



Satisfaction of the complete denture wearers related to various factors

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ABSTRACT

All dentists who have worked with complete denture wearers know that patient satisfaction is not based only on the technical quality of the dentures. The aim of this study was at assessing the effect of gender, the number of the dentures used before, the length of time of denture usage, education and age on the satisfaction of the complete denture wearers. The students of the Dental Faculty of Marmara University (Turkey) made new dentures for 342 patients who were asked to participate in the investigation. The subjects (137 men and 205 women) were 39–89 years of age with a mean of 61.62 years. The attitude toward dentures in general was measured by means of 11 items of a questionnaire. The 10 main questions of the questionnaire were answered by the participants, and quantified on a 7-point scale, while the 11th issue (general satisfaction) was evaluated on a scale of 1–10. All main factors were also estimated in subgroups. For example, the education was analyzed in 4 subgroups, the time of denture usage was divided into two subgroups (below and above 3 years) and the number of dentures used before was also taken as up to 3 or more than 3 dentures. The age of the subjects was taken in 3 subgroups: 40–55, 56–65 and >65 years. One-way ANOVA, Tukey and Student *t*-tests were used to evaluate the answers to the questionnaire. Our patients displayed statistically significant differences only in the topics of their ability of cleaning their dentures, due to education and number of previously used dentures.

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1. Introduction

While the rate of total edentulism is decreasing in developed countries, the reverse is the case in the developing countries, being attributed mainly to the prevalence of periodontal disease and caries (Nalcaci et al., 2007). Often there is no agreement between the patient and the dentist as to the adequacy of their dentures (Jeganathan and Payne, 1993). The various perceptions of patient needs make the management more difficult. The fact that a denture of poor quality may be well tolerated in one person, while a well-made one may result in a failure in another one, has been a frequent source of confusion and frustration (Brunello and Mandikos, 1998).

Garrett et al. (1996) described that 55% of the patients assessed were moderately to fully satisfy with their dentures which have been found by the examining dentists in need of replacement (Ivanhoe et al., 2002). The problem is more serious than any other one in the clinical treatment of edentulous patients, because of continuous resorption of the residual ridges. It leads to the need for repeated replacements and refitting of dentures and periodic occlusal reshaping of teeth on dentures. This problem has not been

solved even though certain impression procedures and materials are supposed to avoid the destruction of the residual ridges (Boucher, 2004).

The patients generally expect new dentures to fit and function better than their existing ones, i.e., most patients anticipate that their new dentures will bring an improvement compared to their previous dentures, but are resigned to understand that compromises may be necessary (Ivanhoe et al., 2002).

The aim of this study was to compare new complete dentures with the old ones in chewing capacity, ease of cleaning, comfort, tasting, phonetic functions and general satisfaction of complete denture wearers, according to age, gender, level of education, number of dentures used before and the length of time of denture usage.

2. Subjects and methods

Students of the Dental Faculty of Marmara University, Istanbul (Turkey) made new complete dentures for 342 patients, who were asked to participate in the investigation. The 137 men and 205 women were 39–89 years of age with a mean of 61.62 years. The attitude toward dentures in general was measured by means of 11 items in a questionnaire.

A questionnaire identifying the patient's perceptions about the importance of various features of complete dentures was

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Table 1

The questionnaire filled in by the patients.

Name:	Surname:	Gender:
Age: ☐ 40–55	☐ 56–65	☐ older than 65
Level of education: ☐ Illiterate		
Literate: ☐ elementary school ☐ senior high school ☐ graduate		
Number of dentures used before:		
☐ less than 3 dentures ☐ 3 dentures ☐ more than 3 dentures		
Time of denture usage: ☐ less than 3 years ☐ more than 3 years		

Please answers each question by ticking the box beside the answer, you agree:

- Q1. How good is your chewing capacity?
☐ very good ☐ good ☐ OK ☐ the same ☐ better ☐ poor ☐ very poor
- Q2. How comfortably can you chew with your dentures?
☐ very uncomfortably ☐ uncomfortably ☐ OK
☐ the same ☐ better ☐ comfortably ☐ very comfortably
- Q3. How comfortably can you chew hard foods with your dentures?
☐ very uncomfortably ☐ uncomfortably ☐ OK
☐ the same ☐ better ☐ comfortably ☐ very comfortably
- Q4. How comfortably can you chew your food ?
☐ very uncomfortably ☐ uncomfortably ☐ OK
☐ the same ☐ better ☐ comfortably ☐ very comfortably
- Q5. How is your attitude towards eating?
☐ very good ☐ good ☐ OK
☐ the same ☐ better ☐ poor ☐ very poor
- Q6. How comfortably can you clean your dentures?
☐ very uncomfortably ☐ uncomfortably ☐ OK
☐ the same ☐ better ☐ comfortably ☐ very comfortably
- Q7. How is your attitude towards cleaning your dentures ?
☐ very good ☐ good ☐ OK ☐ the same ☐ better ☐ poor ☐ very poor
- Q8. How do you smell using your denture?
☐ very well ☐ well ☐ OK ☐ the same ☐ better ☐ poorly ☐ very poorly
- Q9. How safe you feel with your dentures?
☐ very safe ☐ safe ☐ OK ☐ the same ☐ better ☐ unsafe ☐ very unsafe
- Q10. How comfortably can you speak with your dentures?
☐ very uncomfortably ☐ uncomfortably ☐ OK ☐ the same
☐ better ☐ comfortably ☐ very comfortably
- Q11. Would you evaluate your satisfaction of dentures by giving mark between 1–10?

developed. The starting point for the questionnaire was a list of six clinical features related to the success of complete dentures derived from standard prosthodontic textbooks (Smith and McCord, 2004). These features were related to tasting, ease of chewing, ease of cleaning, comfort, the effects of dentures on speech and general satisfaction of the patient; they were taken to represent the normative view of what dentists thought edentulous patients were likely to expect from their dentures (Smith and McCord, 2004).

The list of the questions had an analog scale with straight lines (10 cm in length), a random question sequence and a reversed polarity of questions, the so-called visual analog scale (VAS). Filling out the items was performed during an interview. The first 10 questions of the questionnaire were answered on a 7-point scale, while the 11th one was evaluated on a scale of 1–10 (Table 1).

Age, gender, time of denture usage, number of dentures used before, and educational level of the participants were recorded. According to these factors, the participants were divided in subgroups. E.g., the education level resulted in 4 subgroups, such as illiterate, literate-elementary school, literate-senior high school, and literate-graduated.

The overall time of denture usage was between 2.5 and 4.5 years: patients were divided on this basis into 2 subgroups, as >3, or <3 years. According to the number of dentures used before, we created two subgroups: ≤ 3 or >3 dentures. We created 3 age-groups: 40–55, 56–65 and >65 years. One-way ANOVA, Tukey and Student *t*-tests were used for the statistical evaluation of the answers to the questionnaire.

In the questionnaire with 10 questions, the reliability coefficient (Cronbach's α) was 0.86, indicating a highly acceptable reliability of the questionnaire. The patients evaluated their dentures with the 11th question by using the VAS.

3. Results

The overall satisfaction with their complete denture was $53.2 \pm 13.58\%$ for men and $53.45 \pm 14.41\%$ for women. There were no statistically significant differences between the age- and gender-subgroups in any factor of patient satisfaction.

According to the number of dentures used before, there were no statistically significant differences in chewing capacity, comfort,

Table 2

Comparison of the subgroups on the basis of the number of dentures used before: numerical evaluation of the responses to questionnaires, means $\pm$ S.D.

	Number of dentures used before		<i>t</i>	<i>p</i> =
	≤ 3 dentures	> 3 dentures		
Number	329	13		
Q11	7.05 $\pm$ 1.96	7 $\pm$ 2.48	0.10	0.922
Satisfaction	53.08 $\pm$ 14.04	60.28 $\pm$ 13.33	-1.82	0.07
Q1	4.64 $\pm$ 1.82	4.92 $\pm$ 1.66	-0.55	0.584
Q2	4.64 $\pm$ 1.82	5 $\pm$ 1.73	-0.70	0.482
Q3	4.34 $\pm$ 1.80	4.77 $\pm$ 1.83	-0.84	0.4
Q4	4.23 $\pm$ 1.31	4.77 $\pm$ 1.09	-1.47	0.144
Q5	4.25 $\pm$ 1.21	4.77 $\pm$ 0.93	-1.53	0.126
Q6	4.86 $\pm$ 1.13	5.69 $\pm$ 1.25	-2.59	0.01*
Q7	4.87 $\pm$ 1.16	5.77 $\pm$ 1.3	-2.75	0.006*
Q8	5.92 $\pm$ 0.56	6.08 $\pm$ 0.28	-0.99	0.324
Q9	3.80 $\pm$ 1.37	4.31 $\pm$ 1.11	-1.31	0.191
Q10	4.01 $\pm$ 1.50	4.31 $\pm$ 1.60	-0.69	0.489

* Significant differences.

Table 3

Comparison of the subgroups on the basis of the previous time of denture-wearing based on the numerical evaluation of the responses to questionnaires, means $\pm$ S.D.

	Time of dentures wearing before		<i>t</i>	<i>p</i> =
	≤ 3 years	> 3 years		
Number	270	72		
Q11	6.89 $\pm$ 2.00	7.65 $\pm$ 1.78	-2.93	0.004*
Satisfaction	52.32 $\pm$ 14.08	57.23 $\pm$ 13.4	-2.66	0.008*
Q1	4.49 $\pm$ 1.84	5.28 $\pm$ 1.59	-3.34	0.001*
Q2	4.5 $\pm$ 1.84	5.21 $\pm$ 1.63	-2.96	0.003*
Q3	4.21 $\pm$ 1.79	4.89 $\pm$ 1.75	-2.85	0.005*
Q4	4.16 $\pm$ 1.29	4.57 $\pm$ 1.34	-2.36	0.019*
Q5	4.22 $\pm$ 1.21	4.46 $\pm$ 1.15	-1.51	0.133
Q6	4.91 $\pm$ 1.16	4.82 $\pm$ 1.12	0.60	0.548
Q7	4.94 $\pm$ 1.19	4.76 $\pm$ 1.12	1.11	0.266
Q8	5.91 $\pm$ 0.61	6.00 $\pm$ 0.17	-1.22	0.222
Q9	3.77 $\pm$ 1.35	4.03 $\pm$ 1.39	-1.45	0.149
Q10	3.94 $\pm$ 1.49	4.33 $\pm$ 1.54	-1.97	0.049*

* Significant differences.

tasting, phonetics and general satisfaction between the subgroups, except the ease of cleaning dentures (Table 2). The patients wearing now more than their 3rd dentures showed statistically more satisfaction in ease of cleaning their dentures than the ones using ≤ 3 rd dentures ($p < 0.01$).

Based on the time-length of denture usage, the patients using dentures > 3 years showed statistically higher satisfaction in chewing capacity ($p < 0.001$), chewing comfort ($p < 0.003$), tasting ($p < 0.019$), phonetics ($p < 0.049$) and general satisfaction ($p < 0.008$), compared to those having used dentures ≤ 3 years.

Table 4

Comparison of the subgroups on the basis of the education levels of denture-wearing subjects based on the numerical evaluation of the responses to questionnaires, means $\pm$ S.D.

	Illiterate	Elementary	Senior high	Graduated	<i>F</i>	<i>p</i> =
<i>n</i>	36	185	73	48		
Q11	7.22 $\pm$ 1.64	6.97 $\pm$ 1.95	7.26 $\pm$ 1.97	6.92 $\pm$ 2.32	0.53	0.661
Satisfaction	56.01 $\pm$ 12.94	52.12 $\pm$ 14.08	55.57 $\pm$ 14.17	52.74 $\pm$ 14.44	1.55	0.202
Q1	4.97 $\pm$ 1.68	4.53 $\pm$ 1.84	4.79 $\pm$ 1.76	4.67 $\pm$ 1.91	0.80	0.494
Q2	4.83 $\pm$ 1.72	4.56 $\pm$ 1.85	4.75 $\pm$ 1.75	4.73 $\pm$ 1.87	0.39	0.759
Q3	4.44 $\pm$ 1.73	4.21 $\pm$ 1.82	4.64 $\pm$ 1.66	4.42 $\pm$ 1.98	1.07	0.361
Q4	4.19 $\pm$ 1.26	4.16 $\pm$ 1.24	4.48 $\pm$ 1.43	4.27 $\pm$ 1.4	1.05	0.37
Q5	4.28 $\pm$ 1.21	4.19 $\pm$ 1.21	4.48 $\pm$ 1.28	4.23 $\pm$ 1.04	1.00	0.393
Q6	5.42 $\pm$ 1.08	4.83 $\pm$ 1.11	4.95 $\pm$ 1.23	4.65 $\pm$ 1.10	3.54	0.015*
Q7	5.39 $\pm$ 1.08	4.85 $\pm$ 1.16	4.93 $\pm$ 1.24	4.69 $\pm$ 1.11	2.79	0.04*
Q8	6.03 $\pm$ 0.17	5.89 $\pm$ 0.59	5.89 $\pm$ 0.66	6.06 $\pm$ 0.32	1.76	0.155
Q9	3.69 $\pm$ 1.21	3.7 $\pm$ 1.39	4.19 $\pm$ 1.33	3.83 $\pm$ 1.36	2.44	0.064
Q10	4.28 $\pm$ 1.63	3.99 $\pm$ 1.47	4.12 $\pm$ 1.55	3.79 $\pm$ 1.52	0.85	0.468

* Significant differences.

There were no statistically significant differences between the subgroups of time of denture usage in ease of cleaning factor of patient satisfaction (Table 3).

There were no statistically significant differences in chewing capacity, comfort, tasting, phonetics and general satisfaction between the subgroups of education levels, except in the ease of cleaning dentures. Highly educated patients showed statistically more satisfaction in ease of cleaning their dentures than illiterate and literate patients ($p < 0.015$) (Table 4).

As a result, time of denture usage was the determinant factor and showed statistically significant differences in 6 factors of patient satisfaction.

4. Discussion

In the current study a questionnaire identifying the patient's perception about the importance of various features of complete dentures was developed. Various studies have used questionnaires mostly non-standardized, custom-made evaluating satisfaction with conventional dentures (Celebric et al., 2003; Strassburger et al., 2004; Veyroon et al., 2005; Anastassiadou and Heath, 2006). Baat et al. (1997) claimed that the overall denture satisfaction depends on only one question, is questionable. It is unknown, if dissatisfaction was caused by the mandibular or by the maxillary denture. However, other investigations suggested that the overall satisfaction seems to be a reflection of satisfaction with the mandibular denture (Berg, 1984, 1988).

All who have worked with complete dentures know that patient satisfaction is not based only on the technical quality of the dentures. Psychological and emotional factors may be of great importance in maladaptive patients, even though they seek technical advice. To help such patients, the dentist must be able to listen to them and communicate with them efficiently (Landesman, 1997).

Although this method has not been systematically evaluated, several studies have demonstrated the great impact of the dentist-patient relationship and psychological factors on patients' acceptance of new dentures (Carlsson et al., 1967; Carlsson, 1997). The correlations between patients' satisfaction with their dentures and "objective" measurements of anatomic conditions, denture quality such as retention and stability, and masticatory performance are in general surprisingly weak and often statistically nonsignificant (Närhi et al., 1997).

Reeve et al. (1992) used Cattell's 16 PF questionnaire on patients treated by students and found that dissatisfied patients were less bright, less stable, more meticulous and more self-centered than a satisfied group (Al Quran et al., 2001).

Sensitivity to taste stimuli can decline with age, and although the magnitude of the change is often small, it can affect a number of

older individuals, but these problems are most likely caused by systemic conditions and their treatment (drugs, chemotherapy and radiotherapy), rather than by the normal sequelae of aging (Nalcaci and Baran, 2008).

In the presented study, it was determined that no relationship exists between age and satisfaction. The results of this study support the findings of Berg (1984) who observed no significant patient age or gender relationships on denture acceptance.

Muller and Hasse-Sander (1993) reported that oral motor abilities and the capability of adaptation to new dentures are not clearly age related, and concluded that aging is a biologic process and not simply chronologic, which leads to considerable individual variation in oral motor and adaptation abilities.

The results of this study support the findings of Jonkman et al. (1997) who reported that age, gender or denture experience did not demonstrate a correlation with denture satisfaction. In the present study the patients having used their dentures already more than 3 years, showed more satisfaction in chewing capacity, chewing comfort, tasting, phonetics and general satisfaction, than those having used their dentures ≥ 3 years. Jonkman et al. (1997) reported that patients who have been edentulous for a short period were more dissatisfied with their new dentures.

The quality of complete dentures has been shown to be closely related to denture usage, and that quality of complete dentures is really the product of underlying latent variables, including anatomical factors, anatomical forms, accuracy of reproduction of retruded jaw relationship, etc. (Fenlon et al., 2007).

As regards the masticatory efficiency, it has been demonstrated that it is less than half in complete denture wearers, than in the dentate subjects. But several studies have explored the ability of complete denture wearers to adapt to the rheological properties of foodstuffs, giving contrasting results (Veyrone and Mioche, 2000; Veyrone et al., 2007).

Studies on the phonetic ability have revealed that the edentulous patients frequently complain on this function when they start to wear and function with a new mandibular denture, but it was most often the result of a lack of patient adaptiveness (Bohnenkamp and Garcia, 2007).

We draw the conclusion that no statistically significant differences were seen in our 342 patients, due to gender and age. Also, no statistically significant differences were seen in the other topics, except the ability of cleaning dentures due to education and number of dentures used before. As a result, the time of denture usage was the most determinant factor, and showed statistically significant differences in 6 subfactors of patient satisfaction.

Conflict of interest

None.

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