COMPARISON BETWEEN DENTISTRY AND NON-DENTISTRY UNDERGRADUATE STUDENTS' SELF-PERCEPTION REGARDING THE AESTHETICS OF THEIR OWN SMILE AND FACIAL PROFILE

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Palavras-chave: Enquetes e questionários. Autoimagem. Ortodontia.

RESUMO

Introdução: o objetivo deste estudo foi observar como estudantes de graduação analisam e classificam seu próprio sorriso e perfil facial, comparando os resultados entre estudantes de odontologia (EO) com não estudantes de odontologia (NEO). **Materiais e Métodos:** o questionário respondido pelos participantes incluiu tópicos para identificação dos indivíduos; escala Likert e componente estético do Índice de Necessidade de Tratamento Ortodôntico (IOTN) para avaliar a satisfação com o próprio sorriso; atratividade facial com escala de Turkkahraman and Gokalp e história prévia de tratamento ortodôntico. Os dados intra e intergrupos foram analisados pelo teste qui-quadrado com 95% de confiança ($p \leq 0,05$) utilizando o software SPSS 13.0. **Resultados:** foram obtidas 483 respostas, sendo 166 do grupo EO e 317 do grupo NEO. A maioria dos participantes considerou sua oclusão ideal e agradável (EO - 79,27%; NEO - 79,8%) e seu perfil levemente convexo (EO - 80,6%; NEO - 76%). O perfil levemente convexo também foi preferido por ambos os grupos para ambos os sexos. 71% dos EO e 66,0% dos NEO relataram ter feito tratamento ortodôntico. A maioria dos respondentes estava satisfeita ou muito satisfeita com seu sorriso, porém o NEO teve maior prevalência de alunos muito satisfeitos com seu sorriso em relação ao grupo EO ($p<0,05$). **Conclusão:** a escolha do curso parece não ter influência na análise e classificação do sorriso e perfil facial, talvez porque a maioria dos participantes já tenha realizado tratamento ortodôntico.

Keywords: Surveys and Questionnaires. Self Concept. Orthodontics.

ABSTRACT

Introduction: the study aimed to compare how undergraduate dentistry students (DS) and non-dentistry students (NDS) analyze and classify their own smile and facial profile. **Materials and Methods:** the cross-sectional study questionnaire included topics for the identification of the respondent; Likert scale and aesthetic component of the Index of Orthodontic Treatment Need (IOTN) to assess satisfaction with one's own smile; facial profile attractiveness using Turkkahraman and Gokalp scale and previous history of orthodontic treatment. Intra and intergroup data were analyzed by chi-square test with 95% confidence ($p \leq 0.05$) using SPSS 13.0 software. **Results:** 483 questionnaires were answered, 166 from DS and 317 from NDS. Most participants considered their occlusion as ideal and pleasant (DS - 79.27%; NDS - 79.8%) and their profile as slightly convex (DS - 80.6%; NDS - 76%). The slightly convex profile was also preferred by both groups for both genders. 71% of the DS and 66.0% of the NDS reported having undergone orthodontic treatment. Most respondents were satisfied or very satisfied with their smile, however the NDS had a higher prevalence of students very satisfied with their smile ($p<0.05$). **Conclusion:** the choice of course does not seem to have any influence on the analysis and classification of the smile and facial profile, perhaps because most of them have already undergone orthodontic treatment.

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INTRODUCTION

Facial characteristics play an important role in the analysis of facial attractiveness and in the development of self-esteem.[1–6] The judgment of appearance, especially the facial, influences the individual's psychological state and can affect social interaction and influence the professional and interpersonal areas.[3] It is known that beauty is associated with more positive characteristics and that people considered more attractive are better socially accepted.[7–11]

The aesthetic evaluation of the smile encompasses the analysis of size, color, shape, alignment of dental elements, gingival exposure, proportion of upper anterior teeth, the relationship between teeth and lips during the smiling movement and its integration with all the elements of the face.[12,13] The facial structures that most contribute to the pleasantness of the face, includes the volume and protrusion of the lips,[14] mandibular position, size and shape of the nose and consequent facial convexity.[15–17]

Studies comparing the aesthetic preference between the general population and health professionals can be found in the literature and most of them used questionnaires and manipulated silhouettes photographs to assess participants opinion.[16–18] Among Brazilians, the preferences seems to diverge between regions and the population studied and there is still no consensus.[19–22] Besides, although aesthetics has been studied for many years,[23,24] currently, it can be observed an increase in patients' concern and demand for esthetical procedures and most of the studies were published before 2015. Thus, the present study aimed to compare the smile and profile aesthetic satisfaction between dentistry and other areas undergraduate students. Also searching for their preferences among different facial profiles, analyzing whether it is influenced by gender, ethnicity, previous orthodontic therapy, and type of course attended.

MATERIALS AND METHODS

This cross-sectional study was submitted and approved by the Research Ethics Committee of the Pedro Ernesto Hospital in 2019 (Protocol approval 17324619.7.0000 5259) and all participants signed an informed consent form.

The sample size calculation was based on the paper of Oliveira *et al.*,[21] with 95% confidence level and 5% margin of error, with 153 questionnaires needed. The sample included 166 dentistry undergraduate students and 317 students of other areas, at two different, private and public universities in Rio de Janeiro/RJ - Brasil. Any graduate student willing to answer the questionnaire could be part of the study. Partially filled questionnaires were excluded.

The questionnaire inquired about student's current semester; age; gender; nationality and previous history of orthodontic treatment, organized in direct or dichotomous questions. To analyze the students' satisfaction with their own smile, there was a Likert scale[25] ranging from very satisfied, satisfied, neutral, dissatisfied and very dissatisfied. (Figure 1). The questionnaire also comprehended photographs used in the esthetic component of the Index of Orthodontic Treatment Need (IOTN) (Figure 2).[26] As described in the mentioned index, these photographs are numbered from 1 to 10 (where 1 corresponds to the best dental appearance and 10 to the worst), and the purpose is for the interviewee to identify which of them they would fit into, regardless of the teeth's color and shape (Figure 1).

An analysis of facial profile attractiveness was performed using a facial profile scale from Turkkahraman and Gokalp[17] (Figure 3). It consists of 16 profile images (8 for males and 8 for females), digitally manipulated to obtain different changes in the facial profile, coded from A to H as shown in Figure 3. The respondent was instructed to choose which of the profiles was considered to be the most aesthetic for women and for men. Also, the respondent should point out which profile was the most similar to his/hers.

To analyze intra and inter group differences regarding their satisfaction with their own smile and face attractiveness the qui-square test was used. The descriptive statistic of the data, frequency tables and qui-square test were carried out using the Statistical Package for Social Sciences 20.0 *software* (SPSS Inc., Chicago, Illinois, USA). All analyzes were performed with 95% confidence and $p \leq 0.05$.



***Figure 1**: 5-point Likert Scale.[25] From left to right, the faces indicate very dissatisfied, dissatisfied, neutral, satisfied and very satisfied.*

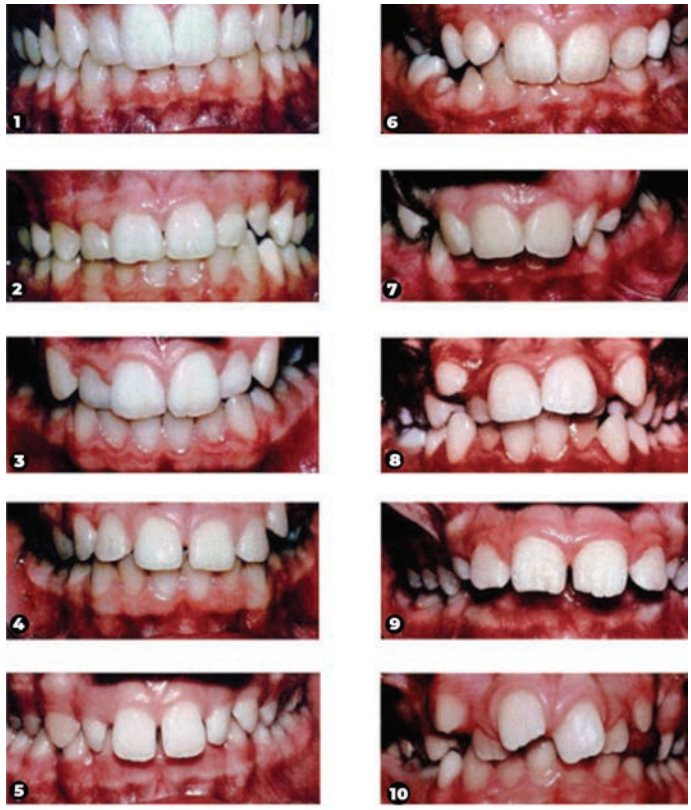


***Figure 2**: Index of Orthodontic Treatment Need (IOTN)[26] questionnaire. The photographs are numbered from 1 to 10 (where 1 corresponds to the best dental appearance and 10 to the worst).*



***Figure 3**: Turkkahraman and Gokalp[17] facial profile attractiveness scale (Figure 3). 16 profile images (8 for males and 8 for females), digitally manipulated to obtain different changes in the facial profile, coded from A to H.*

RESULTS

483 individuals were enrolled in the study. The questions that eventually were found with no answer were tabulated as error. A total of 166 individuals from DS group (74.5% females; 25.5% males) and 317 from NDS (56.15% female; 43.85% male) were answered in three different educational institutions in the state of Rio de Janeiro/RJ - Brasil. From the 317 NDS' individuals 157 (49,5%) participants were from Human and exact 102 (32,2%) Sciences courses and 58 (18,3%) from health science courses, excluding dentistry (Table 1).

In the analysis performed using the aesthetic component of the Index of Orthodontic Treatment Need, 96.52% self-evaluated themselves among the first four images, classified in the category of 'little or no need for treatment', for both groups. (Table 2).

As for their own profile analysis, 79.81% saw themselves as an orthognathic profile, which is slightly concave, with retrusive lips and prominent nose and chin (profile B), for NDS group and 79,37% for DS (Table 3).

Profile B was considered the most aesthetic one for female profiles by 97.48% of the sample (table 4). It was also considered to be the most aesthetic one for males by 81% of the sample, followed by profile A by 18.61% of the sample (Table 4), considering NDS and DS groups.

Most of the interviewee (66.88% for the NDS and 71.7% for the DS) had already used orthodontic appliances (Table 5). Also, most participants (84.85% and 76.4% for groups NDS and DS, respectively) declared they were satisfied or very satisfied with the aesthetics of their own smile (Table 6).

The chi-square test didn't find any significant association between satisfaction with one's own smile and gender, history of previous orthodontic treatment or ethnicity (p>0.05).

***Table 1**: Sample distribution by gender and ethnicity.*

Interviewee's profile		Dentistry Students		Non-Dentistry Students	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Gender	Male	43	25.5	139	43.8
	Female	123	74.5	178	56.2
Ethnicity	White	88	61.5	185	58.5
	Black	23	16.1	47	14.9
	Brown	32	21.7	84	26.6
	Indigenous	1	0.7	0	0

Note: descriptive analysis with frequency and percentage of the qualitative variables.

***Table 2**: Student's self-evaluation according to the IOTN index.*

AC IOTN	Dentistry Students		Non-Dentistry Students			
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Total	*P* value
1	84	50.9	124	39.1	208	0.086
2	49	29.7	117	36.9	166	
3	16	9.7	49	15.5	65	
4	5	3.0	16	5.0	21	
5	4	2.4	4	1.3	8	
6	3	1.8	3	0.9	6	
7	3	1.8	1	0.3	4	
8	1	0.6	2	0.6	3	
9	0	0.0	1	0.3	1	
Total	165	100	317	100	482	

Note: chi-square test was performed to compare Dentistry and Non-dentistry student's self-evaluation using IOTN index.

***Table 3**: Preference for facial profiles.*

Profile	Dentistry Students		Non-Dentistry Students			
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Total	*P* value
A	7	4.27	25	7.9	25	0.129
B	130	79.27	253	79.8	253	
C	17	10.0	18	5.7	18	
D	0	0	2	0.6	2	
E	0	0	0	0	0	
F	2	1.0	9	2.8	9	
G	0	0	0	0	0	
H	8	5.0	10	3.2	10	
Total	164	100	317	100	317	

Note: chi-square test was performed to compare Dentistry and Non-dentistry preference for facial profile.

***Table 4**: Preference for facial profiles according to gender.*

	Dentistry Students Female Profile		Non-Dentistry Students Female Profile	
Profile	**Frequency (n)**	**Percentage (%)**	**Frequency (n)**	**Percentage (%)**
A	1	0.7	0	0.0
B	135	91.2	309	97.48
C	7	4.7	5	1.5
D	0	0	0	0.0
E	0	0	0	0.0
F	0	0	0	0.0
G	0	0	0	0.0
H	5	3.4	3	0.9
Total	148	100.0	317	100.0
Error	18	10.8	0	0.0
	Dentistry Students Male Profile		**Non-Dentistry Students Male Profile**	
Profile	**Frequency (n)**	**Percentage (%)**	**Frequency (n)**	**Percentage (%)**
A	12	8.3	59	18.6
B	129	89.6	257	81.0
C	3	2.1	0	0.0
D	0	0	0	0.0
E	0	0	0	0.0
F	0	0	1	0.37
G	0	0	0	0.0
H	0	0.0	0	0.0
Total	144	100.0	317	100.0
Error	22	13.3	0	0.0

Note: descriptive analysis with frequency and percentage of the qualitative variables

***Table 5**: Sample distribution by Previous Orthodontic treatment.*

Previous Orthodontic treatment	Dentistry Students		Non-Dentistry Students		Total	*P* value
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)		
Yes	119	71.7	212	66.9	331	0.280
No	47	28.3	105	33.1	152	
Total	166	100.0	317	100.0	483	

Note: chi-square test was performed to compare the presence of previous treatment between groups.

***Table 6**: Student satisfaction with their own smile according to the Likert scale.*

Satisfaction	Dentistry Students		Non-Dentistry Students		Total
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	
Dissatisfied	9	5.5	3	0.9	12
Neutral	30	18.2	45	14.2	75
Satisfied	79	47.9	150	47.5	229
Very Satisfied	47	28.5	118	37.3	165
Total	165	100	316	100.0	481

Note: descriptive analysis with frequency and percentage of the qualitative variables

DISCUSSION

The results showed that when analyzing the perceived need for orthodontic treatment by the IOTN, there is a predominance of individuals who self-assessed as having no or minimal need for orthodontic treatment, representing 93% for the DS and 96.5% for the NDS groups. The difference was small between groups and there was no statistically significant difference, which indicates that the perception of need for orthodontic treatment was similar among dentistry and other areas students. In addition, although the self-perceived aesthetics examined by the CA-IOTN are considered an indication of the real need for orthodontic treatment,[27] studies[15,18] mention that individuals who do not have knowledge of the dental field, ie, the general population, tend to be more tolerant with their own dental appearance and are more favorable in their self-perception. However, it is worth emphasizing that the studies mentioned above compared the perceived need by the research subjects with the normative need, and this was analyzed by orthodontists. Thus, divergences are expected as professionals receive specialized training and are guided by orthodontic standards.

The straight profile was chosen as the most pleasant for around 79% for both groups, after all, the orthognathic profile corresponds to the most harmonious and proportional profile, even for those who do not have dental knowledge.[9,28] This finding agrees with other studies on the preference of the population.[9,17,18,21] The facial profile pattern with fewer votes was represented by the concave profile characterized by the retrognathic maxilla, which they also found similar results.[17] However, some authors[9,21,28] found divergent results in their work, determining that the least preferred profile was the concave. This difference may have been possibly due to the sample of evaluators used in the studies, which included dentistry students,[21] specialists in orthodontics[28] and patients.[9]

When asked to classify their own profile, most of the respondents declared having a straight profile. Unlike the studies by Bullen *et al.*[29] and Yin *et al.*,[18] in the current research, the self-perception of undergraduate students was not compared with the clinical assessment of the profile made by orthodontists. The mentioned authors showed divergences on this subject. Yin *et al.*[18] did not find agreement between the research participants and orthodontists and the straight profile was chosen by 85% of respondents when asked about the profile most similar to the one they had. However, in the assessment made by the professionals, only 37% were assessed as straight. Bullen *et al.*,[29] on the other hand, states that young adults are able to accurately assess their own profile, and that their age group influences the assessment. When the female and male profile photographs were analyzed separately, it was seen slightly different between groups. Even though a comparison was not made with Orthodontist's evaluation, most respondents classified their own profile as the most aesthetic, perhaps because they see themselves more face to face than in profile.

The most harmonious for male and female profile was B. This profile is slightly concave, with retrusive lips and prominent nose and chin and similar result was also reported

by Türkkahraman and Gökalp[17] and Almeida *et al.*[30] Further, 18.6% of the respondents of NDS chose A profile for male, against 8.3% of DS and there was a statistically significant difference for male profile preferences between DS and NDS.

It was found that among the students who participated in the survey, most had already undergone orthodontic treatment, with a slightly higher prevalence in DS (71.7%) than in NDS (66.9%) groups. Similar results were found in other studies where 56.25%[19] of respondents had also undergone orthodontic therapy. Although many reasons can influence this decision, for example, the improvement of appearance, biological benefits, indication of a professional, influence and concern of parents in the case of children and adolescents,[8] there is agreement in the literature that aesthetics is the determining factor in search for orthodontic treatment.[3,8,9,15,18,28,31–33] The difference found can be explained by the questionnaire used in the current study, which offered the combined option "aesthetics and function" as a motivational factor, differently from other studies.

The results of the current survey show that students are satisfied or very satisfied with their smiles, in both groups. Other studies also found individuals content with their own dental appearance and values ranged between 35.7 and 88%.[34–36] This range between studies can be explained by the fact that the studies were carried out in different countries, with different cultures and different access to dental care, which could influence the individual's perception.[1,37] Flores-mir *et al.*[1] also emphasized that these differences are possibly of cultural or socioeconomic origin, which was a limitation of the present study, as a socioeconomic analysis of the undergraduates was not carried out. Although it makes sense that most of the interviewees were satisfied or very satisfied with their own smile because they had already undergone previous orthodontic treatment, there was not found any association between satisfaction with one's own smile and gender, ethnicity or history of orthodontic treatment when the chi-square test was applied, similarly with other studies.[1,35]

Although there are beauty standards such as symmetry and proportionality, it is known that the concept of aesthetics is subjective and tends to vary from individual to individual.[5,11–14,17,31] This explains why some patients can tolerate the presence of noticeable changes, while others cannot accept small irregularities.[3,18,35,36] Furthermore, aesthetic preference may vary according to gender, age groups, ethnicities, and cultural patterns. Several studies [11,17,18,38] seek to find the preferred facial profile in different geographic locations, but studies investigating the opinion of Brazilians are still rare.[4,9]

Given this and the high demand for aesthetics procedures, knowing whether there is a difference in aesthetic perception of the smile and the facial profile between undergraduate dental students and other areas students is of extreme importance. The questionnaire was filled out by the participants themselves in person. This method was chosen due to its characteristics of objectivity, practicality, providing standardization of answers, in addition to avoiding interference by the examiner. Satisfaction with dental esthetics was measured using a five-point Likert-type scale, as in other studies,[1,11,16,31,39] for being easy to handle and clear, allowing for the quantification of perceptions.[31,32] Another tool applied was the Index of Orthodontic Treatment Need (IOTN), which is widely used, either to assess the normative need; perceived need[1] or both.[11,18,41]

Almeida *et al.*[30] and Alves and Aras[34] emphasized the importance of the media in the development of beauty standards. In addition to the media,[30,34] the gender; the age group; the level of education of individuals are also factors that influence aesthetic perception.[17,21] Although current research has not found significant associations in preference for facial profiles between DS and NDS group and presence of previous Orthodontic treatment, these external factors need to be considered when studying public opinion.

The analysis of the attractiveness of the facial profile and the self-perception of the profile itself were carried out through photographs. Although this method has limitations, the fact that Turkkahraman and Gokalp[17] facial profile attractiveness scale uses black and white photographs tends to minimize some distraction or influence of aesthetic preference, such as hair color, skin color, presence of skin imperfections or makeup.[39] Besides, it is a widely accepted method and has the advantage over silhouettes and drawings of representing reality and allowing a complete facial analysis.[5,15,28,30,42]

Although important variables were discussed and presented in the study, some information characterizing the population such as the level of education and socioeconomic condition is still lacking and should be included as limitation. In addition, the questionnaire validation should be considered for future studies. Another important issue of the study is the lack of a more robust data analysis to evaluate the variables together.

CONCLUSION

According to the data presented, it can be concluded that:

• When assessing the existence of divergences in results according to gender; ethnicity and previous orthodontic treatment it was found that there is no significant association between the level of satisfaction with the smile and the studied variables.

• DS and NDS were highly satisfied with their dental aesthetics.

• The most preferred profile image for both genders has a straight facial pattern.

• The profile corresponding to the least preferred, according to the young people interviewed, presents mandibular deficiency characterizing the convex profile.

• The choice of course does not seem to have any influence on the analysis and classification of the smile and facial profile.

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