

An Assessment of Factors Motivating Patients to Seek Orthodontic Treatment in a South-Western Nigerian Teaching Hospital

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Abstract

Background: Motivation is a concept that describes the conscious or unconscious stimuli for the action toward a desired goal. The motivations for seeking an orthodontic treatment among the population are diverse. Identifying the underlying motivation for treatment is helpful in reducing dissatisfaction with orthodontic treatment outcome. **Aim:** This study aimed to assess motivating factors for seeking orthodontic treatment and to compare these factors between adolescents and adults attending a Nigerian teaching hospital. **Patients, Materials and Methods:** Self-administered questionnaires were distributed among 130 subjects (79 adolescents and 51 adults). The subjects were asked to assign a score to the motivating factors listed based on their relative importance using a 5-point Likert scale which ranged from 1 to 5, with 5 rated as very important and 1 rated as very unimportant. The choice of motivating factors was compared between the adolescents and adults and between sexes in each group. Data obtained were analyzed using IBM Statistical Package for Social Sciences (IBM SPSS) version 21.0. $P \leq 0.05$ was considered statistically significant. **Results:** Improvement in dental appearance was the main motivating factor for almost all subjects and there was no statistically significant difference between adolescents (60.8%) and adults (68.6%), $P = 0.591$. A significantly higher ($P < 0.001$) number of the adults, (35, 68.6%) chose improvement in facial aesthetics as a motivating factor for orthodontic treatment compared with 29 (44.6%) adolescents. The least motivating factors which were chosen by adolescents were improvement in chewing (9, 13.8%) and relief of temporomandibular joint symptoms (4, 6.2%). There was no statistically significant difference in the choice of motivating factors between female and male in both the adolescent and adult groups. **Conclusion:** Aesthetic concerns were the most important motivating factors in adolescents and adults seeking orthodontic treatment.

Keywords: Adolescents, adults, motivating factors, orthodontic treatment

INTRODUCTION

Motivation can be defined as a concept that describes the conscious or unconscious stimuli for the action toward the desired goal, i.e., goal-directed behavior.^[1] The motivations for seeking orthodontic treatment by patients are numerous: some motivational factors include improvement in dental aesthetics, facial appearance, correction of functional problems, and improvement in overall oral health.^[2] Several studies on motivation have shown that improvement in dental appearance is the prime motivating factor in both adolescent and adult orthodontic patients.^[3-6]

Pabari *et al.*^[3] observed in their study on motivation and psychological characteristics of adult orthodontic patients that a desire to straighten teeth and improve smile was the prime motivating factor followed by a desire to improve bite

and overall facial appearance. These findings corroborated the studies by McKiernan *et al.*^[4] and Daniels *et al.*^[5] in the United States of America, in which a desire to improve dental appearance was found to be the main motivating factor for orthodontic treatment among adults, followed by improvement in the overall facial appearance. A qualitative study carried out by Trulsson *et al.*^[7] on adolescents' decision to undergo

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orthodontic treatment with fixed appliances in Sweden showed that the major motivating factor for orthodontic treatment was to improve their dental aesthetics and their decision was mostly affected by external influence.^[7] Similarly, Hassan *et al.*^[8] also carried out a study on patient and parent motivation for orthodontic treatment and equally observed that improvement in dental aesthetics was the principal motivating factor for both adolescents and adults seeking orthodontic treatment. A similar study carried out by Utomi^[9] in adolescents and adults on the challenges and motivating factors of treatment among orthodontic patients in Nigeria equally reported that improving dental appearance was one of the most important motivating factors for orthodontic treatment.

The importance of exploring a patient's motivation at the initial consultation with the patient's list of treatment objectives has been emphasized in the literature.^[10] It has been suggested that an understanding of what the patients want, why they want it, and how they arrived at the decision to embark on treatment by the clinician should reduce the patient's dissatisfaction with orthodontic treatment outcome.^[11] Orthodontists must determine the patient's motivation for seeking treatment before the treatment begins. Taking this preliminary step increases the chances for a mutually satisfying result.

The aim of this study was to assess and compare the motivating factors for seeking orthodontic treatment between adolescents and adults attending the orthodontic clinic at a Nigerian teaching hospital.

PATIENTS, MATERIALS AND METHODS

This cross-sectional study was carried out at the Orthodontic Clinic of the Department of Child Dental Health at the Lagos University Teaching Hospital (LUTH), Lagos, Nigeria. Ethical clearance was first obtained from the LUTH Health Research and Ethics Committee (ADM/DCST/HREC/2205) before commencing the study.

All consenting consecutive new subjects who presented for orthodontic treatment at the Orthodontic Unit of LUTH and who met the inclusion criteria were recruited for the study. They included subjects with no previous history of orthodontic treatment. Subjects with cleft lip and palate and or other craniofacial anomalies and those with psychological disorders who may have found it challenging to fill out the questionnaire were excluded from the study. There were two groups comprising adolescents aged 10–19 years and adults who were above 19 years of age.^[12] The sample size estimation was determined by utilizing the formula for calculating sample size for comparative research studies.^[13]

$$N = \frac{2(\sigma)^2 [Z \frac{\alpha}{2} + Z_{1-\beta}]^2}{\delta^2}$$

where

N – Is the required sample size for each group.

$Z_{\alpha/2}$ and $Z_{1-\beta}$ – the values of the standardized normal deviate corresponding to a specified confidence and power levels, respectively.

- α = Type I error, β is the Type II error
- δ is the detectable difference between the two groups (adults and adolescents)
- σ is the assumed standard deviation for each group.

In the study, the level of confidence was specified at 95% and the power was fixed at 90% specifications for σ (7.24) and δ (4.61) was based on information from the available literature,^[11]

$$Z_{\alpha/2} = (1.96)$$

$$Z_{1-\beta} = 1.28$$

$$N = \frac{2(7.24)^2 [1.96 + 1.28]^2}{(4.61)^2} = 52$$

From the above calculation, the minimum sample size for each group was 52 and for the two groups, the combined size was 104. To compensate for attrition, the sample size was adjusted upward by 10%; thus, the final minimum sample size was 116. The sample size eventually used in the study was 130.

Interviewer-administered questionnaires from available literature^[4] were adopted to obtain information from the subjects. The questionnaire was designed to provide information on the motivating factors for seeking orthodontic treatment which included aesthetics: improvement in dental appearance and improvement in facial appearance; function: improvement in chewing and improvement in speech; and oral health: healthy attractive gums and relief of joint symptoms.

The subjects were asked to assign a score to the factors based on the relative importance of these factors using a 5-point Likert scale which ranged from 1 to 5, with 5 rated as very important and 1 rated as very unimportant. A combination of responses on motivation was categorized into “motivating” and “nonmotivating” factors: A = nonmotivating factors (1 + 2) where 1 is “very unimportant” and 2 is “unimportant,” B = indifferent,^[3] and C = motivating factors (4 + 5), where 4 is “important” and 5 is “very important.”

Data obtained were fed into a passworded computer and the IBM Statistical Package for the Social Sciences (IBM SPSS) version 21.0 (IBM Corp., Armonk, NY, USA) was used for analysis. Frequency distribution tables were generated for qualitative variables. The number of subjects in each group who picked the various scores was computed and the mean scores were obtained. Pearson's Chi-square statistics test was used to compare the prevalence of motivational factors for treatment between adults and adolescents. The Student's *t*-test was used to compare the mean motivation scores in adolescents and adults. All tests of significance were two tailed and $P = 0.05$ or less were considered statistically significant.

RESULTS

There were 33 males and 46 females in the adolescent group, while the adult group comprised 12 males and 39 females. The

mean age of adolescents and adults was 13.91 ± 2.98 years and 26.33 ± 5.12 years, respectively [Table 1].

Table 2 shows the pattern of responses chosen by the adolescents who filled the questionnaire on motivation. Majority of the subjects (48, 60.8%) chose improvement in dental appearance as the most important motivating factor for presenting for orthodontic treatment (mean = 4.53 ± 0.71). Thirty-four percent of adolescents chose having healthy attractive gums as a very important motivating factor for orthodontic treatment (mean: 4.00 ± 1.16). The mean scores for the choice of improvement in facial appearance and improvement in chewing as motivating factors for orthodontic treatment were 3.24 ± 1.39 and 3.11 ± 1.30 , respectively. Improvement in speech and relief of temporomandibular joint (TMJ) symptoms were the least motivating factors chosen by the adolescents for orthodontic treatment (mean scores: 3.08 ± 1.34 and 2.30 ± 1.29 , respectively).

Table 3 shows the choice of motivating factors among adults seeking orthodontic treatment. Majority of the adults (35, 68.6%)

chose improvement in dental appearance as a very important motivating factor (mean score: 4.63 ± 0.69). The choice for healthy attractive gums (mean score = 4.04 ± 1.08) and improvement of facial aesthetics (mean = 3.96 ± 1.17) were the next important motivating factors chosen by adults for seeking orthodontic treatment. The mean scores for the adults who chose improvement in speech and improvement in chewing as motivating factors for orthodontic treatment were 3.67 ± 1.23 and 3.53 ± 1.22 , respectively. The least popular choice of motivating factors for orthodontic treatment among adults was relief of TMJ symptoms, with a mean score of 2.88 ± 1.47 .

Table 4 shows a comparison of motivating factors between the adolescents and adults. Both adolescents (76, 96.2%) and adults (50, 90.8%), respectively, showed that improvement in dental appearance was the most important motivating factor for orthodontic treatment; however, there was no statistical significance between both groups ($P = 0.591$).

About two-third of the adults (35, 68.6%) chose improvement in facial aesthetics as an important motivating factor for orthodontic treatment, while almost half the number of adolescents (38, 48.1%) regarded this factor as very important. The difference between the two groups was statistically significant ($P < 0.001$). Improvement in chewing and speech was more important as motivating factors for treatment in adults than in the adolescents. About half of the adults (27, 52.9%) and only 37 (46.8%) of adolescents were motivated by chewing and there was a statistically significant difference between both groups ($P = 0.005$). About 59% of adults chose improvement in speech as an important motivating factor, while 41.8% of adolescents made the same choice. The majority of both adolescents (75.9%) and adults (74.5%) regarded healthy nice looking gums as important motivating factors for orthodontic treatment.

Table 5 shows the mean scores for the source of motivational factors for seeking orthodontic treatment in female and male in both the adolescent and adult groups. There was no statistically significant difference in the source of motivational factors between males and females in both groups.

Table 6 shows the source of motivation for subjects to seek orthodontic treatment. A significantly higher number of adults (40, 74.4%) always wanted to have orthodontic treatment than adolescents (33, 41.8%), $P < 0.001$. Majority (52, 65.8%) of the adolescents were encouraged to seek orthodontic treatment

Table 1: Sociodemographic characteristics of the subjects in the study population

Variable	Categories, frequency (%)		Total (n=130), frequency (%)
	Adolescents (n=79)	Adults (n=51)	
Gender			
Male	33 (41.8)	12 (23.5)	45 (34.6)
Female	46 (58.2)	39 (76.5)	85 (65.4)
Age group (years)			
10-13	40 (50.6)	0	40 (30.8)
14-17	25 (31.6)	0	25 (19.2)
18-30	14 (17.7)	41 (80.4)	55 (42.3)
31-42	0	10 (15.4)	10 (7.7)
Mean age	13.91 ± 2.98	26.33 ± 5.12	
Marital status			
Single	77 (97.5)	47 (92.2)	124 (95.4)
Married	2 (2.5)	4 (7.8)	6 (4.6)
Level of education			
Primary school	6 (7.6)	0	6 (4.6)
Secondary school	59 (74.7)	4 (7.8)	63 (48.5)
University	13 (16.5)	32 (62.7)	45 (34.6)
Postgraduate	1 (1.3)	15 (29.4)	16 (12.3)
Total	79 (100)	51 (100)	130 (100)

Table 2: Motivating factors for seeking orthodontic treatment in the adolescent population

Variables (n=65)	Frequency (%)					Mean score \pm SD
	1	2	3	4	5	
Improvement in dental appearance	1 (1.3)	1 (1.3)	1 (1.3)	28 (35.4)	48 (60.8)	4.53 ± 0.713
Improvement in facial appearance	7 (8.9)	26 (32.9)	8 (10.1)	17 (21.5)	21 (26.6)	3.24 ± 1.389
Improvement in chewing	8 (10.1)	23 (29.1)	11 (13.9)	26 (32.9)	11 (13.9)	3.11 ± 1.261
Improvement in speech	10 (12.7)	22 (27.8)	14 (17.7)	18 (22.8)	15 (19.0)	3.08 ± 1.338
Healthy attractive gums	4 (5.1)	7 (8.9)	8 (10.1)	26 (39.8)	34 (43.0)	4.00 ± 1.166
Relief of joint symptoms	25 (31.6)	28 (35.4)	11 (13.9)	7 (8.9)	8 (10.1)	2.30 ± 1.285

SD: Standard deviation

Table 3: Motivating factors for seeking orthodontic treatment in the adult population

Variables (n=65) Motivating factors	Frequency (%)					Mean score±SD
	1	2	3	4	5	
Improvement in dental appearance	1 (2.0)	0	0	15 (29.4)	35 (68.6)	4.63±0.692
Improvement in facial appearance	3 (5.9)	2 (3.9)	11 (21.6)	13 (25.5)	22 (43.1)	3.96±1.166
Improvement in chewing	5 (9.8)	3 (5.9)	16 (31.4)	14 (27.5)	13 (25.5)	3.53±1.222
Improvement in speech	4 (7.8)	4 (7.8)	13 (25.5)	14 (27.5)	16 (31.4)	3.67±1.227
Healthy attractive gums	3 (5.9)	0	10 (19.6)	17 (33.3)	21 (41.2)	4.04±1.076
Relief of joint symptoms	14 (27.5)	6 (11.8)	12 (23.5)	10 (19.6)	9 (17.6)	2.88±1.465

SD: Standard deviation

Table 4: Comparison of motivating factors in adolescents and adults in the study population

Motivating factors	Adolescents (n=79), frequency (%)			Adults (n=51), frequency (%)			χ ²	P
	Unimportant	Indifferent	Important	Unimportant	Indifferent	Important		
	A=(1+2)	B=(3)	C=(4+5)	A=(1+2)	B=(3)	C=(4+5)		
Improvement in dental appearance	2 (2.5)	1 (1.3)	76 (96.2)	1 (2.0)	0	50 (90.8)	1.052	0.591
Improvement in facial appearance	33 (41.8)	8 (10.1)	38 (48.1)	5 (9.8)	11 (21.6)	35 (68.6)	15.94	<0.001*
Improvement in chewing	31 (39.2)	11 (13.9)	37 (46.8)	8 (15.7)	16 (31.4)	27 (52.9)	10.51	0.005*
Improvement in speech	32 (40.5)	14 (17.7)	33 (41.8)	8 (15.7)	13 (25.5)	30 (58.8)	8.97	0.011
Healthy attractive gums	11 (13.9)	8 (10.1)	60 (75.9)	3 (5.9)	10 (19.6)	38 (74.5)	3.88	0.144
Relief joint symptoms (TMJ)	53 (67.1)	11 (13.9)	15 (19.0)	20 (39.2)	12 (23.5)	19 (37.3)	9.86	0.007

Test of statistics used - Chi-square test. *P value significant at ≤0.05. TMJ: Temporomandibular joint

Table 5: Comparing mean motivation scores of males and females in adolescent and adult groups

Sex of respondents	Adolescents			Adults		
	n	Mean±SD	P	n	Mean±SD	P
Improvement in the way teeth looks						
Male	33	4.55±0.506	0.885	12	4.67±0.492	0.825
Female	46	4.52±0.836		39	4.62±0.747	
Improvement in how my face looks						
Male	33	3.12±1.474	0.521	12	4.08±0.996	0.681
Female	46	3.33±1.334		39	3.92±1.222	
Improvement in chewing						
Male	33	3.03±1.237	0.621	12	3.75±1.288	0.480
Female	46	3.17±1.288		39	3.46±1.211	
Improvement in speech						
Male	33	3.15±1.278	0.673	16	3.83±1.030	0.596
Female	46	3.02±1.390		39	3.62±1.290	
Healthy nice looking gums						
Male	33	4.00±1.250	1.000	12	4.42±0.515	0.167
Female	46	4.00±1.116		39	3.92±1.178	
Relief of joint symptoms (TMJ)						
Male	33	2.39±1.273	0.601	12	2.67±1.371	0.565
Female	46	2.24±1.303		39	2.95±1.503	

TMJ: Temporomandibular joint, SD: Standard deviation

by their family members, while only 17 (33.3%) adults were encouraged by family to seek treatment. The difference between both groups was statistically significant ($P < 0.001$).

DISCUSSION

A successful orthodontic treatment outcome depends inter alia, on the availability of a sustainable motivating factor that

drives the patient to continue their orthodontic treatment to completion.

This study revealed that there was no statistically significant difference between males and females in the source of different factors (improvement dental appearance, facial appearance, chewing, healthy attractive gums, and TMJ symptoms) motivating them for orthodontic treatment and this was

Table 6: Sources of motivation for seeking orthodontic treatment

Variable (n=65)	Frequency (%)		Total	χ^2	P
	Adolescents	Adults			
Always wanted treatment	33 (41.8)	40 (74.4)	73 (56.1)	16.92	<0.001
Referred by dentist	26 (32.3)	12 (23.5)	38 (29.2)	1.32	0.251
Impressed by treatment outcome	10 (12.6)	12 (23.5)	22 (16.9)	0.219	2.605
Encouraged by family	52 (65.8)	17 (33.3)	69 (53.1)	13.14	<0.001
Desire to wear the appliance	14 (19.7)	9 (17.6)	23 (17.7)	1.32	0.991

contrary to the study by Mahajan^[14] who evaluated different motivational factors for seeking orthodontic treatment. They observed that females demonstrated more concern for appearance than males. Mahajan^[15] also reported in her study that females gave more importance to aesthetics than males as regards orthodontic treatment. Although more females sought orthodontic treatment than males in the present study, the reason for the nonobservable gender difference in the choice of different motivating factors is not well understood. However, it may be alluded that the males who sought orthodontic treatment in the present study were sufficiently as concerned as their female counterparts in both social and functional issues that motivated them for seeking orthodontic treatment.

The concern for dental appearance was the prevailing motivating factor, for both adolescent and adult groups in the present study. This observation is in agreement with most studies on the reasons why orthodontic patients seek treatment^[3,5,6] Pabari *et al.*,^[3] in their study, reported that adults regarded improvement in aesthetic appearance as a prime motivating factor for orthodontic treatment. In the study by Wedrychowska-Szulc and Stryńska,^[6] a large percentage of the parents were dissatisfied with the dental appearance of their children; hence, it was regarded as an important motivating factor for orthodontic treatment. A study in Nigeria by Utomi^[9] equally reported that one of the most important motivating factors for continuing orthodontic treatment was anticipated improvement in dental appearance.

The present study showed that there was a significant difference between adolescent and adult groups on the concerns for facial appearance as a motivating factor for seeking orthodontic treatment. While majority of the adolescent group did not attach much importance to this factor, many of the young adults considered facial appearance concerns as very important in their decisions for seeking treatment. The reason for this difference could be because adults are more concerned about their facial appearance because of their level of maturity and their social interactions, unlike adolescents who at this stage are more influenced by parental decisions and peer pressure.^[16]

Asad *et al.*,^[17] in their study on adult motivation among Pakistanis, observed that the dentofacial appearance was important in the overall attractiveness of individuals and was therefore a major motivating factor for seeking orthodontic treatment. The reasons for this observation agree with what has been extensively observed about young adults who are said

to be more conscious and concerned about their looks at this stage of their life than children and adolescents.^[5]

The present study showed that adolescents and adults regarded improvement in dental aesthetics as more important than function (chewing and speech) and relief of TMJ symptoms as motivating factors. However, there were a significantly ($P = 0.005, 0.007$) higher number of adults when compared to adolescents who chose improvement in function and relief of TMJ symptoms as motivating factors for orthodontic treatment. This observation is similar to a study by de Souza *et al.*,^[18] on the expectations of orthodontic treatment in adults. They reported that difficulty in biting and chewing was the main motivating factor for undergoing orthodontic treatment in majority of their patients. Problems with mastication and TMJ dysfunctions are more prevalent in adults than adolescents; hence, it is not surprising that the adults in the present study considered these issues as important motivating factors more than adolescents.^[19,20]

There were significantly more number of adults who sought orthodontic treatment out of their own volition than adolescents, $P < 0.001$. The reason for this occurrence could be that more adults are independent in decision-making and are empowered to pay for their treatment compared to adolescents. This observation corroborates the findings of Mckiernan *et al.*^[4] in their study where they reported that 47.4% of their study sample aged 18 years and above sought treatment on their own and therefore implied that a high percentage of adults seeking orthodontic treatment were self-motivated. Similarly, Pabari *et al.*^[3] reported that approximately half of the adults in their study admitted that it was initially their decision to seek orthodontic treatment. Khan *et al.*^[21] also reported that approximately half of the adults in their study had a desire for orthodontic treatment and Singh^[22] in his study reported that majority of the adults made their own decision to attend a consultation. Although there are no comparable Nigerian studies, Ernest *et al.*^[16] in a closely related study found out that two-third of the parents were sufficiently motivated to bring their children for orthodontic treatment out of their own volition.

The present study revealed that significantly more adolescents than adults were encouraged by families to seek orthodontic treatment. This is similar to a study by Story *et al.*,^[23] who also observed that the increased number of children's visit for orthodontic treatment was based on a parental decision.

In addition, Trullsson *et al.*^[7] reported that adolescents were greatly motivated by external influences such as professionals, media, and peer groups in their decision to undergo orthodontic treatment. In the study by Hackett *et al.*,^[24] the adolescent motivation for orthodontic treatment showed great dependence on family and friends in their decision-making. Ernest *et al.*^[16] in Nigeria also reported that the motivation of children for orthodontic treatment depended greatly on parental influence, especially that of the mother. It is therefore imperative that the internal and external factors motivating patients to seek treatment to be sustained for a successful treatment outcome.

CONCLUSION

The present study revealed that concern for aesthetics was the primary motivating factor for orthodontic treatment for all age groups. More adults than adolescents chose improvement of function and relief of TMJ symptoms as important motivating factors for orthodontic treatment. There was no gender difference in the choice of motivating factors for seeking orthodontic treatment. Adults were significantly self-motivated, while adolescents are motivated by their family members to undergo orthodontic treatment. The recognition of relevant factors motivating a patient to seek orthodontic treatment is important to enable orthodontists to plan a realistic treatment protocol that will foster compliance with instructions, meet the expectations of the patients, and reduce dropout rates.

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Conflicts of interest

There are no conflicts of interest.

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