Do Malocclusions Affect the Individual's Oral Health-Related Quality of Life?

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Purpose: To assess the impact of different types of malocclusions on the quality of life in 18-year-old young male adults.

Materials and Methods: A cross-sectional survey with a randomly selected sample of 414 young male adults who applied for military service in the city of Florianópolis in 2003 was carried out. Data on malocclusions were obtained through the dental aesthetic index variables. The impact of the oral health conditions on the quality of life was assessed, using the Oral Impact on Daily Performance index. Chi-squared tests were performed and the malocclusions statistically associated with the impact were included in models of unconditional multiple logistic regression.

Results: The incisal crowding [OR 2.6 (95%CI 1.4–4.8)] (p = 0.002) and the anterior maxillary irregularity greater than 2 mm [OR 2.5 (95%CI 1.3–4.7)] (p = 0.006) had an impact on 'smiling, laughing and showing teeth without embarrassment'. An overjet measure greater than 5 mm [OR 3.7 (95%CI 1.2–11.2)] (p = 0.021) had an impact on 'maintaining emotional state without being irritable'. The molar relationship did not have an impact.

Conclusions: Some types of malocclusions have an impact on quality of life, especially in terms of satisfaction with appearance.

Key words: epidemiology, impact, malocclusions, self-perception, young adults

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The facial features most commonly associated with physical attractiveness are the eyes and the mouth (Baldwin, 1980). The appearance and the position of teeth are factors that may cause negative psychological and social impact on children and young adults, since the appearance of the face plays an important psychosocial role in human life and relationships (Vallittu et al, 1996).

Recently, several indicators have been proposed to measure the impacts of oral health conditions on people's quality of life, including dissatisfaction with appearance, the called socio-dental indicators (Slade, 1997). Such indicators should include several daily actions that may be affected, such as talking, smiling, sleeping, keeping emotional status regular, and social relationships, among others.

The World Health Organization (WHO) defines quality of life as the perception the individual has of his or her life in the context of the culture and values in which they live and in relation to their objectives and expectancies. This involves a wide concept influenced by physical health, psychological status, degree of independence, social relationships, personal beliefs and relationships with the environment (World Health Organization, 1997a).

However, the impact of malocclusions on the quality of life of individuals is not yet clear. Some authors argue that individuals with severe malocclusions suf-

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fer from social bias besides showing problems with chewing and phonation, which are reasons for seeking orthodontic treatment (Proffit et al, 1998). A study performed in Brazil showed that the presence of incisal crowding and an increased overjet measure were risk factors for dissatisfaction with appearance (Peres et al, 2002).

The objective of this study was to assess the impact of the different types of malocclusions on the quality of life and the aspects of daily life affected in 18-year-old young male adults.

MATERIALS AND METHODS

This study was undertaken in the city of Florianópolis, capital of the state of Santa Catarina, Southern Brazil, which had a population of 341,781 in the year 2000 (Instituto Brasileiro de Geografia e Estatística, 2001).

A cross-sectional study was carried out. The reference population was the 3735 18-year-old males who comprised the applicants' list for military service in the city in the year 2003. Military service is compulsory by law for all Brazilian 18 year-old males. Previous contacts with the military authority were made in order to obtain the required authorisation. Furthermore, the project was approved by the Committee for Ethics in Research with Human Beings of the Federal University of Santa Catarina, Brazil.

The sample size was calculated according to the following parameters: prevalence of the investigated outcome – impact of oral health on the quality of life in individuals exposed to malocclusions, estimated at 35% (Cortes et al, 2002) and 20% in the non-exposed individuals. A test power of 90% (β = 10%) and a confidence level of 95% (α = 0.05) were adopted. The minimum required sample size was 394 individuals. This number was increased by 5% in order to compensate for eventual refusals, resulting in a total of 414 individuals. This sample size was sufficient in order to assess the prevalence of each type of malocclusion, considering that for an unknown prevalence (p = 50%), a confidence level of 95% (α = 0.05) and a sampling error of 5% (e = 0.05), a sample size of 394 individuals would be obtained.

Dental clinical examinations and interviews were performed on the 25 days of September 2003 on which the general health examinations of the applicants took place. The applicants were randomly selected on the 25 days.

The malocclusion data were assessed through the Dental Aesthetic Index (DAI) variables proposed by the WHO (World Health Organization, 1997b). Data regarding dental caries, treatment needs and traumatic dental injuries were also surveyed and used as control variables. For dental caries and treatment needs, WHO (World Health Organization, 1997b) criteria were used, and for the traumatic dental injuries, the criteria were those used in the United Kingdom Children's Dental Health Survey (O'Brien, 1994).

The work team comprised three examiners and the examinations were performed in an Army sickroom, with the applicant lying down, and under the room's own artificial light. Oral clinical mirrors, CPI-type millimetric probes, wooden spatulas as well as sufficient sterilised gauze for each workday were used. All bio-security standards were rigorously followed.

Non-clinical data were obtained through a questionnaire applied as a structured interview regarding the impact of oral health conditions on the quality of life. The studied outcome, through the Oral Impacts on Daily Performance (OIDP) (Adulyanon and Sheiham, 1997), was classified in the following way. The first category consisted of applicants who did not report an impact of oral health on the nine dimensions of the indicator: eating and enjoying food, speaking and pronouncing clearly, cleaning the mouth, smiling, laughing and showing teeth without embarrassment, maintaining emotional state without being irritable, performing common tasks, contact with people, playing sports and sleeping. The second category consisted of applicants who did report suffering from an oral health impact on any indicator dimension, regardless of its frequency or severity.

The socio-economic conditions were also surveyed: the family income was assessed in Reais (Brazilian currency) earned in the month preceding the study, divided by the number of people actually living in the house, thus obtaining the per capita income, dichotomised in the median. Also, the educational level of the recruits and their parents was measured in terms of the number of school years completed. For those variables, two categories were established: up to 8 years of schooling and more than 8 years of schooling. The self-evaluation of general health conditions (good, average and poor health) was also surveyed; access to dental services (having or not having attended a dental service in the last 12 months); the type of dental service used (private, public, covenant or at a university); having suffered from dental pain in the 12 months preceding the study (yes or no) and having previously used dental braces (yes or no).

Previously, examiner calibration exercises were performed with 41 18–19-year-old army recruits, according to methodology described elsewhere (Peres et al, 2001). During the calibration exercises, the question-

naire pre-test was performed with the purpose of verifying its applicability. A pilot study was performed with 40 recruits with the purpose of testing the examination methodology and the management aspects.

In order to obtain the degree of intra-examiner diagnostic reliability during the fieldwork, 10% of the total sample was examined twice and the Kappa statistic test was used for each clinical situation. For the statistical analysis, the calculation of the frequency distribution and the chi-squared association tests (χ^2) were performed. The malocclusions proving to be statistically associated with the impact were included in models of unconditional multiple logistic regression (Hosmer and Lemeshow, 1989) with the purpose of investigating in which dimensions of the OIDP the impact was present. A significance level of $p < 0.05$ was established. Control variables for the occurrence of dental caries, the treatment need due to dental caries and traumatic dental injuries were considered because such conditions may affect dental aesthetics and have an impact on the quality of life of recruits.

RESULTS

Of the 414 recruits who comprised the sample, 396 were examined and interviewed, providing a response rate of 95.6%. For the intra-examiner reliability, the results of the repeat examinations showed that the lowest value for the kappa test was 0.7, for the clinical measurement of overjet. For the inter-examiner reliability, the lowest value for the kappa was 0.65, also for the measurement of overjet.

With regard to the prevalence of malocclusions assessed through the DAI variables, it was observed that the highest value was for molar relationship in mesio or distal occlusion (57.3%, 95%CI 52.5–62.1) (Table 1). The prevalence of applicants who reported an impact of the oral health condition measured by the OIDP was 36.4% (95%CI 28.6–44.2).

Results of the chi-squared association tests (χ^2) showed that incisal crowding ($p = 0.001$), an anterior maxillary irregularity of 2 mm or more ($p = 0.004$), a molar relationship in mesio or distal occlusion ($p = 0.003$), an overjet measure of 5 mm or more ($p = 0.006$), the presence of dental caries ($p < 0.001$) and a treatment need due to dental caries ($p < 0.001$) were statistically associated with an impact on the quality of life in at least one dimension of the OIDP (Table 1).

The malocclusions found to be associated with an impact (through the chi-squared test $p < 0.20$) were included in models of multiple logistic regression with the purpose of investigating in which dimension of the OIDP the impact was present. The models were controlled through socio-economic variables, the presence of dental caries and treatment need and through the traumatic dental injury and dental pain report in the last 12 months, since such factors were considered possible confounding variables. The results showed that in models for the incisal crowding and anterior maxillary irregularity greater than 2 mm, the only OIDP dimension on which an impact was exhibited was 'smiling, laughing and showing teeth without embarrassment'. Thus, individuals with incisal crowding in at least one segment were 2.6 times [OR 2.6 (95%CI 1.4–4.8)] more likely to report some impact on 'smiling, laughing and showing teeth without embarrassment' when compared with recruits who did not show crowding ($p = 0.002$), regardless of the other variables studied (Table 2).

Also, individuals who presented an anterior maxillary irregularity greater than 2 mm were 2.5 times [OR 2.5 (95%CI 1.3–4.7)] more likely to report some impact on 'smiling, laughing and showing teeth without embarrassment' when compared with recruits who did not show such an anterior maxillary irregularity ($p = 0.006$) (Table 3), independent of other studied variables.

For the variable overjet measure, an impact was observed on the dimension 'maintaining the emotional state without being irritable', in other words, not becoming upset because of the teeth. The applicants who exhibited an overjet measure of 5 mm or more were 3.7 times [OR 3.7 (95%CI 1.2-11.2)] more likely to report an impact on 'maintaining the emotional state without being irritable' when compared with recruits who did not show such an overjet ($p = 0.021$) (Table 4).

For the variable molar relationship, the OIDP performances included in the model of logistic regression showed no statistically significant association with impact after adjustment (Table 5).

DISCUSSION

Quality of life indicators may be relevant in dentistry for several reasons. Among the most relevant are the importance of the facial appearance in the self-image and self-regard, the occurrence of intense episodes of dental treatment, the impact of oral health conditions on the physical and psychological welfare and the aversion to dental treatment shown by many people (Sheiham, 2001). The oral health status may affect individuals both physically and psychologically, influencing how people live their lives, how they look at each oth-

Table 1 Association between clinical variables and impact on quality of life, according to OIDP (Florianópolis, SC, Brazil, 2003).

	Impact		p*	Total	CI95%
	Yes n (%)	No n (%)		n (%)	
Number of missing incisors, canines and premolars			0.831		
None	129 (89.6)	224 (88.9)		353 (89.1)	
≥ 1	15 (10.4)	28 (11.1)		43 (10.9)	7.8–14.0
Incisal crowding			0.001		
≤ 1 mm	59 (41.0)	147 (58.3)		206 (52.0)	
2 mm or more	85 (59.0)	105 (41.7)		190 (48.0)	38.4–57.6
Incisal spacing			0.255		
No	109 (75.7)	203 (80.6)		312 (78.8)	
Yes	35 (24.3)	49 (19.4)		84 (21.2)	17.3–25.1
Anterior maxillary irregularity			0.004		
≤ 1 mm	108 (75.0)	218 (86.5)		326 (82.3)	
2 mm or more	36 (25.0)	34 (13.5)		70 (17.7)	14.0–21.4
Anterior mandibular irregularity			0.103		
≤ 1 mm	111 (77.1)	211 (83.7)		322 (81.3)	
2 mm or more	33 (22.9)	41 (16.3)		74 (18.7)	14.9-22.5
Mandibular protrusion			0.330		
No	120 (83.3)	219 (86.9)		339 (85.5)	
Yes	24 (16.7)	33 (13.1)		57 (14.5)	11.1-17.9
Anterior openbite			0.072		
No	108 (75.0)	208 (82.5)		316 (79.8)	
Yes	36 (25.0)	44 (17.5)		80 (20.2)	16.3-24.1
Molar relationship			0.003		
Normal	47 (32.6)	121 (48.0)		168 (42.7)	
Mesio or distal occlusion	97 (67.4)	131 (52.0)		228 (57.3)	52.5-62.1
Diastema			0.283		
≤ 1 mm	132 (91.7)	238 (94.4)		360 (93.3)	
2 mm or more	12 (8.3)	14 (5.6)		26 (6.7)	4.3–9.1
Overjet measure			0.006		
≤ 4 mm	132 (91.7)	246 (97.6)		376 (95.4)	
5 mm or more	12 (8.3)	6 (2.4)		18 (4.6)	2.6–6.6
Dental caries			<0.001		
No	24 (16.7)	111 (44.0)		135 (34.1)	
Yes	120 (83.3)	141 (56.0)		261 (65.9)	61.2–70.6
Treatment need due to dental caries			<0.001		
No	49 (34.0)	186 (73.8)		235 (59.3)	
Yes	95 (66.0)	66 (26.2)		161 (40.7)	35.9–45.5
Traumatic dental injury			0.121		
No	107 (74.3)	204 (81.0)		311 (78.5)	
Yes	37 (25.7)	48 (19.0)		85 (21.5)	17.5–25.5

* Chi-squared test.

Table 2 Results of the sample and multiple logistic regression analysis between incisal crowding and OIDP performances (Florianópolis, SC, Brazil, 2003).

OIDP performances	With crowding n (%)	Without crowding n (%)	OR_{crude} (95%CI)	$OR_{adjusted*}$ (95%CI)
Eating and enjoying food				
OIDP = 0	156 (82.1)	180 (87.4)	1.0	1.0
OIDP > 0	34 (17.9)	26 (12.6)	1.5 (0.9–1.6)	1.4 (0.8–2.5)
p			0.145	0.324
Speaking and pronouncing clearly				
OIDP = 0	185 (97.4)	200 (97.1)	1.0	1.0
OIDP > 0	5 (2.6)	6 (2.9)	0.9 (0.3–3.0)	0.7 (0.2–2.3)
p			0.865	0.517
Cleaning the mouth				
OIDP = 0	171 (90.0)	188 (91.3)	1.0	1.0
OIDP > 0	19 (10.0)	18 (8.7)	1.2 (0.6–2.3)	1.0 (0.5–2.0)
p			0.667	0.954
Smiling, laughing and showing the teeth without embarrassment				
OIDP = 0	143 (75.3)	183 (88.8)	1.0	1.0
OIDP > 0	47 (24.7)	23 (11.2)	2.6 (1.5–4.5)	2.6 (1.4–4.8)
p			<0.001	0.002
Maintaining emotional state without being irritable				
OIDP = 0	157 (82.6)	183 (88.8)	1.0	1.0
OIDP > 0	33 (17.4)	23 (11.2)	1.7 (0.9–3.0)	1.3 (0.7–2.3)
p			0.079	0.480
Performing common tasks				
OIDP = 0	182 (95.8)	202 (98.1)	1.0	1.0
OIDP > 0	8 (4.2)	4 (1.9)	2.2 (0.7–7.5)	1.8 (0.5–6.5)
p			0.199	0.407
Contact with people				
OIDP = 0	181 (95.3)	201 (97.6)	1.0	1.0
OIDP > 0	9 (4.7)	5 (2.4)	2.0 (0.7–6.1)	1.5 (0.5–4.7)
p			0.222	0.500
Playing sports				
OIDP = 0	186 (97.9)	203 (98.5)	1.0	1.0
OIDP > 0	4 (2.1)	3 (1.5)	1.5 (0.3–6.6)	1.1 (0.2–5.2)
p			0.626	0.940
Sleeping				
OIDP = 0	178 (93.7)	189 (91.7)	1.0	1.0
OIDP > 0	12 (6.3)	17 (8.3)	0.8 (0.3–1.6)	0.6 (0.3–1.3)
p			0.461	0.113

* Adjusted for the applicants' educational level ($p < 0.001$), per capita income ($p < 0.001$), dental caries ($p < 0.001$), treatment needs due to dental caries ($p < 0.001$), traumatic dental injuries ($p = 0.121$) and dental pain report in the last 12 months ($p < 0.001$).

Table 3 Results of the simple and multiple logistic regression analysis between anterior maxillary irregularity and OIDP performances (Florianópolis, SC, Brazil, 2003).

Performances	With anterior maxillary irregularity n (%)	Without anterior maxillary irregularity n (%)	OR_{crude} (95%CI)	$OR_{adjusted}$* (95%CI)
Eating and enjoying food				
OIDP = 0	59 (84.3)	277 (85.0)	1.0	1.0
OIDP > 0	11 (15.7)	49 (15.0)	1.1 (0.5–2.1)	0.9 (0.5–2.0)
p			0.885	0.545
Speaking and pronouncing clearly				
OIDP = 0	67 (95.7)	318 (97.5)	1.0	1.0
OIDP > 0	3 (4.3)	8 (2.5)	1.8 (0.5–6.9)	1.5 (0.4–5.9)
p			0.404	0.541
Cleaning the mouth				
OIDP = 0	61 (87.1)	298 (91.4)	1.0	1.0
OIDP > 0	9 (12.9)	28 (8.6)	1.6 (0.7–3.5)	1.4 (0.6–3.1)
p			0.269	0.553
Smiling, laughing and showing the teeth without embarrassment				
OIDP = 0	48 (68.6)	278 (85.3)	1.0	1.0
OIDP > 0	22 (31.4)	48 (14.7)	2.7 (1.5–4.8)	2.5 (1.3–4.7)
p			0.001	0.006
Maintaining emotional state without being irritable				
OIDP = 0	58 (82.9)	282 (86.5)	1.0	1.0
OIDP > 0	12 (17.1)	44 (13.5)	1.3 (0.7–2.7)	1.0 (0.5–2.1)
p			0.428	0.940
Performing common tasks				
OIDP = 0	67 (95.7)	317 (97.2)	1.0	1.0
OIDP > 0	3 (4.3)	9 (2.8)	1.6 (0.4–6.0)	1.4 (0.4–5.9)
p			0.503	0.760
Contact with people				
OIDP = 0	66 (94.3)	316 (96.9)	1.0	1.0
OIDP > 0	4 (5.7)	10 (3.1)	1.9 (0.6–6.3)	1.5 (0.5–5.2)
p			0.284	0.548
Playing sports				
OIDP = 0	69 (98.6)	320 (98.2)	1.0	1.0
OIDP > 0	1 (1.4)	6 (1.8)	0.8 (0.1–6.5)	0.6 (0.1–5.6)
p			0.813	0.590
Sleeping				
OIDP = 0	67 (95.7)	300 (92.0)	1.0	1.0
OIDP > 0	3 (4.3)	26 (8.0)	0.5 (0.2–1.8)	0.4 (0.1–1.0)
p			0.290	0.051

* Adjusted for the applicants' educational level ($p < 0.001$), per capita income ($p < 0.001$), dental caries ($p < 0.001$), treatment needs due to dental caries ($p < 0.001$), traumatic dental injuries ($p = 0.121$) and dental pain report in the last 12 months ($p < 0.001$).

er, how they talk, chew, taste food, and socialise, and this in turn affects self-image, self-regard and the feeling of social welfare (Sheiham, 2001).

The OIDP indicator used in this study is based on the evaluation of the impact of the oral health condition in three major dimensions: pain and discomfort, functional limitation and dissatisfaction with appearance. The results of this study showed that the most affected OIDP dimension was the dissatisfaction with appearance, as seen through the impact of incisal crowding and an anterior maxillary irregularity above 2 mm on the dimension 'smiling, laughing and showing teeth

Table 4 Results of the simple and multiple logistic regression analysis between overjet measure and OIDP performances (Florianópolis, SC, Brazil, 2003).

Performances	Overjet 5 mm or more n (%)	Overjet ≤ 4 mm n (%)	OR_{crude} (95%CI)	$OR_{adjusted*}$ (95%CI)
Eating and enjoying food				
OIDP = 0	11 (61.1)	325 (86.0)	1.0	1.0
OIDP > 0	7 (38.9)	53 (14.0)	3.9 (1.4–10.5)	3.0 (1.0–8.8)
p			0.007	0.046
Speaking and pronouncing clearly				
OIDP = 0	16 (88.9)	369 (97.6)	1.0	1.0
OIDP > 0	2 (11.1)	9 (2.4)	5.1 (1.0–25.7)	4.0 (0.7–21.7)
p			0.047	0.111
Cleaning the mouth				
OIDP = 0	14 (77.8)	345 (91.3)	1.0	1.0
OIDP > 0	4 (22.2)	33 (8.7)	3.0 (0.9–9.6)	2.1 (0.6–7.4)
p			0.060	0.227
Smiling, laughing and showing the teeth without embarrassment				
OIDP = 0	11 (61.1)	315 (83.3)	1.0	1.0
OIDP > 0	7 (38.9)	63 (16.7)	3.2 (1.2–8.5)	2.8 (0.9–8.2)
p			0.021	0.060
Maintaining emotional state without being irritable				
OIDP = 0	11 (61.1)	329 (87.0)	1.0	1.0
OIDP > 0	7 (38.9)	49 (13.0)	4.3 (1.6–11.5)	3.7 (1.2–11.2)
p			0.004	0.021
Performing common tasks				
OIDP = 0	17 (94.4)	367 (97.1)	1.0	1.0
OIDP > 0	1 (5.6)	11 (2.9)	2.0 (0.2–16.1)	1.0 (0.1–9.9)
p			0.530	0.972
Contact with people				
OIDP = 0	17 (94.4)	365 (96.6)	1.0	1.0
OIDP > 0	1 (5.6)	13 (3.4)	1.7 (0.2–13.4)	1.1 (0.1–9.5)
p			0.638	0.937
Playing sports				
OIDP = 0	18 (100)	371 (98.1)	-	-
OIDP > 0	-	7 (1.9)	-	-
p				
Sleeping				
OIDP = 0	15 (83.3)	352 (93.1)	1.0	1.0
OIDP > 0	3 (16.7)	26 (6.9)	2.7 (0.7–9.9)	2.3 (0.6–9.4)
p			0.134	0.467

* Adjusted for the applicants' educational level ($p < 0.001$), per capita income ($p < 0.001$), dental caries ($p < 0.001$), treatment needs due to dental caries ($p < 0.001$), traumatic dental injuries ($p = 0.121$) and dental pain report in the last 12 months ($p < 0.001$).

Table 5 Results of the simple and multiple logistic regression analysis between molar relationship and OIDP performances (Florianópolis, SC, 2003).

Performances	Mesio or distal occlusion n (%)	Normal molar relation n (%)	OR_{crude} (95%CI)	$OR_{adjusted}$ (95%CI)
Eating and enjoying food				
OIDP = 0	184 (80.7)	152 (90.5)	1.0	1.0
OIDP > 0	44 (19.3)	16 (9.5)	2.3 (1.2–4.2)	0.6 (0.3–1.1)
p			0.009	0.077
Speaking and pronouncing clearly				
OIDP = 0	221 (96.9)	164 (97.6)	1.0	1.0
OIDP > 0	7 (3.1)	4 (2.4)	1.3 (0.4–4.5)	0.9 (0.3–3.5)
p			0.681	0.967
Cleaning the mouth				
OIDP = 0	204 (89.5)	155 (92.3)	1.0	1.0
OIDP > 0	24 (10.5)	13 (7.7)	1.4 (0.7–2.8)	0.8 (0.4–1.7)
p			0.348	0.621
Smiling, laughing and showing the teeth without embarrassment				
OIDP = 0	179 (78.5)	147 (87.5)	1.0	1.0
OIDP > 0	49 (21.5)	21 (12.5)	1.9 (1.1–3.3)	0.7 (0.4–1.2)
p			0.022	0.192
Maintaining emotional state without being irritable				
OIDP = 0	193 (84.6)	147 (87.5)	1.0	1.0
OIDP > 0	35 (15.6)	21 (12.5)	1.3 (0.7–2.3)	1.1 (0.6–2.2)
p			0.422	0.812
Performing common tasks				
OIDP = 0	219 (96.1)	165 (98.2)	1.0	1.0
OIDP > 0	9 (3.9)	3 (1.8)	2.3 (0.6–8.5)	1.5 (0.4–6.0)
p			0.228	0.668
Contact with people				
OIDP = 0	221 (96.9)	16 (95.8)	1.0	1.0
OIDP > 0	7 (3.1)	7 (4.2)	0.7 (0.3–2.1)	0.5 (0.2–1.6)
p			0.561	0.238
Playing sports				
OIDP = 0	224 (98.2)	165 (98.2)	1.0	1.0
OIDP > 0	4 (1.8)	3 (1.8)	1.0 (0.2–4.4)	0.7 (0.1–3.3)
p			0.981	0.538
Sleeping				
OIDP = 0	208 (91.2)	159 (94.6)	1.0	1.0
OIDP > 0	20 (8.8)	9 (5.4)	1.7 (0.8–3.8)	1.2 (0.5–2.7)
p			0.202	0.902

* Adjusted for the applicants' educational level (p<0.001), per capita income (p<0.001), dental caries (p<0.001), treatment needs due to dental caries (p<0.001), traumatic dental injuries (p=0.121) and dental pain report in the last 12 months (p<0.001).

without embarrassment'. In addition, if we consider that the difficulty in 'maintaining the emotional state without being irritable' may be due to the dissatisfaction with appearance caused by a wide overjet measure, the impact herein could be attributed to the dimension 'dissatisfaction with appearance'. This malocclusion also impacted upon the dimension 'eating and enjoying food'; however, this was at the limit of statistical significance (p = 0.046), probably due to difficulties in biting food in the anterior region.

The dentofacial aesthetics may be assessed in different ways in different populations, depending on the

cultural traditions and the current social standards. As the cultural standards regarding dental positioning may vary between countries, the degree of attractiveness and the treatment need probably would change as well. However, people with an attractive facial appearance are considered to be socially more qualified, more attractive to friends and partners and more successful professionally (Kerusuo et al, 1995). A study showed that among Finnish students, the presence of incisal crowding or incisal diastema represented a social disadvantage, if compared to the normal positioning of incisors. Individuals with the former were regarded as less intelligent, less attractive and less sexually desirable, being classified as belonging to the lowest social classes, if compared to individuals with normal occlusion (Kerosuo et al, 1995). This argument is consistent with results found in this study, since the facial features, especially the dental aesthetics and the smile, possibly have great potential to influence the physical attractiveness of individuals, especially at the age of the subjects involved here, which represents a moment of intense social interaction and affective and sexual involvement.

The reason for the molar relationship DAI variable not establishing an impact on the OIDP dimensions may also be related to aesthetics, since it concerns a problem more related to function. Studies show that the dissatisfaction with appearance is more easily detected than the dissatisfaction with functional aspects (Cortes et al, 2002; Peres et al, 2002).

When planning new oral health initiatives, public health services should include malocclusions, since these are of high prevalence and have an impact on the quality of life. Incisal crowding, an anterior maxillary irregularity and increased overjet deserve special attention due to their great potential for causing social embarrassment and a possible decrease in the self-regard of individuals due to dissatisfaction with appearance. This becomes especially relevant among adolescents and young adults, in whom physical attractiveness plays an important role in social and affective relationships.

Thus, the definition of orthodontic treatment need and the establishment of priorities should include subjective measurements such as the self-perception of the impact generated by the malocclusion. The use of clinical diagnosis alone may overestimate such need, since there are some malocclusions acceptable to individuals. Furthermore, public policies should stimulate the prevention of dental caries as a way of avoiding the precocious loss of deciduous teeth, an important aetiological factor for malocclusions in permanent dentition. Furthermore, the promotion of the consumption of healthy food for chewing, such as harder and more fibrous food, the exclusive adoption of breast-feeding during the first months of life, the detection of risk factors and the precocious treatment of oral breathing are important aspects to be included in health promotion programmes with the purpose of reducing the prevalence and the impact of malocclusions.

It is very important to consider the limitations of this study. Its cross-sectional nature could be considered one of them, as the perception of self-image can change over time. Considering this possibility, a longitudinal study would be more appropriate. Another important limitation is the sample, which was restricted to males aged 18 years. So the results of this study cannot be generalised, and are limited to this particular sector of the population.

Further studies are required for the investigation of the psychosocial effects of malocclusions, including variables regarding age, socio-economic condition, self-regard and relationships, since the impact generated by the malocclusions may be influenced by a combination of such factors.

It can be concluded that the results of this study are consistent with the hypothesis that malocclusions generate an impact on the quality of life of 18-year-old male individuals. However, some malocclusions such as incisal crowding, an anterior maxillary irregularity and increased overjet measure have greater potential for impact, especially on the dissatisfaction with appearance.

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