

Patient's satisfaction with dental implants in Riyadh, Saudi Arabia

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هدفت هذه الدراسة إلى تحديد مدى رضا شريحة من المرضى الذين أجريت لهم زراعة سنية في مدينة الرياض بالمملكة العربية السعودية. تم جمع المعلومات المستخدمة في هذا البحث عن طريق استبيان خاص وزع على المرضى خلال الزيارات الدورية أو من الاتصال الهاتفي. تم توزيع ١١١ استبياناً لفئات مختلفة من المرضى الذين تلقوا العلاج في عيادات حكومية وخاصة ولديهم غرسه سنية أو أكثر منذ عام على الأقل. بينت هذه الدراسة أن ٥٩٪ من العينة كانوا في منتهى الرضا من نتائج العلاج من جميع النواحي. بينما عبّر ٧١٪ من المرضى عن رضاهم التام عن الناحية الجمالية للتعويض، كما أفاد ٧٨٪ من المرضى عن رضاهم من فعالية التعويض في مضغ الطعام وتقطيعه. وعبر حوالي ٧٦٪ من أفراد العينة عن عدم ممانعتهم إجراء عمليات زراعة مرة أخرى بل أكد ٧٩٪ من أفراد العينة بأنهم ينصحوا الآخرين بعمليات الغرس السني. وأبدى ٨٧٪ ارتياحهم للطبيب المعالج. وأفاد ٦٧٪ من المرضى بأن المعلومات المقدمة لهم قبل إجراء عملية الغرس كانت كافية. في المقابل، عبر ٢٢٪ من أفراد العينة عن عدم رضاهم عن طول فترة العلاج وارتفاع تكلفتها المادية. وبشكل إجمالي، أبدى غالبية المرضى رضاهم التام عن نتائج العلاج ومع ذلك فإن بعض المتغيرات كتحقيق النواحي الجمالية وطول فترة العلاج تعتبر من العوامل المهمة لإرضاء المرضى بشكل عام. لذلك يجب على غراسي الأسنان أخذ هذه الأمور بعين الاعتبار.

The **purpose** of this survey was to assess patients' satisfaction with their dental implants and the treatment outcomes in Riyadh, Saudi Arabia. **Materials and Methods:** The information regarding patients' opinion was collected through a self-administered questionnaire distributed during recall appointments or filled through phone contact. A total of 111 subjects of different demographic variables, who were treated in governmental and private clinics and have had the restored implant(s) for more than one year, were included in this report. **Results:** The result of this study indicated that 59% of the subjects were highly satisfied with the overall treatment. Seventy-one percent (71%) were highly satisfied with the esthetic results, whereas 78% were highly satisfied with function. About 76% were willing to undergo same procedure again and 79% would recommend it to the others. Eighty-seven percent (87%) reported comfort with the attending dentists and 67% were satisfied with the preoperative information. On the other hand, 22% indicated that they were neither satisfied with the treatment period nor with the cost. **Conclusions:** It can be concluded that most of the patients were generally satisfied with the implant treatment and some variables such as esthetic and time required for completion of treatment are critical factors for the overall satisfaction. Therefore, dentists who practice dental implants treatment should pay attention to these factors.

INTRODUCTION

Consumer satisfaction with healthcare has, in recent years, gained widespread recognition as a measure of quality. Dental implants are accepted as a successful alternative to conventional fixed and removable prostheses.¹ They were reported to be superior to conventional removable prostheses in terms of chewing comfort, esthetics and phonatics.² Implant supported rehabilitation substantially improves the quality of life and self-confidence of the patients by giving them more masticatory

comfort.³ However, what the public thinks about dental implants has largely been neglected.⁴

In 1988, it was estimated that more than 300,000 implants were inserted worldwide.⁵ Shortly before the turn of millennium the rate of implant insertion was estimated to be more than one million.⁶ This statistical information can be said to reflect the increasing number of implant practice all over the world, which further reflects patients' awareness of dental implant treatment.

The major interest in implant research has been focused on success and failure from biological and mechanical points of view, whereas relatively little has been written on patients' evaluation of the treatment outcome.⁷⁻⁹ Clinical success is usually described in terms of fixture survival, limited bone loss

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and few prosthetic complications but information on patient's opinion of the treatment outcome of tooth implants is insufficient.¹⁰

Patients and dentists have different criteria when judging the quality of dental care. Patients' concerns are primarily related to comfort, function and esthetics, which are factors difficult to measure by the clinician.^{11,12} Acceptance of artificial replacement of the missing natural teeth and thus successful treatment require both functional and psychological adaptation by the patient.¹³ So far, subjective satisfaction of patients with treatment outcome are rarely considered in definition of implants success and has not been adequately recognized in literature.⁹

A report regarding the proceeding of Toronto symposium in 1998 concluded that the patient satisfaction outcome measures should be included in future implant success criteria.⁹ Since then, many studies were introduced to report patients' satisfaction regarding implants treatment worldwide. It is well established that dental implant is a prosthetic driven surgical procedure. Therefore, the objectives of this survey were to evaluate patients' opinion and satisfaction concerning the overall outcomes of treatment with dental implant therapy among a selected sample of patients in Riyadh, Saudi Arabia.

MATERIALS AND METHODS

The information concerning patients' satisfaction with their dental implants and treatment outcome was collected through a self administrated questionnaire, which was a modification of that used by Vermeylen *et al.*¹⁴ The questionnaire was tested among a group of patients who did not participate in the present study and further modifications were made. The questionnaire was handled to the patients

during their recall appointments, or filled over the phone. The following aspects were covered in the questionnaire: (1) demographic variables (age, gender, educational level and occupation), (2) location, number and timing of implant treatment (more or less than one year), and (3) 12 items with six-grade scale ranging from 1 to 6 was introduced to evaluate esthetics, phonetics, mastication, cleansibility and cost to benefit ratio scale (1) representing extreme dissatisfaction and (6) representing extreme satisfaction.

Three hundred fifty (350) questionnaires were distributed to different private and governmental clinics including the College of Dentistry at King Saud University. Patients treated by the investigators were excluded from the study.

All the data collected through the questionnaires was entered into the computer and interpreted utilizing standard statistical program (SPSS). The level of statistical significance was set at $P \leq 0.05$.

RESULTS

One hundred twenty-five (125) questionnaires were collected from the implant clinics and through phone contact. After excluding the questionnaires that did not fit with the criteria (missing answers or less than one year treatment), a total of 111 questionnaires were interpreted.

The mean age of the subjects was 45.9 years ranging from 18 to 88 years. Of these, 32.4% were males while 67.6% were females. Moreover, 66.7% were highly educated (college and above) and only 33.3% had moderate to no education. Forty-six percent (46%) of the patients were treated in governmental clinics, while 54% patients were treated in the private sector. Majority of the subjects (63.1%) had posterior implant restorations (either single or fixed bridge), while 17% had anterior restorations

and 19.8% were given implant-retained overdentures (Table 1).

Table 1. Demographic characteristics of subjects and data abstracted from questionnaire (n=111)

Variable	Frequency (%)
Gender	
Male	36(32.4)
Female	75(67.6)
Age	
40 and below	65(58.6)
41 and above	46(41.4)
Educational level	
Secondary and below	37(33.3)
College and above	74(66.7)
Job	
Working	54(48.6)
Not-working	57(51.4)
Treatment place	
Governmental	51(45.9)
Private	60(54.1)
Implant location	
Anterior (single and fixed)	19(17.1)
Posterior (single and fixed)	70(63.1)
Implant-supported overdenture	22(19.8)

Although the scale included six satisfaction options, only three options were selected by the patients, which included highly satisfied, somewhat satisfied, and not satisfied.

The data showed that 58.6% of the subjects answered the overall satisfaction question with the highest response (highly satisfied) while 36.9% were somewhat satisfied and only 4.5% were not satisfied. Majority of the patients (75.7%) were strongly willing to undergo the same treatment again if necessary and 79.3% would advise others for implant restorations. Regarding, the satisfaction with the treating dentist 86.5% were highly satisfied. Furthermore, 70% of the subjects stated that implant procedure was somehow similar to extraction while 30% of them thought that it was more difficult. About one fifth of the subjects were neither satisfied with the time spent until completion of treatment nor with the cost (Table 2).

Table 2. Frequencies and percentages of the questionnaire variables with different responses.

Variable	Highly satisfied	Somewhat satisfied	Not satisfied
Overall satisfaction	65(58.6%)	41(36.9%)	5(4.5%)
Satisfaction with esthetic	79(71.2%)	26(23.4%)	6(5.4%)
Satisfaction with phonetic	92(82.9%)	15(13.5%)	4(3.6%)
Satisfaction with function	87(78.4%)	23(20.7%)	1(0.9%)
Satisfaction with cleansibility	79(71.2%)	28(25.2%)	4(3.6%)
Willing to undergo treatment again	84(75.7%)	24(21.6%)	3(2.7%)
Advise others for implants	88(79.3%)	21(18.9%)	2(1.8%)
Satisfaction with pre-operative information	74(66.7%)	25(22.5%)	12(10.8%)
Comfortable with dentist	96(86.5%)	11(9.9%)	4(3.6%)
Satisfaction with time of treatment	41(36.9%)	42(37.8%)	28(25.2%)
Satisfaction with cost of treatment	44(39.6%)	45(40.5%)	22(19.8%)

Neither the demographics (age, gender, educational level, job), nor the place of treatment were statically significant ($P \leq 0.05$) when correlated to overall satisfaction. On the other hand, implant location was statically significant in relation to satisfaction with esthetic, phonetics and cleansibility. In relation to satisfaction with pre-operative information, treatment place and educational level were also significant (Table 3).

It should be noted that, all the patients unsatisfied with esthetic results were females and 49% of the highly satisfied with esthetic were under the age of 41 years. Moreover, 76% of those highly satisfied with esthetic were subjects having posterior implants and all the subjects with implant-supported overdentures were in the satisfaction category.

Table 3. P-values of selected demographics and data that were related to questionnaire variables.

Demographic and data variable	Questionnaire variable	P-value
Gender	Satisfaction with esthetics	0.072
	Satisfaction with function	0.892
Age	Satisfaction with esthetics	0.332
	Satisfaction with function	0.314
Educational level	Satisfaction with pre-operative information	0.026
Treatment place	Satisfaction with pre-operative information	0.002
	Satisfaction with time spent	0.091
	Satisfaction with cost of treatment	0.247
Implant location	Satisfaction with esthetics	0.000
	Satisfaction with phonetics	0.006
	Satisfaction with function	0.109
	Satisfaction with cleansibility	0.002

DISCUSSION

The present study has provided basic information about patient satisfaction with dental implants and treatment outcomes. The information might bring more attention to the patient's subjective evaluation of the dental treatment generally and implants in specific in addition to the opinions of the clinician. Although the overall satisfaction level was quite high (59%), the time it took to have the final prosthesis placed (25%) and the cost of treatment (20%) were not at the satisfactory level.

No demographic variables were related to the overall satisfaction at a statistically significant level. These results are in agreement with those of Levi *et al.*¹⁵ and Kiyak *et al.*¹⁶

The present data showed that, although not statistically significant, males were more satisfied with esthetic than females. In addition, people treated in private clinics appeared to be more satisfied with the time spent to complete the treatment than those treated in governmental hospitals ($P = 0.091$).

Four female subjects stated that they avoided eating hard food on their implant and only one female reported having bruxism several weeks after completion of the treatment. It is worth also to mention that Vermylen *et al.* reported 30% of the subjects were avoiding eating or chewing on the implant.¹⁴

Masticatory efficiency of dental prosthesis is an important aspect to the patient. Liedberg *et al.*¹⁷ reported that fixed partial dentures made more active chewing possible than do removable partial dentures.¹⁷ Although, this report did not compare the efficacy of implant-supported prosthesis and conventional prosthesis, the data emerged in this study was that 78% of the patients were highly satisfied with the function of implant-supported prosthesis. It should be mentioned that patient satisfaction and Oral Health-Related Quality of Life (OHQOL) were improved mainly in patients who had complete mandibular prosthesis when their prostheses were supported by dental implants.¹⁸ Furthermore, Grogono *et al.*¹⁹ and Mijiritsky *et al.*²⁰ reported that the use of dental implants to improve unfavorable removable complete or partial denture design is a viable and cost-effective treatment modality and resulted in a great patients satisfaction as compared to conventional dentures.

Cost was not a significant factor for both treatment place and occupation of the subjects. This result is in agreement with Muller *et al.*³ However, Leviet *et al.*¹⁶, Akagawa *et al.*²¹ and Zimmer *et al.*²² reported a significant correlation between cost of the treatment and general patient satisfaction. Furthermore, Tepper *et al.* reported that 79% of the subjects thought that treatment cost was high.⁴

In this study age was not correlated with overall satisfaction. Similarly, Schropp *et al.* found that age was not a significant factor in the satisfaction but there were minor differences between

younger and older patients as well as between men and women concerning the overall treatment.²³

In the present data, 71.2% of the patients were satisfied with the esthetic result of their implants. This is in close agreement with Vermynen *et al.*¹⁴ who reported 68% satisfaction with esthetics. Tepper *et al.* on the other hand reported 51% satisfaction with esthetic and 62% satisfaction with function.⁴ Furthermore, Chang *et al.*⁹ reported 84% satisfaction with esthetic. Recently, Gibbard and Zarb²⁴ reported 90% of their 30 patients were extremely satisfied with the appearance of implant-supported crown. The difference could be attributed to their small sample size. It should be mentioned that the percentage of anterior implant was low (17%), which could be attributed to the esthetic challenges that the clinicians might face in restoring anterior implants which may push them to seek an alternative treatment option than dental implants.

In this study, 76% of the patients were willing to have implant treatment to be performed for them again. This result is in close agreement with De Bruyn *et al.*² who reported that 90% of their patients were willing to undergo the same treatment again if necessary. In contrast, Vermynen *et al.*¹⁴ Gibbard and Zarb²⁴ reported that 50% and 53% of their patients respectively were willing to have implant surgery again. This higher difference could be due by their small sample sizes of 40 and 30, respectively.

The most important variables to the subjects were found to be esthetics, pre-operative information and the time required to complete the treatment. It would be interesting to further investigate why about 76% were willing to undergo the treatment again and recommend it to others while, only 58.6% were strongly satisfied with the overall treatment.

The present study encountered some limitations that included small sample size. Variables that were not shown to be statically significant may have demonstrated significance with larger sample size. In addition, other variables that could affect the subjective evaluation of the treatment outcome like smoking habits, psychology and complications that may occur during treatment, were not included in the questionnaire. Furthermore, no comparison was made for the subjects who used to have conventional removable or fixed partial dentures to record the difference in satisfaction level before and after implant treatment.

CONCLUSIONS

Within limitations of this study, the following conclusions can be drawn:

1. Fifty-nine percent of the subjects were highly satisfied with the overall dental implant treatment.
2. Seventy-one percent of the patients were highly satisfied with the esthetic results, and 78% were highly satisfied with function.
3. Seventy-six percent were willing to undergo same procedure again and 79% would recommend it to the others.
4. Patient satisfaction with esthetic and preoperative information, as well as time length of treatment were critical for overall acceptance of the treatment.
5. Practitioners who provide implant treatment should pay more attention to patients' perception of the treatment results.
6. Future studies of different population with larger sample sizes are necessary to throw more light on current findings of our study.

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