

Evaluation of Public awareness, Knowledge and Approval of Oral Implant Treatment in South Indian Population: A cross sectional study.

Running title - Evaluation of Public awareness, Knowledge and Approval of Oral Implant Treatment in Indian Population

Nayana Prabhu¹, Saumya Kapoor², Sushma Yadav³

1. Department of Prosthodontics and Crown & Bridge, Manipal College of Dental Sciences, Manipal, Manipal Academy of Higher Education, Manipal, Karnataka, India. Orcid id- 0000-0002-3113-850X.

2. Department of Prosthodontics and Crown & Bridge, Manipal College of Dental Sciences, Manipal, Manipal Academy of Higher Education, Manipal, Karnataka, India. Orcid id- 0000-0001-5495-756X

3. Department of Prosthodontics and Crown & Bridge, Manipal College of Dental Sciences, Manipal, Manipal Academy of Higher Education, Manipal, Karnataka, India, Orcid id- 0000-0001-9696-9075

***Corresponding author:**

Dr Saumya Kapoor

Department of Prosthodontics and Crown & Bridge Manipal College of Dental Sciences,
Manipal, Manipal Academy of Higher Education, Manipal-576104
Karnataka, India

*Corresponding author email: mpnayana@gmail.com

Orcid id- 0000-0002-3113-850X.

ABSTRACT

Background - Presently, dental implants are favourable treatment alternatives for completely or partially edentulous patients. Research has reported substantial improvement in attitude of patients toward dental implants, however in developing nations with poorer access to dental care, acceptance of this treatment alternative isn't yet completely known.

Objective: A survey from a representative sample of Indian population was made to assess the level of public awareness, sources of information, need for information and expectations from dental implants in semi urban southern part of India.

Material and Methods: A cross-sectional survey involving 377 adult patients was conducted via systematic multi-choice questionnaire at a tertiary care medical university in southern part of India. The data collected was interpreted using SPSS version 20. A p-value of <0.05 was considered statistically significant.

Results: Patients of both the age groups i.e. less and more than 42 years of age knew about implants, though younger age group had more interest in acquiring further information

about the same. Dentists were the biggest source of information and majority of the patients were not aware of the procedure, duration of treatment and expenditure involved. After receiving the complete information about the procedure, majority were willing for the treatment and expected improved chewing efficiency (p-value of <0.05; significant).

Conclusion: This research showed that the public is not completely aware of implants as an appropriate treatment choice for replacing missing teeth, and don't have complete information about procedures. Revealing a need disseminate relevant information to the public.

Keywords - Dental implants; Behaviour; Awareness; Knowledge.

Introduction

Dental implant is structure analogous to root of a tooth. Embedded in the bone it is the receptacle for prosthetic replacements and is an ideal option for people with reduced dentition. Restoring functional, aesthetic and psychological well-being of an individual, implant supported prosthesis aid in preservation of remaining healthy natural dentition and adjacent periodontal tissues.¹

Around one million implants are inserted each year, worldwide. Dental implants are widely accepted and popular within the dental community. However, the information which is available to the patient regarding the procedure and its success is often fragmentary. With patients having little or incomplete knowledge about the treatment and its use.^{2,3,4}

The researchers from Himachal Pradesh in India⁵ and Australia⁶ have shown that dental implant therapy awareness rates in selected patient are approximately 47% and 64%, respectively. A survey study from Austria⁷ found that 72% of dental patients had awareness of dental implant procedures and 42% said that they had no knowledge about them, whereas only 4% of dental implant patients were well informed. The study concluded that information on general dentistry was slightly greater than information on implant dentistry.

Source of information is an important aspect in improving and increasing the awareness about dental implants. It can be provided by numerous mediums like audio-visual or print media, internet, dental professionals etc. With communication industry highlighting the medical and dental failures, without proper information patients are ill-informed and this may affect their acceptance of the treatment. Requiring the implementation of steps on the part of dental practitioners to spread the correct information.

Research has reported substantial improvement in attitude of patients toward their dental health after treatment with implant prostheses.⁸ Information on public awareness and evaluations of oral implants will give valuable contributions to ability and distribution planning for the future treatment provision, in the sense of public health policies, particularly in proportions of the public who would consider this form of treatment for themselves if necessary. This study focuses to assess the level of public awareness, sources of information, need for information and expectations from dental implants as treatment option among a selected sample of dental patients in semi urban city of southern part of India

Material and Methods

A cross-sectional, self-explanatory questionnaire study was conducted among the patients attending the outpatient department of a tertiary medical centre in the southern part of India. Institutional ethical clearance was obtained (ref no. IEC 329/2016) and pilot study was carried out for 30 dental patients to determine the questionnaire's reliability.

The sample size of 377 was calculated after pilot study, using the confidence interval of 95%. Simple random sampling was followed and patient recruitment was done from the months of May to October 2016. Informed consent was taken from the patients before their participation.

There were 10 questions to determine the following factors in the final questionnaire:

1. The extent of dental implant knowledge as an option to replace missing teeth.
2. Accepting dental implants as an alternative for treatment in contrast to other conventional methods of treatment.
3. Dental implant information source.

Inclusion criteria:

Healthy adults and participants visiting the dental OPD in Department of Prosthodontics. Single or multiple missing teeth in maxillary/mandibular arches and patients above 18 years of age.

Exclusion criteria:

Individuals below 18 years of age and those who were seriously ill/terminally ill, mentally challenged, physically handicapped, and pregnant females. Patient unwilling to give informed consent.

Data collection tool (the questionnaire):

The data for the study was collected via a questionnaire adapted from a previous study conducted by Pommer et al.⁹ The questionnaire was prepared in English and then translated into regional language to suite the local needs. The questionnaire comprised of demographic variables and 10 multiple-choice questions which consisted of questions regarding the dental status of the patients, awareness about implants and the source of information, knowledge about the procedure and the treatment cost, the willingness to accept dental implant as a treatment alternative for missing teeth compared to other prosthetic options. The respondents had to choose the most suitable option for that particular question.

Data were tabulated in Microsoft Excel and the analysis was done using Statistical Package for the Social Sciences (SPSS) version 20. A p-value of <0.05 was considered statistically significant. Age was dichotomised using median split. All the items of the questionnaire were compared between the age groups using Chi-square test. Binary logistic regression was used to evaluate the association of significant predictors with age after adjusting for gender.

Results

The sample comprised of 223 (59.2%) males and 154 (40.8%) females. Age range was from 18 to 75 years, with majority (50.93%) more than 42 years of age. 45 % of the participants were educated till graduation and 70% had 1 to 4 missing teeth. Of the patients who were less than 42 years of age and were part of the survey, 85.4% agreed to have knowledge of the treatment options available for replacement of missing teeth. While 81.8% of those who were more than 42 years of age were aware of the treatment alternative for missing teeth.

The 33.8 % of participants greater than 42 years was mostly aware of removable partial dentures as treatment alternative and 22.3% were aware of implants. While 29.7% of the patients less than 42 years were aware of fixed prosthetic options and 25.3% of implants. The younger population though had greater interest (60.0%) in acquiring basic knowledge about implants. The survey revealed that dentists themselves are the biggest source of information for the patients regarding implants in both the age groups (59.5% and 56.8% in <42 and >42 years respectively.) (Table 1)

Majority of the participants were not aware of the procedure, duration of the treatment and the expenditure involved. And after receiving the complete information about the procedure, in both the age groups, majority of the patients were willing for the treatment (74.3% and 58.3% in the age group <42 and > 42 years respectively). After implant rehabilitation these patients expect improved chewing efficiency in both the age groups (71.9% and 80.7% in the age group <42 and > 42 years respectively). (Table 2)

Discussion

The survey provides information about a selected dental patient sample population of Karnataka, India. This research assesses the patient's experience and the need for dental implant to replace missing teeth. In order to facilitate access and maximize the response rate, patients were contacted at their regular dental treatment visits. The gender distribution was chosen randomly.

Out of 377 patients 85.4% those who were less than 42 years of age and were part of the survey, had knowledge of the treatment options available for replacement of missing teeth. While 81.8% of those who were more than 42 years of age were aware of the treatment options for missing teeth. The older generation (>42 years) was mostly aware of removable prosthesis (33.8%) while patients <42 years majorly were aware of fixed partial dentures (29.7%).

The reason for the reduced awareness can be the poor socioeconomic status of the patients, low level of education and paucity of proper programmes to spread information about implants. However, the level of awareness recorded in this study is lower when compared earlier research⁶ which recorded the level of awareness in their different studies to be from 66.4% to as high as 77%. This may be due to the relatively low level of practice of implant

dentistry in this region and sensitization of patients by dentists toward the use of implant-retained prosthesis as option of tooth replacement

The younger population had greater interest (60.0%) in acquiring basic knowledge about implants, their benefits and disadvantages. They were educated about how fixed prosthetic options can improve the quality of their life. And after receiving the complete information about the procedure, in both the age groups majority of the patients were willing for the treatment (74.3% and 58.3% in the age group <42 yrs and > 42 yrs respectively). This result was in accordance with those concluded by Zimmer et al. (1992) Tepper et al. (2003), and Satpathy et al. (2011)^{10,11,12}. Zimmer et al. (1992) conducted a study in the American population of 120 individuals. Of 84 persons who had information about implants, 51 considered implant treatment, 17 did not, and 16 were undecided. Thus, emphasising that majority of the patients prefer fixed prosthesis in replacing their missing teeth in comparison to removable prosthesis¹⁰.

According to our report, after implant installation these patients expect improved chewing efficiency in both the age groups (p value = 0.043, significant). This is in accordance with a study done by Simensen et al. (2015) who reported that out of 117 subjects, majority of patients are motivated, with dental implant as a treatment option because of expectations of better masticating ability (46.0%), appearance (19.5%), or both (18.6%)¹³.

The survey revealed that dentists themselves are the biggest source of information for the patients regarding implants in both the age groups (59.5% and 56.8% in <42 and >42 yrs respectively). The study by Sinha et al. (2019)¹⁴ and Hosadurga et al. (2017)¹ also stated main source of information as dentist. This finding, however, differs from the Zimmer et al. survey (1992) where he states that the media and the internet are the main source of information about dental implants.¹⁰ The reason could be that majority of the people in this region trust professionals i.e. dentists, as their correct source of information and the reach, accessibility of the internet is still limited in the area, thus highlighting the need to spread more information about implants via magazines, newspaper, radio etc.

Conclusion

Dental implants have been widely used in treating partially and completely edentulous jaws, which particularly increased with the acceptance of the concept of osseointegration and had been a fixed clinical treatment modality due to its high success rate. The survey conducted in a section of population of dental patients from Indian population showed low level of awareness about dental implants as a suitable treatment choice for replacement of missing teeth. Thus, highlighting that adequate awareness and correct information are the essential means to spread the information regarding implant. The study proved that the dentist plays an important role in this along with implementation of dental education programmes, which lay emphasis on the procedure, advantages, and possible complications, which can occur during implant placement. The study demonstrates lack of a program or policy for coordinated dental implant information dissemination and shows that the dental professionals should be more proactive in sensitizing the public about the possible benefits of such treatment mode by disseminating correct information.

Acknowledgments

All the authors have contributed equally for this manuscript.

Dr NayanaPrabhu - Formulation of the study protocol, collection of data, statistical analysis, proof reading of the manuscript

Dr Saumya Kapoor, Dr Sushma Yadav - Formulation of the study protocol, manuscript writing.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

1. Hosadurga R, Shanti T, Hegde S, Kashyap RS, Arunkumar SM. Awareness, knowledge, and attitude of patients toward dental implants - A questionnaire-based prospective study. *J Indian SocPeriodontol*. 2017; 21(4):315–325.
2. NaertI, Koutsikakis G, Duyck J, Quirynen M, Jacobs R, Van Steenberghe D. Biologic outcome of implant-supported restorations in the treatment of partial edentulism: Part 1: A longitudinal clinical evaluation. *Clinical oral implants research*. 2002; 13(4), 381-389.
3. Sharma A, Chaudhari BK, Shrestha B. Knowledge and perception about dental implants among undergraduate dental students. 2019; *BDJ Open* 5, 1
4. Jivraj S, Chee W. Rationale for dental implants. *British dental journal*.2006; 200(12), 661.
5. Kumar A, Gupta R, Nagpal A, Samra RK, Kaur J, Babbar A. Evaluation of awareness toward various treatment modalities for replacement of teeth in local population of Sundar Nagar, District Mandi, Himachal Pradesh: A survey report. *Indian J Dent Sci*.2019; 11:77-82
6. Best H A. Awareness and needs of dental implants by patients in New South Wales. *Australian prosthodontic journal*.1993 7, 9-12.
7. Berge T I. Public awareness, information sources and evaluation of oral implant treatment in Norway. *Clinical oral implants research*.2000; 11(5), 401-408.

8. Grogono A L, Lancaster D M, Finger I M. Dental implants: a survey of patients' attitudes. *Journal of Prosthetic Dentistry*. 1989; 62(5), 573-576.
9. 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 Impl. Res.* 22, 2011; 223–229
10. Zimmer C M, Zimmer W M, Williams J, Liesener J. Public awareness and acceptance of dental implants. *International Journal of Oral & Maxillofacial Implants*, 1992;7(2): 228-232
11. TepperG, Haas R, Mailath G, Teller C, Zechner W, Watzak G, Watzek G. Representative marketing-oriented study on implants in the Austrian population. I. Level of information, sources of information and need for patient information. *Clinical oral implants research*.2003; 14(5), 621-633.
12. Satpathy A, Porwal A, Bhattacharya A, Sahu P K. Patient awareness, acceptance and perceived cost of dental Implants as a treatment modality for replacement of missing teeth: A survey in Bhubaneswar and Cuttack. *Int J Public Health Dent*.2011; 2(1), 1-7.
13. Simensen A N, Bøe O E, Berg E, Leknes K N. Patient knowledge and expectations prior to receiving implant-supported restorations. *International Journal of Oral & Maxillofacial Implants*.2015; 30(1) :41–47
14. Sinha M, Agarwal M, Shah SS, Desai S, Desai A, Champaneri H. Constraints among patients while opting dental implant as a treatment option. *Int J Oral Care Res*.2019; 7:8-11

		Age				P-value
		<42		≥42		
		N	%	N	%	
Knowledge about treatment alternatives available for the replacement of missing	No	27	14.6%	35	18.2%	0.341;
	Yes	158	85.4%	157	81.8%	NS
If yes	Removable prosthesis	28	17.7%	53	33.8%	0.012; Sig
	Fixed prosthesis	47	29.7%	34	21.7%	
	Implants	40	25.3%	35	22.3%	
	More than 1 response	43	27.2%	35	22.3%	
Interest in knowing about implants as a treatment option	Had knowledge	49	26.5%	53	27.6%	0.205; NS
	Interest in acquiring basic knowledge	111	60.0%	102	53.1%	
	not interested	19	10.3%	33	17.2%	

	had knowledge and interest	6	3.2%	4	2.1%	
Source of information regarding implant	Newspapers / posters	20	10.8%	36	18.8%	0.247; NS
	TV /Radio	4	2.2%	2	1.0%	
	Friends and relatives	22	11.9%	24	12.5%	
	Dentist	110	59.5%	109	56.8%	
	Internet	7	3.8%	4	2.1%	
	more than response	22	11.9%	17	8.9%	

Table 1: Knowledge, interest and source of information with respect to implants as the choice for replacement of missing teeth

			Age				P-value	OR (95% CI) †	
			<42		≥42				
			N	%	N	%			
Knowledge	Knowledge regarding the implant placement procedure	No	110	59.5%	109	56.8%	0.597; NS	-	
		Yes	75	40.5%	83	43.2%			
	Knowledge regarding the duration of the treatment	No	136	73.5%	119	62.0%	0.017; Sig		1.71 (1.12-2.7)
		Yes	49	26.5%	73	38.0%			
	Knowledge regarding the cost of the procedure	No	125	67.6%	132	68.8%	0.805; NS		-
		Yes	60	32.4%	60	31.2%			
Willingness	Willingness for the implant treatment as an alternative to replace missing teeth after acquiring the knowledge about the procedure, treatment duration and cost	No	47	25.7%	80	41.7%	0.001; Sig	0.49 (0.31-0.75)	
		Yes	136	74.3%	112	58.3%			
Expectations	Better esthetics	No	49	26.5%	42	21.9%	0.296; NS	-	
		Yes	136	73.5%	150	78.1%			
	Improved chewing efficacy	No	52	28.1%	37	19.3%	0.043; Sig		1.65 (1.02-2.66)
		Yes	133	71.9%	155	80.7%			
	Better phonetics	No	162	87.6%	169	88.0%	0.893; NS		-
		Yes	23	12.4%	23	12.0%			
	Social acceptancy	No	155	83.8%	170	88.5%	0.18; NS		-
		Yes	30	16.2%	22	11.5%			

Table 2: Knowledge, willingness and expectations with respect to implant as the choice for replacement of missing teeth