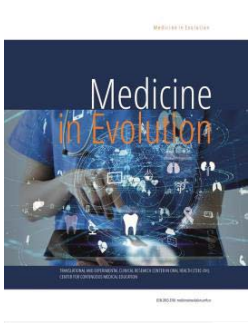
Children' perception on facial aesthetics and orthodontic treatment



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Abstract

Aim and objectives: The aim of this study was to assess the attitude of children towards facial aesthetics and the idea of wearing braces. *Material and methods:* A 5 items questionnaire was applied in the city of Oradea, Romania and distributed to orthodontic patients, with ages between 8 and 11.9 years. *Results:* A number of 256 patients remained in the study, after applying the exclusion criteria. Of the total number of patients, 136 were girls and 120 were boys. Regarding the distribution of the patients according to their living environment, 84 patients were coming from a rural environment, and 172 patients were coming from an urban environment. The majority of patients wanted to have the aspect of their teeth corrected (Item1), and were happy that they were wearing an orthodontic appliance (Item 3). However, more than a third were not happy that they were wearing an orthodontic appliance (Item 3). Half of the patients declared that their habits did not change after they started the orthodontic treatment (Item 5). Most patients were disturbed by the aspect of their face with different scores of gravity (Item 2). At the same time, most patients considered that the aspect of their face improved after they started the orthodontic treatment (Item 4). *Conclusions:* Patients declared that they were affected by the aspect of their teeth, and had a generally positive attitude regarding orthodontic appliances.

Keywords: facial aesthetics, children, orthodontic treatment

INTRODUCTION

Dental anomalies are considered a special category of dental alterations [1], that are frequently associated with other pathologies of the oral cavity [2]. They appear as a result of complex interactions between genetic and environmental factors [3] that occur during the morpho-differentiation or histo-differentiation proccesses of tooth development [1].

Dental anomalies can be mild or severe, with varying degrees of complexity and are caused by disorders that affect the number, shape, position or structure of teeth [4]. Impacted teeth, supernumerary teeth, hypodontia, supraocclusions, infraocclusions [5], dental ectopia, dental malpositions [6] are observed more often in children, and can negatively influence the alignment of teeth on the arch, or the occlusion [5]. Some forms of dental anomalies, such as alterations in the number or shape of teeth, may affect both dentitions [7].

Through the changes they produce in children, dental anomalies can affect the craniofacial development [8], and can also cause functional disorders, occlusal dysfunctions, that are reflected in the change of facial appearance [9].

Facial aesthetics is beginning to become important for children, as well. In this sense, dental anomalies can affect the child physically and psychologically. Self-esteem decreases significantly, which is reflected on the child´s social quality [10]. Treating dental anomalies is possible with the help of removable or fixed braces in a short period of time [11], but in children, the motivation for orthodontic treatment is often absent [12].

Aim and objectives

The aim of this study was to assess the attitude of children towards facial aesthetics and the idea of wearing braces.

MATERIAL AND METHODS

The retrospective study was conducted in agreement with the World Medical Association Declaration of Helsinki-Ethical Principles for Medical Research Involving Human Subjects and approved by the Ethics Committee of the University of Oradea, Romania.

The study was carried out over a period of six months, between March and September 2021. The authors conceived a short questionnaire consisting of 5 items. The questionnaires were printed on paper and applied in two private orthodontic practices from Oradea, Romania. They were distributed to children, aged between 8 and 11.9 years, both girls and boys, from urban and rural areas. The respondents were children with previously diagnosed dento-maxillary anomalies who received the indication for orthodontic treatment and were already wearing an orthodontic appliance. Before filling in the questionnaires, all parents, legal guardians and children were informed that the questionnaires were applied for research purposes, and that by filling in the questionnaires, they confirmed their willingness to participate anonymously in this study. Patients had the possibility to withdraw from the research with no consequences. No financial benefits were promised to the respondents. No time limit was imposed. The language used for the questionnaires was Romanian.

A Likert-type scale was used for items 2 and 4. Participants had to choose a number from 1 to 5 (1 being the lowest possible score and meaning a complete negation, and 5 being the highest possible score and meaning a complete affirmation) in order to assess their attitude regarding the questions. For items 1,3 and 5 participants had to choose from three options, these being”yes”,”maybe” and”no”. Items are translated in Table I.

Table I. Items

Item 1	"Do you want to have the aspect of your teeth corrected?"
Item 2	"Are you disturbed by the aspect of your face?"
Item 3	"Are you happy that you are wearing an orthodontic appliance?"
Item 4	"Do you consider that your facial aspect changed after you started wearing an orthodontic appliance?"
Item 5	"Did your habits change after you started wearing the orthodontic appliance?"

The following inclusion criteria were applied: children with dento-maxillary anomalies who were wearing removable or fixed orthodontic appliance bonded on the buccal surfaces of the teeth, with ages between 8 and 11.9 years, living in Romania. The questionnaires belonging to patients who answered incompletely or incorrectly were excluded from the study.

The questionnaires were handed out to a number of 270 pediatric orthodontic patients, wearing removable or fixed orthodontic appliances but only 265 agreed to take part in this research and filled in the survey forms. After applying the exclusion criteria, a number of 256 participants remained in the study (Figure 1).

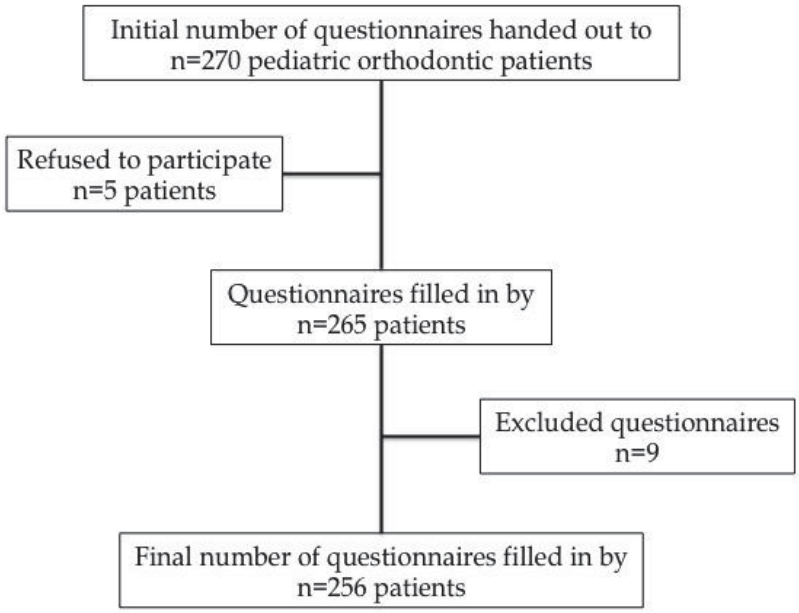

Figure 1. Study profile

The statistical analysis was performed by using IBM SPSS software, version 25 (IBM, Chicago, IL, USA). Quantitative variables were tested for distribution using the Shapiro-Wilk test and were expressed as mean values with standard deviations or medians with interpercentile intervals. The independent quantitative variables with a non-parametric distribution were tested with the Mann-Whitney U test, and all correlations between them were verified with the Spearman´s rho correlation coefficient. Qualitative variables were expressed as absolute numbers or percentages.

RESULTS

A total number of 256 patients remained in this study. Of the total number of patients, 136 were girls and 120 were boys (Figure 2). Regarding the distribution of the patients according to their living environment, 84 patients were coming from a rural environment, and 172 patients were coming from an urban environment (Figure 3). The mean chronological age of the participants was 9.89 ± 1.3 years, with a median of 10 years, and a range between 8 and 11.9 years.

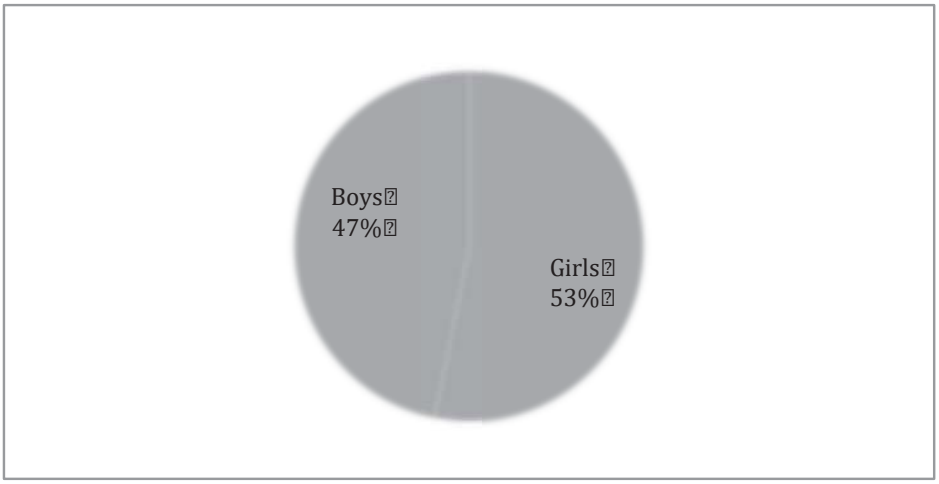

Figure 2. Participants' gender

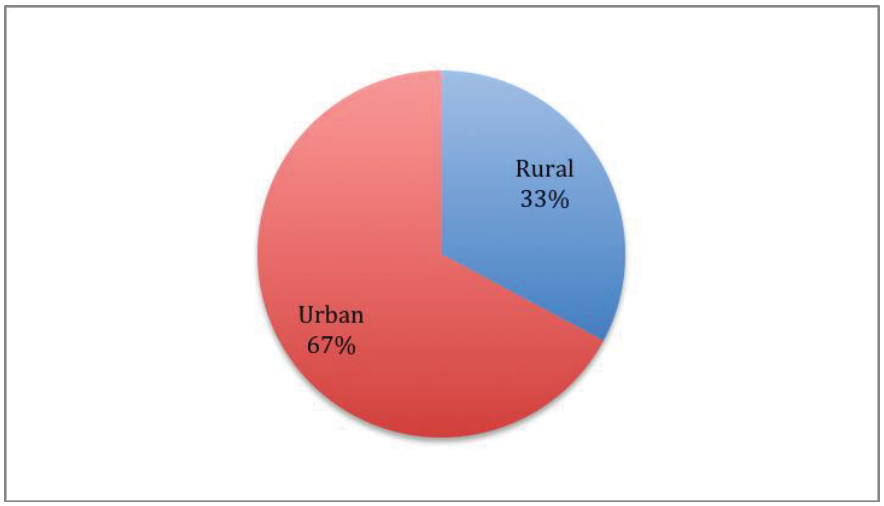

Figure 3. Participants' living environment

Data in Figure 4 shows the distribution of the patients according to the answers provided for items 1, 3 and 5. As such, the majority of patients wanted to have the aspect of their teeth corrected (Item1), and were happy that they were wearing an orthodontic appliance (Item 3). However, more thand a third were not happy that they were wearing an orthodontic appliance (Item 3). Half of the patients declared that their habits did not change after they started the orthodontic treatment (Item 5).

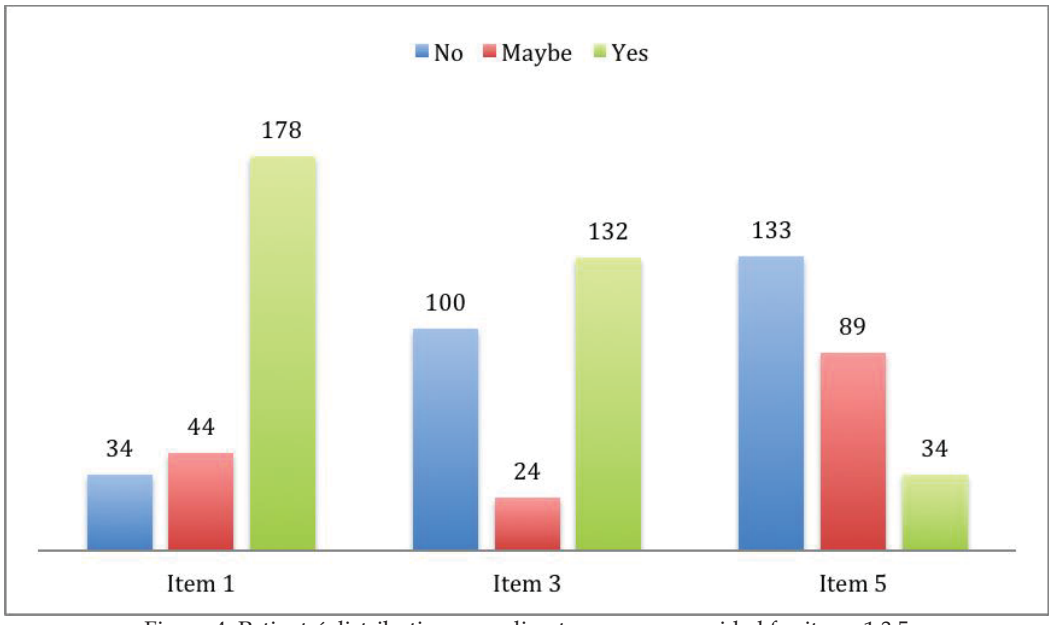

Figure 4. Patients´ distribution according to answers provided for items 1,3,5

Data in Figure 5 shows the distribution of the patients according to the answers provided for items 2 and 4. As such most patients were disturbed by the aspect of their face with different scores of gravity (Item 2). At the same time, most patients considered that the aspect of their face improved after they started the orthodontic treatment (Item 4).

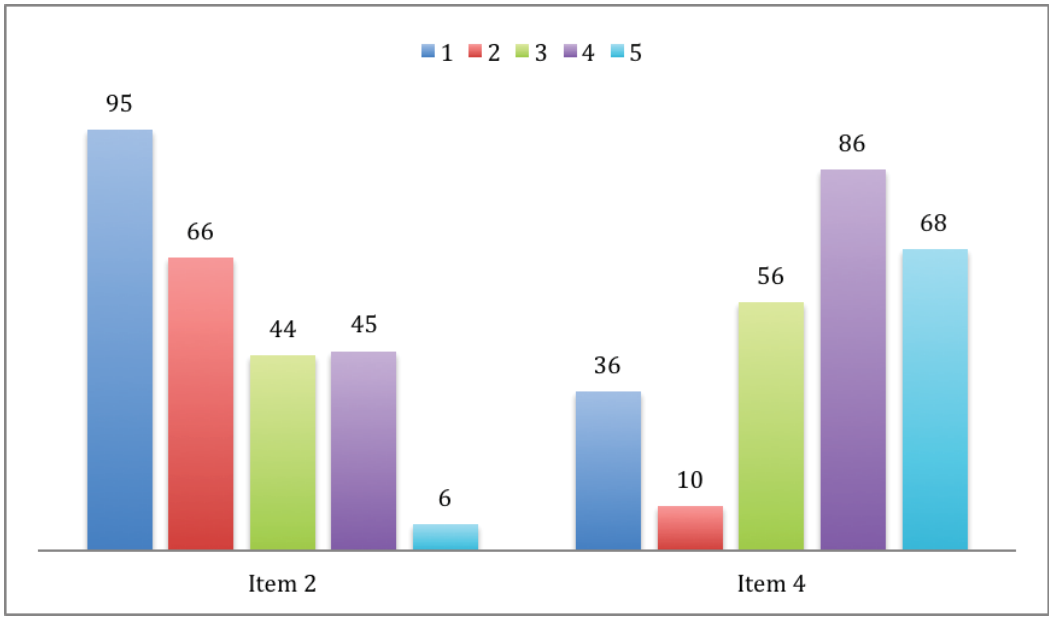

Figure 5. Patients´ distribution according to answers provided for items 2 and 4

Some statistically significant correlative and comparative results were, also, obtained. Data in Table II shows the distribution of the participants according to their living environment and the answers provided for items 3 and 5. The differences between the investigated groups are significant according to Fisher´s Exact Test, and Z tests with a Bonferroni correction show that patients that are indecisive regarding their happiness towards the orthodontic treatment (Item 3) are, more frequently, living in a rural environment. Patients that declared that their habits did not change after they started the orthodontic treatment (Item 5) are, more frequently, living in an urban environment.

Table II. Patients´s distribution according to the living environment and items 3, 5

Living environment/Answer (Nr., %)	Rural	Urban	p*
Item 3			
No	34 (40.5%)	66 (38.4%)	0.014
Maybe	14 (16.7%)	10 (5.8%)	
Yes	36 (42.9%)	96 (55.8%)	
Item 5			
No	35 (41.7%)	98 (57%)	0.012
Maybe	40 (47.6%)	49 (28.5%)	
Yes	9 (10.7%)	25 (14.5%)	

*Fisher´s Exact Test

Data in Table III shows the comparison of the answers provided for item 4, in relation to the participants´ living environment. According to Mann-Whitney U Test, the differences between the investigated groups are significant. As such, patients who were living in an urban environment, more than patients living in a rural environment, considered that the aspect of their face improved after the beginning of the orthodontic treatment.

Table III. Comparison between answers provided for item 4 according to patients´ living environment

Living environment	Mean ± SD	p*
Rural (p<0.001)**	3.29 ± 1.26	0.012
Urban (p<0.001)**	3.67 ± 1.31	

SD: Standard Deviation; *Mann-Whitney U Test, **Shapiro-Wilk Test

Data in Table IV shows the distribution of the patients according to their desire to have the aspect of their teeth corrected, and the happiness towards wearing an orthodontic appliance. The differences between the investigated groups are significant according to Fisher´s Exact Test, and Z tests with a Bonferroni correction show that patients that are neutral towards the desire to have the aspect of their teeth corrected (Item 1) are, more frequently, unhappy with wearing and orthodontic appliance (Item 3).

Table IV. Patients distribution according to answers provided for items 1 and 3

Answer (Nr., %)	Unhappy	Neutral	Happy	p*
Correction -	8 (8%)	2 (8.3%)	24 (18.2%)	0.002
Neutral	26 (26%)	6 (25%)	12 (9.1%)	
Correction +	66 (66%)	16 (66.7%)	96 (72.7%)	

*Fisher's Exact Test

Data in Table V shows the comparison between answers provided for items 3 and 4. The distribution was non-parametric according to the Shapiro-Wilk Test. The differences between the groups are significant according to Krusak-Wallis H Test, and post-hoc tests show that patients that are happy to wear an orthodontic appliance, considered that their face changed more, in comparison to patients that are unhappy about wearing an orthodontic appliance.

Table V. Comparison of answers provided for item 4, according to answers provided for item3

Answer	Mean ± SD	p*
No (p<0.001)**	3.3 ± 1.17	<0.001
Maybe (p=0.003)**	2.75 ± 1.11	
Yes (p<0.001)**	3.88 ± 1.33	

SD: Standard Deviation; *Kruskal-Wallis H Test, **Shapiro-Wilk Test

DISCUSSIONS

Dental anomalies in children are very common, and can affect both temporary and permanent teeth. There are a number of previous studies that confirm the occurrence of dental anomalies in the temporary dentition [13–16], as well as in the permanent dentition [17– 9].

Dental anomalies with multifactorial etiology, have an important impact on the mental and social well-being of children and can influence the development of their personality [20]. The facial aspect plays a fundamental role in shaping self-esteem and self-image, but also in establishing interpersonal social relationships [21]. Smile and dental aesthetics have a significant contribution in the development of self-esteem and facial attractiveness [22]. The perception of dental aesthetics is decisive in the formation of children' personality [23], so that visible dental anomalies affect the quality of social life, and lowers self-esteem in children [24].

Despite the young age, children are often aware of the existent dental anomalies. They are aware of the affected facial appearance, and of the phonatory or masticatory difficulties they encounter. As a result of these dental anomalies, many children are negatively impacted, feel different from other children and acquire behavioral changes over time, become introverted, no longer socialize, no longer smile, precisely out of the desire to hide existing defects. To limit the negative effect on children, if certain dental anomalies cannot be prevented, interceptive orthodontic treatment can be applied during mixed dentition, by wearing removable orthodontic appliances or fixed orthodontic appliances [25]. In this study, most patients were disturbed by the aspect of their teeth and were happy to wear an orthodontic appliance, meaning that children are already aware of their appearance.

Early orthodontic treatment prevents many of the complications caused by dental anomalies and the occurence of a malocclusion [26]. The choice of the type of dental appliance must suit the clinical situation of the child, this requiring a good prior documentation. Also, the orthodontic treatment must be acceptable to the child, it should cause only little and temporary pain or discomfort, is should prove its clinical effectiveness and ensure the preservation of the results obtained over time, and should be affordable [26].

In this study questionnaires were applied, because they are considered a valid method that can be used in order to analyze patients' opinions regarding a specific topic [27]. There are many methods in which questionnaires can be applied, such as online platforms [28,29], websites [30,31] e-mail addresses [32] or in a combined version of both online and on paper [33]. In this study, the questionnaires were printed on paper and applied in the orthodontic office, in order to evaluate the perception of children with dental anomalies and with the indication of an orthodontic treatment, on facial aesthetics and the idea of starting an orthodontic treatment with braces. In addition, any ambiguities in the formulation of the questions could be easily clarified, but without influencing their answers and without promising them certain rewards.

CONCLUSIONS

The majority of patients wanted to have the aspect of their teeth corrected, and were happy that they were wearing an orthodontic appliance. Most patients were disturbed by the aspect of their face with different scores of gravity. At the same time, most patients considered that the aspect of their face improved after they started the orthodontic treatment. Although, children were negatively affected by the aspect of their smile, the attitude towards orthodontic appliances was, generally, positive.

Acknowledgments

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