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PATIENTS AND PARENTS EXPECTATIONS AND SATISFACTION WITH ORTHODONTIC TREATMENT

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ABSTRACT:

Objectives: To determine parents/guardians and patients' satisfaction with various aspects of orthodontic treatment in two private orthodontic practices in the State of New York.

Materials and methods: Parents/guardians and patients in two rural private practice settings were asked to anonymously provide their levels of satisfaction with the orthodontic services provided by two independent orthodontists. A total of 51 patient and 49 parent/guardian surveys were completed.

Results: Both parents and patients were extremely satisfied with final appearance, smile and arrangement of teeth. All groups indicated they would undergo treatment again and expressed a significant positive influence on self-confidence. Parents/guardians and patients indicated the most difficult aspect of orthodontic treatment was pain during treatment and difficulty in eating. All surveyed indicated high marks with desire to have treatment by an orthodontic specialist as well as extreme satisfaction with the doctor.

Conclusions: Although the majority of patients and their parents were satisfied with orthodontic treatment, a small group is not and therefore future studies are warranted to further explore the topic. It is quite significant to all practitioners to evaluate, on an ongoing basis, our patients and parents satisfaction with their orthodontic experience, so that continuous and never-ending improvements can be undertaken.

Keywords: Satisfaction; Orthodontic treatment; Motivation; Survey

INTRODUCTION:

Satisfaction with treatment is important to the patient, parent, orthodontist and staff in the private practice of orthodontics. Levin suggests "Satisfaction and a sense of quality is judged in our office by the smile at the end of treatment and the patient and parent experience while there"[1]; i.e., customer service. From this we can assume that satisfaction with orthodontic treatment is a multi-faceted issue. Not only is it affected by

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quality of treatment, but also by the quality of service [2].

Interest in patient satisfaction with various aspects of health care has grown over the past 25 years. Bennett et al [3] suggested that satisfied patients are more likely to be compliant with their treatment regimen. In addition, increased marketing of all health services has led to a focus on patient satisfaction as a part of "practice building" – an important function in any practice.

Satisfaction with orthodontic treatment has been investigated in few studies. Birkland and coworkers [4] recorded a high degree of satisfaction with orthodontic treatment among children and their parents. Both rate pleasant aesthetics as an important factor for psychosocial wellbeing. As orthodontic treatment improves facial appearance, it is assumed to increase self-worth. Uslu and Akcam [5] investigated long-term satisfaction among skeletal Class III patients following orthodontic treatment using a 28-item questionnaire. The survey responses indicated 92.5% of patients were satisfied with their facial appearance and 95% with final esthetics profile. Only 5% were dissatisfied with their final profiles and a prognathic mandible was given as the reason, probably indicating in these patients that surgical treatment may have been a more appropriate treatment modality. Caban [6] at the University at Buffalo, concluded that expense as compared to private practice and confidence in academic facilities were the main motivating factors for seeking treatment at the University at Buffalo Department of Orthodontics. Patients and guardians identified long treatment times, pain, and difficulty eating as the most difficult aspect of orthodontic treatment. Patients were more concerned with the appearance of the appliances than were the guardian respondents. Overall satisfaction in both groups was high. On the other hand, O'Connor [7] in a private practice setting found that the number one dislike during treatment was pain, followed by discoloration of elastomeric ligatures and appearance.

Surveys to determine satisfaction have been previously performed in university settings. These studies are important at the university level to evaluate patient and parent satisfaction with different facets of orthodontic treatment. This information is even more important to the orthodontist in private practice since competition and referral patterns differ significantly from university clinical settings. The purpose of this study was to determine parents and patients' satisfaction with various aspects of orthodontic treatment in two private practices in the State of New York.

MATERIAL AND METHODS:

The sample for this cross-sectional study was drawn from two rural private practices in the State of New York between March and August of 2008. Orthodontic patients and one of their parents/guardians were invited to participate. Ethical approval was obtained from the Institutional Review Board at the State University of New York at Buffalo.

The inclusion criteria were orthodontic patients who were consecutively undergoing comprehensive two-jaw orthodontic treatment of their malocclusions for the first time. Two orthodontists who had at least 15 years' experience in orthodontics treated the patients at two locations. Subjects were excluded if they had craniofacial syndromes, mental retardation, conditions that might affect their comprehension and understanding of the questionnaires, or refused to participate.

One trained staff member handed out surveys with a cover letter explaining the purpose of this study. Risks and benefits were explained to the patients and their parents. No names were provided and participants were asked to complete their questionnaire independently and returned it in an envelope. Completion of the questionnaires was implied as consent to participate in the study.

A 25-item questionnaire was used for patients and a similar one with slight wording modification for the parent/guardians. The questionnaires were specifically modeled after questionnaires used by Caban [6], which was originally derived from several earlier studies [5,8,9] that were determined to be valid in evaluating patient satisfaction. Several questions were modified to fit a private practice setting. A visual-analog scale was used to measure responses analogous to a 0-100 scale. A rating of 0 represented a response of unlikely, not important or dissatisfied; while a rating of 100 represented extreme importance or satisfaction, or depending on the question, extreme difficulty.

The questionnaires asked about the following: Questions 1 and 2 dealt with the referral source, Questions 3 and 4 evaluated the reason and decision to undergo treatment, Question 5 was dichotomized and measured satisfaction with the practitioner, Questions 6 and 7 dealt with overall health, orthodontics and peer group reaction to treatment, Questions 8 and 9 examined oral hygiene practices, Questions 10, 11, and 12 were detailed questions regarding difficulties during orthodontic treatment, Questions 13 and 14 looked at the way information regarding orthodontics is made available to the public, Questions 15 through 20 assessed degree of satisfaction with the orthodontic result, smile, function and speech quality, Questions 21 through 24 explored whether the patient or parent would choose to undergo treatment again in addition to psychosocial variables like self-confidence, effect on school/work, and communication. Question 25 was a binary yes or no question asking about the participant's comfort in referring a friend or relative. The questionnaires were pre-tested on ten patients who were not part of the study sample to assess readability and acceptability.

Statistical analysis was carried out using SPSS (Version 18 for Windows, Chicago III). Descriptive statistics were produced for all variables. Chi-square tests (with continuity correction factor) were used to assess differences in proportions between patients and parent/guardians.

Comparisons of single sample proportions were assessed by the Normal approximation to the Binomial distribution. The two independent samples Student's t-tests were used for comparison of mean responses between the groups. All tests were evaluated at the 5% level of significance with no adjustment of multiple tests.

RESULT AND DISCUSSION:

A total of 51 orthodontic patients and 49 parents/guardians returned the questionnaires (response rate was 100%). Sixty-one percent of the patient respondents were females (31 F, 20 M). The overwhelming number of parent/guardian respondents was female, 85.7%, compared to 14.2% for males. This was a highly significant difference (Normal approximation to Binomial distribution). The mean ages of patient respondents were 19.7±9.68 years for female participants and 16±2.66 years for males but the difference was not statistically significant. The female and male parents' ages were 43.6±4.97 and 48.1±6.07 years respectively.

Table 1 presents responses to Questions 1 and 2 about suggestion to receive orthodontic treatment and referral sources. Parents/guardians overwhelmingly (81.6%) identified the Dentist/Dental Specialist as having made the suggestion, while the patients indicated this at a slightly lower percent (66.7%). There were no statistically significant differences in the proportions.

Table 2 presents the results from Questions 3 until 20 using the visual analogue scale. Question 3 assessed the reasons for the decision to undergo treatment. The majority of the respondents rated the referral source from Question 2 as important. In all five possible reasons, the parent/guardian had a higher mean than the patients. The differences in mean responses between the groups were statistically significant (t-test) for Questions 3-b (P=0.023), 3-c (P =0.006), and 3-e (P=0.002). In Question 4, parents and patients rated "straightening your teeth" (means 95.9±8.9 and 91.8±14.8) as extremely important. The differences were statistically significant for Questions 4-e (P=0.027) and 4-f (P=0.041).

The results for Question 6 showed that the parent/guardian responses were statistically significantly higher (t-test, P=0.008) than for patients. As far as issues that were difficult during treatment for patients (Question 10), difficulty in eating was the most significant for patients at a moderate level (45.8±22.6), with pain second (43.2±24.1), and long treatment time third (40.2±26.6). The results showed no statistically significant differences between mean responses for the groups on any of the nine components. Question 12 asked about spots on the teeth after the braces were removed and the patients reported higher levels than parents, 30.4 versus 19.1 respectively, (t-test, P=0.036). The parents/guardians reported significantly greater improvement in their children's chewing function (Question 18)

compared to the patients, (t-test, p-value = 0.007).

The majority of the respondents were very satisfied with the treating doctor with no statistically significant difference between the percent of "Yes" responses for parents/guardians (81.6%) and patients (84.0%), Figure 1. When asked about satisfaction with the arrangement of teeth, parents/guardians reported statistically significantly greater satisfaction (95.9±7.34) with the arrangement of the patients' teeth than did the patients (91.5±13.35), although both were very high, (t-test, P=0.043), Table 3. Parents/guardians reported greater satisfaction with facial appearance than patients, 95.7 versus 82.2 (t-test, P=0.003).

Question 22 asked about the influence of orthodontic treatment on self-confidence and again the parents/guardians reported higher levels than the patients, 91.7 versus 80.4 respectively (t-test, P=0.007), Figure 2. Influence of orthodontic treatment on social communication was significantly positive in both groups. When asked if the respondents would feel comfortable in referring others for treatment, 100% of both groups answered "yes".

The purpose of this study was to determine patient and parental/guardian satisfaction with orthodontic treatment in a private practice setting. The questions were designed to be similar to those used in a study in a university setting [6] so that conclusions can be drawn to not only compare results between a private practice and a university clinic setting, but also to use both results as a guide to improve treatment delivery and patient experience overall in both settings.

Of the 49 parental respondents, over 86% were females, suggesting that as in a previous study [10], the mother is the most significant decision maker in choosing an orthodontic office. Regarding referral sources, the general dentist was identified as the predominant source suggesting orthodontic treatment was needed whereas in the Caban study [6] the general dentists were identified as number three on the list, after parents and friends or relatives.

The decision to undergo treatment in our study focused mainly upon confidence in the office and a positive experience with the Doctor at the initial visit as well as the desire to be treated by an orthodontic specialist. This is similar to an earlier study [10] that suggested patient and parental preference for orthodontic practices focuses on the reputation of the practitioner as most important, along with the attitude of caring of the office. The payment plan, not the cost, was the crucial element in the decision process. A previous study by O'Connor [7] stated that reduction of fees is the number one recommendation from patients followed by the accurate timing estimate. Caban [6] reported the reason patients and parents chose the University at Buffalo orthodontic clinic for treatment was primarily the expense as compared to private practices, with confidence in academic facilities as well as a positive

experience with the Doctor at initial visit being nearly as important. This suggests that fees do play a significant role in the orthodontic decision; however, flexibility with payment plans may reduce its significance as long as consumers are aware of the "word of mouth" reputation of the office, the attitude of friendliness and caring of the staff, and initial positive interaction with the Doctor.

Participants in our study were in agreement with other studies [4,5,11] regarding aesthetic factors of importance to them such as straightening the teeth and improving the smile; patient respondents leaned more toward the obvious aesthetic improvements, while parents/guardians placed as much emphasis on functional concerns. Petrone et al [12] in a study of patients recruited from nine private orthodontic practices in southwest Pennsylvania, found that orthodontic consumers have high overall expectations of treatment outcome. This is not surprising because of the money and time invested in orthodontic treatment. Additionally, they stated that parents of patients with severe malocclusions have expectations of the benefits of treatment that may exceed treatment outcome.

Areas of difficulty during orthodontic treatment were similar to other studies [11,13] with pain and difficulty in eating being the most significant. The Caban university study [6] also suggested long treatment time as a significant factor. Treatment times in both private practice settings average less than 24 months. This may be an area that seems to be lacking in the university setting, not only for patient satisfaction, but also as it relates to cost control. Responses to questions related to practice management suggested no issues regarding time spent waiting for the Doctor, making appointments and reaching someone in the office.

The set of questions regarding satisfaction with the alignment of the teeth, final facial appearance, the smile, and overall results of treatment, all elicited extremely high satisfaction scores for both groups. This is similar to a previous study [6] and it also suggests not only are parents and patients satisfied with their clinical care, but also their own experience in the offices.

In terms of the impact of treatment regarding its influence on self-confidence and patient's social communication, these areas seem to have been positively affected with parents/guardians reporting slightly higher scores than patients, but all being significantly positive. Although the majority of patients and their parents were satisfied with orthodontic treatment, a small group was not. Future studies are warranted to further explore the topic and the dissatisfied subgroups.

CONCLUSION:

- Patients and parents/guardians agreed that treatment by an orthodontic specialist was a significant concern and that confidence in the office and a

positive initial experience with the Doctor were extremely important.

- All groups stated that the important issues concerning orthodontic treatment were straightening teeth, improving facial appearance and improving smile, while getting braces because friends have them was relatively unimportant.
- All groups identified pain during treatment and difficulty in eating as the two most significant negative sequelae of treatment.
- Parents rated satisfaction with the final appearance of the teeth and final facial appearance slightly higher than patients, although both groups were very satisfied.
- Most patients and parents would consent to the same treatment and felt orthodontic treatment had a very positive effect on the patient's self-confidence and social communication.

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TABLES:

Table 1: Patients and parents/guardians responses to Questions 1 and 2 about the suggestion to undergo orthodontic treatment and the referral source*

Item	Q1: Who suggested orthodontic treatment was needed?		Q2: Who referred you to our office for orthodontic treatment?	
Option	**Parent/ Guardian N (%)**	**Patient N (%)**	**Parent/ Guardian N (%)**	**Patient N (%)**
Dentist/Dental Specialist	40 (81.6)	34(66.7)	25 (51.0)	22 (43.1)
Self	14 (28.6)	12(23.5)	10 (20.4)	6.0 (11.8)
Parents / Guardian / Patients[1]	1.0 (2.0)	6.0(11.8)	0.0 (0.0)	8.0 (15.7)
Television	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Internet	0.0 (0.0)	0.0 (0.0)	1.0 (2.0)	0.0 (0.0)
Friends/Relatives	3.0 (6.1)	7.0(13.7)	9.0 (18.4)	13 (25.5)
Other	1.0 (2.0)	1.0(2.0)	8.0 (16.3)	7.0 (13.7)
Total	49 (100)	51 (100)	49 (100)	51 (100)

* Respondents chose all that applied

[1] Patients choice was Parents/Guardians and Parents/Guardians choice was Patient.

Table 2: Patients and parents/guardians experience with orthodontic treatment.

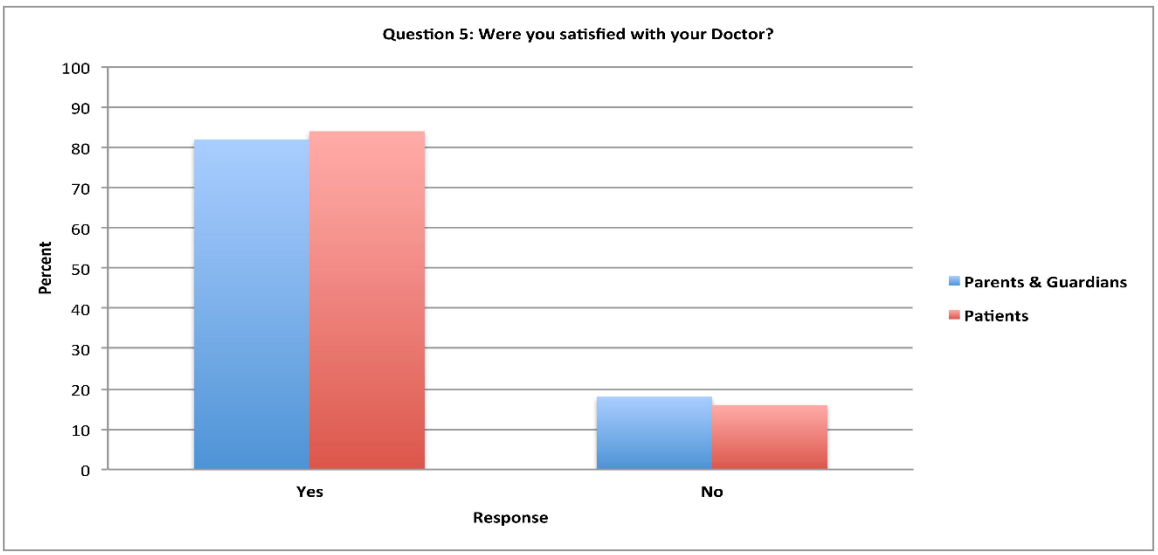
Item		Patient			Parent/Guardian		
		N	Mean	SD	N	Mean	SD
Q3: Why did you decide to undergo treatment at our office?							
	Referral source from question #2	50	81.4	20.5	46	86.3	17.9
	(b) Confidence in our office	48	85.0	15.0	48	91.3	11.2
	(c) Positive experience with Doctor at an initial screening visit	50	86.4	17.9	48	94.4	7.9
	(d) Family member was previously treated at our office	48	39.4	31.6	43	40.5	34.2
	(e) Desired treatment by an Orthodontic Specialist	46	80.4	23.5	46	92.8	10.7
Q4: Which issues were important for you concerning orthodontic treatment							
	(a) Straightening your teeth	51	91.8	14.8	49	95.9	8.6
	(b) Improving your facial appearance	48	72.9	30.0	49	77.8	28.6
	(c) Improving your chewing function, "making it easier to eat	47	69.4	31.7	48	72.7	31.0
	(d) Improving your speech quality, "making it easier to speak"	44	54.3	34.9	46	59.6	34.5
	(e) Improving your smile	49	88.4	18.9	49	95.1	8.9
	(f) Increasing your self-confidence	47	77.4	28.5	49	88.2	21.9
	(g) Getting braces because classmates/friends have them.	47	21.9	21.3	46	16.7	13.5
Q6: How important is orthodontic treatment in your overall health?		50	79.8	20.7	49	89.4	14.1
Q7: Did friends/classmates react negatively or tease you during treatment?		49	21.8	21.9	46	21.1	20.7
Q8: Did you use oral hygiene aids other than a toothbrush during treatment?		50	80.2	23.6	49	75.3	25.1
Q9: Did you use a fluoridated mouth rinse during treatment?		49	58.2	35.3	49	50.6	34.7
Q10: Which issues were difficult for you during Orthodontic treatment?							
	(a) Long treatment time	50	40.2	26.6	49	39.6	25.8
	(b) Pain	50	43.2	24.1	48	46.9	25.8
	(c) Difficulty in speaking	50	31.2	27.1	48	27.1	20.9
	(d) Difficulty in eating	50	45.8	22.6	48	42.5	26.3
	(e) Appearance of braces and/or other appliances in mouth	50	35.6	28.0	48	29.4	23.7
	(f) Problems with the Doctor	50	17.0	8.6	48	16.2	5.3
	(g) Long time spent waiting for Doctor on Day of Appointment	50	17.6	16.4	48	13.8	9.4
	(h) Making appointments at reception desk	50	13.6	9.4	48	15.0	15.4
	(i) Reaching someone when calling our office	49	14.3	11.7	49	15.9	16.2
Q11: Did you have pain in your jaw joints during or after treatment?		47	35.7	29.9	43	25.1	20.9
Q12: Did you have spots on your teeth after braces were removed?		47	30.4	28.8	43	19.1	20.7
Q13: Do you think that one can get satisfactory information about orthodontic treatment through the media?		50	54.4	32.0	46	47.8	26.9
Q14: How do you thing the public should be informed about orthodontic treatment?							
	(a) General dentists should inform more	51	75.1	22.7	47	74.5	23.3
	(b) Radio and television programs/commercials	50	50.8	30.6	49	40.2	29.5
	(c) Internet sites	51	56.9	27.9	49	55.9	29.2
	(d) University dental clinical programs/public seminars	49	64.9	25.8	48	63.7	27.3
Q18: Do you feel treatment has improved your chewing function?		45	69.3	27.8	45	83.3	19.9
Q19: Do you feel treatment has improved your speech quality?		44	60.5	27.9	40	66.8	29.7
Q21: Would you choose to go through the same treatment?		51	52.7	43.1	49	52.9	44.3

Table 3: Patients and parents/guardians' satisfaction with orthodontic treatment.

Item	Patient			Parent/Guardian		
	N	Mean	SD	N	Mean	SD
Q15: How satisfied are you with the arrangement of your teeth?	51	91.5	13.4	49	95.9	7.3
Q16: How satisfied are you with your final facial appearance?	51	82.2	30.4	49	95.7	8.7
Q17: How satisfied are you with your smile?	50	91.0	13.6	49	95.5	8.7
Q20: How satisfied are you with the overall results of treatment?	51	92.7	11.5	49	96.1	7.3

FIGURES:

Figure 1: Responses to patient and parental satisfaction with the orthodontist*



∗ Chi-square test, $\chi^2 = 0.002$; P=0.961.

Figure 2: Mean responses of patients and parents/guardians to questions 22-24