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Original Research

Socio-economic Characteristics of Orthodontic Patients in Lagos, Nigeria: A Cross-sectional Study

Sylvia Simon Etim[1], Onyinye Dorothy Umeh[2]

Department of Orthodontics and Paediatric Dentistry, Faculty of Dentistry, College of Health Sciences, University of Port Harcourt, Port Harcourt, Rivers State. Nigeria

Abstract

Background: Orthodontic treatment for malocclusion is one of the costly dental treatments globally, leading to the general belief that it is mostly accessible to individuals in the high socioeconomic category (SEC) in Nigeria. This study aims to assess the socio-economic characteristics of Nigerian orthodontic patients.

Methodology: This was a descriptive cross-sectional study, conducted in Lagos State, Nigeria, from March to August2025. The study sites were Lagos University Teaching Hospital and Hilton Dental Services, a major private orthodontic clinic in Lagos. Data was collected using a 15-item structured interviewer questionnaire, analyzed with SPSS version 26 statistical software using descriptive (frequency and percentage) and inferential (Fisher's exact test) statistics. The level of significance was set at $p < 0.05$.

Result: A total of 309 respondents participated; 220 females and 89 males, with a mean age of 24.8 ± 10 years. Most, 217 (70.2%), were at the tertiary education level. The majority (197, 63.8%) fell into the high SE category, and rented apartments were the most common type of housing. Respondents from the high SEC agreed that SE status serves as a barrier to accessing orthodontic treatment. However, it was not a factor in choosing the treatment facility. Out-of-pocket payment was the most common method used for paying for orthodontic treatment.

Conclusion: Socioeconomic status has a significant impact on access to orthodontic treatment, and most orthodontic patients belong to the higher socioeconomic category. Recommendation is the main reason for choosing a treatment facility.

Keywords: Socioeconomic Status; Orthodontic treatment; Access; Barrier; Facility; Out-of-Pocket.

***Correspondence:** Dr Sylvia Etim. Department of Orthodontics and Paediatric Dentistry, Faculty of Dentistry, College of Health Sciences, University of Port Harcourt, Port Harcourt, Rivers State. Nigeria. **Email:** udypride@yahoo.ca

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Introduction

Malocclusion and dentofacial anomalies are prevalent worldwide, affecting many children and adolescents. Lombardo et al. estimated that over half of the global population has some form of malocclusion (about 56%), with the highest prevalence reported in Africa (around 81%).[1] Otuyemi et al. found that only about 9.2% of Nigerian adolescents have severe malocclusion requiring treatment. [2] However, access to orthodontic care remains limited: some reports indicate that Nigeria, with a population of over 160 million, has fewer than a hundred orthodontists, significantly restricting service availability. [3,4] In Lagos, Nigeria's largest city and tertiary healthcare center, orthodontic services are mainly provided by teaching hospitals yet demand far exceeds capacity. [3,5]

Orthodontic treatment is often sought primarily for cosmetic improvement. The desire for an improved smile and facial appearance is a major motivator for adolescents and their parents to pursue braces.[3] However, socio-economic factors can strongly influence who receives care. International and local studies have consistently shown that children from higher socio-economic backgrounds are much more likely to undergo orthodontic treatment (and general oral health care) than those from deprived backgrounds.[6–11]In Jordan, Badran *et al.* reported that adolescents in the lowest socio-economic class had dramatically lower treatment uptake (only 5%) and were over 25 times more likely not to receive treatment compared to wealthier peers.[6] Similarly, lower-income individuals tend to have greater normative and perceived need for treatment but exhibit less satisfaction with dental appearance and visit dentists infrequently.[6,7] Recent systematic reviews conclude that low socio-economic status is often linked to orthodontic treatment discontinuation and missed appointments, reflecting barriers in access, though overall conclusions were limited by study heterogeneity.[1,8,9,12]

In Nigeria, evidence indicates similar disparities. Adeyemi et al. found that most orthodontic patients at a Lagos teaching hospital came from higher social classes, suggesting that cost is a major barrier for poorer families.[13] In school surveys, private (higher SEC) students demonstrated better awareness of orthodontics and had more treatment aspirations than public-school (lower SEC) students.[3] Despite a high prevalence of malocclusion, many Nigerians cannot afford braces, and knowledge about orthodontics remains limited outside wealthier groups.[3,14] The gap between need and utilization highlights the importance of examining socioeconomic status among those who have access to care. This study, therefore, assessed the socio-economic characteristics of orthodontic patients in Lagos, Nigeria, to identify potential socioeconomic barriers or patterns in treatment uptake.

Materials and Methods:

The study used a descriptive cross-sectional design. It was conducted in Lagos, Lagos State, Nigeria, located in the South-West region, which is the country's most populous city. The research lasted six months, from March to August2025. The main study sites were Lagos University Teaching Hospital (LUTH) and Hilton Dental Services, a major private orthodontic clinic in Lagos. LUTH is a leading tertiary care hospital with specialized departments, including a well-established orthodontic unit**.** LUTH's Orthodontic Unit, founded decades ago, serves urban and peri-urban patients from Lagos and nearby states. The private clinic (a multi-specialty dental practice in Lagos) mostly serves urban residents who can afford private care. Patients were recruited from the Orthodontics unit of the Department of Child Dental Health at LUTH, as well as the orthodontic unit of a private clinic. The inclusion criteria were as follows:

Orthodontic patients who attended the LUTH orthodontic clinic and Hilton Dental Services clinic during the study window; Patients (or parents/guardians) who were capable of understanding and responding to the questionnaire and Patients who consented to participate in the study (and assented for minors).

Data was collected using a structured questionnaire and basic clinical examination. The questionnaire had two sections. Section Awas on demographics (age, sex), family socio-economic factors (education levels and type of residence). Section B, patients were asked about their perception and satisfaction with their treatment and factors influencing their decision (cost, referral source). Data was collected by two research assistants who were calibrated to ensure consistency. A pilot test of the questionnaire was conducted on a small group of patients to refine the wording, who were later excluded from the study. The collected data were entered into Microsoft Excel for initial cleaning and then analyzed using R (2022): A language and environment for statistical computing (R Foundation for Statistical Computing, Vienna, Austria). Computed data were analysed using descriptive statistics, with categorical variables summarized as frequencies and percentages, and numerical variables presented as means and standard deviations (for normally distributed data). Associations between socio-economic status and other factors were analyzed using Chi-square or Fisher's Exact test as appropriate. A significance level of $p < 0.05$ was used for all statistical tests.

Ethical Considerations

Ethical approval for this study was sought from the Health Research and Ethics Committee of the Lagos University Teaching Hospital to ensure the protection of participants' rights with reference number ADM/DSCST/HREC/APP/7611.

Results:

Demographics: A total of 309 participants took part in the study, including 220 females and 89 males, with a mean age of 24.8 ± 10.0 years. Most participants were single, accounting for 254 (82.2%), and the majority (217, 70.2%) were at the tertiary educational level. The largest group (131, 42.4%) was students, followed by full-time employed individuals (95, 30.7%), with the smallest group being those unemployed (10, 3.2%). Respondents lived in various housing types, with rented apartments being the most common (152.0, 49.2%), followed by owned apartments (133.0, 43.0%). Shared housing was reported by 17 (5.5%), and the least common was government-provided housing, at 7 (2.3%). (Table I)

Table 1: Demographic Characteristics of Orthodontic Patients

Characteristic	N = 309[1]
Age (years)	24.8 ± 10.0
Age Category	
≤17	93.0 (30.2%)
18-25	85.0 (27.6%)
26-35	86.0 (27.9%)
36-45	31.0 (10.1%)
>45	13.0 (4.2%)
Gender	
Female	220.0 (71.2%)
Male	89.0 (28.8%)
Marital Status	
Divorced	1.0 (0.3%)
Married	54.0 (17.5%)
Single	254.0 (82.2%)
Education Level	
Primary education	6.0 (1.9%)
Secondary education	86.0 (27.8%)
Tertiary education	217.0 (70.2%)

Employment Status	
Employed (Full-time)	95.0 (30.7%)
Employed (Part-time)	12.0 (3.9%)
Self employed	61.0 (19.7%)
Student	131.0 (42.4%)
Unemployed	10.0 (3.2%)
Type of Residence	
Government-provided housing	7.0 (2.3%)
Owned apartment	133.0 (43.0%)
Rented apartment	152.0 (49.2%)
Shared housing	17.0 (5.5%)

[1] **Mean ± SD; n (%)**

Socioeconomic Distribution

One hundred and ninety-seven (63.8%) of the respondents were found to be in the high socioeconomic category (SEC), followed by middle SEC, 102.0 (33.0%). Respondents with a monthly income of ₦250,000.00 and above were the most, 223.0, 72.2%, followed by those with below ₦50, 000 (64.0, 20.7%). (Table 2)

Table 2: Socioeconomic Distribution of Orthodontic Patients in Lagos

Variable	N = 309[1]
Socioeconomic Status Category	
Low SES	10.0 (3.2%)
Middle SES	102.0 (33.0%)
High SES	197.0 (63.8%)
Monthly Household Income	
₦50,000 - ₦100,000	22.0 (7.1%)
₦250,000 and above	223.0 (72.2%)
Below ₦50,000	64.0 (20.7%)
Education Level	
Primary education	6.0 (1.9%)
Secondary education	86.0 (27.8%)
Tertiary education	217.0 (70.2%)
Type of Residence	
Government-provided housing	7.0 (2.3%)
Owned apartment	**133.0 (43.0%)**
Rented apartment	152.0 (49.2%)
Shared housing	17.0 (5.5%)

[1] **n (%)**

Facility type used by patients: One hundred and two (69.9%) females attended a private clinic, and 118 (72.4%) females attended a public hospital, while 44.0 (30.1%) males attended a private clinic, and 45.0 (27.6%) attended a public hospital. Of the participants who were of high SEC, 107.0 (65.6%) attended a public hospital, while 90.0 (61.6%) attended a private clinic. For the middle SEC participants, 52.0 (31.9%) attended a public hospital, and 50.0 (34.2%) attended a private clinic. There was no statistically significant difference between the public hospital and private clinic attendees. (Table 3)

Table 3: Patient Characteristics by Facility Type

Characteristic	Overall N = 309[1]	Private Clinic N = 146[1]	Public Hospital N = 163[1]	p-value[2]
Age (years)	24.8 ± 10.0	25.5 ± 12.0	24.3 ± 7.9	0.7
Gender				0.6
Female	220.0 (71.2%)	102.0 (69.9%)	118.0 (72.4%)	
Male	89.0 (28.8%)	44.0 (30.1%)	45.0 (27.6%)	
Education Level				**0.013**
Primary education	6.0 (1.9%)	5.0 (3.4%)	1.0 (0.6%)	
Secondary education	86.0 (27.8%)	49.0 (33.6%)	37.0 (22.7%)	
Tertiary education	217.0 (70.2%)	92.0 (63.0%)	125.0 (76.7%)	
Socioeconomic Status				0.6
Low SES	10.0 (3.2%)	6.0 (4.1%)	4.0 (2.5%)	
Middle SES	102.0 (33.0%)	50.0 (34.2%)	52.0 (31.9%)	
High SES	197.0 (63.8%)	90.0 (61.6%)	107.0 (65.6%)	

[1] Mean ± SD; n (%)

[2] Wilcoxon rank sum test; Pearson's Chi-squared test; Fisher's exact test

Socioeconomic status and association with access factors: Most of the participants, 139.0 (70.6%), who visited for review monthly were of the high SEC, followed by (48.0, 47.1%) of the middle SEC participants, and least (4, 40.0%) of the low SEC. There was a statistically significant difference, p-value 0.001, among the three socioeconomic statuses of the patients as regards their visit frequency. Socioeconomic status was perceived as a barrier mostly (129, 65.5%) by the high SEC and followed by middle SEC participants, 53.0, 52.0%. (Table 4)

Table 4: Association between SES and Clinical/Access Factors

Variable	Overall N = 309[1]	Low SEC N = 10[1]	Middle SEC N = 102[1]	High SEC N = 197[1]	p-value[2]
Facility Type					0.6
Private Clinic	146.0 (47.2%)	6.0 (60.0%)	50.0 (49.0%)	90.0 (45.7%)	
Public Hospital	163.0 (52.8%)	4.0 (40.0%)	52.0 (51.0%)	107.0 (54.3%)	
Visit Frequency					**0.001**
Every 3 months	32.0 (10.4%)	1.0 (10.0%)	15.0 (14.7%)	16.0 (8.1%)	
Every 6 months	10.0 (3.2%)	1.0 (10.0%)	5.0 (4.9%)	4.0 (2.0%)	
Monthly	191.0 (61.8%)	4.0 (40.0%)	48.0 (47.1%)	139.0 (70.6%)	
Only when necessary	76.0 (24.6%)	4.0 (40.0%)	34.0 (33.3%)	38.0 (19.3%)	
Perceives SES as a Barrier					0.13
Yes	187.0 (60.5%)	5.0 (50.0%)	53.0 (52.0%)	129.0 (65.5%)	
No	37.0 (12.0%)	2.0 (20.0%)	16.0 (15.7%)	19.0 (9.6%)	
Not sure	85.0 (27.5%)	3.0 (30.0%)	33.0 (32.4%)	49.0 (24.9%)	

[1] n (%)

[2] Fisher's exact test

Reasons for choosing an Orthodontic facility: It was found that the reason for choosing a public hospital or private clinic was mostly recommendation by 157, 50.8% of the participants, followed by quality of care provided by the facility by 144, 46.6%, cost of treatment by 113, 36.6% and proximity to where the participants live being the least reason by 79, 25.6%. (Fig 1)

Financial factors and Barriers: The middle SEC participants were found to have the most family support in their orthodontic treatment, followed by High SEC participants, 59.0 (29.9%). Government assistance was 1.0 (0.5%) among high SEC and low SEC, 1.0 (10.0%), and none were among middle SEC participants. Out-of-pocket payment was found most among the high SEC participants, 131.0 (66.5%), followed by middle SEC participants with 29.0(28.4%). There was a statistically significant difference among the socioeconomic classes of the participants, p-value < 0.001, as concerns their payment method. The high SEC participants said they were satisfied with the cost of treatment, as they also felt that socioeconomic status affects access to orthodontic treatment, 129.0 (65.5%), as 49.0 (24.9%) said they were not sure. Fifty-three (52.0%) of middle SEC participants felt socioeconomic status affected access to orthodontic treatment, followed by 33 (32.4%) participants, who were not sure whether SEC affects access to orthodontic treatment. There was no statistically significant difference, p = 0.13, as concerns the perception among participants from the three socioeconomic classes. Most, 192 (97.5%), attested that they would recommend orthodontic treatment, followed by the middle SEC participants with 99 (97.1%).

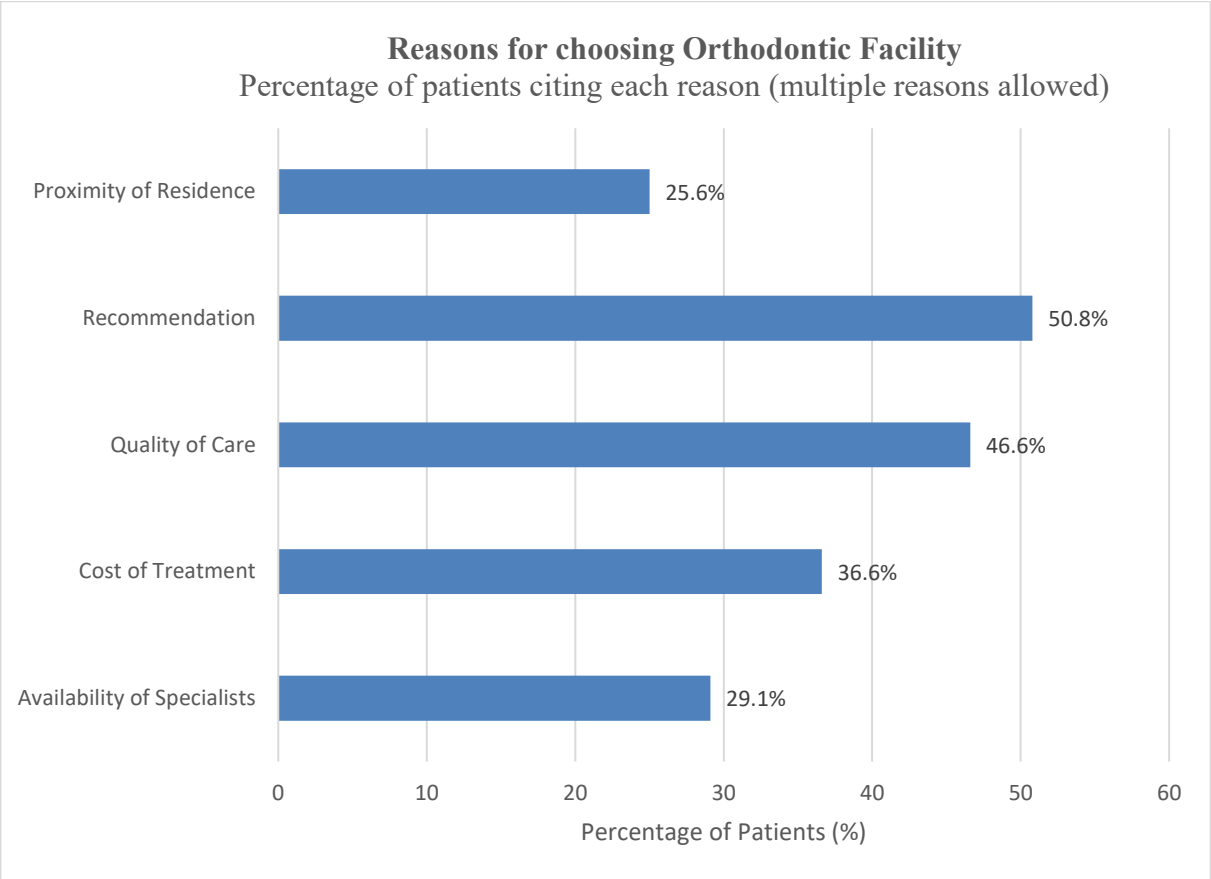

Fig 1: Reasons for choosing an orthodontic facility

Discussion:

Orthodontic treatment is considered expensive compared to other dental procedures. Though it is often performed on children, it has recently become more popular among different age groups. This is shown in this study by the wide age range of respondents. The majority of respondents studied were under 17 years old, followed by the 26–35 age group. This contrasts with a previous Indian study,[15] where most respondents were over 28 years old, aligning with the next group in our study. The high number of participants in the 26-35 years age range suggests increasing adoption of orthodontic treatments among young adults. This trend is also supported by an earlier study. [16] In this present survey, more females were seen to be undergoing orthodontic treatment. This was consistent with previous studies,[17, 18] for the reasons being that females show more dissatisfaction with their dental appearances, and similar to another study,[19]where girls were found to be more frequently treated than boys, and that of a previous study,[20]which reported that females were more likely to seek cosmetic care than their male counterparts. The current survey had most of the respondents having a tertiary education, which was consistent with findings by Chaturvedi et al.[15] This may be because individuals with higher educational levels can better convince their parents of the need to correct their malocclusions and can plan financially, often with their allowances, to cover treatment costs, which parents might support at a more convenient time for them. Though most respondents were students, this was followed by fully employed people, in contrast with a previous study [15] where self-employed individuals were the majority. The difference seen in this study could be because Nigerian youths are beauty-conscious, and comments of peers about their dentition will make them seek orthodontic treatment in the nearest possible time, which can be done. Since it is common knowledge that orthodontic treatment is costly, it is expected that people from higher socioeconomic backgrounds will be able to access the treatment. This was confirmed in this survey, as most respondents from both public hospitals and private clinics belonged to higher socioeconomic classes. This aligns with previous reports from international studies [6, 7,8] and Nigerian research [9, 10, 13] on

the high socioeconomic status of orthodontic patients. However, it is encouraging to find that the class of the orthodontic patient was not a factor in the choice of facility used, as they were seen to attend both public hospital and private clinic alike. This finding may be because a similar quality of orthodontic services can be obtained from either public or private facilities, which is an advantageous report for orthodontic services in Nigeria. Most respondents earned about ₦250,000 per month, still indicating they belong to the higher social class. This finding could be comparable to that by German et al [21] who found an association between annual income and orthodontic treatment, suggesting that children from families with low annual income were less likely to have orthodontic treatment than children of families with high income. Socioeconomic status can be measured by income, education, occupation, and location, which influence individual circumstances. [22]. The monthly income reported in this study, by most respondents, suggests they can afford quality housing. This matches a previous report by Aluko et al [23] that the monthly income of participants studied was an indicator of being able to afford good housing. Although most respondents had good incomes, they mostly lived in rented apartments, followed by those who owned their homes. It is expected that those from higher socioeconomic classes will find it easier to rent good houses or own one than people from lower socioeconomic classes in Nigeria due to the harsh economic environment. The main reason for choosing a facility for orthodontic treatment by the respondents was recommendation, followed by the quality of care received by previous patients. These two popular reasons will encourage a good relationship between the orthodontist and the patients and good clinical services, as this will make a patient who had a good experience during his or her treatment give a recommendation afterwards. There was no statistically significant difference across the three socioeconomic groups regarding the choice of treatment facilities, as the high socioeconomic respondents also attended both public and private clinics, due to recommendations. Many people tend to make enquiries from people wearing braces to know who and where to go for their orthodontic treatment. This finding corresponds to that of a previous study [24] where it was found that self-referrals and word of mouth are becoming more common ways of decision on where to go for orthodontic treatment. Furthermore, the finding is consistent with other studies where referrals from family dentists and general dentists were reported as a major influence on seeking orthodontic care. Though most respondents were of a high socioeconomic category, they saw economic status as a barrier to treatment, and this is comparable to reports from previous studies. [8,9,12,13] Out-of-pocket payments were the most common method for paying for orthodontic treatment, as revealed by this study. This is so because in Nigeria, there is no insurance cover for orthodontic treatment, and medical treatment is undertaken mainly from the pockets of individuals. The finding is in keeping with that of a previous study [27] where out-of-pocket payment was also the most common type of orthodontic payment, and findings from another study [28] where those who underwent orthodontic treatment were found to be those who can afford out-of-pocket expenses and who belonged to relatively high-income quintiles. Otherwise, cost was seen as a barrier to orthodontic treatment; respondents were satisfied with the cost of treatment and would recommend orthodontic treatment to people.

Conclusion:

Orthodontic treatment is being taken up more by females and tertiary-level individuals. Orthodontic patients are mostly those of the high socioeconomic class. Whereas the barrier in orthodontic treatment is cost, orthodontic patients attest to being satisfied with the cost and would recommend orthodontic treatment to people. Socioeconomic status of patients is not a factor in the choice of facility to get orthodontic care, as recommendation is the main reason for going to a particular facility for orthodontic treatment. It is recommended that an insurance cover for a certain percentage of the cost of orthodontic treatment should be implemented in Nigeria to allow more Nigerians to have access to orthodontic care.

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