



EVALUATION OF THE INFLUENCE OF THE TYPE OF ORTHODONTIC BRACKET ON THE PERCEPTION OF AGE

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ABSTRACT

Background: The demand for orthodontic treatment has increased considerably among adult patients. Factors that contribute to this scenario are the use of new technologies, development of new materials and access to information. However, a large number of adults still do not adhere to treatment due to poor aesthetic appearance of brackets.

Objective: To assess the influence of the use of metallic or aesthetic brackets on the perception of age.

Methods: A 45-year-old female was photographed smiling and the image was manipulated in an editing program in order to generate a smile without brackets or with metallic or aesthetic brackets. A photographic album was assembled in addition to a questionnaire in which the interviewees answered questions about the age of the individual in the three situations.

Results: The proportion of respondents who assigned age > 40 years (actual age) was higher in the group that evaluated the image without the orthodontic appliance. The frequency of respondents who indicated ages < 30 and between 30 and 40 years was higher in the groups that evaluated the images with aesthetic and metallic brackets, respectively. The appearance < 30 years of age was positively associated with the use of aesthetic and metallic brackets. The appearance of 30 to 40 years was positively associated with the use of metallic, but not with the use of aesthetic brackets.

Conclusions: It was possible to infer that, according to the participants of this study, the use of orthodontic appliance made the individual look younger. There was no significant difference between aesthetic and metallic appliances in contributing to a more youthful appearance corresponding to age < 30 years. The appearance of 30 to 40 years of age was positively associated with the use of metallic brackets, but not with the use of aesthetic brackets.

KEYWORDS: Orthodontic. Brackets. Adult. Age.

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INTRODUCTION

There is an ongoing increase in the aesthetic demand by dental patients, which has been, in most cases, the main motivation for seeking treatment.^{1,2} Having a smile that fits the current standards of beauty and harmony is both the greatest wish of patients and a challenge for dentists, considering that this treatment involves several specialties working together to improve the health and smile. Currently, adults represent a great proportion of patients seeking orthodontic treatment, a fact that was less common until a few years ago. Factors that play a role in this setting are the development of self-perception, the importance of aesthetics in today's society, facilitated access to treatment due to the flow of information, the improvement of the financial situation of the general population and the better quality of oral health of the patients.²⁻⁴

The adult patient is more concerned about the duration of treatment, both for aesthetic reasons and for the discomfort caused by the orthodontic appliance.^{2,3} Excessive metal in conventional appliances has become a downside regarding the adherence of these patients to treatment. However, with the development of the aesthetic brackets, many are those who have reconsidered their stand, taking into account the best aesthetic appearance and, for example, a better acceptance in the work environment.^{3,5} Generally, adults have a better perception of their own smile and facial harmony, which leads them to the office with an objective chief complaint, which they hope to solve completely. It is up to the dentists to manage the patient's expectations, being as clear as possible about the treatment

plan, duration, limitations and complications.¹⁻⁵

Several studies have shown that the majority of patients seeking orthodontic treatment are female, which shows a greater concern regarding appearance and a greater interest in seeking treatment by this group.^{2,4,6} Kulman et al.⁷ evaluated the aesthetic attractiveness of eight different types of orthodontic appliances among Brazilian children and adolescents. This study showed that the perception of attractiveness is influenced by age. In the group of 8-12 years, there was a greater preference for metallic appliances with colored elastomeric ligatures, whereas in the group of 13-17 years the preference was for the aesthetic appearance of the sapphire brackets, showing that the amount of metal visible in the devices compromises the aesthetic appeal with age.

The patient's self-perception regarding appearance is decisive in the choice of the type of appliance to be used. Many patients tend to have a distorted self-perception, considering themselves less attractive because they are using an orthodontic appliance. Therefore, the opinion of family, friends and partner is of great importance for building self-esteem in these patients.⁸

Given the lack of studies about the influence of orthodontic brackets on the appearance of adult patients and considering that aesthetics is one of the main factors for both the search and adherence to orthodontic treatment, it is of the utmost importance to establish aesthetic parameters that can guide the choice of the appliance by orthodontists. It is speculated that the metallic brackets are subjectively more related to the adolescent patients due to the history of Orthodontics itself and especially to the

recurrent caricaturization of this appliance by the media. The objective of the present study is to assess the influence of the use of aesthetic or metallic orthodontic appliances on the perception of age.

MATERIALS AND METHODS

This study was approved by the Research Ethics Committee. In this study, a 45-year-old female was photographed while smiling. The image was manipulated in an editing program (Photoshop 7, Adobe, USA) in order to generate a smile without brackets or with metallic or aesthetic brackets. The photos were approximated in order not to allow the identification of elements related to the sex or age of the individual (Figures 1A, B and C).

Following a descriptive logic, a semi-structured questionnaire was prepared exclusively for this research and it was administered to 210 volunteers randomly approached in public sites in the city of Salvador / Bahia, Brazil. Participants were asked about the age of the individual in the three situations. For each interviewee, it was presented a single photograph of the model smiling without brackets or using metallic or aesthetic brackets. Although each participant had access to only one photo, all images were strictly the manipulation of the same photo, with the appliance inserted virtually in the images using the editing program. Respondents were requested to answer the following question: Do you think the individual in question is in which age group? () Less than 15 years () 15 to 20 years () 20 to 30 years () 30 to 40 years () Higher than 40 years. A socio-demographic questionnaire was then administered, containing the following

Figure 1A: Photographs presented to study volunteers: Smile without appliance.



Figure 1C: Photographs presented to study volunteers: Smile with aesthetic brackets



Figure 1B: Photographs presented to study volunteers: Smile with metallic brackets.



questions: age, gender, family income, education, ethnicity, if one has ever used a fixed orthodontic appliance and if someone in the family has used it.

All individuals who agreed to participate in the study signed a consent form and were aware that they could decline participation at any stage of the research. The convenience sample was composed of 210 individuals. Each participant answered the questionnaire referring to only one of the photos, so that 70 people evaluated each photo. None of the study participants had access to the three photographs.

STATISTICAL PROCEDURE

The characteristics of the study participants were compared among the groups using the chi-square test, as well as the differences in the age attributed to the evaluated individual, according to the type of bracket. The association

between a younger appearance and the use of orthodontic appliance was tested using the multinomial logistic regression technique, and the category > 40 years (real age) was

defined as the reference category in the model. With the intention of controlling selection bias, all categories related to the characteristics of the participants that presented significant difference among the groups were included in the regression model as adjustment factors. The level of significance was 5% ($\alpha = 0.05$). The data was analyzed in IBM SPSS Statistics for Windows (IBM SPSS, 21.0, 2012, Armonk, NY: IBM Corp.).

RESULTS

As the study participants were randomly approached, asymmetries were expected in the distribution of the descriptive

characteristics of the sample. There was no significant difference among the three groups in the distribution of participants according to gender, use of orthodontic appliance by a relative and ethnicity. However, a significant difference was observed for the categories age group, use of orthodontic appliance by the respondent, income and education.

The proportion of respondents who associated age > 40 years (actual age) to the patient was higher in the group that evaluated the patient's image without orthodontic appliance. The frequency of evaluators that indicated age < 30 years and 30 to 40 years was higher in the groups that evaluated the images of the patient with aesthetic and metallic appliances, respectively (Figure 2).

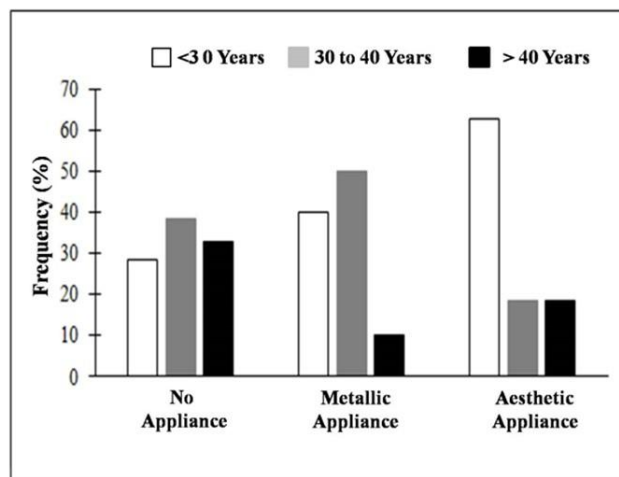


Figure 2: Age attributed to the patient, according to the use of orthodontic appliance

In the intra-group comparison according to the type of orthodontic appliance, a greater uniformity was observed among the responses in the photo without the appliance, possibly indicating a difficulty of the participants to define the age. In the groups with the appliance, the brackets seem to have influenced the decision regarding the age choice. Metallic brackets were not considered compatible with the age of > 40 years for a significant proportion of the participants. Regarding the aesthetic brackets, these had a decisive factor in the choice of the most youthful age group. (Figure 1C)

Table 1 demonstrates the results of the multinomial multiple logistic regression model for a younger appearance in relation to orthodontic appliance use. The appearance < 30 years attributed to the patient was positively associated with the use of metallic and aesthetic appliances. The appearance of 30 to 40 years was positively associated with the use of metallic appliance, but not with the use of aesthetic appliance.

are determinant in the choice of the type of orthodontic appliance and the adherence to the treatment. The literature shows a shortage of studies that evaluates the perception of the apparent age of an adult patient using a fixed orthodontic appliance, usually because the focus is either not on the age or is not on the adult patient. This population often tends to be reluctant about the use of orthodontic appliances, mainly based on their own impression about the aesthetic appearance of the brackets, but also on the impression of other people.^{8,9} In a study on the influence of different types of orthodontic appliances in the third-party judgment on the personal characteristics of a young adult, Jeremiah et al.¹⁰ concluded that the dental appearance and design of the appliances is of great importance in this analysis, which may also influence the choice of the appliance.

In a study performed in India with professionals and non-professionals regarding the appearance

in the groups that evaluated the images with aesthetic and metallic appliances, respectively. The result of the multinomial multiple logistic regression model for younger appearance in relation to the use of the appliance revealed that the appearance < 30 years was positively associated with the use of aesthetic and metallic ones. The appearance of 30 to 40 years was positively associated with the use of metallic appliances, but not with the use of aesthetic appliances.

Moreover, the use of the orthodontic appliance was therefore positively associated with younger ages. Interestingly, a positive association of the aesthetic bracket with the image of a young adult was revealed. It is suggested that the perception of the population may be undergoing an inversion regarding the correlation between the type of bracket and the perception of age. In addition, this may at least partly explain the increasing access of adult patients for orthodontic treatment and their preference for aesthetic devices.

The present findings ratifies the study by Feu et al.⁵ in which the average age of the respondents was 26 years, the attractiveness of the aesthetic orthodontic appliances was considered to be higher than the metallic appliances, showing the preference of young adults for appliances with less exposure of metal.

Conversely, the study performed by Berto et al.¹² in 2009 showed that the aesthetic appliance was evaluated by the general public as being less attractive. Nonetheless, the presence of metallic brackets had no negative effect on the attractiveness of the patient's smile in the evaluation of orthodontists and the public.

Table 1: Association between younger appearance and the use of orthodontic appliance

	< 30 Years			30 to 40 Years		
	OR*	CI95%	p-value	OR*	CI95%	p-value
No Appliance	1			1		
Metallic Appliance	3.76	1.24 – 11.41	0.020	3.27	1.11 – 9.59	0.031
Aesthetic Appliance	4.20	1.49 – 11.82	0.007	0.61	0.20 – 1.84	0.378

OR, odds ratio; CI95%, confidence interval of 95%. *Adjusted by age group, orthodontically treated, income and schooling of the evaluators. The category > 40 years (real age) was considered as the reference category of the dependent variable in the multiple multinomial logistic model.

DISCUSSION

Once the decision to start orthodontic treatment is made, several issues arise for the patient. The perception on their own appearance, self-esteem, interpersonal relationships, in addition to the perception of their orthodontic need and financial situation

of various types of appliances, the authors concluded that as metal exposure increases the reported attractiveness decreases. Clear aligners, lingual appliances and ceramic brackets have shown greater acceptability by both orthodontists and the general public.¹¹

In the present study, the frequency of responses that indicated ages < 30 and 30 to 40 years were higher

It is important to remark that due to the sample size, it was necessary to use the multinomial regression model with only three age categories. Because the highest frequency of responses has indicated the age of 30 to 40 years, the age options initially presented in the questionnaire were re-categorized for statistical analysis in the intervals < 30, 30 to 40 and >40 years. It is assumed that important information can be collected with a further study design that investigates the interval of 15 to 30 years in detail. A previously published study⁷ reported a higher appreciation of the younger population for appliances that have greater metal exposure and an intimate relation of this with children and adolescents, compared with the aesthetic appliance.

Regarding the analysis of the photograph without the appliance, it seemed to present a greater difficulty for the participants in categorizing the age, since greater uniformity was observed in the responses. The fact that there was a higher frequency of answers regarding the patient's correct age was considered less important, since the relationship between physical appearance and age is quite subjective. Nonetheless, the finding that the appliance has an important effect on age perception the need for more studies in this area, so that these concepts will be applied to treatments and result in greater patient satisfaction.

CONCLUSION

The use of orthodontic appliance caused the evaluated patient to look younger in the perspective of the participants of this study. There was no significant difference between aesthetic and metallic appliances in promoting a

younger appearance corresponding to age < 30 years; however, only the use of the metallic device was associated with appearance corresponding to the age of 30 to 40 years.

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