

Satisfaction with orthodontic treatment

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ABSTRACT

Objectives: To examine the satisfaction of patients with their orthodontic treatment at the Department of Orthodontics at the Academic Centre for Dentistry Amsterdam (ACTA) in The Netherlands.

Materials and Methods: To analyze differences in satisfaction through time, the results of patients treated at ACTA in 2008 and 2009 were compared with the results of patients treated at ACTA in 2000. A validated questionnaire about patient satisfaction was used. The total scale was divided into six subscales. A questionnaire was sent to all patients younger than 30 years who finished orthodontic treatment in 2008 and 2009 at ACTA.

Results: The internal consistency of the total scale and the six subscales of the questionnaire was satisfactory. Respondents scored highest on items about satisfaction with the doctor-patient relationship (mean 4.24; SD 0.63) and lowest on items regarding their satisfaction with psychosocial improvement (mean 2.88; SD 0.87). Compared to the results of the sample from 2000, significant differences were found on the subscales doctor-patient relationship, residual category, and psychosocial improvement as well as on the total sum scale.

Conclusions: The doctor-patient relationship remains the most important factor contributing to patient satisfaction. However, the results show that, overall, patients are more satisfied with their orthodontic treatment than patients were a decade ago. (*Angle Orthod.* 2013;83:507–511.)

KEY WORDS: Orthodontics; Patient satisfaction; Trend study

INTRODUCTION

Patient satisfaction after orthodontic treatment is influenced by a number of factors. To illustrate, psychological traits of individual patients affect their satisfaction with orthodontic treatment outcomes.^{1,2} Factors like gender, age, duration of treatment, compliance, and dentofacial improvement also seem to contribute to the level of satisfaction.^{2–5} Patient satisfaction is important for ensuring patient adherence in orthodontic treatment. In previous studies, different factors have been explored and different instruments

have been used to assess satisfaction after orthodontic treatment. Not surprisingly, investigations of patient satisfaction after orthodontic treatment have shown a wide range of satisfaction levels.^{2,6} This makes comparisons between studies difficult.

Almost a decade ago, in a study in the Netherlands, the patient satisfaction questionnaire developed by Bos et al.³ was used to examine different factors of patient satisfaction after orthodontic treatment. The factors doctor-patient relationship, situational aspects, dentofacial improvement, psychosocial improvement, and dental function, as well as a residual category, were explored. It was shown that the most important factor contributing to patient satisfaction was the patient's satisfaction with the doctor-patient relationship.³ Gender was shown to be a significant predictor of the patient's satisfaction with the doctor-patient relationship and the situational aspects of the treatment.³

However, dental attitudes of patients have changed over time.⁷ Over the past decade, the number of patients seeking orthodontic treatment has increased considerably with socioeconomic development and changing opinions on appearance.^{4,7–9} Do these changes affect the satisfaction of patients after orthodontic treatment? To answer this question in a

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valid and reliable way a standardized instrument is needed.

In this study, the trend study design was used to examine changes in time. With this method, two or more cross-sectional studies are conducted at two or more moments, and at each time comparable samples are drawn.¹⁰ In this way, it is possible to analyze whether a trend in the satisfaction of patients exists through time.

The aim of this study was to examine patients' satisfaction with their orthodontic treatment at the Academic Centre for Dentistry Amsterdam (ACTA) in 2008 and 2009 and to compare these results with the satisfaction levels of patients treated at ACTA in 2000. The same questionnaire was used in both studies to ensure the comparability of the measurements. Different subscales were analyzed to examine whether the doctor-patient relationship still is the most important factor contributing to the patient satisfaction and to explore gender differences.

MATERIALS AND METHODS

Questionnaire

The same questionnaire used by Bos et al.³ for the orthodontic patient sample in 2000 was used in this study. This questionnaire contained 58 questions about patient satisfaction and patient perspective on treatment outcome. Instead of the six-point response format used in the questionnaire of the sample from 2000, in this study a five-point response format with end points one (completely disagree) and five (completely agree) was used. The responses of the 2000 sample were rescored in order to compare them with the results of the present study.

The total scale was divided into six subscales on the basis of item content. The first subscale was formed by 11 items about the satisfaction of patients with the doctor-patient relationship. The second subscale contained 15 items about patient satisfaction with the situational aspects of the orthodontic clinic. The third subscale was based on nine items about patients' satisfaction with their dentofacial improvement. The fourth subscale consisted of nine items about patients' satisfaction with their psychosocial improvement. The fifth subscale was formed by four items about patient satisfaction with dental function. And, the sixth consisted of 10 items that formed a residual category. Items that were formulated negatively were rescored, so that a high score indicated a high level of satisfaction.

Sample

A questionnaire was sent to all patients younger than 30 years who did not have cleft lip and palate and

who finished orthodontic treatment at ACTA in 2008 and 2009 ($n = 220$). Of the 121 questionnaires returned, six were excluded from the study because of incomplete data. Therefore, 115 questionnaires were used in the analyses. The response rate was 55% (65.2% female and 34.8% male patients). The mean age of the subjects was 17.23 years (SD 3.76).

Statistical Analysis

The responses provided by the patients were analyzed using SPSS (SPSS Inc, v15, Chicago, Ill). Data were examined, and the differences in the responses to each item were compared with the responses in 2000 using one-sample *t*-tests. Gender differences were tested by independent sample *t*-tests. The reliability of the satisfaction questionnaire and of the six subscales was tested using Cronbach alpha. Correlations between age, gender, and satisfaction scores were analyzed. Mean treatment time was analyzed exploratively and compared with the sample from 2000.

RESULTS

The internal consistency of the total scale and the six subscales of the satisfaction questionnaire was highly satisfactory. Cronbach alpha was 0.91 for the total scale and 0.89, 0.76, 0.75, 0.88, 0.76, and 0.69, respectively, for the six subscales.

In Table 1, the mean item scores, total mean scores for the six subscales, and total sum scale in 2008 and 2009 are presented. Independent sample *t*-tests showed no significant gender differences in mean scale scores for male and female subjects. Respondents scored highest on items about satisfaction with the doctor-patient relationship (mean 4.24; SD 0.63) and lowest on items regarding their satisfaction with psychosocial improvement (mean 2.88; SD 0.87).

Tables 2 and 3 present mean scores of male and female subjects for the six subscales and the total sum scale in 2008–2009 compared with the sample in 2000, the *t* values and *P* values. Compared to the sample in 2000, significant differences were found on the subscales doctor-patient relationship, residual category, and psychosocial improvement as well as on the total sum scale.

Correlations between age, gender, and satisfaction scores are presented in Table 4. No significant correlations were found between age, gender, and satisfaction scores. Almost all satisfaction scores are correlated. The only scores for which no correlation was found were between the psychosocial improvement scores and the situational aspects and doctor-patient relationship.

Table 1. Total Mean Scale Scores for Six Subscales in 2008–2009 (n = 115)

Area of Satisfaction	Total Subscale Score		Item Score		Ranking
	Mean	SD	Mean	SD	
Doctor-patient relationship (11 items)	46.64	6.98	4.24	0.63	1
Situational aspects (15 items)	54.17	8.00	3.61	0.53	4
Dentofacial improvement (9 items)	33.82	5.35	3.76	0.59	2
Psychosocial improvement (9 items)	25.88	7.79	2.88	0.87	6
Dental function (4 items)	12.68	3.84	3.17	0.96	5
Residual category (10 items)	36.74	6.18	3.67	0.62	3
Sum score satisfaction (58 items)	213.02	26.35			

The treatment time was measured in months (mean 30.81; SD 13.02). Independent sample *t*-tests showed no gender differences in treatment time for male and female subjects. There was also no significant difference found in treatment time compared to 2000. The mean treatment time showed no correlations with the subscales.

DISCUSSION

In the present study it was found that the doctor-patient relationship in the sample from 2008–2009 was the most important factor contributing to patient satisfaction. This corresponds with the results of the sample from 2000 and with the results of previous studies.¹¹ This finding indicates that doctor-patient interactions still have strong influences in predicting patient satisfaction.¹¹ In the present replication study it was also shown that patients in general are more satisfied with their orthodontic treatment compared with patients almost a decade ago. Other studies have also shown that patients' expectations and attitudes change with time.^{7,12} In our study, it was shown that male patients were more satisfied on the subscales doctor-patient relationship and the residual category compared to male patients in the sample from 2000, while female patients in the present study were more satisfied on the subscale psychosocial improvement compared to female patients in 2000.

Previous studies showed that female patients perceive more need for orthodontic treatment than male patients and that female patients demonstrate

less satisfaction than male patients with the appearance of their dentition.^{4,5,13–17} Earlier studies also showed that male patients have different expectations of orthodontic treatment than female patients. Although female patients seek treatment to improve their appearance and self-confidence, male patients want treatment to improve their social well-being.^{8,9,18–22} So, to be able to better explain and predict patient satisfaction after orthodontic treatment, it is important to get a clear understanding of the motivations and expectations of patients before initiating any treatment. In a future study, possible gender differences at the start of the orthodontic treatment might be measured in order to explain differences found in the present study.

Patient satisfaction with orthodontic treatment has no definitive outcome in the literature.^{2,6} This can be explained by the different motivations and expectations of patients receiving orthodontic treatment. Most studies report functional, esthetic, and social reasons as the main motives to seek orthodontic treatment.^{18–22} Satisfaction level may be affected by the severity of the malocclusion at the beginning of the treatment or by the final result of the treatment. However, a recent study showed that patient satisfaction is not necessarily bound to the severity of malocclusion before treatment or the final result of the treatment.²³ The current status of the dentition may be more relevant for patients than the benefits obtained just after orthodontic treatment.

Some limitations of the results must be noted. First, the findings reflect only the satisfaction of patients treated at ACTA. Therefore, the results cannot be

Table 2. Mean Scale Scores of *Male* Patients for Six Subscales in 2008–2009 Compared With 2000 Using a One-Sample *t*-Test

Area of Satisfaction	2008–2009 (n = 40)		2000 (n = 44)		<i>t</i>	<i>P</i>
	Mean	SD	Mean	SD		
Doctor-patient relationship (11 items)	46.49	6.42	43.43	7.00	2.89	.006*
Situational aspects (15 items)	53.72	7.88	54.60	8.00	−0.67	NS
Dentofacial improvement (9 items)	33.38	5.31	34.87	4.63	−1.71	NS
Psychosocial improvement (9 items)	24.79	7.87	23.61	8.74	0.92	NS
Dental function (4 items)	12.87	3.83	12.66	4.24	0.35	NS
Residual category (10 items)	37.08	5.44	34.70	6.24	2.63	.013*
Sum score satisfaction (58 items)	211.48	23.84	201.29	23.86	2.30	.029*

* *P* < .05. NS indicates not significant.

Table 3. Mean Scale Scores of *Female* Patients for Six Subscales in 2008–2009 Compared With 2000 Using a One-Sample *t*-Test

Area of Satisfaction	2008–2009 (n = 75)		2000 (n = 56)		<i>t</i>	<i>P</i>
	Mean	SD	Mean	SD		
Doctor-patient relationship (11 items)	46.72	7.30	46.38	5.08	0.39	NS
Situational aspects (15 items)	54.39	8.17	53.70	6.76	0.72	NS
Dentofacial improvement (9 items)	34.09	5.42	33.68	4.94	0.63	NS
Psychosocial improvement (9 items)	26.64	7.65	22.94	9.08	4.05	.000*
Dental function (4 items)	12.57	3.90	12.54	3.83	0.05	NS
Residual category (10 items)	36.54	6.60	36.35	5.76	0.23	NS
Sum score satisfaction (58 items)	213.82	27.73	203.49	20.52	2.79	.007*

* $P < .05$. NS indicates not significant.

generalized to orthodontic patients in general. We acknowledge that people from different socioeconomic backgrounds, cultures, and ethnicities may place different values on the results. This is an interesting area that requires further research.

The age range in both samples was broad. Although the ratio of male to female subjects was substantially equal in both samples, in the present study both the average age and the standard deviation around the mean were different in comparison to the first study. Comparing responses based on age groups, however, revealed no significant differences. According to previous studies, it is not expected that age will be a significant factor contributing to satisfaction with orthodontic treatment in the homogeneous samples.^{2,11}

Another limitation was that in the present sample the type of orthodontic treatment has not been taken into account. The type of orthodontic treatment may affect patient satisfaction. To analyze the experiences of orthodontic patients more specifically, the satisfaction levels of patients undergoing different types of treatment should be elucidated more specifically in future studies.

The differences in satisfaction levels of the subjects in our study compared with the sample from 2000 might be due to different expectations or different motivations of patients for orthodontic treatment. To eliminate this limitation in future studies, it is recommended that the

expectations of patients in two samples are matched at the beginning of the treatment.

To explore whether a trend exists in declining patient satisfaction after orthodontic treatment, we recommend replicating this study over another 10 years. It is important to further explore factors contributing to patient satisfaction in order to help orthodontists improve patient satisfaction in the future.

CONCLUSIONS

- In the present study, it was shown that the satisfaction of patients with orthodontic treatment has significantly increased compared with the sample from 2000.
- No correlation was found between gender and patient satisfaction.
- The doctor-patient relationship still seems to be the most important factor in patient satisfaction. Orthodontists should be aware that a good relationship with the patient may be even more important for the patient than just a technical successful treatment alone.
- Further investigations are necessary to search for a possible relation between the expectations and motivations of orthodontic patients at the beginning of their treatment and their satisfaction at the end of treatment.

Table 4. Correlations Between Age, Gender, and Subscales

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Age	1.00								
(2) Gender	.155	1.00							
(3) Doctor-patient relationship	.028	.016	1.00						
(4) Situational aspects	.011	.040	.715**	1.00					
(5) Dentofacial improvement	.006	.063	.291**	.299**	1.00				
(6) Psychosocial improvement	-.050	.115	.063	.113	.577**	1.00			
(7) Dental function	-.082	-.038	.284**	.278**	.399**	.460**	1.00		
(8) Residual category	.114	-.043	.732**	.659**	.362**	.063**	.214**	1.00	
(9) Sum score satisfaction	.028	.042	.737**	.773**	.699**	.549**	.586**	.766**	1.00

* $P < .05$; ** $P < .01$.

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