

Comparison of Self-Perception of Esthetics and Orthodontic Treatment Needs among Dental and Non-Dental Students with Assessment by Orthodontist

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Abstract

Objectives: The present study was conducted to compare the self-perception of esthetics and wish for seeking orthodontic treatment among dental and non-dental students. The realistic orthodontic treatment needs were confirmed by expert orthodontist. **Methods:** A cross-sectional study was conducted among 255 male students (Dental—75, Medical—93 and Pharmacy—87 students). The questionnaire included 20 items covering dental esthetics self-perception (10 questions), self-confidence and psychological impact (5 questions), and the need for seeking orthodontic treatment (5 questions) on a five-point Likert scale. The realistic orthodontic treatment needs were confirmed by photographs using aesthetic component of IOTN and clinical examination for the participants and analysis of jaw models using Dental aesthetic index (DAI). Kruskal-Wallis ANOVA was used to check the significant difference between groups. **Results:** The overall average esthetic self-perception score for total sample was 3.83. The overall average psychological impact score for the whole sample was 2.67. The total percentage of participants who either agree or strongly agree with the question related to their perception of need for seeking orthodontic treatment was 70%. According to the assessment of orthodontic needs using AC-IOTN, 19.8% required definitive treatment. According to the assessment of orthodontic treatment needs based on DAI, 20.3% and 9.9% needed highly desirable (DAI 31 - 35) and definite need of treatment (DAI \geq 36) respectively. **Conclusion:** It can be concluded that there was no difference between the esthetic perception of dental and non-dental students. The self-perception for seeking orthodontic treatment was over-reported by participants compared to real requirement as assessed by orthodontic specialist. Dental esthetics has no psychological impact on academic perfor-

mance and self-confidence as perceived by study participants.

Keywords

Self-Perception, Orthodontic Treatment Needs, Orthodontist Opinion, Esthetics

1. Introduction

Esthetic facial appearance is a universal desire, which is highly complimented by dental esthetics [1]. Although the esthetic facial appearance is somewhat subjective and varies among different geographic populations, dental esthetics is dependent on the alignment of the teeth, which is definitely categorized into various malocclusions [1] [2]. The pleasing dental and facial esthetics has a psychological influence on social well-being; one's own self-confidence and quality of life [1] [2] [3] [4] [5]. The appearance of anterior teeth highly contributes to the individual's pleasant smile, which influences the decision for seeking corrective dental measures including orthodontic treatment [6]. Age, gender, socioeconomic status, education status, marital status, employment, familial, cultural and ethnic aspects influence the perception of facial and dental esthetics [7] [8]. Several past researchers [9] [10] [11] have assessed the requirements of dental esthetics by general population, and perception of dental students about dental esthetics is assessed globally through surveys. Past studies have shown variations in clinician-defined orthodontic treatment needs and self-perceived orthodontic needs [9]-[15]. The perception of dental esthetics and intended orthodontic treatment needs vary among dental and non-dental students, which will influence their option for seeking orthodontic treatment [9] [10] [11] [15]. The comparison of self-perception of dental esthetics with an expert orthodontist opinion will help determine the realistic orthodontic treatment needs for the population under study [15] [16]. With this background, the present study intends to compare the self-perception of esthetics and wish for seeking orthodontic treatment among dental and non-dental students. The realistic orthodontic treatment needs were confirmed by expert orthodontics opinion.

2. Materials and Methods

Institutional research ethics committee approved the cross-sectional study. The sample population included male students of Taif University belonging to faculty of Dental, Medical and Pharmacy. All the students were provided with the information about the study and invited for voluntary participation in the survey shared through emails and social media contacts. No names and emails were collected in the responses to encourage honest response from the participants. A separate consent of participation was obtained from the participants for facial pictures, jaw models and clinical examination. The study period was from Jan 2022 to April 2022.

The questionnaire included 20 items covering different aspects of their dental esthetics self-perception (10 questions), self-confidence and psychological impact (5 questions), and need for seeking orthodontic treatment (5 questions) on a five point Likert scale. The Items in the questionnaire is summarized in (**Table 1**). The reliability of the questionnaire was assessed using Cronbach's Alpha for all the questions by testing on 15 participants. The correlation coefficients were high and ranged from 0.83 to 0.91.

A total of 255 students responded to the survey, which included 75 dental, 87 pharmacy and 93 medical students. Among the participants of the survey, 60 dental students, 54 pharmacy and 58 medical students consented for facial pictures, jaw models and clinical examination.

The facial pictures included a frontal smile photo of anterior dentition with sufficient anterior teeth display, right and left profile photo. The photographs and clinical upper and lower jaw models were taken by a dentist who was not involved in assessment of orthodontic treatment needs for the participants. A blinded orthodontic specialist graded the photographs using aesthetic component of IOTN. The score of 1 - 4 considered as no need for treatment; 5 - 7 as borderline; 8 - 10 as definite need for treatment.

A second blinded orthodontic specialist performed clinical examination for the participants and analysis of jaw models using Dental aesthetic index (DAI). Based on DAI assessment a score ≤ 25 considered as no or slight treatment need; 26 - 30 elective treatment; 31 - 35 as treatment highly desirable, and a score greater than 36 as treatment mandatory.

Statistical analysis

Data analysis was undertaken using the Statistical Package for Social Science (version 20.0; IBM). Comparison between the groups for the mean Likert scores of the questionnaire items was performed using the Kruskal-Wallis ANOVA. The percentage distribution of samples according to the categories for AC-IOTN and DAI was tabulated descriptively and comparison between the groups was analyzed using Kruskal-Wallis ANOVA. The confidence interval was set at 95% with the significance level of $p < 0.05$.

3. Results

The total of 255 valid responses from male students of dental, medical and pharmacy were included. The age group of the study participants ranged between 19 - 25 years with a mean age of 22.3-years. The overall average esthetic self-perception score for total sample was 3.83 with corresponding scores of 3.85, 3.81 and 3.83 for dental, medical and pharmacy students respectively with no statistically significance ($p = 0.11$). None of questionnaire item assessing self-perception of esthetics demonstrated statistical significant difference between the groups ($p > 0.05$) (**Table 1**).

The overall average psychological impact score for the whole sample was 2.67 with a score of 2.7, 2.88 and 2.44 respectively for dental, medical and pharmacy

Table 1. Average scores for esthetics self-perception, psychological impact and orthodontic treatment needs.

Questions	Average Likert score			Kruskal-Wallis ANOVA, p value
	Dental (n = 75)	Medical (n = 93)	Pharmacy (n = 87)	
Questions on esthetics self-perception				
1. I like the way my teeth are shaped	3.9	4.1	4.2	0.09
2. My teeth are not too long/short for my face	4.0	4.2	3.9	0.12
3. My teeth are not too wide/narrow for my face	3.9	4.0	3.7	0.13
4. My teeth are not too square/round for my face	3.7	3.8	3.6	0.11
5. I am satisfied with the way my gum look	3.8	3.4	3.2	0.14
6. I show just the right amount of teeth on smiling (not too many or too few teeth)	3.7	4.0	4.1	0.06
7. I show just the right amount of gums on smiling (not too much or too less).	3.5	3.7	3.6	0.12
8. The alignment of my teeth is good without crowding (overlapping)	4.0	3.8	4.0	0.05
9. The color of my teeth/gums is normal and satisfactory	3.9	3.3	3.8	0.06
10. My photograph is better from either side of my face	4.1	3.8	4.2	0.06
Average Esthetics self-perception score	3.85	3.81	3.83	0.11
Questions on Self-confidence and psychological impact				
11. I try to hide my teeth while smiling	2.7	3.1	2.4	0.04
12. I hesitate being photographed	2.9	3.3	2.9	0.07
13. I hesitate to socialize with friends and family	3.1	2.8	2.9	0.05
14. I hesitate to face-to-face communication with teachers/friends/family	2.8	2.7	2.1	0.07
15. My dental and facial esthetics affects my academic performance/self-confidence	2.0	2.5	1.9	0.06
Average psychological impact score	2.7	2.88	2.44	0.09
Questions on self-perception of seeking orthodontic treatment (braces)				
16. When I look at my smile in mirror, I see defects in your teeth or gums?	4.1	4.2	3.8	0.06
17. My friends or family members comment on defects in appearance of my teeth	3.8	3.3	3.7	0.09
18. Someone advised me about my need for orthodontic treatment (Braces)	3.1	3.3	2.9	0.07
19. I need orthodontic treatment (Braces) for improving my dental esthetics	3.8	3.3	3.4	0.08
20. I have consulted a dentist/specialist orthodontist for esthetic opinion	4.1	3.3	3.1	0.04
Average self-perception of seeking orthodontic treatment	3.78	3.48	3.38	0.12

students. There was no statistical significant difference in psychological impact score between groups ($p = 0.09$) (**Table 1**). The question related to trying to hide the smile showed statistically significant difference between the groups with a psychological impact score of 3.1 for medical compared to 2.4 for pharmacy ($p =$

0.04) (**Table 1**). The response to the specific question related to the influence of dental and oral esthetics on academic performance and self-confidence was 2.1 with 81% responding either disagree or strongly disagree.

The average score for self-perception of seeking orthodontic treatment for the total sample was 3.55 with no statistical difference between groups ($p = 0.12$) (**Table 1**). The question regarding consultation with dentist or orthodontic specialist for esthetic purpose was statistically significant with a score of 4.1 for dental students and 3.1 for that of pharmacy students ($p = 0.04$) (**Table 1**). The total percentage of participant either agree or strongly agree for the question related to their perception of need for seeking orthodontic treatment was 70%.

According to the assessment of orthodontic needs using AC-IOTN, 62.2% of total sample were categorized as no treatment needed, 18% were borderline and 19.8% required definitive treatment. There was no statistical difference between the groups ($p > 0.05$) (**Table 2**).

According to the assessment of orthodontic treatment needs based on DAI, the 47.1% of total sample was recognized as requiring no treatment ($DAI \leq 25$). The sample categorized as treatment highly desirable ($DAI 31 - 35$) and definite need of treatment ($DAI \geq 36$) was 20.3% and 9.9% respectively. There was no statistically significant difference between the group ($p > 0.05$) (**Table 3**).

4. Discussion

Self-perception of esthetics is one of the main influencing factor for an individual for seeking orthodontic treatment [9] [10] [11] [15]. The influence of dental esthetics on one's self confidence and its psychological impact has been reported

Table 2. Orthodontic treatment needs assessed using AC-IOTN.

AC-IOTN Criteria	Total sample (n = 172) n (%)	Comparison between the groups			Kruskal-Wallis ANOVA, p value
		Dental (n = 60) n (%)	Medical (n = 58) n (%)	Pharmacy (n = 54) n (%)	
No treatment needed	107 (62.2)	37 (61.7)	41 (70.7)	29 (53.7)	0.06
Borderline	31 (18.0)	12 (20)	8 (13.8)	11 (20.4)	0.07
Definite treatment needed	34 (19.8)	11 (18.3)	9 (15.5)	14 (25.9)	0.06

Table 3. Orthodontic treatment needs assessed using DAI.

DAI Criteria	Total sample (n = 172) n (%)	Comparison between the groups			Kruskal-Wallis ANOVA, p value
		Dental (n = 60) n (%)	Medical (n = 58) n (%)	Pharmacy (n = 54) n (%)	
$DAI \leq 25$ (No or slight treatment)	81 (47.1)	28 (46.7)	29 (50)	24 (44.4)	0.11
$DAI 26 - 30$ (elective treatment)	39 (22.7)	15 (25)	10 (17.2)	14 (25.9)	0.08
$DAI 31 - 35$ (treatment highly desirable)	35 (20.3)	13 (21.7)	12 (20.7)	10 (18.5)	0.07
$DAI \geq 36$ (Definite need of treatment)	17(9.9)	4 (6.7)	7 (12.1)	6 (11.1)	0.06

by past researchers with inconsistent and contrasting findings [1] [2] [3] [4] [5]. The self-perception of orthodontic treatment needs may vary from realistic requirement which should be verified by specialist orthodontist [9]-[15]. To determine the esthetic and functional characteristics of occlusion, orthodontists usually use Dental Esthetic Index (DAI) and Index of Orthodontic Treatment Needs (IOTN) respectively [11]-[16]. The present study intends to compare the self-perception of esthetics and wish for seeking orthodontic treatment among dental and non-dental students. The realistic orthodontic treatment needs were confirmed by expert orthodontics opinion.

The present study result showed no significant difference between average esthetic self-perception score for dental, medical and pharmacy students. The study conducted by Oliveira Meira *et al.* [1] showed significant association between self-perceived orthodontic treatment need and malocclusion diagnosed clinically using DAI.

In the present study there was no significant difference between average psychological impact score for dental, medical and pharmacy students. The dental esthetics has no psychological impact on academic performance and self-confidence as perceived by study participants. However, the question related to trying to hide the smile showed statistically significant difference between the groups with a psychological impact score of 3.1 for medical compared to 2.4 for pharmacy ($p = 0.04$). This may be due to increased self-perception of seeking orthodontic treatment among medical students compared to pharmacy students. The previous authors concluded varying results related to psychological impact of malocclusion on self-confidence and academic performance [17] [18] [19] [20] [21].

In the present study 70% of participants agreed that they need orthodontic treatment for malocclusion. This was much higher compared to the previous studies which have reported self-perceived orthodontic treatment need ranging from 8.8% to 45% [12] [13] [14] [15]. This may be due to the fact that self-perceived need included esthetic component only, compared to complete dental health component assessed by clinicians while recording normative need [15]. In line with the previous studies, [15] [16] the present study showed 19.8% of study participants needed definitive treatment as assessed by using AC-IOTN and 9.9% needed definite treatment as assessed by DAI.

One of the limitations of the present study is that only male students were included as study participants, which prevented a comparison of gender differences in study outcome. The influence of self-perceived aesthetics on academic performance was not verified by comparison with the students' grade point average (GPA). As a future framework for the present study, a longitudinal analysis of the perception of dental aesthetics and orthodontic treatment needs and their influence on the psychological impact is recommended for a better generalization of the results, including proven academic performance of both sexes.

5. Conclusion

Within the limitations of the study, it can be concluded that there was no dif-

ference between the esthetic perception of dental and non-dental students. The self-perception for seeking orthodontic treatment was over-reported by participants compared to real requirement as assessed by orthodontic specialist. Dental esthetics has no psychological impact on academic performance and self-confidence as perceived by study participants. The comparison between the survey results and the orthodontic opinion should be accepted with caution due to the different sample sizes for those who consented to photos and models.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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