

Which factors can affect the satisfaction of complete denture wearers?

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Abstract

Background: The success or failure of the prosthesis is predictable not only by the residual ridge morphology, but also by patient's satisfaction and attitude toward prosthodontic treatment. However, a patient's satisfaction with dentures depends on several factors. The aim of this study was to evaluate different factors that can affect patient's satisfaction with complete denture therapy.

Methods: The study was performed on forty edentulous patients referred to Prosthodontics department of Babol University of Medical Sciences. Socio-demographic, inter and extra oral clinical data were recorded before fabricating complete denture. The dentures were fabricated and delivered to patients based on standard procedures. Satisfaction of complete denture was measured using five Likert scale questionnaire in a two months follow up visit. The results were analyzed by SPSS v18 Software.

Results: The results of statistical analyses showed that the four factors of housing ($p=0.043$), treatment expectations ($p=0.002$), salivation ($p=0.004$) and temporomandibular joint (TMJ) disorders ($p=0.007$) have an impact on patient's satisfaction with complete removable prostheses.

Conclusion: Normal salivation, lack of TMJ disorders, logical treatment expectations of patients (patients' lower levels of expectations before treatment), and type of housing (better economic status) can lead to higher levels of patient satisfaction with complete denture therapy.

Keywords: Complete dentures, Patient's satisfaction, Oral health.

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The number of edentulous adults has declined in recent decades especially in developed countries. However, the edentulous population is still large in developing countries, which may result from an overall increase in the number of elderly people (1-5). In spite of recent achievements in dental implants for treatment and rehabilitation of edentulous patients, complete denture therapy is considered as the main, or the only, treatment for many edentulous patients (1, 6-7).

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In addition to the basis of the patients' residual ridge morphology, one of the most important factors which predicts success or failure of complete denture treatment is the patient's attitude toward prosthesis (1). Moreover, producing a good complete denture depends on the technical, biological and psychological interaction between the patient and the dentist (7).

Patient satisfaction with denture therapy can be analyzed from several perspectives, including beauty, functionality, ease of use, stability, convenient chewing, speaking, ease of cleaning, and so on. Regarding to the lack of sufficient evidence about the relation of demographic and clinical factors, and patient satisfaction with complete denture, specifically in Iran, this study aimed to investigate the factors influencing patient satisfaction with complete denture therapy in an Iranian population.

Methods

The sample size of this study was calculated according to the prevalence of satisfaction ($p=0.8$) and the precision of the study ($d=0.014$) which were obtained from the results of a pilot study on 10 patients. So this study was conducted on 40 edentulous patients, including 22(55%) women and 18 (45%) men, referred to the Dental School of Babol University of Medical Sciences with an age range from 40 to over 60 years old. These patients underwent clinical examinations. Data were collected through a questionnaire in relation to demographic information, health status, overall checkups, oral examinations and satisfaction of previous denture. After the necessary examinations, dental students fabricated the dentures under the supervision of prosthodontists and were delivered to patients based on standard procedures as described here below:

A) Preparing the primary impressions with prefabricated trays and tropicalgin alginate chromatic (manufacturer: Zhermack, made in Italy). An appropriate tray must be larger than the covering tissues in order to make alginate impression with sufficient thickness and must cover all anatomical parts of the maxilla including the tuberosity and vestibular depth as well as parts of the mandible including the distolingual area, the retromolar pad, and the depths of the buccal and lingual vestibules.

B) Making final impressions with special trays (with selective technique) made of acrylic resin materials

(Acropars 200) (Cold Cure Acrylic for Special Tray, manufacturer: Marlic Medical Industries CO, made in Iran), border molding with green compound (manufacturer: Harvard, made in Germany) and ZOE materials as final impression material (Paste Zinco-Enolica T, manufacturer: Tecknew, made in Brazil)

C) Building temporary record bases; obtaining VDO and lips and cheeks support of patients, proper occlusal planes ; obtaining centric relation records; selection of appropriate teeth (color, mold and size); mounting dental casts on semi-adjustable articulators; arranging the teeth on the articulators in the centric relation and trying it in the patients' mouth; verifying the centric records; analyzing the correct alignment (occlusion), patient's satisfaction with appearance; and other important parameters for teeth arrangement.

For obtaining VDO record, the patient was positioned directly without headrests. One point was set on the chin and another point on the nose using a copying pencil. The lower jaw was at rest and the lips were in contact with each other. The distance between the two points was measured. Measuring the distance between the two points was repeated several times. The average measure represented the vertical dimension at rest (VDR). The vertical dimension between the two points was calculated by using the following formula:

$$VDO = VDR - FWS.$$

D) Denture processing, remounting of dentures and adjustment of tissues and occlusal relationships. Then, the quality of occlusion, VDO, tissue adaptation and border extension were examined. To analyze the occlusion, the centric and eccentric relations were evaluated. In case of occlusal interferences, or lack of accordance between the occlusal plan and the residual ridge, the occlusion was evaluated as not satisfactory. Tissue adaptation, proper space for frena during function and satisfactory border extensions were evaluated. The dentures were delivered to patients after this stage and after the final approval. After insertion, necessary occlusal adjustments were done. Follow-up visits scheduled after 24 hours, 72 hours and after 2 weeks for the adjustment of post-insertion complaints.

When the patients were free of post-insertion complaints, then patient satisfaction level was assessed after 2 months of denture insertion by using a valid and reliable seven-item questionnaire (8-10). The first six items of the questionnaire make up the variable of "calculated satisfaction". In addition

to descriptive statistics, cross tabulation and chi-square test served to test the relation between satisfaction, demographic and clinical variables.

Results

From whole participant, 22 women (55%) and 18 men (45%) participated in this study. Seventeen point five percent (n=7) of the patients were in the age group under 50 years and 82.5% (n=33) were in the age group 50 years and above. Two point five percent were unemployed, 50% were housewives, 40% were self-employed and 7.5% were government employees. Regarding to the level of education, 32.5% were illiterate, and 20% had a high school diploma or a higher degree. Forty percent had chronic diseases and 42.5% were taking medication.

The distribution of patients' expectations before treatment, oral health and clinical examinations are in Table 1. All the participants who had high treatment expectations expressed low satisfaction with denture stability (p=0.008). According to statistical analyses, there was a significant relationship between age and the variables of satisfaction with chewing, convenience, and denture stability (Table 2). There was also a statistically significant relationship between treatment expectations and the variables of ease of cleaning, satisfaction with beauty and satisfaction with denture stability (Table 3). People who lived in their own house reported high levels of calculated satisfaction with treatment compare to those resident in a rental house, while there was no significant relationship between calculated satisfaction

and demographic factors (including age, sex, education and so on) and previous experience of denture therapy.

Table 1: Patient expectations before treatment, previous denture therapy, TMJ disorders and Salivation, N=40

	N (%)
Treatment expectation	
Average	31 (77.5)
High	9 (22.5)
Previous denture therapy	
Yes	12 (30)
No	28 (70)
TMJ disorders	
Yes	7 (17.5)
No	33 (82.5)
Salivation	
Mucous and thicker	3 (7.5)
Mucinous and thinner	4 (10)
Low	8 (20)
Normal	25 (62.5)

The data obtained from clinical records showed that 87.9% of the people who lacked TMJ disorders reported high levels of calculated satisfaction with treatment (p=0.007). Also, 88% of the people who had normal salivation reported high levels of calculated satisfaction with treatment (p=0.004).

There was also a statistically significant difference between calculated satisfaction and overall satisfaction (6 items) from the perspective of patients (p<0.001).

Table 2: The relationship between age and satisfaction with chewing, convenience and stability, N=40

	Under 50 years	50 years and above	P value*
	N (%)	N (%)	
Question 1: Satisfaction with chewing			
High	6 (85.7)	13 (39.4)	0.026
Low	1 (14.3)	20 (60.6)	
Question 5: Satisfaction with convenience			
High	5 (71.4)	7 (21.2)	0.008
Low	2 (28.6)	26 (78.8)	
Question 6: satisfaction with stability			
High	5 (71.4)	10 (30.3)	0.041
Low	2 (28.6)	23 (69.7)	

*: Chi-Square

Table 3: The relationship between patient expectations before treatment and satisfaction with ease of cleaning, beauty, denture stability, as well as calculated satisfaction after treatment, N=40

	Patient expectations	Patient expectations	P value*
	Average N (%)	High N (%)	
Question 2: Satisfaction with ease of cleaning			
High	22 (71.0)	3 (33.3)	0.04
Low	9 (29.0)	6 (66.7)	
Question 4: satisfaction with beauty			
High	24 (77.4)	2 (22.2)	0.002
low	7 (22.6)	7 (77.8)	
Question 6: satisfaction with stability			
High	15 (48.4)	0 (0)	0.008
Low	16 (51.6)	9 (100)	
Calculated satisfaction after treatment			
High	28 (90.3)	4 (44.4)	0.002
low	3 (9.7)	5 (55.6)	

*: Chi-Square

Discussion

Patient's satisfaction is the ultimate goal of any dental treatment and many factors are involved in it. The main objective of this study was to analyze the factors affecting patient's satisfaction with complete dentures at Prosthodontics Department of Babol University of Medical Sciences. A questionnaire was used to collect the required data from the patients. Two months after the delivery of dentures, the patients were called back to the department to report their level of satisfaction with complete denture therapy. Based on the results of current study, it was found that the four factors of residential status, treatment expectations, salivation and TMJ disorders have an impact on the level of calculated satisfaction with complete denture therapy. A high percentage of those who lived in their own house reported a high level of calculated satisfaction, which indicates the role of residential status in satisfaction with the result of the treatment. Although the impact of housing on satisfaction has not often been considered in previous studies, we can consider this factor as an indicator of the patients' economic status. These findings are consistent with the results of the study by Singh et al. who stated that a better economic status will lead to higher levels of satisfaction (3).

There are controversies in this field (7, 11). We may attribute this inconsistency to some sort of cultural difference such that the participants with a better economic status, show less anxiety and stress; therefore, the clinical outcomes were less affected by this factor. Another effective variable on calculated patient satisfaction was treatment expectations. According to the study, those who had higher treatment expectations showed lower levels of calculated satisfaction compared to those who had lower expectations. They also reported lower levels of satisfaction with ease of cleaning (item 2), beauty (item 4) and denture stability (item 6).

This result may be due to the fact that higher expectations at the beginning of the treatment increase the sensitivity toward the final result of the treatment, therefore, patients may raise unreasonable expectation, while small technical or clinical errors could decrease their contentment of treatment as well. Another significant factor is salivation. Patients who had normal and sufficient levels of salivation reported higher levels of satisfaction, which can be explained by the role of salivation as a natural lubricant and chemical buffer for improved comfort and functionality (1, 12). This result is similar to the results of the study by Shetty et al. (12). The fourth factor involved in calculated satisfaction

was TMJ disorders. People who had TMJ disorders showed lower levels of satisfaction in the survey. This is not too far-fetched since temporomandibular joint receptors have an important role in controlling mandibular movements and TMJ disorders can lead to denture instability. There was also an inverse relationship between age and satisfaction with chewing (item 1) also age and satisfaction with denture stability (item 6) in such a manner that higher ages are associated with lower levels of satisfaction with chewing and denture stability, which can be due to the resorption of the alveolar ridge. Age and gender had no effect on calculated satisfaction.

However, different studies showed different results, some of which are consistent with the results of this study (11, 13-15). For instance, Weinstein et al. stated that age does not play a significant role in determining satisfaction (16). Also, Celebic et al. concluded that gender does not have a significant relationship with patient's satisfaction of complete denture (7). In addition, Singh et al. concluded that socio-demographic characteristics such as age and gender are associated with denture satisfaction (although not so significantly with all variables) (3).

In order to analyze patient's satisfaction more accurately and in detail, we defined the factor of "calculated satisfaction" as the sum total of the first six items of the questionnaire. The surveys also revealed that there was a significant difference between the percentage of patient responses to the seventh item of the questionnaire, i.e., overall satisfaction, and calculated satisfaction ($p < 0.001$). Therefore, evaluation of content of treatment as a single factor was less than analyzing several items as details which will constitute satisfaction of complete denture. Therefore, this factor (calculated satisfaction) can assess the result of treatment with more reliability.

Population-based studies have their own limitation such as gaining effective cooperation of the patients. Also in this study we had a small sample size. Moreover, since Faculty of Dentistry of Babol University of Medical Sciences is not geographically located downtown, the clients cannot effectively and comprehensively represent the entire population of the city. Therefore, it is suggested to conduct another study with a larger sample size and include as well the patients who visit private hospitals and clinics across the city to consider a possible change in the results given the presence of people with varied socio-economic levels.

Considering the limitations of the study, it can be concluded that normal salivation, temporomandibular joint health, logical patient expectations (lower levels of expectation before treatment) and type of residential status (as representing economic status) can lead to higher levels of patient satisfaction after treatment.

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