



ORIGINAL ARTICLE

Impact of Orthognathic Correction of Class II Malocclusion on the Perception of Social Characteristics

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ABSTRACT

Objective: To evaluate the influence on the perception of social characteristics after orthognathic treatment for the correction of Class II malocclusion.

Methods: A cross-sectional study was conducted with the participation of 240 observers who evaluated images of individuals before and after orthognathic surgery for the correction of malocclusion. Based on the images, two different questionnaires were applied containing 44 questions each for evaluating social competence, intellectual ability, psychological adjustment, and attractiveness. The mean scores for evaluations of the images were compared using the Mann-Whitney U test at 5% level of significance ($\alpha=0.05$).

Results: Orthognathic treatment significantly ($p<0.05$) improved the evaluation of individuals in the requisites of the score attributed to the image ($p=0.008$), extroversion ($p=0.026$), happiness ($p=0.006$), self-confidence ($p=0.046$), and attractiveness ($p=0.015$).

Conclusion: Orthognathic treatment for the correction of Class II malocclusions has a positive effect on the perception of social characteristics of individuals. The individuals subjected to orthognathic surgery were evaluated as being more attractive, intelligent, socially competent, and psychologically adjusted.

Keywords: Orthognathic surgery, social perception, orthodontics, malocclusion

INTRODUCTION

The face is considered one of the main constituents of the body that leads to physical attractiveness; particularly, the mouth, smile, and eyes have been specifically identified as key components (1-4). Recent researches have demonstrated that malocclusions affect the appearance of individuals and may result in social disadvantages (5).

Over the last few years, there has been an enormous demand for orthodontic-surgical treatment seeking to correct the most varied types of skeletal malocclusions (6). The increasing demand for this treatment modality is related to both the quest for dental and facial harmony (7). Importantly, orthognathic surgery is a well-established treatment modality for individuals with skeletal discrepancies that exceed the limit of conventional orthodontic treatment. Patients who have undergone orthognathic treatment may experience psychosocial benefits and improve their self-confidence, facial and body image, and social adjustment (8).

Researchers have demonstrated that patients with dentofacial deformities, irrespective of their severity, are frequent victims of ridicule, provocation, and center of jokes, which renders improvement in esthetic appearance the main motivation for patients to seek orthodontic surgery (5,9).

The social impact of orthodontic-surgical correction of Class II malocclusion has been described in the literature; however, data on the treatment of Class II malocclusion are scarce (10,11). From this perspective, the authors in this study aimed to evaluate the influence on the perception of the social characteristics, such as social compe-

tence, intellectual ability, psychological adjustment, and attractiveness, after orthognathic treatment for the correction of Class II malocclusion.

METHODS

A cross-sectional study was conducted with 240 individuals, of whom 120 were men and 120 were women from three different age groups: 15-19 years, 35-44 years, and 65-74 years. Participants were prepared to evaluate images of individuals before and after orthognathic surgery for correction of Class II malocclusion. Evaluators who presented visual disturbances that would hamper their evaluation of the images were excluded.

The sample size was initially calculated using nQueryAdviser (Version Statistics 6.01 Solution; York, Ireland) to attain a power of 80% with a 5% ($\alpha=0.05$) level of significance. The sample size calculation showed that 40 individuals of each sex and age would be necessary.

Before the data collection, a favorable report (No. 405.925) was obtained from the research ethics committee. All the participants who answered the questionnaires signed Free and Informed Term of Consent.

To conduct this study, extra-oral photographs were used, captured from the front and right profile views of four female patients who presented mandibular deficiency in the antero-posterior direction and were subjected to mandibular advancement surgery and individuals who served as positive (without skeletal malocclusion) and negative (with mandibular deficiency) controls. The control images were used to verify the reliability of the evaluators' responses to two questionnaires.

Based on the images, two different questionnaires were created (1 and 2). Each questionnaire contained the images of all the patients, each questionnaire included images of all patients with malocclusion and those with malocclusion after treatment. When a patient was included in one questionnaire without the correction of skeletal malocclusion, she was included in the other questionnaire after the occlusion had been treated by mandibular advancement. The control images were included in each questionnaire without alteration, serving as a parameter for evaluating whether there was agreement among evaluators.

The questionnaires were randomly distributed among the evaluators, and each individual could receive questionnaire 1 or 2. Upon receiving the questionnaires, the evaluators were instructed regarding how to complete the form and informed about the age and the sex.

The images in questionnaires 1 and 2 were accompanied by 11 questions:

01. What score would you give these images?
02. This person works for a large bank. How popular do you think this person is with his/her colleagues? (Please circle/check only one answer)
03. How friendly does this person seem to be to you? (Please circle/check only one answer)

04. Do you think this person has a good social life? (Please circle/check only one answer)
05. How successful do you think this person was at school? (Please circle/check only one answer)
06. How intelligent does this person seem to be to you? (Please circle/check only one answer)
07. Do you think this person went to university? (Please circle/check only one answer)
08. Do you think this person is extroverted or introverted? (Please circle/check only one answer)
09. Does this person seem to be a happy person? (Please circle/check only one answer)
10. How self-confident does this person seem to be to you? (Please circle/check only one answer)
11. How would you classify this person? (Please circle/check only one answer)

Each question was followed by a visual analog scale, ranging from 0 to 100 mm, on which the evaluator had to mark the position that represented his/her response. Each image was accompanied by 11 questions; thus, a total of 44 questions had to be answered.

Statistical Analysis

The mean scores for evaluations of the photographs were compared using the Mann-Whitney U test. The level of significance adopted was 5% ($\alpha=0.05$). The data were tabulated and analyzed using the software program IBM Statistical Package for Social Sciences (SPSS) for Windows version 21.0 (IBM Corp.; Armonk, NY, USA).

RESULTS

Table 1 shows the distribution of the study participants according to the research group and demographic data.

The image of individual A used as negative control was evaluated in a similar manner, in both write researches, with regard to judgment of sociability, success at school, intelligence, extroversion, happiness, self-confidence, and attractiveness. However, there were significant differences in the evaluation per score, popularity, friendliness, and access to university, with the participants in Research 1 attributing higher scores to these characteristics. With respect to the image of individual B used as positive control it was evaluated differently only with regard to self-confidence and attractiveness, with the participants of Research 1 also attributing the highest scores to these characteristics (Figure 1, 2).

Table 1. Description of evaluators

Variable	Research Group	
	1 (n=120)	2 (n=120)
Age Groups		
15-19 years	40 (33.3%)	40 (33.3%)
35-44 years	40 (33.3%)	40 (33.3%)
65-74 years	40 (33.3%)	40 (33.3%)
Sex		
Male	60 (50.0%)	60 (50.0%)
Female	60 (50.0%)	60 (50.0%)

Table 2. Evaluation of the images before and after orthognathic treatment

Characteristic	Pre-treatment	Post-treatment	p
	Mean±SD	Mean±SD	
Note	2.38±1.84	2.99±1.93	0.008
Popularity	4.19±2.02	4.56±1.95	0.132
Friendliness	4.70±1.72	5.02±1.85	0.160
Sociability	3.73±2.97	4.38±3.17	0.099
Success at school	5.28±1.57	5.43±1.65	0.214
Intelligence	5.58±1.57	5.56±1.53	0.582
Access to university	5.27±3.56	5.63±3.54	0.374
Extroversion	4.03±1.78	4.51±1.65	0.026
Happiness	5.58±1.60	5.05±1.51	0.006
Self-confidence	4.36±2.11	4.84±1.83	0.046
Attractiveness	2.82±1.90	3.40±2.06	0.015

SD: standard deviation

As detailed in Table 2, it was observed that of the 11 characteristics evaluated, orthognathic treatment significantly improved the evaluation of individuals in five aspects: score, extroversion, happiness, self-confidence, and attractiveness.

DISCUSSION

The quest for facial harmony has been one of the main reasons why patients sought orthodontic treatment. However, in some clinical situations, it is necessary to resort to orthognathic surgical procedures to obtain the desired results. Nicodemo et al. (12) investigated the quality of life of patients treated with orthognathic surgery and concluded that when occlusion improved, there was also an improvement in the aspects related to oral and general health, such as mastication, speech, respiration, and bite. Importantly, orthognathic treatment not only changes the individual's functional capacity, but also interferes in esthetic questions.

Similarly, orthognathic surgery is capable of promoting psychological changes; therefore, it is essential to prepare patients carefully before surgery by explaining the functional discomfort which they may experience (13).

Jesani et al. (14) evaluated the influence of orthognathic treatment for the correction of Class III malocclusion in adult patients with respect to social competence, intellectual capacity, psychological adjustment, and attractiveness. In the present study, the same characteristics were analyzed however with individuals who presented Class II malocclusion. The results of this study are similar to those presented by Jesani et al. (14), in which all the faces analyzed were classified as significantly more sociable and more likely to be successful, as was the case with psychological adjustment and attractiveness that maintained the same pattern of improvement after orthognathic surgery.

The choice of "partners," job interviews, access to university, and inter-relationships at work and in education are aspects of life that involve social interaction and social judgments. In this sense, dental esthetics may influence the opinion of an individual regarding another's characteristics (15). Thus, Hunt et al. (8) affirmed that orthognathic surgery benefits an individual in aspects, such as improvement in self-esteem, attractiveness, relationship with society, and emotional stability, in addition to improving personal relationships. Backing these affirmations, Henson et al. (16) also found that when improving dental esthetics, the aspects evaluated, which were related to social perception, obtained a better classification, thus supporting the results of the present study.

Similarly, another study evaluated the social impact of dentofacial appearance on children and concluded that more harmonious faces were considered more favorable from the aspects of friendship and intelligence; this individuals were also evaluated as being more attractive and socially acceptable (17).

Based on the perspective that facial or dental esthetics considered adequate influence the judgment of an individual's personality, Pithon et al. (18) evaluated the influence of dental esthetics on the perception of individuals responsible for hiring staff. The

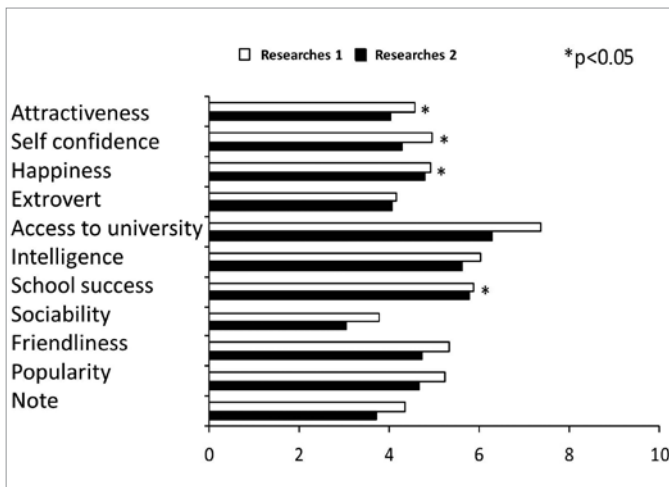


Figure 1. Comparison of the evaluations between write Research groups 1 and 2 for the characteristics perceived with regard to Individual A (negative control)

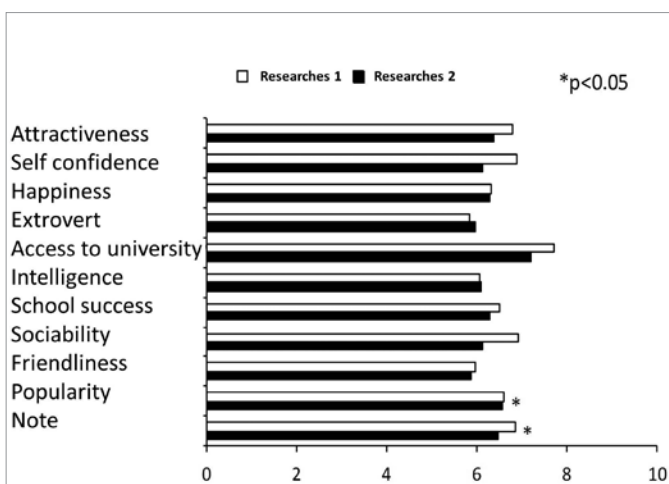


Figure 2. Comparison of the evaluations between write Research groups 1 and 2 for the characteristics perceived with regard to Individual B (positive control)

results indicated that individuals with an ideal smile were more favorably evaluated in the requisites for hiring and intelligence compared with those with non-ideal smiles, suggesting that individuals with more pleasant smiles are perceived as being more intelligent and having better chances of being hired.

In this study, the purpose of the questionnaire was to help participants evaluate personal characteristics of four individuals. Therefore, the first four questions were related to sociability and the subsequent three to success; the following three questions were related to psychological adjustment, and the last question was regarding attractiveness.

All the analyzed individuals were considered more attractive, intelligent, socially competent, and psychologically adjusted after orthognathic treatment. Similarly, in the study by Shaw et al. (19), of the ten characteristics evaluated, eight received more favorable classifications with regard to the faces exhibiting a normal ratio of incisors.

With regard to the characteristics analyzed in this study, the authors found that the score attributed to the images, extroversion, happiness, self-confidence, and attractiveness improved significantly after the treatment. Sinko et al. (20) analyzed the positivity of patients before and after they were subjected to orthognathic surgery and concluded that the results for the personality traits, in addition to the characteristics of attractiveness, were significantly better after the surgery, which is in agreement with the findings of the present study.

The improvement in facial esthetics has a great influence on the quality of life and perception of one individual of another. Based on the perspective that individuals are frequently judged by their appearance, the importance of orthodontic-surgical treatment can be understood. Therefore, patients must be prepared for the different changes they will face after surgery, whether of a social, psychological, intellectual, behavioral, functional, or esthetic nature.

CONCLUSION

Orthognathic treatment for correction of Class II malocclusions has an influence on the perception of social characteristics. Therefore, all the individuals were evaluated as being more attractive, intelligent, socially competent, and more psychologically adjusted, with five aspects having improved significantly after the treatment: the score attributed to the image, extroversion, happiness, self-confidence, and attractiveness.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Sothwest Bahia State University (number 17333113.1.0000.0055).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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REFERENCES

- Riggio RE, Widaman KF, Tucker JS, Salinas C. Beauty is more than skin deep: components of attractiveness. *Basic Appl Soc Psychol* 1991; 12: 423-9. [CrossRef]
- Synnott A. Truth and goodness, mirrors and masks. Part 1: a sociology of beauty and the face. *Br J Sociol* 1989; 40: 607-36. [CrossRef]
- Goldstein RE. Study of need for esthetics in dentistry. *J Prosthet Dent* 1969; 21: 589-98. [CrossRef]
- Kerns LL, Silveira AM, Kerns DG, Regennitter FJ. Esthetic preference of the frontal and profile views of the same smile. *J Esthet Dent* 1997; 9: 76-85. [CrossRef]
- Heldt L, Haffke EA, Davis LF. The psychological and social aspects of orthognathic treatment. *Am J Orthod* 1982; 82: 318-28. [CrossRef]
- de Lira Ade L, de Moura WL, Artese F, Bittencourt MA, Nojima LI. Surgical prediction of skeletal and soft tissue changes in treatment of Class II. *J Craniomaxillofac Surg* 2013; 41: 198-203. [CrossRef]
- Tsang ST, McFadden LR, Wiltshire WA, Pershad N, Baker AB. Profile changes in orthodontic patients treated with mandibular advancement surgery. *Am J Orthod Dentofacial Orthop* 2009; 135: 66-72. [CrossRef]
- Hunt OT, Johnston CD, Hepper PG, Burden DJ. The psychosocial impact of orthognathic surgery: a systematic review. *Am J Orthod Dentofacial Orthop* 2001; 120: 490-7. [CrossRef]
- Lauffer D, Glick D, Gutman D, Sharon A. Patient motivation and response to surgical correction of prognathism. *Oral Surg Oral Med Oral Pathol* 1976; 41: 309-13. [CrossRef]
- Kiyak HA, West RA, Hohl T, McNeill RW. The psychological impact of orthognathic surgery: a 9-month follow-up. *American J Orthod* 1982; 81: 404-12. [CrossRef]
- Hodge TM, Boyd PT, Munyombwe T, Littlewood SJ. Orthodontists' perceptions of the need for orthognathic surgery in patients with Class II malocclusion based on extraoral examinations. *Am J Orthod Dentofacial Orthop* 2012; 142: 52-9. [CrossRef]
- Nicodemo D, Pereira MD, Ferreira LM. Effect of orthognathic surgery for class III correction on quality of life as measured by SF-36. *Int J Oral Maxillofac Surg* 2008; 37: 131-4. [CrossRef]
- Kiyak HA, Hohl T, West RA, McNeill RW. Psychologic changes in orthognathic surgery patients: a 24-month follow up. *J Oral Maxillofac Surg* 1984; 42: 506-12. [CrossRef]
- Jesani A, DiBiase AT, Cobourne MT, Newton T. Perceived changes by peer group of social impact associated with combined orthodontic-surgical correction of class III malocclusion. *J Dent* 2014; 42: 1135-42. [CrossRef]
- Newton JT, Prabhu N, Robinson PG. The impact of dental appearance on the appraisal of personal characteristics. *Int J Prosthodont* 2003; 16: 429-34.
- Henson ST, Lindauer SJ, Gardner WG, Shroff B, Tufekci E, Best AM. Influence of dental esthetics on social perceptions of adolescents judged by peers. *Am J Orthod Dentofacial Orthop*. 2011; 140: 389-95. [CrossRef]
- Fonte PP, Colares V, Santos F, Caraciolo G. The social impact of children's dentofacial appearance. *Eur Arch Paediatr Dent* 2008; 9: 84-9. [CrossRef]
- Pithon MM, Nascimento CC, Barbosa GC, Coqueiro Rda S. Do dental esthetics have any influence on finding a job? *Am J Orthod Dentofacial Orthop* 2014; 146: 423-9. [CrossRef]
- Shaw WC, Rees G, Dawe M, Charles CR. The influence of dentofacial appearance on the social attractiveness of young adults. *Am J Orthod* 1985; 87: 21-6. [CrossRef]
- Sinko K, Jagsch R, Benes B, Millesi G, Fischmeister F, Ewers R. Facial aesthetics and the assignment of personality traits before and after orthognathic surgery. *Int J Oral Maxillofac Surg* 2012; 41: 469-76. [CrossRef]