larger scale to evaluate the level of awareness about dental implants as this survey was conducted in a limited group of participants, additionally, the area of coverage in this study needs to be more widely distributed.

V. Conclusion

Within the limitation of this study, it can be concluded that 45% of the people in the study were aware about dental implants as treatment option for replacing missing teeth. Awareness and acceptance of dental implant treatment is more for participants with a better socio-economic status. Majority of the aware participants got information regarding implant from the dental professionals. Secondary source of information is from journals followed by friends and relatives. High cost of treatment is a major barrier preventing the participants from choosing implants for replacement of missing teeth. Efforts should be made to reduce the cost of treatment to make it affordable. More awareness about dental implants could be imparted by implementing various public awareness programmes through dental camps or various health programmes. Newspapers, television and other social medias can be used for creating awareness regarding dental implants. Awareness and knowledge regarding implant treatment may help to reduce any incorrect/unrealistic expectations about dental implant.

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