Assessing the degree of experience and satisfaction of patients treated with implant-supported complete dentures

Abstract / Introduction: *Dental implants can solve the issue of lack of stability of conventional dentures, but little is known about patients' satisfaction regarding implant-supported complete denture.* Objective: *Identify the experience and the degree of satisfaction of patients treated with implant-supported complete denture.* Material and Methods: *Sixty-six patients were interviewed by one single investigator. Patients were questioned about potential unpleasant experiences during treatment and whether treatment should be recommended to others. A Visual Analogue Scale was also used to assess the degree of patients' satisfaction in terms of stability, esthetics, comfort, speech, and ease of sanitization. Data were analyzed by Spearman correlation ($P < 0.05$) and submitted to multiple regression.* Results: *Of the patients interviewed, 22.7% reported experiencing something unpleasant or uncomfortable during treatment, and all of them stated that they would recommend it. The degree of patients' satisfaction was high, reaching an average of 97.7%. The following items were statistically relevant: stability, speech and comfort, as well as treatment recommendation.* Conclusion: *The degree of patients' satisfaction proves high, mainly due to stability, followed by speech and comfort provided by implant-supported complete denture.*

Keywords: *Patients' satisfaction. Complete denture. Dental implant.*

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INTRODUCTION

Current Brazilian population at 60 years of age or older exceeds 15 million people. In 2020, this age group will comprise 15% of the overall population. Studies estimate that, in 2025, five in every ten powerful countries with older population will be emerging countries, including Brazil.[1]

Assessments on the use or need for denture in the population older than 15 years reveal that, among individuals aged between 65 and 74 years old, approximately 32% and 56% require upper and lower dentures, respectively.[2] Edentulism is directly related to significant anatomical, functional and psychological changes. Lack of stability and retention of conventional denture associated with impaired masticatory function are commonplace oral findings that can lead to patients' decreased quality of life.[3]

Mucosa-supported complete denture is an alternative treatment for edentulism. Complete denture success depends on the clinician's ability to manufacture a well adaptable prosthesis, as well as on patients' ability to adapt to this new condition[4]. Nevertheless, flabby ridges with high resorption rates do not provide stability. Additionally, in terms of anatomical shape, the lower arch does not provide stability due to contact with the tongue and muscle.

Implantology has recently managed to overcome patients' dissatisfaction resulting from the use of conventional denture, particularly because it is a specialty with great predictability capable of restoring patients' esthetics, speech and function, in addition to providing them with comfort, greater stability and retention; thereby resulting in improved quality of life.[5]

Studies demonstrate that Implantology procedures yield highly successful results in most cases. However, success is established by clinicians rather than patients.[6] Presently, research has been concerned with assessing esthetic and functional results yielded by rehabilitation treatment by means of questionnaires directed to patients with a view to valuing their opinion.[7]

The Visual Analogue scale (VAS) was used for assessment. It is an instrument designed to measure subjective issues that cannot be standardized among individuals. On this scale, the patient chooses from 0 to 10, according to his condition, as follows: 0 = completely dissatisfied and 10 = completely satisfied.[8]

The objective of the present study was to identify the experience and degree of satisfaction of patients treated with implant-supported complete denture in order to collect relevant information for dental professionals regarding the rehabilitation of edentulous patients with this type of prosthesis.

MATERIAL AND METHODS

A total of 66 patients treated with implant-supported complete denture were selected from the Study and Research Center for Dental Implants (CEPID) of Federal University of Santa Catarina (UFSC) and the Postgraduate and Refresher Institute on Dentistry (IPENO).

This study was approved by UFSC Ethics Committee on Human Research under protocol number 2126 (FR 438 935). All patients read and signed an informed consent form before data collection.

Research was conducted from 2012 to 2013 by a calibrated researcher who

identified all patients treated with implant-supported complete fixed dentures on upper and/or lower arches at UFSC over the last 20 years. There were no restrictions on patients' age or sex; however, those who could not read were excluded from the study.

Initially, patients were questioned about how long they had been using the implant-supported fixed denture and what they would say to someone interested in undergoing the same treatment modality (whether they would recommend, strongly recommend or not recommend it at all). Patients were also asked whether they experienced some discomfort or unpleasantness during treatment. Finally, with the aid of a visual analogue scale (in which 0 stands for 'completely dissatisfied' and 10 stands for 'completely satisfied'), patients responded to seven questions concerning their degree of satisfaction with regard to fixed denture. The items questioned were as follows: overall satisfaction, esthetics, speech, stability, masticatory function, comfort and hygiene.

Data were digitized and statistically analyzed with Statistical '99 Edition software (Statsoft, Inc., USA). Patients' degree of satisfaction was associated with each one of the variables studied by means of Spearman correlation suitable for ordinal data. Statistically significant correlations ($P < 0.05$) were submitted to multiple regression to estimate the strength of this set of variables in explaining patients' degree of satisfaction.

RESULTS

The sample comprised 66 patients, 27 males (40.9%) and 39 females (59.1%). Patients aged between 39 and 76 years old, with a mean age of 61.7 years. Twenty-one patients (31.8%) were younger than 60 years old, whereas 45 patients (68.2%) were older than 60 years old. A total of 39 patients (59.1%) with upper implant-supported complete denture, 46 patients (69.7%) with lower implant-supported complete denture and 19 patients (28.8%) with both upper and lower complete denture were interviewed. Upper denture was used for 1 to 10 years, with a mean time of 3.6 years; whereas lower denture was used for 1 and 10 years, with a mean time of 4.19 years (Table 1).

When asked what they would say to other people about this treatment modality, 60 patients (90.9%) said they would strongly recommend it. Many supplemented their response, claiming that they had already recommended it to friends and family. The six remaining patients (9.1%) said they would only recommend it for people who have no other options due to treatment being extremely painful. No patients said they would not recommend this treatment modality.

Fifteen patients (22.75%) claimed having experienced something unpleasant or uncomfortable during treatment. Of them, five patients (7.6%) reported that surgery was painful, five (7.6%) reported feeling severe pain after surgery, one (1.5%) complained about a power blackout, one patient (1.5%) reported bleeding on the third day after surgery, one patient (1.5%) lost an implant, and two patients (3.0%) lost sensitivity of the lower lip and, for this reason, kept biting it unintentionally.

Fifty-four patients (81.8%) assigned full score for the item "overall satisfaction with treatment." One patient reported improvements in social relationships as a result of using the new prosthesis. Nine

Table 1. Description of variables (amount, percentage and means).

Variables	n	%	Mean
Males	27	40.9	-
Females	39	59.1	-
Younger than 60 years old	21	31.8	-
Older than 60 years old	45	68.2	-
Age (39 to 76 year)	-	-	61.7
Upper denture	39	59.1	-
Treatment time (1 to 10 years)	-	-	3.6
Lower denture	46	69.7	-
Treatment time (1 to 10 years)	-	-	4.19
Upper and lower denture	19	28.8	-

Table 2. Descriptive results of VAS scale.

Variables	Mean	Full score	
		n	%
Overall satisfaction	9.77	54	81.8
Esthetics	9.80	56	84.8
Speech	9.89	62	94.0
Stability	9.96	64	97.0
Masticatory function	9.84	59	89.5
Comfort	9.96	64	97.0
Hygiene	7.86	3	4.5

patients (13.6%) assigned a 9, whereas three patients (4.5%) assigned an 8 to the same question (Table 2).

Fifty-six patients (84.8%) assigned full score for the item "prosthesis esthetics," while the remaining patients assigned 8 and 9 scores. One patient who did not assign full score claimed finding denture teeth stained. Another patient said that the prosthesis was broken, which hindered esthetics (Table 2).

Sixty-two patients (94%) assigned full score for speech. Three patients (4.5%) assigned a 9 while one patient (1.5%) assigned a 6. The latter also stated having difficulty speaking and reported being under speech therapy (Table 2).

With regard to stability, 64 patients (97.0%) assigned full score, whereas the other two patients (3.0%) assigned a 9. Fifty-nine patients (89.5%) assigned full score for the item "mastication with prosthesis." The fixed denture allows patients to chew food they could not with conventional dentures (Table 2).

In terms of comfort, 64 patients (97.0%) assigned full score while two patients (3.0%) assigned a 9. As for easy hygiene, only three

patients (4.5%) assigned full score, 18 patients (27.3%) assigned a 9, and 24 patients (36.4%) assigned an 8. Patients using Waterpik cleaning device claimed not having difficulty sanitizing the prosthesis. Three patients (4.5%) assigned a 5 and claimed having difficulty cleaning the prothesis due to motor impairment. Six patients (9.1%) assigned a 6 while twelve patients (18.2%) assigned a 7. Importantly, the nearer the prosthesis is to the ridge, the more difficult it is to be cleaned.

Patients' degree of satisfaction was associated with each one of the variables studied by means of Spearman correlation suitable for ordinal data (Table 3). The variables "recommendation," "speech," "stability" and "comfort" proved significantly

Table 3. Spearman correlation results.

Variables	Correlation (r)	P value
Stability	0.43	0.0002*
Comfort	0.39	0.0010*
Speech	0.38	0.0015*
Treatment recommendation	-0.29	0.0178*
Experiencing something unpleasant	-0.22	0.0693
Masticatory function	0.22	0.0722
Esthetics	0.17	0.1675
Treatment time (mandible)	-0.16	0.2050
Hygiene	0.15	0.2361
Age	0.11	0.3638
Treatment time (maxilla)	-0.09	0.4804
Sex	-0.07	0.5636

*Statistically significant values at $P < 0.05$.

Table 4. Multiple regression analysis results.

ANOVA (F test)	F = 11.57 (P < 0.0001)
Regression coefficient (R)	r = 0.657
Coefficient of determination (R^2)	r^2 = 0.432*
Beta values (β)	β stability = 0.486* β speech= 0.197 β comfort = 0.126 β treatment recommendation = 0.06

*Statistically significant values.

relevant ($P < 0.05$) and were subjected to multiple regression. However, these four variables were poorly correlated with patients' satisfaction. Beta values suggest that the variable that most contributes to explain patients' satisfaction is stability, although comfort and speech are also significant (Table 4).

DISCUSSION

The VAS scale was chosen as the research instrument. It is commonly used by researchers in the field of dental implants for being simple to understand. Thus, individuals of all ages are able to assess their treatment perceptions. Other studies[17-20] have used questionnaires with categorical scales with measurements representing the frequency of occurrence of a given situation ("never," "sometimes," "often" or "always") or reflecting the strength of an experience ("very easy," "easy," "medium," "difficult" or "very difficult"). This method is also easy to use and understand; however, its analysis requires nonparametric tests which might not identify small statistical and clinically relevant differences. Other researches[21-24] have used standard questionnaires to assess the impact of certain treatments on patients' quality of life; however, the results yielded by these studies do not provide specific information for professionals to increase patients' comfort and degree of satisfaction.

With better living conditions, people are living longer. Therefore, the elderly population and the number of edentulous patients has increased. The average age of respondents was 60 years old, with prevalence of females. Epidemiological data obtained in the present study are consistent with a literature review on the oral health of Brazilian elderly population.[9] This literature review reveals the prevalence of tooth loss (68%), especially in elderly women, and points out that only 3.9% of seniors do not need and do not use any kind of prosthesis.[9]

Of all patients interviewed, only fifteen reported having experienced something unpleasant or uncomfortable during treatment. All problems reported as unpleasant were related to implant placement surgery, with postoperative pain being predominant. Leão et al[10] highlighted that implant placement surgery is first among the major reasons of discontent regarding dental implants treatment. It is followed by the surgical stage (implant opening) and the time of manufacture or adjustment of the new prosthesis.[10] It is worth noting that the last two discontent reasons were not reported by the patients interviewed in the present study.

Experiencing something unpleasant or uncomfortable does not seem to be correlated with treatment recommendation, as of the fifteen patients who reported having experienced something bad, six would recommend it while nine would strongly recommend it. This was also reported by a study on immediate implants,[11] in which all patients strongly recommended implant treatment, although 6.7% of patients stated having experienced something unpleasant or uncomfortable.

The items assessed by the visual analogue scale yielded high means and could, therefore, be responsible for the high degree of patients' satisfaction. However, only stability, comfort and speech were statistically significant (Table 3). These three items, along with treatment recommendation, account for 43% of patients' satisfaction; with stability being the item with the highest contribution, according to patients' opinion.

In other words, edentulous patients using conventional removable denture further treated with implant-supported complete denture feel satisfied mainly due to stability.[25,26] Comfort and speech also influence patients' view; however, it can be said that these items are directly connected to stability (Table 4). Borges et al[12] consider comfort and speech as the main factors responsible for patients' overall satisfaction. The authors conclude that these two items have a positive impact on patients' quality of life.[12]

Feine and Lund[13] claim that masticatory function, esthetics, comfort, stability and speech are responsible for patients' degree of satisfaction.[13] However, the authors assessed patients with lower implant-supported complete denture only. For the masticatory function to be efficient and pleasant, the patient needs to have good conditions both in the maxilla and in the mandible. In upper edentulous patients, the esthetic issue is more complicated. Studies comparing upper and lower implant-supported fixed dentures reveal that speech and esthetics are more important in the maxilla than in the mandible. Nevertheless, comfort at chewing is the most important factor both in the maxilla and in the mandible.[14,15]

The item with the lowest score was oral hygiene. Importantly, when dentures were in close contact with the ridge, the difficulty to sanitize it increased, especially for those patients who did not use Waterpik cleaning device. However, Lundgvist et al[16] explained that by decreasing the space between the mucosa and the denture base, it is possible to suppress potential speech problems, which was also proved by this study.

CONCLUSION

Within the limitations of this study, it is reasonable to conclude that the degree of satisfaction of patients treated with implant-supported complete denture is high, mainly due to stability, followed by speech and comfort. Treatment recommendation was also statistically significant. Esthetics and masticatory function also influenced it; however, these items were not statistically significant.

Denture cleansing and discomfort exert little influence on patients' satisfaction. Thus, it is possible to conclude that this therapeutic modality can be provided to an increasingly large number of patients with good clinical results.

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