

Factors Affecting Satisfaction with Orthodontic Treatment Process at Obafemi Awolowo University Teaching Hospital Complex (OAUTHC), Ile-Ife

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ABSTRACT

Objectives: This study aims to determine the factors contributing to patient satisfaction with orthodontic treatment at Obafemi Awolowo University Teaching Hospital Complex. The specific objectives were to identify factors improving and negatively impacting patient satisfaction, and determine the level of patient satisfaction.

Methods: A cross-sectional study design was employed, which involved patients attending the orthodontic clinic at Obafemi Awolowo University Teaching Hospital Complex. A self-administered questionnaire assessed patient demographics, satisfaction levels, and factors influencing satisfaction. Data analysis was performed using descriptive statistics, chi-square tests, and mean scores.

Results: Of the 67 respondents, 91% reported satisfaction with their orthodontic treatment. The doctor-patient relationship received the highest mean satisfaction score, while psycho-social improvement received the lowest. Dissatisfied patients were predominantly females in the 21-30

age group. Factors such as dento-facial and dental function improvements significantly affected satisfaction levels.

Conclusion: The majority of orthodontic patients at Obafemi Awolowo University Teaching Hospital Complex reported satisfaction with their treatment. Improving patient communication, managing expectations, and addressing dento-facial and dental function improvements can enhance satisfaction levels. Strengthening the doctor-patient relationship and optimizing clinic experiences can improve patient satisfaction.

INTRODUCTION

Patient satisfaction is a complex concept that is influenced by many variables and is challenging to quantify and define. Simply asking patients if they will be willing to have the treatment again is not an accurate measure of satisfaction. According to the definition of patient satisfaction, it is "a person's positive feeling of pleasure or disappointment resulting from comparing a product or service perceived performance or outcome concerning his or her expectations" ¹. This demonstrates that patients' expectations are among the most crucial elements that influence how the results of the therapy received would be interpreted. It is more likely that a patient would not be content if the results don't measure up to his/her expectations. ^{2,3} However, the majority of the time, patients' expectations are not realistic, therefore addressing this adequately can help to offer patients a more realistic perspective of what to expect. However, it is not always possible for the doctor to address the patient's expectations because a variety of factors that the doctor might not be able to foresee can influence the course of treatment and therefore the result.

Patients' satisfaction has recently received increased emphasis as a gauge of therapy success. This is a departure from the traditional authoritarian approach, in which

the doctor was assumed to know what was best for the patient and how to get healthy.⁴ It is crucial to understand the distinction between satisfaction with the treatment process and satisfaction with the outcome when measuring treatment satisfaction.³ Depending on the type of treatment, patients may be satisfied with the result if it meets their expectations, but if the procedure is unpleasant, inconvenient, or carried out in an unkind way, the patient will not be satisfied with the treatment process.³ Even a treatment that yields an unsatisfactory result but is administered in a kind and sympathetic way might make the treatment process satisfying.³ This demonstrates how the course of treatment and its results are two distinct but complementary aspects of treatment.³ Therefore, both satisfaction with the treatment outcome and with the treatment process should be considered when using methods to measure patient satisfaction.

The benefits of measuring patient satisfaction extend beyond individual experiences to impact overall healthcare quality.⁵ Trust-building, enduring relationships, and customer loyalty are fostered by high patient satisfaction levels, influencing return visits and recommendations. Given that orthodontics treatment helps correct malocclusions and improve aesthetics, it is vital that patients are satisfied with their treatment and that their expectations are met, hence, this study will focus on satisfaction among orthodontic patients. Patient compliance which is essential for treatment success, is intricately linked to satisfaction, influencing treatment duration and associated costs.⁶

Within a clinic setting, studies confirm a direct link between longer wait times and decreased patient satisfaction. Research in Nepal demonstrates that communication and convenience significantly affect overall satisfaction, emphasizing the need for targeted strategies to enhance patient experiences.⁵

Previous studies on satisfaction with dental care underscore the importance of various factors, including accessibility, clinic conditions, and the cost of services.^{5,9} Patient dissatisfaction with dental care costs reveals a noteworthy aspect influencing overall satisfaction. Similarly, a study carried out in Lagos, Nigeria, emphasized the role of

comfort, cleanliness, and cost in determining patient satisfaction.⁹ Orthodontic studies demonstrate several factors affecting patient satisfaction. Some of these factors are dental anxiety, fear levels, and the quality of patient-dentist interactions.^{10,11} Other research identifies factors such as age, communication, staff professionalism, physical environment, appointment schedules, and treatment impacts.¹²⁻¹⁶

Orthodontists depend on patients' cooperation for successful treatment. If patients are not satisfied with the treatment process, they might not follow the instructions required for a smooth treatment, and this can lead to increased treatment duration and extra cost.⁶ Therefore, knowing what influences patient satisfaction helps orthodontists improve patient cooperation, reducing treatment time, cutting cost, and making the overall patient experience better.

This study aims to determine the factors contributing to patient satisfaction with orthodontic treatment at Obafemi Awolowo University Teaching Hospital Complex, (OAUTHC). The specific objectives are to identify factors improving and negatively impacting patient satisfaction, and determine the level of patient satisfaction.

METHODS

This is a cross-sectional study. The study was conducted among patients attending the orthodontic clinic of Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife, Nigeria. Ethical approval for the study was sought from and obtained from the Institute of Public Health, Obafemi Awolowo University, Ile-Ife.

A self-administered questionnaire was used for this study, and it was conducted among orthodontic patients of Obafemi Awolowo University Teaching Hospital Complex. The questionnaire was made up of two sections, sections A and B. Section A of the questionnaire assessed the biodata of the patients, including their age, sex, ethnicity, marital status, level of education, and occupation.

Section B of the questionnaire was used to determine the level the satisfaction and factors affecting it, section B contains the same instrument used by Bos et al.¹⁷ It

contained 58 items to measure satisfaction, which assessed 6 subcategories. The first subcategory was the doctor-patient relationship and it contained 11 items, and the second was patients' satisfaction with the situational aspects of the clinic and it contained 15 items. Satisfaction with dento-facial improvement was the third subcategory with 9 items, and the fourth subcategory was the psycho-social improvement and was assessed with 9 items. The patient perception of improvement in dental function was the fifth subcategory, with 4 items. The sixth subcategory contained 10 items that formed a residual subcategory. The questions in each subcategory are included in Appendix 1. This questionnaire has been used in several studies to measure satisfaction among orthodontic patients and its validity tested in regions such as the Netherlands, Canada, Saudi Arabia, the United Kingdom, and Brazil¹⁷⁻²¹

Each item was answered on a Likert six-point scale with endpoints 1 (strongly disagree), 6 (strongly agree), and no neutral point. Some of the questions in the questionnaire were phrased negatively, and these questions were rescored so that a high score indicated a high level of satisfaction consistent with the scoring of the other questions. To determine the level of satisfaction with the result of the orthodontic treatment, a single statement was used to assess this, which was "I am satisfied with the results of my orthodontic treatment." Subjects who agreed with this statement were taken to be satisfied with their orthodontic treatment while those who disagreed were taken to be dissatisfied with their treatment.

Using the sample size formula for cross-sectional studies, the sample size for the study was calculated to be 67 as shown in the equation below. A standard normal deviate of 1.96 and a precision of 5% were used for the sample size calculation. The study population was selected using a convenience sampling method, so all consecutive patients who met the inclusion criteria during the period of data collection were included in the study, also former patients who had completed their treatment within 1 year of the study were contacted via telephone and email and recruited into the study. Data for this research was collected between October 2022 and April 2023. The

sample size of 67 was scientifically determined.²²

A total of 67 patients who completed their orthodontic therapy at the Orthodontic Clinic of the Obafemi Awolowo University Teaching Hospital Complex, Nigeria were recruited. Those recruited into the study were patients 12 years or older who had completed their orthodontic treatment using fixed or removable orthodontic appliances. However, those who had craniofacial anomalies such as cleft lip/palate or who had orthognathic surgery for their treatment were excluded from this study. The data were analyzed using the IBM SPSS software version 26. Descriptive statistics such as mean and standard deviation for continuous variables (such as age, and duration of treatment) and frequency and percentage for categorical variables (ethnicity, marital status, level of education, and sex) were determined. An inferential statistics, that is, the chi-square test, was used to compare the socio-demographic variables such as gender, age, and education levels with satisfaction. A 95% confidence interval and 5% level of significance was used. The reliability of the tool used in this study was measured using a Cronbach's alpha scale for the whole questionnaire and each of its subcategories.

RESULTS

Socio-demographic characteristics of respondents

A total of 67 questionnaires were completed, with respondents' ages ranging from 12-61 years old, with a mean age of 25.42 years (SD 7.56). Forty-nine subjects (73.1%) were female, whereas there were eighteen male respondents (26.9%). The male respondents had a mean age of 24.17 years (S.D. 7.00), while the female respondents had a mean age of 25.88 years (S.D. 7.78). Among the respondents, 83.6% had received tertiary education while the remaining 16.4% had secondary education as the highest level of education. (Table 1).

The internal consistency of the total scale and the subcategories using Cronbach's alpha scale are as follows, 0.93, 0.83, 0.65, 0.83, 0.86, 0.86, 0.61. (Table 2)

Table 1: Socio-demographics

Variable	Frequency	Percentage, %
Age Category		
11-20 years	17	25.4
21-30 years	38	56.7
31 years and above	12	17.9
Total	67	100.0
Sex		
Male	18	26.9
Female	49	73.1
Ethnicity		
Igbo	4	6.0
Yoruba	59	88.0
Others	4	6.0
Marital Status		
Single	47	70.1
Married	19	28.4
Widowed	1	1.5
Highest level of education		
Secondary	11	16.4
Tertiary	56	83.6

Table 2- Reliability test using Cronbach's Alpha

Items	Cronbach's Alpha Score
Total scale	0.93
Doctor-Patient relationship	0.83
Situational Aspect	0.65
Dento-facial Improvement	0.83
psycho-social Improvement	0.86
Dental function	0.86
Residual Categories	0.61

Table 3- Mean Satisfaction scores of male and female subjects for the six sub-scales

	Male		Female		Total	
	Mean	SD	Mean	SD	Mean	SD
Doctor-patient relationship	5.07	0.58	4.91	0.52	4.95	0.54
Situational aspect	4.47	0.49	4.51	0.49	4.50	0.49
Dento-facial improvement	4.94	0.73	4.79	0.69	4.82	0.70
Psycho-social Improvement	4.56	0.87	4.33	0.85	4.39	0.86
Dental Function	4.86	0.65	4.52	1.08	4.60	0.99
Residual Category	4.52	0.59	4.52	0.60	4.52	0.59

Table 4- Mean scores of dissatisfied subjects

Age in years	Sex	Doctor-patient relationship	Situational factors	Dento-facial improvement	Psycho-social improvement	Dental Function	Residual categories
28	F	4.91	4.00	3.67	2.67	1.00	4.60
30	F	3.82	3.60	2.56	2.00	2.00	2.60
24	F	4.91	4.53	4.22	4.78	4.25	4.80
22	F	4.18	4.00	4.56	3.89	4.00	4.20
28	F	4.00	3.93	2.56	2.33	3.00	3.00
24	F	5.27	4.60	4.67	4.44	4.50	4.40
Total		4.52	4.11	3.71	3.35	3.13	3.93

Table 5- Socio-demographic background of patients who were & were not satisfied with their orthodontic treatment.

Age Group	Satisfied	Not Satisfied	P value
12-19 years (Adolescents)	12	0	0.230
>19 years (Adults)	49	6	
Gender	Satisfied	Not Satisfied	P value
Males	118	0	0.120
Females	43	6	

* Statistically significant is P value < 0.05

Factors affecting satisfaction

Ninety-one percent of the subjects (61 subjects) were content with the outcomes of their treatment, while only 9 percent of subjects (6 subjects) were dissatisfied. Six of the 67 subjects who filled out the questionnaire expressed dissatisfaction with the outcome; all six were adults (aged ≥ 20 years) and females. Chi-square analysis, however, demonstrated that there is no statistically significant relationship between age or sex and satisfaction with the treatment's outcome. (Table 5)

Based on the results in Table 3, the doctor-patient relationship received the highest mean score, 4.95 (S.D. 0.54), and dento-facial improvement received the second-highest mean rating, 4.82 (S.D. 0.70). The level of satisfaction with these factors was, thus, the highest. Additionally, the factors with the lowest average scores were situational

aspect (mean: 4.50; SD: 0.49) and psycho-social improvement (mean: 4.39; SD: 0.86).A

The results in Table 4 show the mean scores of six respondents who were dissatisfied with the outcome of their orthodontic treatment. It shows that dental function and psychological improvement had the lowest mean scores below the midpoint of 3.5, with mean scores of 3.13 and 3.35, respectively. The results also show that, with mean scores of 4.52 and 4.11, respectively, the doctor-patient relationship and situation factors were rated as the most favorable among these respondents. Therefore, satisfaction with the doctor-patient relationship and situational factors were independent of patient satisfaction with the result of orthodontic treatment.

DISCUSSION

The study examined the level of satisfaction

with orthodontic treatment as well as 6 factors that affect patient satisfaction with the process of orthodontic treatment. A high level of patient satisfaction with treatment results was noted. Furthermore, all who were not satisfied with their treatment results were females greater than 20 years of age. The doctor-patient relationship and dento-facial improvement were the factors with the highest mean satisfaction scores.

In this research, the level of patients' satisfaction with their orthodontic treatment was 91%, this result is comparable to results from Oyapero et al¹⁶ who reported a satisfaction level of 81.9%. However, other studies show a wide variation in satisfaction levels ranging from as low as 34%²³ to as high as 95.4% by Birkeland et al.²² The level of patient satisfaction was highest in the dentist-patient relationship which is in harmony with several studies.^{12,16} The lowest mean score was recorded in the psychosocial improvement, and this trend is similar to that seen in the study by Bos et al.¹⁷ Respondents in the 11-20 age brackets had a higher mean score across all six sub-categories compared to the 21-30 age bracket, which is similar to that pattern noted by Oyapero et al and Bos et al.^{16,17} This might be attributed to the fact that respondents in the 21-30 age bracket are more likely to bear the cost of their treatment and, therefore, they are critical about the expected results.

In comparing male and female subjects in this study, it was found that the male subjects had higher mean scores across all sub-scales except the 'situation aspect' where the female subjects had a slightly higher mean score. It was also noted that all subjects who were not satisfied with the result of their orthodontic treatments were females. This result is similar to what was found by Bos et al who reported higher satisfaction levels among male respondents.¹⁷ On the other hand, Oyapero et al observed a higher level of satisfaction among female subjects.¹⁶ The trends noted in this study might be a result of the predominance of female subjects in this study. A study that has an equal amount of male and female subjects will, therefore, be required to properly determine the effect of gender on patient satisfaction. However, there was no significant association between the level of satisfaction and the

ethnicity and level of education. The mean satisfaction scores for dental functions, psychological improvements, and dento-facial improvements were lowest among patients who were not satisfied with their orthodontic treatment. This could be a result of high expectations by the patients that were not realized at the end of the treatment. Also, patients who do not experience noticeable improvements in their dento-facial function and dental functions, such as an improvement in chewing, will be less satisfied with the result of their treatment. Another factor that may affect a patient's satisfaction with the treatment's outcomes is how much they feel their psychological well-being has improved. However, it is important to note that patient satisfaction with the doctor-patient relationship remained high even among respondents who were not satisfied with their treatment results, this shows that satisfaction with the doctor-patient relationship can be maintained even if the satisfaction with the treatment outcome is low.

Based on the findings of this study, it is possible to infer that improvement in dental function, dento-facial, and psychological improvement are important factors in improving patients' satisfaction with the process of orthodontic treatment. Therefore, patients' expectations of improvements in their dental function, dento-facial appearance, and psychological well-being can be addressed by adequate doctor-patient communication before commencing treatment, as this is crucial to make sure that anticipated dento-facial improvements, psychosocial improvements, and improvements in oral functions are achievable by the orthodontic treatments. Emphasis should be placed on maintaining positive doctor-patient relationships since this will help patients feel more satisfied with the orthodontic treatment process, even if the treatment outcome is below their expectations. It is also evident that satisfaction with the doctor-patient relationship in Obafemi Awolowo University Teaching Hospital Complex orthodontic clinic is high, and this high level of satisfaction is seen even among patients who are not satisfied with their treatment outcome. This is a positive point that demonstrates the good effect that orthodontists in this facility have on their patients during the treatment process.

Since some of the respondents for the study were recalled, there is a possibility for recall biases due to the time lag between the end of their treatment and the start of the study, and this is a potential limitation of this study. Additionally, only six subcategories were assessed in this study, even though satisfaction is a complicated phenomenon that might entail several additional factors.

To further assess satisfaction, patients can be given questionnaires to assess their satisfaction with their orthodontic care when their treatment finishes, and, subsequently, periodically. Furthermore, the factors affecting patient satisfaction among orthodontic patients in Obafemi Awolowo University Teaching Hospital Complex can be better understood with additional variables defined through a qualitative study like it was done in a study conducted by Wong et al.¹²

CONCLUSION

According to this study's findings, the majority of orthodontic patients at the Obafemi Awolowo University Teaching Hospital Complex in Ile-Ife were satisfied with their care. Doctor-patient relationships received the highest satisfaction ratings, whereas psycho-social improvement received the lowest ratings. All those who were dissatisfied with their orthodontic treatment were between ages 21-30 years, and they were all females. Patients who were not satisfied with their treatment outcomes also showed low satisfaction for psycho-social improvements and dental function, however, they maintained a high level of satisfaction with the doctor-patient relationship. Therefore a good doctor-patient relationship improved patient satisfaction, whereas poor improvement in dental function and psycho-social factors reduced patient satisfaction.

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APPENDIX

Items on the Patient Satisfaction Questionnaire, Divided Over Six Subscales^a

Factor 1. Doctor-patient relationship

7. I personally liked the orthodontist(s) who treated me
8. Greater efforts should have been made to reduce the pain from braces (+)
9. The orthodontist(s) always checked their work carefully
18. The orthodontic care I received could have been better (+)
20. The orthodontist(s) was gentle when treating me
21. Before treatment began, my orthodontist(s) carefully explained what treatment would be like
25. I liked the orthodontist(s) who treated me
29. Questions I had about my treatment were answered promptly
31. The assistants were gentle when treating me
33. The orthodontic staff (assistants and office personnel) treated me with respect
38. The orthodontist(s) treated me with respect

Factor 2. Situational aspects

1. Orthodontic treatment was a good value for the money
2. My treatment took about as long as I

expected it would

- 3. I missed too much school for orthodontic appointments (+)
- 5. Even though some appointments were short, each was necessary for my treatment to be successful
- 11. Problems that arose during treatment were quickly taken care of
- 12. The treatment area was modern and up to date
- 14. The orthodontic treatment fees were too high (+)
- 15. The orthodontist's office was conveniently located
- 17. I was satisfied with the selection of days and times when I could be seen for orthodontic appointments
- 24. Plenty of time was spent with me during each appointment
- 27. I was rarely kept waiting for appointments
- 35. The waiting area was comfortable
- 37. The treatment area was clean and sanitary
- 41. I had to travel far to reach the orthodontic clinic (+)
- 42. The treatment took much too long (+)

Factor 3. Dentofacial improvement

- 19. Now that orthodontic treatment is complete, my teeth are straighter
- 32. Now that orthodontic treatment is complete, I have a better bite
- 34. Now that orthodontic treatment is complete, I think I have a more attractive face
- 45. I really thought that my appearance would improve better than it actually did
- 48. My appearance has changed exactly like I expected
- 50. My teeth fit very well since I have been treated

51. When I look in the mirror, I feel very satisfied about the way my appearance is improved since orthodontic treatment

56. After my orthodontic treatment, I feel really happy when I look in the mirror

58. I feel very happy because I look so much better since I have been treated

Factor 4. psycho-social improvement

4. I feel better about myself because of orthodontic treatment

10. I believe I will have better career opportunities because of my orthodontic treatment

16. I believe my school performance is better because of orthodontic treatment

22. I feel more outgoing because of orthodontic treatment

26. I feel more confident because of orthodontic treatment

30. I think I will be able to get a better job once out of school because of orthodontic treatment

36. I feel more popular because of orthodontic treatment

44. Even people who do not know me very well have made positive remarks about my appearance after I have been treated

54. When I meet people for the first time, they react much more positively to me since I have been treated

Factor 5. Dental function

43. Eating is more easy since I have been treated

47. Chewing is easier since I have been treated

53. I can bite food more easily since I have been treated

55. I would recommend orthodontic treatment to everyone who has difficulties chewing food

Factor 6. Residual category

6. My orthodontic treatment was inconvenient for me (+)

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- 13. I take better care of my teeth since having braces
- 23. I am satisfied with the results of my orthodontic treatment
- 28. If I had it to do over again, I would still want orthodontic treatment
- 39. My braces gave me a lot of discomfort (+)
- 40. It was difficult for me to wear my headgear or activator (or both) (+)
- 46. If I had to do it all over again, I would do it
- 49. I would recommend orthodontic treatment to others
- 52. I am dissatisfied with the treatment result (+)
- 57. Generally speaking, I have had bad experiences with orthodontic treatment (+)

^a Each item that is negatively correlated with the scale construct is rescored (+), so that a high item score is in agreement with the scale construct.