



Original Article

Assessing perceptions of oral health related quality of life in dental implant patients. Experience of a tertiary care center in India

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ABSTRACT

Background: Patients perception of treatment outcomes are invaluable assessment tools and are effective indicators for future prognosis. Various tools of measurement have been used to assess the same. The oral health impact profile questionnaire (OHIP 14) has been effectively used to evaluate the oral health-related quality of life (OHRQoL) with regards to individual perceptions. This study was conducted to assess OHRQoL in patients who have had dental implants to replace missing teeth in the Department of Dental Surgery, Unit 1, Christian Medical College and Hospital, Vellore, TN, India by using the OHIP 14 questionnaire.

Materials and Methods: A total of 107 patients who had treatment with dental implants were sent a modified form of the OHIP 14 questionnaire. An attempt was made to draw an inference by correlating scores of the OHIP 14 with data pertaining to key independent variables. Gamma regression was applied to the results as the outcome score distribution was skewed. All statistical analyses were performed using SPSS Version 21.0.

Results: The mean score for the OHIP 14 was 16.82 with the highest score of 30 for a total score of 70. OHIP 14 scores were higher in patients with implant-supported fixed dental prosthesis as compared to patients with single implant supported crowns ($P = 0.0069$). Patients with no complaints scored 9% lesser than those who reported complaints ($P = 0.0438$).

Conclusion: Assessing quality of life with regards to specific treatment interventions may help to draw critical inferences that determine overall success. Results from the study enabled us to delineate and appreciate the success imparted by esthetics and function from the general well being imparted by treatment with dental implants. Social media could be used to positively improve responses in questionnaire based studies. Future studies using implant specific OHRQoL questionnaire may help to elicit unbiased patient perception in dental implant patients.

1. Introduction

Edentulism and resulting dental disability have shown to cause functional limitation, physical, psychological and social handicap with severe impact to the health and overall well being.^{1,2} Rehabilitation of edentulous sites with dental implants has had long term success with more patients considering dental implant supported prostheses as appropriate replacements for their lost dentition with marked improvements to their OHRQoL.³ A fast growing digital economy is sensitizing the urban Indian population to their dental needs with awareness to dental implants and other dental treatments.⁴ Scope of treatment with dental implants continues to be intangible due to improved economic and resource factors.⁵

Tools assessing the quality of life (QoL) have become invaluable aids to gauge patient's perception of treatment outcomes and their wider impact on the life outcomes. OHRQoL as an entity is defined as an

individual's assessment of how functional factors, psychological factors, social factors, and experience of pain/discomfort affect an individual's well being in relation to orofacial concerns.^{6,7} Various authors such as Slade and Spencer (1994), Leao and Sheiham (1996), Slade (1997), Slade et al (1998), McGrath and Bedi (2001), and Allen and Locker (2002) have developed questionnaire based tools to record patient's perception of treatment outcomes. The original OHIP 49 questionnaire developed by Locker and Miller (1994) modified later by Slade (1997) into the OHIP 14 is adapted from the WHO's framework used to classify impairments, disabilities, and handicaps. It has emerged as a highly validated and reliable tool to assess the OHRQoL and consists of 14 items organized in seven subscales namely functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. The English version of the oral health impact profile questionnaire (OHIP 14) as a psychometric tool with appropriate validation has been used in study designs of the

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Indian population to measure various aspects related to oral health and also interpreted with other psychometric tools and clinical situations.⁹ The OHIP 14 has also been translated and validated in the Indian national language Hindi and Gujarati language.^{10–12} Studies exclusively pertaining to assessment of OHRQoL in patients treated with dental implants in various sub groups among the Indian population are being documented. The aim of this study was to assess the OHRQoL in patients who had received treatments with dental implants by using a validated and modified version of the OHIP 14 questionnaire through various modalities of sending the questionnaire to elicit response from the participants and to correlate the score with independent variables to help draw inference to gain better understanding of the overall success.

2. Materials and methods

All patients who had received dental implants to replace missing teeth in the Department of Dental Surgery, unit 1, Christian Medical College and hospital, Vellore, TN, India, were identified and those with adequate contact details were informed about the study and questionnaires sent based in their convenience of receipt. These patients were treated with two implant systems (Zimmer Dental, Carlsbad, CA; Nobel Biocare USA, Inc., Yorba Linda, CA) over a period of 15 years from 2002 to 2016. The original English version of the OHIP 14 questionnaire was assessed for face and content validity through a pilot study on a convenient sample (n = 13). The feedback provided in the survey was used to modify the latter part of each of the 14 OHIP questionnaire by replacing the words "mouth or dentures" to "after treatment with dental implants". The altered questionnaire was assessed for reliability and content validity.

Questionnaire based studies have traditionally used postal methods and face to face interviews to obtain data. Based on the convenience and accessibility of the patients a hybrid approach of sending the questionnaires through, inviting patients for a face to face interview with the principal investigator (PI) and dispensing the link to the questionnaire through email and a popular encrypted messaging service 'Whatsapp' for achieving maximum response among the study sample was employed. The questionnaires included an information sheet and informed consent. Participants in all the categories were invited for a face to face interview or call the PI in case of difficulties.

The three part questionnaire consisted of patient demographics including non dependent variables, the 14 item OHIP questionnaire, and general feedback respectively. The response strategy to the 14 item OHIP questionnaire was based on a Likert scale model with five responses each with a score: Never (1), Hardly ever (2), Occasionally (3), Fairly often (4), Very often (5). The scores were added to obtain the final value. The lowest scores represented a higher satisfactory perception of an individual's OHRQoL and vice versa. Responses were collated and analysed using appropriate tools.

3. Statistical analysis

Mean and median (Minimum-Maximum) were calculated for outcome scores. Frequencies (percentages) were analysed for the independent variables like gender, level of education, area of implant placement, type of prosthesis, total number of implants and implant experience with regards to complaints. As the scores were skewed with outcomes displaying continuous but non-normal data with constant coefficient of variation, the risk factor analysis was performed using gamma regression. $P \leq 0.05$ was considered to be statistically significant. All the data were collected and entered into spreadsheets and processed using SPSS software (Version 21.0., IBM, Chicago, IL, USA). The study was conducted in accordance with the ethical principles of the Helsinki declaration. The study was approved by the institutional ethics committee.

Table 1
Method of administering questionnaire.

Method of administering questionnaire	Response	Non Response	Total
Whatsapp	32 (84.3%)	06 (15.7%)	38 (35.51%)
Email	26 (86.6%)	04 (13.3%)	30 (28.03%)
Letter	02 (8.69%)	21 (91.3%)	23 (21.49%)
Face to face	16 (100%)	0 (0.0%)	16 (14.95%)
Total	76 (71.02%)	31 (28.97%)	107 (100%)

4. Results

A total of 151 patients were identified as possible participants for the study out of which 107 were sent questionnaires based on the adequate reliable contact details. Validation of the modified questionnaire was achieved using Cronbachs alpha in which the reliability between the original and modified OHIP 14 questionnaire among a sample (n = 10) showed 73% and 63% respectively. There was also no significant difference between the sum of the original and the modified questionnaire. The mean (SD) of the original and modified were 18.10 (3.81) and 17.3(3.06) respectively ($P = 0.61$). The questionnaires were sent by post with a prepaid return envelope, and link sent through email, and 'Whatsapp'. Besides these, a few patients preferred face to face interview. The response percentage of each mode is displayed (Table 1). A total of 76 patients (females n = 41; males n = 35) responded to the questionnaire with a 71.02% participation ratio. The maximum number of implants in any one patient ranged from a maximum of 6 and minimum 1. The various sites in which implants were placed are described (Table 2). The type of prosthesis in these patients ranged from implant supported single crowns (78.95%), partial fixed prosthesis (13.16%), multiple single and partial fixed prosthesis (2.63%) and removable denture retained by implants (5.26%). A total of 72.37% of patients did not report complaints. The remaining 27.63% experienced loose crowns (14.47%), pain (6.58%), food impaction (2.63%) and caries to adjacent teeth (2.63%) with varying frequency. The mean, median and frequency was analyzed (Table 3). The reported OHIP 14 scores ranged between 14 and 30 out of a possible maximum score of 70. Higher OHIP 14 scores indicated poor OHRQoL, while lower OHIP 14 scores indicated better OHRQoL. The skewed outcome was analyzed using gamma regression. It was observed that with an increase in the number of dental implants the score of OHIP 14 decreased ($1-0.91 = 0.09$, that is 9%), which was statistically significant ($P = 0.0001$). As compared to patients with single crowns, patients with fixed dental implant based prosthesis had higher scores (1.19, that is 19%) ($P = 0.0069$). Statistically significant results were obtained in 'No complaint' subjects' with scores 9% lesser ($1-0.91 = 0.09$, that is 9%) as compared to subjects who experienced some complaints ($P = 0.0438$) (Table 4).

Table 2
Site of implant.

Site of implant	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Lower front jaw	4	5.26	4	5.26
Lower left jaw	8	10.53	12	15.79
Lower right jaw	17	22.37	29	38.16
Upper front jaw	19	25.00	48	63.16
Upper left jaw	3	3.95	51	67.11
Upper right jaw	8	10.53	59	77.63
Multiple sites	17	22.37	76	100.00

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