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Societal perceptions of dentofacial appearances of patients with malocclusion: a systematic review

Percepção da sociedade sobre a aparência dento-facial de pacientes com má oclusão: revisão sistemática

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ABSTRACT

Aim: This systematic review aimed to evaluate whether or not there is evidence enough to support the hypothesis that society promotes judgments on the facial aesthetics of individuals with malocclusion. **Methods:** Searches were conducted in the PubMed, Bireme, BBO, LILACS, Web of Science, EMBASE, Cochrane Library, and SciELO databases, supplemented by an additional manual search. **Results:** The present study included all articles that appeared in each of these databases between January 1965 and February 2015. Inclusion criteria were based on the articles whose primary focus was the societal perception of dentofacial appearances, written in English; observational and experimental epidemiological studies (Cross-sectional, Longitudinal, Cohort, Randomized Clinical Trial, Case-Control); and systematic reviews. Review articles, clinical case reports, laboratorial experiment studies, and abstracts were excluded. This search identified 2,530 articles, of which four fulfilled the inclusion criteria. Of these, only one study showed a high level of scientific evidence. The main flaws found included blind assessment of the measurement, validity of the measurement methods, error analysis of the method, and confounding factors not reported in all articles. **Conclusion:** According to this systematic review, it could be concluded that there is a need for further studies with more efficient methodological qualities.

Uniterms: Orthodontics. Malocclusion. Visual perception. Systematic review.

INTRODUCTION

Facial aesthetics is a significant factor in societal perceptions and plays an important role in assessing personality and social acceptance[1,2]. The perception of appearance, especially facial, affects one's social behavior, with significant consequences in areas such as education, as well as one's professional and the affective life[3,4,5].

Malocclusions can be considered a public health problem, since they have a high prevalence and can cause a social impact by interfering in the quality of life (QoL) of affected individuals[6]. Individuals with malocclusion (particularly in the anterior region) may require orthodontic treatment to improve oral health, dental function, and aesthetics, resulting in an improvement in one's QoL. Orthodontic treatment traditionally focuses on normative criteria, despite the fact that the psychosocial dimension has equal importance[7].

Conditions that affect dental aesthetics influence one's psychological well-being and social interactions among Brazilian teenagers. Upper anterior crowding, a median diastema of less than 2 mm, a low socioeconomic level, and the normative need for orthodontic treatment (highly desirable) are factors that are directly involved in the aesthetic impact on one's QoL[8].

In the last two decades, many measures, such as the Child Perceptions Questionnaire[9] (CPQ), which is one of the instruments of the Oral Health-Related Quality of Life (OHRQoL) that has the enormous advantage of respecting the constant changes that occur during childhood and is consequently divided according to the age groups of 6-7, 8-10, and 11-14 years; the Psychological Impact of Dental Aesthetics

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10.7308/ aodontol/2015.51.2.01

Questionnaire (PIDAQ), which is a specific questionnaire used to assess the psychosocial impact of dental aesthetics in young adults from 18-30 years of age[10]; the OHRQoL questionnaire, which is used to determine individuals' impressions regarding their own health, given that it assesses the impact of oral conditions on one's QoL; among other such instruments, have been developed to evaluate the impact of oral health on one's QoL[11,12]. However, understanding the physical, social, and psychological impacts of malocclusion on one's QoL still requires further attention[13,14].

Most studies developed regarding the aesthetic impact of individuals' facial appearances, associated with malocclusions, on their QoL discuss the involved individuals' perceptions[12]. However, studies addressing the societal perception and judgment placed upon individuals with malocclusion and changes in facial aesthetics are still poorly explored[1]. Thus, malocclusion may adversely affect an individual's social interactions and psychological well-being. Studies have revealed that individuals with malocclusion experienced a greater negative impact on OHRQoL than did those without malocclusion[15].

Therefore, this systematic review aimed to evaluate whether or not there is sufficient evidence to support the hypothesis that society promotes judgments on the facial aesthetics of individuals with malocclusion.

METHODS

Search strategies

The relevant literature searches were conducted in the electronic databases of Pub Med, Bireme, BBO, LILACS, Web of Science, EMBASE, Cochrane Library, and SciELO, according to the following combinations of terms: 'malocclusion and quality of life', 'malocclusion and social judgment', 'malocclusion and facial attractiveness', 'malocclusion and facial attractiveness', 'malocclusion and the perception of beauty', 'malocclusion and visual perception', 'malocclusion and patient perception', 'facial perception and malocclusion', and 'malocclusion and facial aesthetics'.

The results included all articles published in English that have appeared in each of these databases, according to the terms cited above, from January 1965 to February 2015. The reference lists of selected articles were also researched manually for additional relevant publications that might have been missed in these data searches.

Selection criteria

Inclusion criteria were based on articles whose primary focus was the societal perception of the dentofacial appearances, published in English; observational and experimental epidemiological studies (Cross-sectional, Longitudinal, Cohort, Randomized Clinical Trial, Case-Control); and systematic reviews. Review articles, clinical case reports, laboratorial experiment studies, and abstracts were excluded.

Data collection and analysis

The data were organized considering the following items: author, year of publication, measures, study design, study groups, methods/ measures, and results. Trials of eligible studies, assessment of the methodological quality, and data extraction were performed. Quality assessment was conducted to document the methodological soundness of each article as regards pre-established characteristics[16,17], evaluating eight main variables (Table 1).

Table 1 - Score used to analyze the selected articles

Adequate Study Design	**Randomized Clinical Trials (RTC), Prospective (P), Controlled Clinical Trials (CCT), Longitudinal (L) - 03 Points Clinical Trials (CT) - 01 Point ***
Adequate sample size	01 Point
Adequate selection description	01 Point
Valid measurement methods	01 Point
Use of the method's error analysis	01 Point
Blind evaluation of measurement	01 Point
Valid statistical methods	01 Point
Confounding factors included in the analysis	01 Point

*Jadad AR et al. (1996); Antczak AA et al. (1986)

10.7308/ aodontol/2015.51.2.01

Sample sizes were considered adequate when they presented a sample calculation. Measurement methods were considered valid when a test measurement error was displayed. Each study was classified according to their score as low (0-5 points), medium (6-8 points), or high (9-10 points)[18].

Data extraction and quality score for each article was assessed independently by two trained and calibrated researchers, who selected the articles by reading the title and abstracts. All articles that appeared to comply with the inclusion criteria were selected. A high agreement was found among the researchers in this step (Kappa > 0.90). At this stage, the full articles were read by two raters in order to obtain a common assessment. When there was disagreement on the evaluation, the article was re-read, re-assessed, and resolved by discussion.

A systematic review was performed following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) recommendations[19].

RESULTS

Following the search strategy, 2,530 papers were identified. After the selection, and based on the eligibility criteria, 60 articles were initially selected, 30 of which were related to the subject of study. After the removal of duplicate articles, 20 studies were selected, the summaries of which were read by both researchers, reaching a final sample of 11 articles. After a complete reading of these studies, four met all of the inclusion criteria and were selected for final analysis (Table 2). The full texts of these articles were obtained for analysis. (Figure 1).

Table 2 - Descriptive assessment of the selected studies

Study (reference)	Study Groups	Sample	Age	Measurement method	Results
1. O`Brien K et al. (2009)[28]	Random selection of photographs of patients with Class II malocclusion with overjet of at least 7 mm at the beginning of treatment and 15 months after.	Initial sample: 174 patients that were randomly divided into 2 groups: control (n = 20) and treated (n = 20)	Between 8 and 10 years of age	Likert scale and Pancherz's Analysis Assessment up of 30 children (10-11 years) and 24 teachers	Class II profiles of children who received early orthodontic treatment were perceived as being more attractive by their peers than children who received no treatment. The profiles that were considered more attractive tended to have less overjets, no visible teeth, and a slightly more keen labiomental angle.
2. Mugonzibwa EA et al. (2004)[25]	Random selection of children in primary and secondary schools in the city of Dar es Salaam, Tanzania, assessing their opinions on dental attractiveness and their perceptions of orthodontic treatment	A random sample of 386 children (48% boys, 52% girls)	Between 9 and 18 years of age	Questionnaire (three sections), clinical examinations: **AC** (Aesthetic Component) **IOTN** (Index of orthodontic treatment needs)	Most of the children recognized that well-aligned teeth are important for facial appearance and were unhappy with the appearance of their teeth. More studies involving children in different areas of the country, especially rural areas, were recommended.
3. Shaw WC (1981)[20]	Research conducted in 5 schools with broad social origin and in a busy snack bar beside a major hospital in the region	840 children and 840 adults	Between 11 and 13 years of age, and between 20 and 65 years of age	Photo Manipulation of 2 boys and 2 girls who were appealing, and a boy and a girl who were not appealing, totaling 20 photos	Severe dentofacial anomalies are enough to disrupt the facial attractiveness of a child and may represent an important social disadvantage.
4. York J and Holtzman J (1999)[22]	Convenience sample of community volunteers of Cherry Hill, New Jersey	60 individuals	Between 65 and 75 years of age	18 manipulated photos (9 women and 9 men) simulating common dental defects, and questionnaires about their level of satisfaction with facial attractiveness and dental appearance	The results strongly suggest that dental appearance affects judgments of facial attractiveness, regardless of gender and facial features.

10.7308/ aodontol/2015.51.2.01

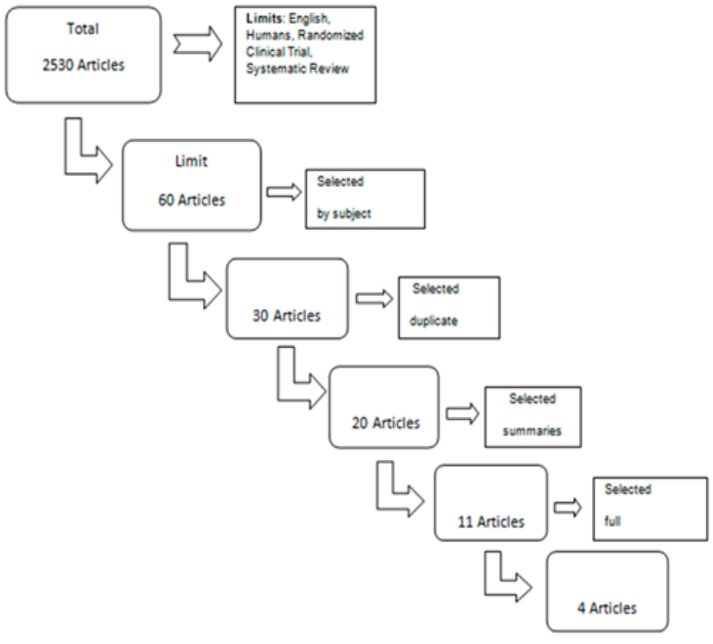

Figure 1 - Study flowchart

The quality of research and methodological consistency was considered high in only one study. Two were classified as low and one as medium methodological consistency (Table 3).

Table 3 - Quality evaluation of the included studies

Articles	Study design	Sample size	Selection description	Valid measurement methods	Method error analysis	Blinding in measurement	Adequate statistics provided	Confounding factors considered	Judged Quality Standard
O`Brien K et al. (2009)	RCT	Adequate	Adequate	Yes	ND	Yes	Yes	Yes	High
Mugonzwa EA et al (2004)	RCT	Adequate	Adequate	ND	ND	ND	Yes	ND	Medium
Shaw WC (1981)	CT	Adequate	Adequate	No	No	ND	Yes	No	Low
York E Holtzman J (1999)	CT	ND	Inadequate	No	No	No	ND	No	Low

DISCUSSION

According to the inclusion criteria, only four studies were selected for this systematic review. Among them, only one study presented a high level of scientific evidence. The main flaws found included the blind assessment of the measurement, the validity of the measurement methods, the method of error analysis, and the confounding factors not reported in all articles.

Children with dental appearance without changes would be judged more beautiful, more prone to friendships, smarter, and less aggressive[2,20]. One problem in this region immediately becomes a focus for observers, which noticeably modify their attitude, consequently generating psychosocial reactions in patients[12, 21].

The dental appearance affects judgments of facial attractiveness, regardless of the facial features and gender of the individual[22]. The malocclusions and dentofacial deformities significantly affect the aesthetics, masticatory function, and, consequently, an individual's social and psychological well-being[23,24].

10.7308/ aodontol/2015.51.2.01

Further, concern with personal appearance and physical attractiveness does not appear to decline with age[22]. No statistically significant differences were found between genders regarding the impact of malocclusion on OHRQoL, which is on accordance with some previous studies. However, gender has been described as a factor affecting the self-perception of dental appearance/malocclusion[12].

Evaluating the opinions of children regarding their dental attractiveness and perception of orthodontic treatment concluded that most children recognize that well-aligned teeth are important for facial appearance and that they were unhappy with the appearance of their teeth. According to the authors, more studies involving children from different areas of the country, especially rural settings, are recommended[25], confirming that the social implications of malocclusion often occur, given that the dentofacial complex is the most important component of communication and interpersonal relations[12].

Some studies have reported that perceptions of malocclusion do not differ among various racial groups and cultural circumstances; however, African people living in Africa can have different malocclusion perceptions when compared to other societies. For example, spacing (especially median diastema) is significantly disliked in white cultures, but it is considered desirable and a sign of beauty in many African cultures[26,27]. Although our results might reflect cultural and educational differences, other explanations could be that the frequency of malocclusion in the Tanzanian population is low, whereas orthodontic treatment, which can increase orthodontic awareness, is uncommon[25].

One study was performed to assess whether or not treatment with a twin-block functional appliance in children of 8-10 years of age (in the transitional dentition) improves the attractiveness of a class II profile and determines the orofacial characteristics of a profile that more commonly influences the perception of attractiveness. The results show that children with Class II malocclusion, who received early orthodontic treatment, were considered more attractive by their peers than were children who received no treatment[28]. The profiles that were considered more attractive tended to have smaller overjets, no visible teeth, and slightly more acute labiomental angle[29].

Future studies need a more consistent design methodology, with adequate sample sizes, together with sample calculations and the standardization of evaluation methods, such as the reuse of the same questionnaires and the performance of randomized clinical trials, while minimizing possible bias and strengthening scientific evidence of the results.

CONCLUSION

This review suggests that there is an association between malocclusion/orthodontic treatment needs and one's QoL, and that they coexist in the same population. Studies with more efficient methodological qualities, thus producing greater scientific evidence, are warranted in an attempt to facilitate the comparison of trial results.

RESUMO

Objetivo: Avaliar se existem evidências que suportam a hipótese de que a sociedade promove julgamentos considerando a estética facial de indivíduos com má oclusão. **Material e Métodos:** Foram realizadas buscas nas bases de dados PubMed, Bireme, BBO, LILACS, Web of Science, EMBASE, Cochrane Library e Scielo, complementando por uma busca manual. **Resultados:** Foram incluídos todos os artigos que apareceram em cada uma destas bases de dados de janeiro de 1965 a fevereiro de 2015. Critérios de inclusão foram os artigos cujo foco principal era a percepção da sociedade em relação à aparência dento-facial, publicados em inglês, estudos epidemiológicos observacionais e experimentais (Transversal, Longitudinal, Coorte, Ensaio Clínico Randomizado e Caso-Controle) e revisão sistemática. Artigos de revisão, relatos de caso clínico, estudos laboratoriais e resumos foram excluídos. A busca bibliográfica identificou 2530 artigos e 4 preencheram os critérios de inclusão. Destes somente um estudo apresentou elevado grau de evidência científica. A avaliação cega da medição, a validade dos métodos de medição, a análise de erro de método e os fatores de confusão não declarados em todos os artigos, foram as principais falhas encontradas. **Conclusão:** De acordo com esta revisão sistemática, concluiu-se que há a necessidade de estudos com qualidades metodológicas mais eficientes.

Descritores: Ortodontia. Má oclusão. Percepção visual. Revisão sistemática.

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