Original Research Article

A comparative assessment of dento-facial aesthetics among dental, medical, nursing and physiotherapy students in a college of health sciences

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A B S T R A C T

Background: There is increased awareness and concerns about dentofacial aesthetics in most population. We sought to determine the self-assessment of dental aesthetics and perceived treatment need among a group of health professions trainees and compare the same with the researcher's report using the Aesthetic component (AC) of Index of Orthodontic Treatment Need (IOTN).

Materials and Methods: This was a cross-sectional study of undergraduates in our College of Health Sciences. The researcher was calibrated. Subjects supplied their socio-demographic details, responses on perception of their teeth, and smile on a self-administered questionnaire. Additionally, respondents selected and documented a picture that best matches theirs from the AC of the IOTN chart, while the researcher did the same and compared the scores. Data were analyzed using the SPSS version 16.0.

Results: 121 students were studied. 59% were previous dental clinic attendees. The majority (80.2%) usually females rated their smile pleasant. 69.4% expressed satisfaction with the appearance of their teeth. Male and female subjects differed significantly in the ratings of their smile and teeth; with significantly more females rating themselves better than average. Subjects' scores differ significantly from the researcher's; most subjects rated their occlusion better especially females (p<0.001), physiotherapy students(p=0.0016), and previous clinic attendees(p=0.02). The odds of correct self-assessment increased by 1.6 with respondents' gender and department.

Conclusions: While dental students are well suited for dento-facial aesthetic assessment, there is a need to introduce aspects of dental aesthetics and orthodontic treatment need appraisal among other oral health subjects to curricula in college of health science.

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1. Introduction

The term "self-perception" refers to the idea that individual persons have about themselves.[1] The definition of an ideal dento-facial appearance on the other hand remains controversial as there are diverse individual opinions of what the ideal dento-facial appearance should be.[2] The controversy may be related to racial and socio-cultural differences that are peculiar to humans in general. A good dento-facial appearance is believed to be strongly associated with an individual's social and intellectual competence, peer group acceptance and by extension, related to successful life outcomes when compared with people with a poor dento-facial appearance.[3–5] A global increase in the desire for orthodontic intervention among children, adolescents and young adults owing to improved awareness and concern about dento-facial aesthetics has been reported in literature.[6–20]

Orthodontic treatment is often carried out for aesthetic rather than functional considerations, since it is assumed

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that failure to meet social norms for dental aesthetics will have negative psycho-social effects and these effects may well-exceed the biological problems.[3,7,8] In fact, it has been estimated that about 64-80% of orthodontic patients seek services out of a concern for aesthetics rather than for reasons related to health or function.[3] Dentists have predicted that psychosocial component of malocclusion is and will continue to be one of the strongest motivators for orthodontic treatment.[9]

From the foregoing, it is also imperative that enhancement of function and aesthetics.[2] and patient's satisfaction are important aims of orthodontic treatment. Factors influencing self-perception of dental appearance, malocclusion, and the desire for orthodontic treatment are thought to include: gender, age, socioeconomic status, self-esteem, and peer group norms.[10]

Since there were varying opinions as to what entities constitute a need for orthodontic intervention, qualitative and quantitative indices were developed in the late 1960's and early 70s to assist professionals in categorizing malocclusion.[4] Furthermore, six types of occlusal indices have been described. They are: Diagnostic, Epidemiologic, Indices of Orthodontic Treatment Need (IOTN), Indices of Orthodontic Treatment Outcome, Indices of Orthodontic Treatment Complexity and Other Indices.[11–13] The AC of the IOTN which classifies the aesthetic arrangement of the teethpermits subjects' self-assessment and documentation of his/her occlusion while the Dental Aesthetic Index is used by the clinician.[12] The validity and reliability of the IOTN have been established by several researchers.[14–16] Cut-off points for aesthetic need for orthodontic treatment were introduced using professional opinion as the 'gold standard'; grades 1–4 represent 'no need for treatment', grades 5–7 'borderline need', and grades 8–10 'definite need for treatment.[15]

On the premise that oral health awareness is low in the general Nigerian populace; and knowledge of Orthodontics is very low.[17] this study seeks to examine a group of students; (potential health workers,) self-assessment of dental aesthetics / orthodontic treatment need compared with a researcher. The use of AC of IOTN by subjects and clinicians allows for comparison of the two reports.

2. Aim and Objectives

This study was designed to investigate self-perception of malocclusion, and dental aesthetics among dental, medical, nursing and physiotherapy students in our College of Health Sciences. Also, to compare subjects' perception (scores indicating treatment need) with that of trained personnel (calibrated researcher OOC) using the AC of IOTN and to determine the factors that influence self-perception and perceived need for treatment.

Proposed null hypotheses were:

Using the AC of IOTN,

1. There is near perfect agreement between dental students' self-rating of their dental aesthetics compared with the researcher's.
2. There is moderate disparity between medical students' self-rating of their dental aesthetics compared with the researcher's.
3. There is great disparity between physiotherapy and nursing students' self-rating of their dental aesthetics compared with the researcher's.

3. Materials and Methods

The subjects in this cross-sectional study were consenting undergraduates (Parts 2-6 / 200-600 level dental, medical, and Parts 2-5 / 200-500 level nursing and physiotherapy students) in the College of Health Sciences. Subjects with history of jaw surgeries, past/present orthodontic treatment and non-consenting students were excluded from the study. Ethical clearance was obtained from the Institute of Public Health at the University. Subjects were approached in their classes and selected randomly for consent and participation.

Inter/Intra examiner reliability was ensured by calibrating the researcher (OOC). This entailed assessing the aesthetic components of IOTN on ten study casts twice at ten days interval. The Researcher's rating was reviewed by a Consultant Orthodontist, who certified the reliability of his assessment.

Consenting subjects completed Section A of the questionnaire (Appendix I) which sought to know their socio-demographic details and self-perception of their teeth and smile. Furthermore, subjects were presented with a copy of the picture chart, (AC of IOTN) and requested to select a picture showing an occlusion that has the closest resemblance to their own. Respondents' choices were documented appropriately. The researcher then examined subjects aseptically and determined their scores on the AC of IOTN.

Data was imputed into a computer and analyzed using the SPSS version 16.0.[21] Simple descriptive statistics was employed in analyzing subjects' demographic details. Chi square tests was used to determine relationships between categorical variables and binary logistic regression were employed in predicting the relationship between the independent and dependent variables appropriately. Statistical significance was inferred at p value ≤ 0.05.

4. Results

We approached 130 undergraduates and studied 121(93.1%) consenting respondents. 59 (48.8%) of them were males and 62(51.2%) were females (M:F ratio 1:1.05). Table 1 shows the distribution of respondents by their age group and sex. Most respondents (55.4%) were in the 21-25 year old bracket. Twice as many males as females were aged ≥26years, while a majority of the female respondents

Table 1: Distribution of subjects by the age group and gender

Age (Years)	Male NO (%)	Female NO (%)	Total NO (%)
≤ 20	11 (9.1)	25 (20.7)	36 (29.8)
21-25	36 (29.8)	31(25.6)	67 (55.4)
≥26	12 (9.92)	6 (5.0)	18 (14.9)
Total	59 (48.8)	62 (51.2)	121 (100.0)

$\chi^2 = 7.75$ p = 0.021 df=2

Table 2: Subjects distribution by their departments and levels

| Level of study | Subjects' Courses | | | | Total No (%) |
	Medicine & Surgery	Dentistry	Nursing	Medical Rehabilitation	
200 Level	5(4.1)	4(3.3)	12 (9.9)	- (-)	21 (17.4)
300 Level	9 (7.4)	14 (11.6)	3 (2.5)	11(9.1)	37(30.6)
400 Level	8 (6.6)	4 (3.3)	5(4.1)	8(6.6)	27(22.3)
500 Level	7 (5.8)	4 (3.3)	4 (3.3)	8(6.6)	23(19.0)
600 Level	8 (6.6)	7 (5.8)	0 (0.00)	0 (0.00)	15(12.4)
Total	37 (30.6)	33 (27.3)	24 (19.83)	27(22.31)	121 (100.0)

$\chi^2 = 41.38$ p < 0.001 df=12

Table 3: Subjects' responses to questions on appearance of their smile and teeth

| Questions | Response is Yes No | | | Response is No No (%) | | | p values |
	Males No(%)	Females No(%)	Total No(%)	Males No(%)	Females No(%)	Total No(%)	
Do you have a pleasant smile?	43 (35.5)	54 (44.6)	97 (80.2)	16 (13.2)	8 (6.6)	24 (19.8)	0.049
Do you like the way your teeth look?	43 (35.5)	41(33.9)	84 (69.4)	16 (13.2)	21 (17.4)	37 (30.6)	0.42
Are your front teeth straight?	49 (40.5)	41(33.9)	90 (74.4)	10 (8.3)	21 (17.4)	31 (25.7)	0.033
Are your teeth good looking?	38 (31.4)	49(40.5)	87 (71.9)	21(17.4)	13 (10.7)	34 (28.1)	0.073
Do your teeth need straightening?	43(35.5)	41 (33.9)	84 (69.4)	16 (13.2)	21(17.4)	37 (30.6)	0.420

"Yes" versus "No" groups' Totals $X^2 = 4.92$ df= 4 p= 0.2955.

Table 4: Subjects' ratings of their smile, face and teeth

| Tasks | Compare your smile with your classmates' | | | Compare your teeth with your face | | |
	Males	Females	Total	Males	Females	Total
One of the nicest	23 (19.0)	14(11.6)	37(30.6)	20 (16.5)	20 (16.5)	40(33.0)
Better than average	14 (11.6)	37 (30.6)	51(42.2)	21 (17.4)	34 (28.1)	55(45.5)
Average	13 (10.7)	6 (5.0)	19(15.7)	15 (12.4)	3 (2.5)	18(14.9)
One of the poorest	9 (7.4)	5 (4.1)	14(11.6)	3 (2.5)	5 (4.1)	8(6.6)
	$X^2= 16.22$ df=3 p=0.001			$X^2= 11.51$ df=3 p=0.0093		
Tasks	How much do you like your teeth?			How much do you like your smile?		
	Males	Females	Total	Males	Females	Total
Very much	21(17.4)	20 (16.5)	41 (33.9)	23 (19.0)	40 (33.0)	63 (52.1)
Quite a bit	18(14.9)	24 (19.8)	42 (34.7)	17 (14.1)	17 (14.1)	34 (28.1)
Not much	17(14.1)	10(8.3)	27 (22.3)	19 (15.7)	5 (4.1)	24 (19.8)
Not at all	3(2.5)	8 (6.6)	11(9.1)	0 (0.0)	0 (0.0)	0 (0.0)
	$X^2= 4.89$ df=3 p=0.18			$X^2=12.7$ df=3 p=0.005		

Table 5: Comparison of the AC of IOTN between subjects and researcher

Scores	1	2	3	4	5*	6*	7	8**	9**	10	Total
Treatment need	No or little treatment need				Borderline treatment need			Needs treatment			
Subjects' scoring	53(43.8)	32(265.5)	16(13.2)	6(5.0)	4(3.3)	3(2.5)	-	7(5.8)	-	-	121(100.0)
Researcher's (PI's) scoring	34(28.1)	46(38.0)	21(17.4)	6(5.0)	-	7(5.8)	-	4(3.3)	3(2.5)	-	121(100.0)

χ^2= 14.50 df= 5 p= 0.013 ** merged for analysis *merged for analysis

Table 6: Comparing the correctness of AC of IOTN between subjects and researcher by their departments

Department	Correct rating	Over-rated	Under-rated	Total
Medicine	23 (62.2)	10 (27.0)	4 (10.8)	37 (100.0)
Dentistry	28(84.8)	5 (15.1)	0 (0.00)	33 (100.0)
Nursing	14 (58.3)	10 (41.7)	0 (0.00)	24 (100.0)
Medical Rehabilitation	16 (59.3)	11 (40.7)	0 (0.00)	27 (100.0)

Pearson χ^2= 16.7 p= 0.010

Table 7: Comparison of Researcher versus subjects' scores by their gender, department and previous dental visit.

Variables		X^2	df	P values
Gender	Males	0.841	5	0.97
	Females	29.32	4	<0.0001
Department	Medicine	6.67	4	0.16
	Dentistry	0.14	4	0.998
	Nursing	4.56	2	0.12
	Medical Rehabilitation	15.23	3	0.0016
Previous dental visit	Yes	13.41	5	0.02
	No	5.02	4	0.28

Table 8: Logistic regression model predicting the correctness of respondents self-reported aesthetic component of IOTN scores.

Variables	B	SE	SIGN	EXP (B)	95% CONFIDENCE INTERVAL
Gender	0.464	0.435	0.285	1.591	0.679 – 3.731
Department	0.463	0.195	0.018	1.588	1.084 – 2.328
Level of study	0.003	0.002	0.113	1.003	0.999 – 1.006
Previous dental visit	0.84	0.449	0.851	1.088	0.451 – 2.2621

were aged ≤ 25years. These differences attained statistical significance (p=0.021). Furthermore, a significant majority of respondents, (85/121=70.25%) were in the 300-500 Level of their education (Table 2) (p<0.001).

Over half (59%) of the respondents had visited a dental clinic in the past for a variety of reasons; the commonest being for scaling and polishing / dental prophylaxis (49.9%). Others had dental fillings (20.0%), dental extractions (20.0%) and routine dental check-up (17.1%). Five respondents had paid more than 1 visit.

Table 3 Summarizes subjects' general self-assessment of their smile and teeth. Majority (97/121- 80.2%) rated their smile pleasant. A significant majority of these were females (54/97) but more males (16/24) were not pleased with their smiles compared with females (8/24) (p=0.049)

69.4% (84/121) of respondents expressed satisfaction with the appearance of their teeth with a near equal distribution between the sexes (43 males and 41 females) but more females (21/37) were not pleased with the appearance of their teeth, compared with males (16/37). A direct enquiry "Are your front teeth straight" yielded a statistically significant more "Yes" response from male (49/90) than female (41/90) respondents and a higher number of "No" response for the females (21/31) (p=0.033).

84/121- 69.4% of the respondents did not see the need for straightening their teeth but majority of those who saw a need for straightening their teeth were females. The differences observed were however not statistically significant (p>0.05).

Table 4 shows subjects' ratings of their smile, face and teeth. Male and female subjects differed significantly

in their ratings of their smile compared with classmates (p=0.001), teeth compared with faces (p=0.009) and how much they liked their smile (p=0.002). A significant majority of the respondents who rated themselves better than average were females; at the same time, more females than males did not like their teeth at all.

Table 5 shows a comparison of subjects' scoring with the researcher's. Findings suggest that they differ significantly from each other. The scores tallied in 66.9% (81/121) of instances; where there were discrepancies, most subjects rated their teeth better than the researcher did (35/40=87.5%) by a unit of 1 while 5/40 (22.5%) rated their teeth worse than the researcher. Thus, most subjects saw less need for treatment than the researcher (p=0.013). The discrepancies were significant among female respondents, (p<0.001), physiotherapy students (p=0.0016) and respondents who had visited the dental clinic before (p=0.02). Dental students had the closest (near perfect (p=0.998) assessment, followed by Medical and Nursing students (p=0.16 and 0.12 respectively) compared with the researcher (Table 6).

A positive correlation exists between subject's self-allotted aesthetic scores and the researcher's (correlation coefficient = 0.84, p<0.001). The correctness of subjects' scores and their course of study were also positively correlated (Correlation Index 0.2 p=0.031) but no association was found with previous dental visits.

A binary logistic regression report is presented in Table 7. The dependent variable is the accuracy of the respondents' self-reported aesthetic score (when compared with the researcher). The independent variables were respondents' gender, department, level of study and previous visit to dental hospital for treatment. The odds of accuracy /correctness increase by 1.6 with respondents' gender (p= 0.285) and department (p=0.018).

5. Discussion

It is common knowledge that communication between humans far transcends the use of words. The human face remains an essential component of the body, engaged in communication from time to time. Face to face communication and interactions facilitate detection of body language, tones, feelings and reactions. Furthermore, the reflection of true personality, emotions and reactions are displayed.[18,19] A pleasant smile and well aligned set of teeth are inviting and acceptable to any audience; contrariwise mal-aligned teeth. Consequently, an individual's perception of his or her dental aesthetics and occlusion can affect these and many other aspects of his or her life.[20,22] The young adults in any population are particularly prone to the adverse effects of unpleasant smile and teeth alignment and thus deserve every possible attention.

Only 9 (6.9%) individuals (5 males and 4 females) did not consent to participate in our study and that for no stated reason(s). We opine that possible reasons could range from general lack of interest in the subject, to shyness or lack of confidence. None of these possibilities could be ascertained.

Participants' demographic details represent the typical pattern in a Nigerian Institution of higher learning. Despite random selection, a statistically significant female preponderance p=0.021 (Table 1) is attributable largely to chance. Perhaps the female respondents is more beauty consciouss and therefore possesses greater tendency to accept a researcher's invitation to participate in this study that boarders on aesthetics more than a male respondent would do is another possibility.

Female subjects in this study were relatively and generally younger than their male counterparts with a preponderance of females aged less than 20 years and males older than 26 years. This again is a true reflection of the demographic profile of students in the college at the period.

A significant difference in subjects' level of study (when grouped by their gender as shown in Table 2) may also be attributed to chance with the random sampling technique employed in this study.

A low level of dental care awareness was displayed by 41% of respondents having never visited a dental clinic; even though there was one situated within the college of health sciences where they attended classes daily. This is similar to findings among medical and dental students at Peking University in Beijing, China[23] where awareness increased among dental students as they progressed in their education but not in medical students. This finding calls for efforts directed at raising oral health awareness among all students in the college of health sciences. A similar position informed the introduction of oral health curriculum for medical students at the University of Washington.[24]

Among our subjects, self-rating of their smile, appearance of their teeth and comparison with peers shows positive views well above average and appreciable self-acceptance. This is similar to the findings of Isiekwe and Aikins.[25] Few subjects expressed perception of displeasure at their facial and dental appearances. This suggests some level of transparency/ sincerity/ objectivity in the group; a statement that would not hold true had all respondents rated themselves perfect.

The perceptions did not differ between males and females. The results obtained suggest the possibility of some (very few) subjects' display of uncertainty in the expression of the perception of their dental aesthetics and the need for treatment. Example is a situation where 14 subjects Judged that their teeth were not looking good, but only 6 believed that they needed braces. looking good, but only 6 think they definitely need braces. 10 students rated the appearance of their smile below average and among the worst but only 6 expressed the need for braces. Could it be that assessment of smiles for some of these subjects did not capture their dental aesthetics? Or is this an expression of some confusion

in a borderline occlusion group. Or yet a manifestation of ignorance about what braces are and what they are used for?

A by far more objective assessment, using the AC of IOTN, saw majority of the subjects over-rating their occlusion positively. The researcher identified 4 (3.0%) subjects that needed orthodontic treatment, but only 1 subject admitted the same conclusion. The others judged themselves as borderline.

Similarly, 94.8% of respondents concluded that they do not need treatment while the researcher judged that 81.5% would not need orthodontic treatment. The rest had borderline treatment need. The researcher found 15.5% boarder line treatment need but respondents reported 4.4% borderline treatment need. A significant difference exists between the subjects' and researcher's assessment of their occlusion. These differences were marked and significant among female subjects compared with males. We attribute this to a female's inherent quest for perfect look, resulting in unrealistic self- assessment. This trait was uncommon in males. It is however unclear if female subjects in this study would rate individuals other than themselves correctly since the element of bias may not be present.

Looking at the students' course of study, the dental students (expectedly) gave near perfect self- assessment, there by lending credence to the impact of knowledge acquired and a dispartionate assessment. The medical rehabilitation students' rating differed significantly from the researcher's. We opine that the medical rehabilitation students possibly work mostly in locations distant from the oral cavity and consequently are not too conversant with "the ideals" in the oral cavity. It appears that subjects' previous visits to the dental clinic may also have pooled them into an assumption of perfect occlusion. We presume that these subjects may also have concluded for perfect occlusion if the attending clinician said nothing about their occlusion.

In a nation where there is a dentist to about 40,000 people and less than 70 Orthodontists to about 198 million Nigerians, an inclusion of dental aesthetics and introduction to the role of orthodontists in the medical, nursing and physiotherapy curriculum would go a long way to help detect more patients in need of orthodontic care, enlighten them and refer m to the appropriate source of care.

6. Conclusions and Recommendation

Majority of the group of students studied in the college of health sciences have a positive perception of their facial appearances and dental aesthetics. However, there is a general but inconsistent under-reporting of anomalies in the group. The perception of non-dental students differed significantly from that of the researcher, so their self-assessment may not be reliable for deciding treatment needs.

While the non-dental trainees' assessment of individuals other than themselves may be more accurate, there is a need to introduce aspects of dental aesthetics to the curriculum of all trainees in College of Health Sciences if they will be able to serve as proxy, referring orthodontic cases for treatment at the appropriate unit.

7. Source of Funding

None.

8. Conflict of Interest

None.

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