Knowledge and Awareness of Dental Implants as a Treatment Choice in Adult Population in South India: A Hospital-based Study

Abstract

**Context:** Implant-supported prosthesis improves the self-confidence and quality of life of the patient by giving them masticatory comfort and a high level of satisfaction. For any professional community, it is essential to know whether patients feel well informed and whether what they know reflects on the current advances in dental health care. The aim of this study was to assess the knowledge and awareness of dental implants as a treatment choice in patients visiting a dental college situated in Mangalore, Karnataka, India. **Materials and Methods:** A questionnaire consisting of 13 close-ended questions was used to assess the level of knowledge and awareness among patients visiting prosthodontics outpatient department regarding dental implants as a treatment option for replacing missing teeth. A total of 242 participants were interviewed to collect the required data. Chi-square test was used to study the association between demographic variables and awareness about implantation. **Results:** Only 17.8% of the population with missing teeth knew about dental implants as a treatment choice. For 69.8% of the population, the source of information regarding prosthetic options was through friends and relatives, and for 28.1%, it was from dentists. Awareness percentage was significantly higher among males \( (P = 0.024) \) and among those whose education level was graduation and above \( (P < 0.001) \). **Conclusion:** This study showed that knowledge and awareness regarding dental implants was disturbingly low. The patients had a very minimal and superficial knowledge regarding prosthetic options. Emphasis is placed on the need for conducting and implementing various public awareness campaigns and for establishing counseling centers.

**Keywords:** Awareness, dental implants, India, knowledge

Introduction

Oral implantology is a well-established subspecialty of restorative dental and oral surgery. The loss of natural teeth is a health problem that is associated with functional, cosmetic, and psychological morbidities since antiquity.\(^1\) Various attempts have been made to replace the lost dentition with artificial teeth (prosthesis) that resemble the natural teeth in function and appearance. This solution is often achieved with dentures and fixed bridges.\(^1\) Today, implant-supported restorations can be considered the treatment of choice from the perspective of occlusal support, preservation of adjacent teeth, and avoidance of a removable partial denture.\(^2\) Currently, dental implants are widely accepted as a prosthetic treatment of completely or partially edentulous patients. This led to widespread acceptance and popularity of dental implants within the dental professional community.\(^3\) The level of awareness of dental implant treatment varies among several studies in different countries. In a survey by Zimmer et al. among 120 American participants, public awareness and acceptance of dental implants were found to be high as well as to have a general positive attitude toward dental implants.\(^4\) An overwhelming 77% of those questioned knew about dental implants, but their main source of information was the media, while the dentist did not contribute much.\(^4\) In a Swedish study, long-term satisfaction rates were determined 10 years after the implant treatment. This showed 97% of those questioned to be generally satisfied with masticatory function and phonation and to be more self-confident.\(^5\)

Knowing what the patients know about implants helps to match the patients’ expectations with what can realistically be achieved to ward off a negative image of implant dentists caused by a communications gap and by consumer discontent.\(^6\)

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The present study was carried out to provide information for analysis about the level of knowledge, awareness, and attitude of a group of Indian population toward the options available for replacing missing teeth. In particular, this investigation focused on their perception and knowledge about dental implants.

Materials and Methods

Study design and study population

This study adopted a cross-sectional survey design. The target population for this study was the prosthodontics outpatients of a dental college situated in Mangalore, Karnataka. The data were collected by interviewing a total of 242 participants (149 males and 93 females) who agreed to participate and signed the consent form. The study was conducted after receiving approval from the Institutional Ethics Committee. All the participants were either partially or completely edentulous within the age groups of 20–75 years.

The questionnaire

A self-explanatory questionnaire was designed to assess the patient’s knowledge and awareness regarding prosthetic options and dental implants. The questionnaire was adopted from a previous study conducted by Tepper et al., 2003. The questions were revalidated through three professors of prosthodontics, and a pilot study was performed on ten dental patients to evaluate the efficiency of the questionnaire. The questionnaire was finalized with the necessary modifications. The final questionnaire comprised of demographic variables and 13 multiple-choice questions relating to the study objective in two parts. The items in the first set of questions included dental status, replacement for missing teeth if any, and the general attitude toward the need for prosthodontic evaluation.[7] The second set of questions assessed their awareness and level of information about dental implants as a prosthetic option along with the level of acceptance of dental implants as a treatment option as compared to other prosthetic options. These questions were asked only to those who knew about dental implants.

Considering the multiple local languages (Kannada, Tulu, Malayalam, etc.) and poor English language ability of the participants, it was decided to administer the questionnaire through an interviewer who knows the language of the responder.

Statistical analysis

A total of 242 participants were interviewed to collect the required data. Data were summarized by computing the frequency and percentages. Chi-square test was used to study the association between demographic variables and awareness about implantation. Statistical package version 15 was used to analyze the data.

Results

The sample comprised of 149 (61.6%) males and 93 (38.4%) females. The age range of the participants was 20–75 years, with majority (42.6%) in the age group of 40–59 years. The level of education of 102 (42%) participants was graduation and above. Majority of the participants (71.1%) were with 1–5 missing teeth [Table 1].

When asked whether missing teeth must be replaced, 21.9% felt that the need arose only when there was a visible gap (esthetically compromised), while 78.1% felt the definitive need for prosthetic rehabilitation [Table 2].

The awareness level regarding prosthetic options varied, with 100% of the participants knowing about complete dentures and only 17.8% of the respondents having heard of dental implants. Majority of the participants (67.8%) did not replace their missing teeth. A huge majority (93.4%) of the study population preferred fixed prosthetic rehabilitation to removable options [Table 2].

Regarding the sources of information about prosthetic options, 69.8% of the respondents received information from friends and relatives and 28.1% from the dentists. Only 2.1% of the participants had information from electronic media such as TV, radio, and Internet [Table 2].

Of the 43 participants (17.8%) who knew about dental implants, only 4.7% felt well informed about

| Table 1: Demographic characteristics of respondents of the survey |
|--------------------|------------------|
| Characteristics     | Frequency (%)    |
| Sex                |                  |
| Male               | 149 (61.6)       |
| Female             | 93 (38.4)        |
| Total              | 242 (100.0)      |
| Age (years)        |                  |
| 20-39              | 81 (33.5)        |
| 40-59              | 103 (42.6)       |
| 60-75              | 58 (24.0)        |
| Total              | 242 (100.0)      |
| Level of education |                  |
| Illiterate         | 4 (1.7)          |
| Primary education  | 6 (2.5)          |
| Secondary education| 61 (25.2)        |
| PUC/diploma        | 69 (28.5)        |
| Graduation or more | 102 (42.1)       |
| Total              | 242 (100.0)      |
| Number of missing teeth |            |
| 1-3                | 83 (34.3)        |
| 4-5                | 89 (36.8)        |
| 6-10               | 41 (16.9)        |
| ≥10 (not all)      | 21 (8.7)         |
| All                | 8 (3.3)          |
| Total              | 242 (100.0)      |
Table 2: Perception, awareness, and practice about missing teeth

| Missing teeth should be replaced (perception) | Frequency (%) |
|----------------------------------------------|---------------|
| Yes, definitely                              | 189 (78.1)    |
| Yes, if gap visible                          | 53 (21.9)     |
| Total                                        | 242 (100.0)   |

| Alternatives for replacing missing teeth (awareness) | Frequency (%) |
|-----------------------------------------------------|---------------|
| Bridge                                              | 64 (26.4)     |
| Removable                                           | 108 (44.6)    |
| Complete                                            | 242 (100)     |
| Implants                                            | 43 (17.8)     |
| Total*                                              | 242           |

| Missing teeth replacement (practice)                | Frequency (%) |
|----------------------------------------------------|---------------|
| Not replaced                                       | 164 (67.8)    |
| Bridge                                             | 19 (7.9)      |
| Removable                                          | 38 (15.7)     |
| Complete                                           | 20 (8.3)      |
| Implants                                           | 1 (0.4)       |
| Total*                                             | 242 (100.0)   |

| Preferred prosthetic rehabilitation                 | Frequency (%) |
|----------------------------------------------------|---------------|
| Fixed                                              | 226 (93.4)    |
| Removable                                          | 16 (6.6)      |

| Source of information about prosthetic options      | Frequency (%) |
|-----------------------------------------------------|---------------|
| TV/radio/Internet                                   | 5 (2.1)       |
| Dentist                                            | 68 (28.1)     |
| Friends/relatives                                   | 169 (69.8)    |
| Total*                                              | 242 (100.0)   |

*Percentage will not add up to 100 as some of them knew more than one alternative for replacing missing teeth.

Table 3: Perception about dental implants among the 43 participants who are aware of implants as a treatment option

| Frequency (%) |
|---------------|
| How well informed about implants                     | 2 (4.7)       |
| Well                                                   |               |
| Not sure                                              | 14 (32.6)     |
| Poorly                                                | 27 (62.8)     |
| Total*                                                 | 43 (100.0)    |
| How long do you think an implant lasts?               | 2 (4.7)       |
| Up to 5 years                                         |               |
| Up to 10 years                                        | 33 (76.7)     |
| Up to 20 years                                        | 4 (9.3)       |
| For a lifetime                                        | 4 (9.3)       |
| Total*                                                 | 43 (100.0)    |
| Do you think implants need special care and hygiene?  | 9 (20.9)      |
| No, are cleaned like natural teeth                    |               |
| Yes, need more cleaning than natural teeth            | 34 (79.1)     |
| Total*                                                 | 43 (100.0)    |
| What do you personally think about implants?          | 4 (9.3)       |
| Would have them made if needed                        |               |
| Implants are good for everyone                        | 20 (46.5)     |
| Implants are expensive, only for the rich            | 14 (32.6)     |
| Would not have any                                   | 5 (11.6)      |
| Total*                                                 | 43 (100.0)    |
| What do you think is the biggest disadvantage of dental implants? | 33 (76.7) |
| High cost                                             |               |
| Need of surgery                                       | 10 (23.3)     |
| Long treatment time                                  | 14 (32.6)     |
| Total*                                                 | 43             |
| What do you think is the biggest advantage of dental implants? | 43 (100) |
| Fixed replacement                                     |               |
| Can eat hard food easily                             | 12 (28)       |

*Percentage will not add up to 100 as some of them expressed more than one disadvantage.

Regarding the lifespan of an implant, 33 participants (76.7%) felt that the average lifespan of an implant is 10 years, while four participants (9.3%) felt it lasted for a lifetime. When asked about the care to be taken for maintaining implants, 34 participants (79.1%) felt that implants needed more cleaning than natural teeth, while 20.9% of them felt that implants require the same amount of care as natural teeth [Table 3].

When asked what their personal opinion of dental implants were [Table 3], a minority of 9.3% of the 43 participants who knew about implants were willing to opt for dental implants, while 32.6% of them felt that it was an expensive treatment meant only for the rich and well-off. This tallies with the fact that a higher percentage (76.7% of 43) of the participants expressed that the main disadvantage of dental implants was the high cost involved. Others felt the need for surgery was a disadvantage. All the 43 participants who had heard of dental implants felt that their fixed nature was the biggest advantage [Table 3].

Awareness percentage was significantly higher among males (P = 0.024) [Table 4] and among those whose education level was graduation and above (P < 0.001) [Table 5].

**Discussion**

The patient poll of the level of awareness among Indian public about dental implants differs significantly from most other earlier studies. The present survey gives information about the participants’ knowledge and their need for more information related to dental implants as an option to replacing missing teeth in a sample of dental patients visiting a dental college situated in Mangalore, Karnataka. Interestingly, 21.9% of those questioned felt that replacing missing teeth was only necessary if gap was visible. This agrees well with an earlier published report, indicating that 79% of the Swedish population felt that it did not need to be replaced. Dentists must make more effort to educate their patients of the complex
The subjective level of awareness of dental implants varies, and only 17.8% knew about dental implants as an option for replacing missing teeth. This is in stark contrast with the results reported by Zimmer et al., Tepper et al. (2003a), and Berge et al., indicating the level of awareness as 77%, 70.1% and 72%, respectively.[4,6,9] A study conducted in an Austrian population reported the awareness level as 71%.[10] The low subjective awareness in this study can be attributed to the lower socioeconomic status and education level of this region. This study is also in congruence with Indian studies conducted by Gharpure et al., Venkata et al., and Satpathy et al., which showed low levels of awareness at 32%, 29%, and 16%, respectively.[11-13]

This survey showed that the main source of information about dental implants was friends and relatives, followed by dentists, newspapers and magazines, and last the Internet. This finding is different from those published before. Indian studies by Saha et al. and Suprakash et al. showed that dentists were the main source of information.[14,15] The survey made by Zimmer et al. showed that the media was the main source of information about dental implants.[4] Berge and Best also found the media to be the main source of information.[9,16] In contrast to this, another study done in Saudi Arabia showed similar results, where the main source of information was from friends and relatives. This result confirmed that family and friends are significant motivators for oral maintenance and tooth replacement in general.[3]

Most of the patients (99%) felt that a fixed prosthesis appears more natural and gives a better feeling in the mouth. This result was similar to that of Zimmer et al. (1992) and Tepper et al. (2003a), who concluded that fixed prosthesis is better than removable, and less annoying in the mouth.[4,6] This result was also in congruence with the finding reported by Al-Johany where only 3.3% of the participants chose removable prosthesis as the best treatment.[3]

In this study, 76.7% of the 43 participants who knew about implants felt that implants would last for 10 years. This is in contrast to the studies conducted by Tepper et al. (2003), Akagawa et al., and Tomruk et al. where almost 46%, 28%, and 33% of the participants felt that implants lasted for a lifetime.[7,17,18] Only 9.3% of the participants who knew about implants felt that implants lasted for a lifetime. Among those who were aware of implants, 79.1% felt that implants needed more cleaning than natural teeth. This shows that the participants who were aware had some idea about the maintenance of the prosthesis. Whereas in a patient awareness survey in Khamam, Andhra Pradesh, most of them felt that there was no need to take care at all and a few felt equal importance should be given for both natural teeth and implants.[19] In a study conducted by Tepper et al., (2003) only 44% of the sample thought that special oral hygiene was necessary for implants.[7]

When patients were asked about the disadvantages about dental implants, high cost was the major contributing factor. Other disadvantages included long treatment time and need for surgery. A recent study by Kohli et al. concluded that over 80% of the study group felt the high cost was a deterrent.[20] These results are in agreement with most of the previously mentioned studies conducted by Zimmer et al. and Tepper et al.[4,7]

Conclusion

The results of this survey among a selected sample indicated that the majority of the questioned participants were not aware about dental implants, their uses, or their advantages and disadvantages. Awareness about dental implants should be made by implementing various public awareness campaigns and establishing counseling centers in the patient outpatient ward of private dental clinics and dental colleges. Special effort is needed to improve the knowledge among females and less educated population. Efforts should be made by the public sector to lower the cost of the implants so that they can be made affordable to all.

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Conflicts of interest

There are no conflicts of interest.

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