WEST AFRICAN JOURNAL OF ORTHODONTICS

ISSN 2315-9502

VOLUME 13, NUMBER 1

JUNE 2024

Academic and emotional intelligence of orthodontic patients

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OFFICIAL PUBLICATION OF ORTHODONTIC ASSOCIATIONS IN THE WEST AFRICAN SUB-REGION

"DENTISTRY'S FIRST SPECIALTY JOURNAL IN SUB SAHARAN AFRICA"

Effects of Academic Performance and Emotional Intelligence on Oral Hygiene Status of Adolescent Orthodontic Patients

Adewuya AP[a], Otuyemi OD[a]

Abstract

Background: This study assessed the effects of academic performance and emotional intelligence on good oral health maintenance among adolescents undergoing orthodontic treatment at Obafemi Awolowo University Teaching Hospital Complex (OAUTHC), Ile-Ife, Nigeria.

Method: The study was conducted among 23 adolescent patients on fixed orthodontic appliance treatment in OAUTHC, Ile-Ife, Nigeria. Oral hygiene status was assessed objectively using the simplified Greene and Vermillion's Oral Hygiene Index. An adapted questionnaire on emotional intelligence by Haralur and associates was administered. The academic performance was based on patients' academic records in the last one year.

Results: The majority of the adolescent patients were in a very good (52.2%) grade. None of the patients reported with very fair, fair, and poor grades. Similarly, most of the patients were in high (43.2%) and average (39.1%) emotional intelligence categories. Only 17.4 per cent showed low emotional intelligence. About two-thirds (60.9%) of patients had fair oral hygiene status with oral hygiene scores ranging between 1.3 and 3.0. Only one patient had poor oral hygiene with a score of 3.1 to 6.0.

There was a significant association between academic performance and oral hygiene index scores (P= 0.032). However, no statistically significant relationship was observed between the emotional intelligence and the oral hygiene index scores of patients (p=0.162).

Conclusion: The study concluded that emotional intelligence had no significant effect on the oral hygiene status of orthodontic patients. However, the high academic performance of orthodontic patients was significantly related to better and favourable oral hygiene status.

Authors' affiliations
[a]Department of Child Dental Health, Faculty of Dentistry, Obafemi Awolowo University, Ile-Ife, Nigeria

Correspondence:
Prof. O.D. Otuyemi, Department Of Child Dental Health, Obafemi Awolowo University Ile-Ife. Nigeria.
Email: ootuyemi@yahoo.com

ORIGINAL ARTICLE

Introduction

The goal of any therapy is to achieve specific desired outcomes in the patients concerned.[1] However, these outcomes may not be achieved if the patient is non-compliant. Non-compliance to treatment has not only been associated with treatment failures but also with increased treatment cost. [2] Therefore, knowledge of the factors that can assist in predicting treatment compliance is important and it will not only assist in treatment planning but also in patient selection.

The use of multi-bracket fixed appliances as a common method of treating malocclusion is associated with an increased dental plaque accumulation around the teeth. This is due to the inability to brush and floss effectively with these appliances in place. Problems often associated with plaque build-up include enamel decalcification, and gingivitis among other deleterious effects. [3] Some of these challenges can be so severe as to necessitate the discontinuity of orthodontic treatment in order to preserve the individual's oral health. Different predictors of oral hygiene compliance have been identified among individuals undergoing orthodontic treatment which include age, gender, socioeconomic status, relationship with parents. [4,5]

The effect of academic performance or emotional intelligence of individuals on their compliance with different orthodontic treatments has been sparsely

reported in the literature. However, Al-Jewair et al [5] reported that adolescents with married parents and those with good academic performance in school were more likely to comply with fixed orthodontic treatment. Richter et al [6] also reported a positive correlation between the patient's academic performance in school with their compliance. However, not all of these studies were specific to oral hygiene compliance in the adolescent population.

Emotional Intelligence (EI), on the other hand, is simply the ability to identify and manage the emotions of self as well as others.[7] Different authors have also defined EI as the ability to perceive accurately, appraise, and express emotions; the ability to access and or generate feelings when they facilitate thought. [8]

There was a proposed model of emotional intelligence and health outcomes which is usually referred to as the hassles of daily living. [9] This model proposed that EI has a protective effect on health outcomes. This is because it moderates the negative emotions that affect health. [10]

A positive correlation has also been observed between the emotional intelligence and motivational level of orthodontic patients. [11] Thus, there may exist a possibility that emotional intelligence and academic performance can influence oral hygiene behaviour.

This study aimed to assess the relationship between academic performance and emotional intelligence as factors that can influence oral hygiene status among adolescents undergoing orthodontic treatment.

Material and methods

Ethical approval for this study was obtained from the Institutional Review Board of the Institute of Public Health, College of Health Sciences, Obafemi Awolowo University, Ile Ife, Nigeria [HREC no. IPH/OAU/12/2011]. The study population comprised 23 consecutive adolescent patient populations between the ages of 10 and 19 years undergoing fixed orthodontic appliance therapy at the orthodontic clinic, Obafemi Awolowo University Teaching Hospitals, Ile-Ife between January and May 2023. A written informed consent was obtained from identified individuals and the guardians of adolescents below 18 years of age. The study utilized a questionnaire with close-ended questions to assess the academic performance and emotional intelligence on oral hygiene compliance. The academic performance was based on the average score of the school's academic records in the last three terms for secondary school students or two semesters for undergraduate students. All patients' exact grades or scores were verified through a snapshot picture of their academic records sent to the researchers. Emotional Intelligence (EI) was adapted from the study by Haralur et al. [12] The questionnaire included four sections; three of which were completed by patients while the other section was assessed by the patient's orthodontist.

The first section assessed the socio-demographic characteristics of the patient and treatment duration; the second recorded information on the academic performance of adolescent patients in primary, secondary, or tertiary schools. The third section contained questions that assessed the emotional intelligence of the adolescent patients. [12]

The fourth section reported oral hygiene status as objectively assessed using the simplified oral hygiene index by Greene and Vermillion. [13]

Inclusion criteria were the ability to perform and understand basic oral hygiene activities and communicate in English. Patients with removable or functional appliances, or segmented fixed appliances, and those who refused to participate in the study were excluded.

Data was entered into a personal computer and analyzed using SPSS for Windows (version 26). Descriptive statistics were used to explore the distribution of the data. Analysis of variance statistical tests was also performed to assess the

relationship between emotional intelligence, academic performance, and oral hygiene index scores.

Results

Table 1 shows the distribution of patients according to gender, age, and educational level.

There was a slight male and older adolescents' preponderance with 56.5%, and 52.3% respectively. Most of the patients were in tertiary institutions (47.8%) while the least were in primary schools (17.4%).

In Table 2, the majority of the patients were in the very good (52.2%) and excellent grades (39.1%) categories. None were in the very fair, fair, and poor grades categories.

Table 3 shows the patients' distribution of emotional intelligence categories. The majority were in high (43.2%) and average (39.1%) intelligence categories. Only 17.4 percent showed low emotional intelligence.

Table 4 shows the distribution of patients' oral hygiene status according to the simplified oral hygiene index score. About two-thirds (60.9%) had fair oral hygiene with oral hygiene scores between 1.3 and 3.0. Only one patient had poor oral hygiene (4.3%).

Table 5 demonstrates the relationship between a patient's oral hygiene status compared with their emotional intelligence. The relationship between the patient's oral hygiene scores and their emotional intelligence showed no significant association with the patient's oral hygiene index scores ($p = 0.162$).

Table 6 shows the relationship between the oral hygiene scores of patients and their academic performance. The results showed a significant association between academic performance and oral hygiene index scores ($p=0.032$)

Table 1: Socio-demographic characteristics of patients

Variable	Number	Percentage
Gender		
Male	10	43.5
Female	13	56.5
Age(years)		
10-15 (young adolescents)	11	47.7
16-19 (older adolescents)	12	52.3
Educational level		
Junior secondary school	4	17.4
Senior secondary school	8	34.8
Tertiary institution	11	47.8

Table 2: Distribution of patients according to their Academic Performance (AP) in school

Grade ranks	Number	Percent (%)
Excellent	9	39.1
Very good	12	52.2
Good	2	8.7
Very fair	0	0
Fair	0	0
Poor	0	0

Table 3: Distribution of the Emotional Intelligence (EI) categories of patients

Emotional intelligence categories	Number	Percent (%)
Low (score < 90)	4	17.4
Average (score of 90-110)	9	39.1
High (score >110)	10	43.5

Table 4: Oral hygiene status of the patients based on oral hygiene index-simplified.

Oral hygiene status (score)	Number	Percent (%)
Good (score of 0.0 – 1.2)	8	34.8
Fair (score of 1.3 -3.0)	14	60.9
Poor (score of 3.1 - 6.0)	1	4.3

Table 5: Relationship between oral hygiene status and emotional intelligence of orthodontic patients.

Source of variability	Sum of squares	Degree of freedom	Mean squares	F- statistic	p-value
Emotional intelligence (Between groups)	8.383	19	0.441	3.545	0.162
Emotional intelligence (within groups)	0.373	3	0.124		
Total	8.756	22			
Not significant p>0.05					

Table 6: Relationship between oral hygiene status and academic performance of orthodontic patients

Source of variability	Sum of squares	Degree of freedom	Mean squares	F- statistic	p-value
Academic performance (Between groups)	2.559	2	1.279	4.128	0.032*
Academic performance (within groups)	6.198	20	0.310		
Total	8.756	22			
Significant p>0.05					

Discussion

The primary objective of this investigation was to assess the relationship between two critical socio-behavioural factors of academic performance and emotional intelligence on the oral hygiene status of patients undergoing orthodontic treatment. Education and emotions are important socio-behavioural factors that interact and influence an individual's behaviour which shapes decisions, actions, and overall oral well-being of patients. In this study, it was assumed that oral health status is significantly correlated to oral hygiene compliance and maintenance in individuals undergoing orthodontic treatment.

In this study, high academic performance of individual orthodontic patients was significantly related to better and favourable oral hygiene status. Several studies have also examined the relationship between these two factors, shedding light on the potential effects of academic performance on oral hygiene behaviors. Croffoot et al., [14] investigated the oral hygiene compliance of university students and found a significant association between academic performance and oral health status. The study revealed that students with higher academic performance tend to have better oral hygiene practices, including regular toothbrushing, flossing, and mouthwash use.

Similarly, Folayan et al.,[15] explored the oral hygiene compliance of dental students. They found that dental students with better academic performance exhibited higher levels of oral hygiene compliance compared to those with lower academic achievement. The researchers hypothesized that dental students with a higher academic performance may have a greater understanding of the importance of oral health and may be more motivated to maintain good oral hygiene habits. These findings suggest that there is a positive correlation between academic performance and oral hygiene status. Students who excel academically may be more likely to prioritize oral health and engage in regular oral hygiene practices. On the other hand, students who struggle academically may be more prone to neglect their oral hygiene routines.

It is important to note that academic performance can also be influenced by factors such as stress levels, time management skills, and overall well-being. Poor oral hygiene practices and oral health issues, such as dental pain or bad breath, can lead to discomfort and may affect concentration and academic performance. This highlights the bidirectional relationship between academic performance and oral hygiene status. [16]

Corrêa et al.,[17] examined the oral health habits of university students in Southern Brazil and found a positive correlation between higher GPA scores and

improved oral hygiene compliance. The researchers suggested that students with better academic performance may possess higher levels of self-discipline, time management, and organization, which could translate into better adherence to oral health routines.[18]

A previous study by Richter et al [6] evaluated the effect of behaviour modification on the compliance of 144 orthodontic patients. The authors reported a correlation between the patient's academic performance in school and their compliance. Patients with better compliance tend to have lower absenteeism rates and are regarded by their teachers as academically bright and social. [19] This may not always be the case in many other health disease burdens as Kaona et al [20] reported no significant association between educational level and treatment compliance. The authors' assessment was on factors contributing to treatment adherence amongst patients with tuberculosis.

A very few studies have been conducted to assess the effect of emotional intelligence on compliance with oral hygiene maintenance rules among patients undergoing dental treatment in the literature. [11,21] Our present Nigerian study showed no significant relationship between emotional intelligence and oral hygiene status of orthodontic patients seen in Ile-Ife Nigeria.

This is in contrast to many studies that suggest that individuals with higher emotional intelligence may have a better understanding of the importance of oral hygiene and are more motivated to maintain it. [11,21,22] The link between emotional intelligence and compliance with health treatment generally however may be influenced by several factors as Willard [23] found no correlation between emotional intelligence and treatment adherence among people with HIV disease. The author however claimed the data set was inadequate to prove any significance.

The limitation of this study may not be unconnected with its small sample size. Again the questionnaires filled out by the patients were self-administered, indicating a possibility for bias regarding the emotional intelligence questions. Further studies need to be carried out with increased sample size, andthe emotional questionnaire should be subjected to the rigour of internal validity.

The study concluded that emotional intelligence had no significant effect on oral hygiene status of orthodontic patients. However, the high level of academic performance of patients was significantly related to better and favourable oral hygiene status. Further studies with larger sample sizes and more rigour of internal validity of the emotional questionnaire are needed.

Contribution to Authorship

Conceptualized by ODO, Data collection, analysis and write-up by both authors

Funding

Funded by the authors

Conflict of Interest

None declared by the authors

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