

Patient's satisfaction following dental implant treatment among Sudanese patients

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Abstract:

Objectives: The aim of this study was to evaluate patients' satisfaction with dental implant therapy.

Materials and Methods: A cross-sectional study was conducted at Khartoum Teaching Dental Hospital. All patients who received implants and completed their implant treatment between 2012 and 2015 were telephone-interviewed by a single interviewer to give their perception on the implant therapy using a questionnaire. The questionnaire was focusing on the overall satisfaction, aesthetic outcome, chewing ability, gingival health, food impaction, phonetics, prosthesis loosening and costs. The main portion of the questionnaire was to evaluate the level of satisfaction and the influencing factors like socio-demographic factors, occupation and implant's number and site.

Results: The responses from 80 patients (28 males, 52 females) with a total of 104 implants were included in the analysis. Responses to statements were given on a response scale of 5. The mean score for overall satisfaction level with implant therapy was 4.11. Gender and occupation of the patient seems to have the greatest impact among other factors in influencing the overall satisfaction in general and satisfaction regarding cost particularly. Clinical factors like the number, position of implant, restored jaw or the longevity of treatment seems to have no significant difference in regard to the overall satisfaction.

Conclusion: Patients' satisfaction was influenced by various factors. In this study, the only drawback of dental implant was the cost.

Key words: Dental implant, Patients' satisfaction, dentistry

I. Introduction

Dental implants have been used as a viable option for replacement of missing natural teeth for the last four decades since their introduction in clinical dentistry^{1,2}. Since aging is accompanied by increased tooth-loss, the demand for dental implants is continuously increasing parallel to improvements in life expectancy^{3,4}. It is known that dental implants have many advantages such as superior masticatory efficiency and adjacent teeth preservation compared to other prosthetics; however, high cost and long treatment period remain the main limitations of dental implant therapy.

less than 2% of the implant related studies in literature deal with patient-centered outcomes of implant dentistry which may represent major aspects of the implant success for the patient⁵. Psychological impact of the treatment, cost-effectiveness and benefits are more important from the patient's point of view. In contrast, implant survival, prosthesis longevity, and the frequency of complications are the most significant parameters for the clinician⁶.

In 2013, a study was done in Khartoum teaching dental hospital to evaluate patients' knowledge and awareness regarding dental implant treatment, Considerable number of patients (68.5%) were aware of dental implant as treatment option for replacing missing teeth⁷. Since patients who spend more money and time for their dental treatment expect satisfactory results and dental services in return, it is important to understand the factors influencing patient's satisfaction in order to provide better services in the future⁸.

Despite increasing interest in patient reported outcomes research on dental implants has tended to focus on clinical and radiographic parameters. The aim of this study was to evaluate patient-reported outcomes following implant-supportive restorative treatment and the association with demographic variables (gender and age), number and site of implant. The general hypothesis is that these factors could influence the satisfaction level.

II. Material and methods:

A cross-sectional study was carried out involving patients treated with implant-supported prostheses at a Khartoum Teaching Dental Hospital (KTDH). The inclusion criteria were patients who received implants and completed their implant treatment at KTDH between 2012 and 2015 and wearing implant-supported prostheses for at least 3 months. Ethical approval obtained from the ethics committee ministry of health and permission was taken from hospital directory.

Eighty patients who received implant treatment at KTDH were included in the study. The patients had a total of 104 implants placed to support or retain dental prostheses. All patients were interviewed by telephone by a single interviewer to give their perception on the implant therapy using a questionnaire. After verbal consent was obtained, each patient was asked to answer a satisfaction questionnaire regarding aspects of cost, esthetics, eating ability, gingival health, food impaction, phonetics, prosthesis loosening, and general satisfaction. Responses to statements were given on a response scale, e.g. 5 =strongly agree; 4 = agree; 3 = neither agree nor disagree; 2 =disagree; 1 = strongly disagree for each of these parameters. When the score for a variable was high, patients were more satisfied.

The collected data was cleaned, coded, entered in master sheet and analyzed by Statistical Package for Social Sciences SPSS (IBM SPSS Inc., Chicago, version 22) software. One way ANOVA test was used to find out the correlation between different factors and patient's satisfaction with the Level of significance set at $P = 0.05$. The reliability of the response scales was measured by calculation of its internal consistency, expressed as Cronbach's α (alpha). The scales were distinguished by means of factor analysis method performed on the pooled data and a maximum amount of variance for each factor was calculated.

III. Results:

A total of 80 patients were involved in this study. There were 28 men (35%) and 52 women (65%). The mean age was 39.23 years (standard deviation: 10.60) with a minimum age of 20 years and maximum of 80 years. Approximately one third of the patients were in age group 40-49 years. Table 1

Table 1: Patient's distribution among different age groups

Age group	Number	%
20 - 29 years	14	17.5
30 -39 years	24	30
40 - 49 years	28	35
50 - 59 years	10	12.5
60 years and above	4	5

The overall sample had a total number of 104 implants. The five-grade categorizing scale questionnaires were completed by all the patients. The categorized statements of the questionnaire and responses to the statements were shown in table 2.

Table 2: Categorized statements of the questionnaire and responses to the statements

Categorized statements	Percentage of patients responded				
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. The cost of the treatment was reasonable.	12.5%	18.8%	1.3%	38.8%	28.8%
3. I am pleased with the esthetic results.	27.5%	66.3%	2.5%	3.8%	0%
4. I can chew on my crown or bridge very well.	26.3%	65%	2.5%	6.3%	0%
5. The tissue around the implant bleeds less than around the teeth.	17.5%	78.8%	3.8%	0%	0%
6. I haven't felt uncomfortable because of food packing during chewing.	15%	85%	0%	0%	0%
7. I can speak well with my crown or bridge.	23.8%	73.8%	2.5%	0%	0%
8. I haven't been to the clinic because the prosthesis had come loose.	15%	77.5%	3.8%	3.8%	0%
9. I am satisfied with my implant prosthesis.	26.3%	63.7%	5%	5%	0%

Most of the responses were marked on 'strongly agree' or 'agree' scale, except the first statement about the cost for implant therapy. The scale scores on the statements were displayed in figure 1. by calculating the mean of the scale scores given that strongly agree score 5 and strongly disagree score 1, high mean reflect high satisfaction and vice versa.

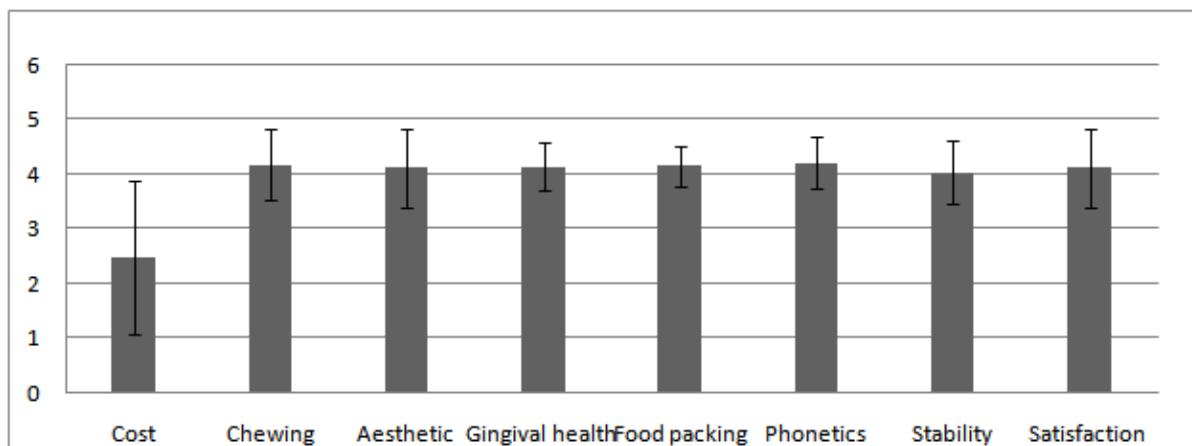


Figure 1: Mean scale scores on the statements of questionnaire.

Although the reliability of these scales proved to be fair to high, with Cronbach's alpha being 0.825, values of Cronbach's alpha if item deleted was higher than Cronbach's alpha in one statements (Cost of treatment: 0.892). The mean score of overall satisfaction level with implant therapy was 4.11. A 'satisfied' response (score ≥ 4) was marked in 72 (90%) patients. The mean scores of satisfaction level with chewing and gingival health were 4.18 and 4.14 respectively. The 'satisfied' response with both chewing and gingival health was reported in 75 (93.8%) patients. In contrast, a 'dissatisfied' response (the score under '3') was detected in 54 (67.6%) patients with cost of the implant treatment where the mean score of satisfaction was 2.48. Table 3

Table 3: Mean of satisfaction level among patients.

Evaluation category	Mean	SD
cost	2.48	1.41
chewing	4.18	0.65
aesthetic	4.11	0.73
Gingival health	4.14	0.44
Food packing	4.15	0.36
speaking	4.21	0.47
stability	4.04	0.58
satisfaction	4.11	0.71

There was no statistical difference between different age groups, when one way ANOVA test performed the overall satisfaction level was statistically insignificant (p -value = 0.19). However, gender has affected the satisfaction level when chi square test performed, there was a statistical difference between males and females regarding overall satisfaction, phonetic function and cost (p -value = 0.01, 0.03 and 0.049 respectively). There was no gender difference for satisfaction level in the other factors. Regarding cost satisfaction, only 21.1% of female patients were satisfied while 50% of males were satisfied. Overall satisfaction was reported in 15.4% of female patients who were highly satisfied (score > 4) in comparison to 46.4% of males.

Educated patients formed 92.2% (Table 4) of the patients and the majority of patients were a graduate patient (67.6%). When one way ANOVA test performed the overall satisfaction level was statically insignificant (p -value = 0.063). The test was statistically significant for phonetics, food packing and stability (0.015, 0.002 and 0.021 respectively).

Table 4: Education level among patients

Level of education	Number	%
illiterate	7	8.8
primary school	5	6.3
Secondary school	14	17.5
Graduate	49	61.3
Post graduate	5	6.3

Unemployed patients (mostly housewives) were 26 (32.5%) patients and the patients with a semi-professional job (mostly teachers) were 35 (43.8%) patients. When one way ANOVA test performed the overall satisfaction level was statically significant (p -value = 0.022). The mean value for patients with non-professional jobs was the highest (4.57). The test was statically insignificant for phonetics, cost and aesthetics (0.166, 0.278 and 0.119 respectively). Table 5

Table 5: Mean of satisfaction level among different occupations.

Patients' occupation	mean
Professional job	3.92
semi professional	3.91
Non-professional jobs	4.57
Un- employed (dependent)	4.35

*One way ANOVA test (p value-0.022)

More than half of the patients received one implant (56.3%) and only 2.5% had more than 3 implants (Table 6). Among all patients, 72.5% had upper implant. There was no statistical difference reported when one way ANOVA test performed among all categories regarding the number and position of implants. However, there was statistical difference between patients with anterior and posterior implants when chi square test performed (p-value= 0.015). Patients with anterior teeth were found to be highly satisfied in comparison to the ones with posterior (mean score '4.34' and 3.94 respectively).

Table 6: Number of implants used in treatment

Implant number	Frequency	Percent
One implant	45	56.3
Two implants	27	33.8
Three implants	6	7.5
More than 3 implants	2	2.5

IV. Discussion

Patients treated with dental implants had been reported with high degrees of satisfaction^{5,9-11}. Patients' concept of esthetic appearance differs substantially from that of the dentist. Factors considered by professionals to be of significance for the esthetic result of restorative treatment may not be of decisive importance for patients¹². Wismeijer et al reported that implant treatment gave patients social rehabilitation as well as oral rehabilitation¹³. Moreover, the patients who were treated with implant-supported overdenture showed a higher level of satisfaction than those who were treated with conventional full dentures¹⁴⁻¹⁶. Also, studies on patients who were treated with a single implant prosthesis showed a high level of satisfaction^{17,18}.

This study was designed to estimate the overall satisfaction level of dental implant patients with implant therapy and to further evaluate factors influencing patient's satisfaction. In this study, the patients' overall satisfaction level with implant therapy turned out to be high in general (mean score: 4.11). The majority of the patients; 90% patients were in the satisfied or extremely satisfied categories with their implant treatment, 5% were neither satisfied nor dissatisfied and only 5% patients replied 'dissatisfied'. In Korea, Young-Kyun Kim et al reported an overall satisfaction level in 76.3% of patients in their study and a 'dissatisfied' response was detected in 5.4% patients with overall implant therapy¹⁹. It was remarkable that 76.6% of the patients were dissatisfied regarding the reasonability of treatment cost. A similar result were reported in Korea (75.3%)¹⁹.

Demographic data retrieved from the patients showed that most of the patients who participated in this study were females, 65% (52) while the males represent 35% (28) of the patients. In 2015, a similar finding was reported by Alam et al (20) where 66.6% of patients were females and 33.3% were males and gender had no effects on the overall satisfaction. In contrast, Suleiman et al (21) found 74.1% (281) of the patients were males and 25.9% (98) were females. In the present study, there was a statistical difference between genders in terms of overall satisfaction, phonetic function and the cost as males were more satisfied in contrast to females.

in the present study, patients' age was classified to groups, the highest percentage of patients falls in the range of 40-49 years which is similar to finding of Alam et al in Malaysia²⁰ where most of patients were in range of 41-50 years. However, a Saudi study by Suleiman et al reported that majority of the subjects (51%) were less than 30 years of age. No significant differences were observed between age groups hence it can be said that results obtained from patients in this study are not affected by age factor. a similar finding was reported by Alam et al²⁰

Regarding functional satisfaction, majority of the patients were satisfied with the implant during function as it provided better masticatory function while only 3(3.7%) of them was not satisfied. A study by Satpathy et al²² reported 37% of patients found fixed nature of dental implants more advantageous. This finding is also in accordance with the results revealed by clinical studies on implanted patients that patients already fitted with implants perceived no difference in chewing compared with natural teeth^{5,23,24}. As for aesthetics, most of the patients were satisfied with the appearance of their dental implants except 5(6.3%) patients who were not satisfied. This is in agreement with high satisfaction levels of the aesthetic outcome found in other studies^{20,24}. Most of the patients reported that they were satisfied with phonetics and gingival health. Moreover, no patients experience food impaction between the implant and the adjacent tooth and only 3(3.7%) were not satisfied regarding the implant stability.

V. Conclusion:

Generally, patients in the present study were satisfied with the outcome of implant treatment; however, the high cost was the major complaint. Socio-demographic factors like gender and occupation of the patient seems to have the greatest impact among other factors in influencing the overall satisfaction in general and satisfaction regarding cost particularly. The impact of the other socio-demographic factors like age and education seems to affect the satisfaction regarding food packing and gingival health without affecting the general satisfaction, no doubt these effects may be related to the general oral hygiene status which may be affected by the differences in the level of education and stage of life. In the other hand, clinical factors like the number, position of implant, restored jaw or the longevity of treatment seems to have no significant difference in regard to the general satisfaction.

Acknowledgement:

We would like to thank all medical staff and nurses in implant department of Khartoum Teaching Dental Hospital who were very helpful and welcoming.

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