



Research Article

PERCEPTION OF MALOCCLUSION IN LAY PERSONS MEASURED BY PSYCHOSOCIAL IMPACT OF DENTAL AESTHETICS QUESTIONNAIRE (PIDAQ)

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ABSTRACT

Aim: The aim of this study was to assess the perception of malocclusion in lay persons as measured by PIDAQ questionnaire.

Methods: Thirty-Three Dental students were asked to complete a modified version of the 'Psychosocial Impact of Dental Aesthetics Questionnaire' (PIDAQ) at the start of their BDS course. A total of four variables including 'Dental Self-confidence', 'Social impact', 'Psychological impact' and 'Perceived orthodontic treatment need' were assessed by a series of statements. The severity of malocclusion was measured by the Index of Orthodontic Treatment Need (IOTN). Gender was also recorded. The data was statistically analyzed using SPSS software.

Results: The total and subscale PIDAQ scores showed no significant differences by gender. Also, IOTN-DHC and IOTN-AC score showed no significant association with gender. No significant association was seen between any PIDAQ subscale and IOTN-DHC grades. IOTN-DHC and IOTN-AC were not a predictive variable of PIDAQ subscales- DSC, SI, PI and AC scores.

Conclusion: Malocclusion has a psychological impact in adults. No significant difference was seen between girls and boys for psychological impact of malocclusion. Both the components of IOTN are not significant predictable variables of PIDAQ scale

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INTRODUCTION

Recently, dental aesthetics and its psychological implications have received growing interest in orthodontic research. Socio-psychological research on impression forming about physically attractive versus nonattractive persons suggests a halo effect, which was originally described as "what is beautiful is good."¹ Generally it is assumed that attractive individuals have a more desirable personality and are more positively related to social success. Society quite often forms specific beliefs about individuals with abnormal dental and facial appearance. It further appears that, in agreement with the research on the general physical attractiveness stereotype, the beholders attribute compromised psychosocial well-being or lower quality of life to targets with visibly aberrant tooth position. It appears likely that these impressions originate from observation or societal cultural standards.¹

Patients have their own perception of likes and dislikes for various malocclusion traits, like crowding, spacing, overjet and openbite. To understand the perception of patient is important for success of Orthodontic treatment.

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Highly variable association exists between self-perception of Orthodontic needs by laypersons and Orthodontist assessment.²

The purpose of most occlusal or orthodontic treatment need indices is to assess the anatomical and esthetic aspects of the malocclusion, ignoring the patient's own perception of it and its effect on his or her quality of life. The first index to consider the patient's own esthetic perception was the Aesthetic Component (AC) of the Index of Orthodontic Treatment Need (IOTN).³ However, its reliability has been questioned by many authors.^{11,14-18} Researchers have used the Visual Analog Scale (VAS) as it is considered a simpler way to ascertain the patient's perception of the esthetics of his or her smile and a quicker method with high reproducibility.³ In recent years increasing interest has been shown in questionnaires which provide more information on the oral health-related quality of life of the patients and their esthetic perception of themselves.

A questionnaire designed to measure specifically orthodontic-related quality of life in adults was developed by Klages and coworkers¹ based on the studies by Cunningham and coworkers. This instrument, termed the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ), comprises four scales which are Dental Self-Confidence, Social Impact,

Psychological Impact, and Aesthetic Concern. The factor structure was confirmed on two independent samples, and the subscales showed good internal consistencies. They were able to discriminate between subjects with varying degrees of examiner-and self-rated dental aesthetics as assessed by means of the IOTN-AC, the Perception of Occlusion Scale and the Dental Aesthetic Index.³

This study endeavors to understand more closely the perception of malocclusion from laypersons point of view.

METHODOLOGY

The participants were a sample of 28 first-year Dental students from Dayananda Sagar College of Dental Sciences, who were approached to participate in the study. A written informed consent for the examination and survey was obtained from the participants of the study. The Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) were completed by the participants at the start of the course. The PIDAQ was originally designed for young adults. Therefore, participants were included only if they were within the ages of 18 to 25 years. It is a 23-item condition-specific oral health related quality of life (OHRQoL) measure encompassing four subscales: DentalSelf-Confidence (DSC), Social Impact (SI), Psychological Impact (PI) and AestheticConcern (AC). The Dental Self-Confidence subscale measures the positive impacts of dental aesthetics on the emotional state of an individual. The Social Impact measures potential problems in social situations due to subjective perception of an unfavorable personal dental appearance. The Psychological Impact domain is composed of items dealing with a feeling of inferiority or unhappiness when an individual compares him or herself with superior dental aesthetics, while the fourth Aesthetic Concern is concerned with disapproval of one's own dental appearance when confronted with a mirror, photographic or video image. Participants were asked to evaluate the items using a five-point Likert scale with numerical values: 0="not at all"; 1="a little"; 2="somewhat"; 3="strongly" and 4="verystrongly". Each subscale score can be calculated separately and is obtained by summing the item scores.

The IOTN was used to determine the severity of malocclusion. This index is composed of 2 parts: the dental health component (DHC) and the aesthetic component (AC). The IOTN-DHC is assessed by the examiner and classified into five grades according to the therapeutic need: grade 1 = none (normal occlusion); grade 2 = little (minor malocclusion); grade 3 = borderline (moderate malocclusion); grade 4 = great (severe malocclusion); and grade 5 = very great (very severe malocclusion). The IOTN-AC is assessed by the patient using 10 photographs that show the degrees of malocclusion ranging from the least severe to the most severe. The patient must identify with one of the photographs. The 10 IOTN-AC grades are combined into three groups: grades 1 - 4, grades 5 - 7, and grades 8 - 10.⁴

Statistical analysis: SPSS software was used for the data analysis. The means were compared by using Student's t-test and chi-squared test was performed for association of IOTN-DHC and IOTN-AC with gender. Stepwise linear regression models were employed to study the linear relationship between the PIDAQ data as the dependent variable and the IOTN components.

RESULTS

By gender, 29% and 71% of the sample were boys and girls, respectively. (table 1)

Table 1 Gender distribution in the sample

Gender	n	%
Male	8	29%
Female	20	71%
Total	28	100%

For males, the mean DSC score was 8.88 (8.8863.52) with a 95% confidence interval= 5.93 to 11.82, mean SI score was 5.63 (5.6363.89) with a 95% confidence interval = 2.37 to 8.88, mean PI score was 7.38 (7.3864.31) with a 95% confidence interval= 3.77 to 10.98, mean AC score was 4.00 (4.0063.34) with a 95% confidence interval= 1.21 to 6.79 respectively. (table 2)

For females, the mean DSC score was 10.20 (10.2064.82) with 95% confidence interval= 7.94 to 12.46, mean SI score 3.95 (3.9565.31) with 95% confidence interval=1.47 to 6.43, mean PI score 5.60 (5.6065.39) with 95% confidence interval= 3.08 to 8.12, mean AC score was 1.55 (1.5562.91) with 95% confidence interval= 0.19 to 2.91 respectively. (table 2)

Table 2 shows the relationships of the PIDAQ with gender. The total and subscale PIDAQ scores showed no significant differences by gender

IOTN-DHC and IOTN-AC score show no significant association with gender and is represented in table 3 and 4.

Table 5 depicts the comparison of PIDAQ subscales with IOTN-DHC grades. No significant association was seen between any PIDAQ subscale and IOTN-DHC grades.

The β coefficient did not show any strong linear association between IOTN-DHC scores and PIDAQ subscales. This indicated that IOTN-DHC was not a predictive variable of PIDAQ subscales- DSC, SI, PI and AC scores. (table 6)

The β coefficient did not show any strong linear association between IOTN-AC scores and PIDAQ subscales. This indicated that IOTN-AC was not a predictive variable of PIDAQ subscales- DSC, SI, PI and AC scores. (table 7)

DISCUSSION

The present study included a randomized and representative sample and a validated questionnaire to measure the psychosocial impact of malocclusion in adults.

Many authors consider it more advisable to analyze the psychosocial impact of dental aesthetics in adults, who are emotionally stable and have a realistic view of dentofacial aesthetics, than in adolescents.^{5,6} Cooper *et al.*⁷ observed that the perception of dental aesthetics changes and even improves with age. Tuominen *et al.*⁸ also concluded that the perceived orthodontic treatment need seems to lessen with age even if the patient does not undergo orthodontic treatment.

Several authors agree that the IOTN-DHC measures the severity of malocclusion,⁹ but the reliability of the IOTN-AC has been questioned.^{10,11}

Table 2 Comparison of different parameters between males and females: (t-test)

Parameter	Gender	Mean	Std Dev	SE of Mean	Mean Difference	t	P-Value	95% CI for Mean	
								Lower Bound	Upper Bound
Dental Self-Confidence Score	Male	8.88	3.52	1.25	-1.325	-0.703	0.488	5.93	11.82
	Female	10.20	4.82	1.08				7.94	12.46
Social Impact Score	Male	5.63	3.89	1.38	1.675	0.807	0.427	2.37	8.88
	Female	3.95	5.31	1.19				1.47	6.43
Psychological Impact	Male	7.38	4.31	1.52	1.775	0.828	0.415	3.77	10.98
	Female	5.60	5.39	1.21				3.08	8.12
Aesthetic Concern	Male	4.00	3.34	1.18	2.450	1.932	0.064	1.21	6.79
	Female	1.55	2.91	0.65				0.19	2.91

Table 3 IOTN-DHC grade association with gender: (Chi-squared test)

IOTN (DHC)	Male		Female		χ^2	P-Value
	n	%	N	%		
Grade 1	2	25%	1	5%	3.968	0.265
Grade 2	4	50%	7	35%		
Grade 3	2	25%	11	55%		
Grade 4	0	0%	1	5%		
Total	8	100%	20	100%		

Table 4 IOTN-AC grade association with gender: (Chi-squared test)

IOTN (AC)	Male		Female		χ^2	P-Value
	n	%	n	%		
Grade 1	2	25%	3	15%	2.787	0.426
Grade 2	1	13%	1	5%		
Grade 3	4	50%	7	35%		
Grade 4	1	13%	9	45%		
Total	8	100%	20	100%		

Table 5 Comparison of different parameters amongst IOTN-DHC grades: (t-test applied as there was only one sample in Grade 4-5)

Parameter	IOTN (DHC) Grade	n	Mean	Std. Deviation	SE of Mean	95% CI for Mean		t	P-Value
						Lower Bound	Upper Bound		
Dental Self-Confidence Score	Grade 1-2	14	9.79	4.63	1.24	7.11	12.46	0.053	0.959
	Grade 3	13	9.69	4.61	1.28	6.91	12.48		
	Grade 4-5	1	12.00	---	---	---	---		
Social Impact Score	Grade 1-2	14	5.43	6.26	1.67	1.81	9.04	1.018	0.318
	Grade 3	13	3.46	3.15	0.87	1.56	5.37		
	Grade 4-5	1	3.00	---	---	---	---		
Psychological Impact	Grade 1-2	14	7.21	6.42	1.72	3.51	10.92	1.040	0.309
	Grade 3	13	5.15	3.24	0.90	3.20	7.11		
	Grade 4-5	1	3.00	---	---	---	---		
Aesthetic Concern	Grade 1-2	14	2.71	3.79	1.01	0.53	4.90	0.690	0.496
	Grade 3	13	1.85	2.58	0.71	0.29	3.40		
	Grade 4-5	1	1.00	---	---	---	---		

Table 6 Predicting IOTN-DHC score using different parameters: (Linear Regression)

Parameter	Constant	β	SE of β	R	P-Value	95% CI for β	
						Lower Bound	Upper Bound
Dental Self-Confidence Score	2.52	-0.01	0.03	0.054	0.784	-0.08	0.06
Social Impact Score	2.56	-0.03	0.03	0.194	0.323	-0.09	0.03
Psychological Impact	2.67	-0.04	0.03	0.267	0.169	-0.10	0.02
Aesthetic Concern	2.51	-0.04	0.05	0.157	0.425	-0.13	0.06

Table 7 Predicting IOTN-AC score using different parameters: (Linear Regression)

Parameter	Constant	β	SE of β	R	P-Value	95% CI for β	
						Lower Bound	Upper Bound
Dental Self-Confidence Score	3.23	-0.03	0.05	0.125	0.526	-0.13	0.07
Social Impact Score	3.22	-0.07	0.04	0.298	0.123	-0.15	0.09
Psychological Impact	3.28	-0.06	0.04	0.273	0.160	-0.14	0.02
Aesthetic Concern	3.14	-0.09	0.06	0.273	0.159	-0.23	0.04

Indeed, many studies have shown that results differ considerably according to whether the treatment need is measured objectively with the IOTN-DHC or subjectively with the IOTN-AC.^{10,12,13} Nevertheless, the present study showed an insignificant linear association between the PIDAQ scores and the grades of both the IOTN components. This indicates that though objectively IOTN-DHC and subjectively IOTN-AC are scales for assessment of malocclusion and aesthetics, in our study they did not relate to the psychological impact of malocclusion on individuals. Hence IOTN-DHC and IOTN-AC cannot be considered as predictable variables of PIDAQ.

Gender, however, did not affect the psychosocial impact of malocclusion in adults. In fact in our study even though no significant difference was found between males and females for readings of various subscales of PIDAQ, females seemed do have less psychological impact of malocclusion than males.

This was contradictory to the study done by De Oliveira and Sheiham¹⁴ who found that the psychosocial impact of malocclusion is significantly greater in women than in men and affects their quality of life. Other studies have also indicated that men tend to be more satisfied with their dental aesthetics.¹⁰ This difference of results in our study could be due to various factors.

It could be due to a more positive and carefree attitude of females which is seen in today's generation. Also, only one participant had an IOTN grading 4-5 indicating that majority of the sample had minor malocclusion traits. The sample had 29% of males and 73% females. The variation in results could be attributed to the above-mentioned factors.

CONCLUSION

Malocclusion has a psychological impact in adults. No significant difference was seen between girls and boys for psychological impact of malocclusion. Both the components of IOTN are not significant predictable variables of PIDAQ scale

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