Review

Proposal about service flow for Brazilian children diagnosed with dental malocclusion in dentistry care: an integrative review study

Proposta de fluxo de atendimento para crianças brasileiras diagnosticadas com maloclusão dentária nos serviços de odontologia: um estudo de revisão integrativa

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Abstract

Objective: Proposing a service flow for orthodontic dental services based on a review of publications on the prevalence of malocclusions in Brazilian children, to make it possible to plan and execute dental services with equity. **Data sources**: In October 2020, a search was made in the Lilacs, PubMed and Scielo databases, for articles published between the years 2014 and 2020, using the following descriptors: prevalence, dental malocclusion, children, Brazilians; in any language. Seventy-nine publications were identified and, after applying the inclusion and exclusion criteria, 11 articles were analyzed. From the analysis of the studies, a flow for the care of children with dental malocclusion was developed. **Summary of the data**: This is a transversal character study that assessed the prevalence of malocclusion in Brazilian schoolchildren. In the studies evaluated, an association was found between deleterious habits and socioeconomic condition with the presence of dental malocclusion. Epidemiological studies addressed in this literature review indicate that most children in the mixed dentition phase have some type of morphological deviation from the occlusion. The attention given in this phase can be extremely important to allow the normal development of the dentition and the establishment of an adequate occlusal relationship. Furthermore, it is important to know how to differentiate patients who will benefit from interceptive therapy from those in whom corrective treatment is essential. **Conclusion**: The prevalence of malocclusion in the studied population was significantly high, thus justifying the need and importance of obtaining updated epidemiological data capable of helping managers to plan their actions effectively. It is important that the dental services standardize the flow of care for these children, to prevent progression to more complex and costly treatments.

Keywords: prevalence; dental malocclusion; children; Brazilian.

Resumo

Objetivo: Propor um fluxo de atendimento dos serviços odontológicos de ortodontia a partir da revisão de publicações sobre a prevalência de maloclusões em crianças brasileiras, para tornar possível planejar e executar esses atendimentos com equidade. **Fonte de dados:** Foi realizada em outubro de 2020 uma busca nas bases de dados Lilacs, PubMed e Scielo, por artigos publicados entre os anos de 2014 e 2020, utilizando os seguintes descritores: prevalência, maloclusão dentária, crianças, brasileiras; em qualquer idioma. Identificou-se 79 publicações e, após aplicação dos critérios de inclusão e exclusão, selecionou-se 11 artigos. A partir da análise dos estudos foi desenvolvido um fluxo de atendimento de crianças com maloclusão dentária. **Síntese dos dados**: Foram selecionados estudos transversais que avaliaram a prevalência de maloclusão em escolares brasileiros. Nos estudos avaliados encontrou-se associação entre hábitos deletérios e condição socioeconômica com presença de maloclusão dentária. Os estudos epidemiológicos abordados nessa revisão de literatura indicam que a maior parte das crianças na fase da dentição mista apresenta algum tipo de desvio morfológico da oclusão. A atenção dada nessa fase pode ser extremamente importante para permitir o desenvolvimento normal da dentição e o estabelecimento de uma adequada relação oclusal. Ademais, é importante saber diferenciar os pacientes que se beneficiarão de uma terapia interceptora daqueles nos quais o tratamento corretivo seja essencial. **Conclusão**: A prevalência de maloclusão na população estudada foi considerada significativamente elevada, justificando, assim, a necessidade e importância de se obter dados epidemiológicos sempre atualizados, capazes de auxiliar gestores a planejarem suas ações de modo eficaz. É importante que os serviços de odontologia padronizem o fluxo de atendimento dessas crianças, numa tentativa de evitar evolução para tratamentos mais complexos e onerosos.

Palavras-chave: prevalência; maloclusão dentária; crianças; brasileiras.

Introduction

Dental malocclusion is a characteristic imbalance that affects the stomatognathic system, generating aesthetic and functional limitations in affected individuals, caused by genetic and environmental factors.[1] It can be understood as a clinical variation of normal growth, resulting from the interaction of several factors, such as environmental and congenital influences, which can generate aesthetic changes in the teeth and/or face, in addition to disorders in occlusion, chewing, swallowing, phonation and breathing.[2]

The SB-Brazil 2010 study, with 5-year-old children, related to malocclusion, indicated an approximate prevalence of 29% for overproad changes, 32% for altered overbite, and 25% for posterior crossbite. In addition, it was observed that, in this age group, 69% of the children were in at least one of these conditions.[3] It is important to emphasize that the attention given at this stage of life can be extremely important to allow the normal development of dentition and the establishment of an adequate occlusal relationship, and the intervention should be performed by a qualified professional, knowing how to differentiate patients who will benefit from an interceptive therapy, from those who will need corrective treatment.[4]

The evaluation of prevalence studies is important for the implementation of appropriate public policies. Recognizing the epidemiological situation, it is possible to plan and execute dental services fairly, through the implementation of policies focused on preventing the worsening of malocclusions and not only on the corrective character.[4,5] In addition, the surgeon-dentist can collaborate in the management of dental care, proposing strategies that evidence the prevention of changes during early childhood, based on the prevention of both harmful oral habits and early tooth loss, minimizing possible expenses with more complex treatments in permanent dentition, in which orthodontic treatments are complex and costly.[5,6]

Once established, malocclusions may generate consequences that go beyond functional limitations or mere aesthetic implications, affecting self-esteem, well-being and socialization capacity.[6-8] They may interfere in the daily activities of individuals, such as hygiene, chewing, phonation and even the act of smiling has already shown to be affected, due to a poor perception of beauty of the individual with occlusion, thus causing a compromise of social relations.[7,9]

In this context, the aim of this study was to propose a flow of care for dental orthodontic services from the review of publications on the prevalence of malocclusions in Brazilian children, to make it possible to plan and execute this care with equity.

Methodology

The study is characterized as an integrative review of the literature, which allows the search, critical evaluation, synthesis, analysis and incorporation of evidence from national and international scientific productions emerged on the subject.[10]

A bibliographic survey was conducted in October 2020, through a consultation of the databases: Latin American and Caribbean Literature on Health Sciences (LILACS), Scientific Electronic Library Online (SciELO) and National Library of Medicine (PubMed). The choice of these sources was due to the greater approximation with the other search parameters, as well as because they had a greater number of indexed studies. Descriptors corresponding to the objective of the study were used, departing from the Descriptors in Health Sciences (DeCS) and the Medical Subject Headings (MeSH): "prevalence", "malocclusion", "children" and "Brazilian".

Studies were included in this research, according to the following criteria: publications in article formats; publication period between 2014 and 2020; availability in full, in electronic environment; in any language and studies with children up to 12 years old. Editorials, letters, theses, dissertations, monographs, manuals, summaries of congresses were excluded; duplicate articles in more than one database; or that did not meet the research question, the objective and descriptors.

The search was conducted independently, by 2 reviewers, who carefully read all abstracts related to the studies to verify participation to the theme and the ability to respond to the objective defined for this review. The form was prepared for the organization of publications containing the following information: main author; year; study site; type of study; sample; objectives and main findings.

The sample obtained, after searching the established databases, was of 79 articles. Initially, all titles and abstracts were read, respecting the inclusion and exclusion criteria, choosing 19 studies for detailed analysis. After the evaluation of the full text, eight were excluded, leaving only 11 articles (Figure 1).

The analysis of the selected studies, in addition to other studies on deleterious oral habits and the clinical experience in the specialty of orthodontics in the public service, served as a foundation for the construction of a suggestion of flowchart of care of children with dental malocclusion.
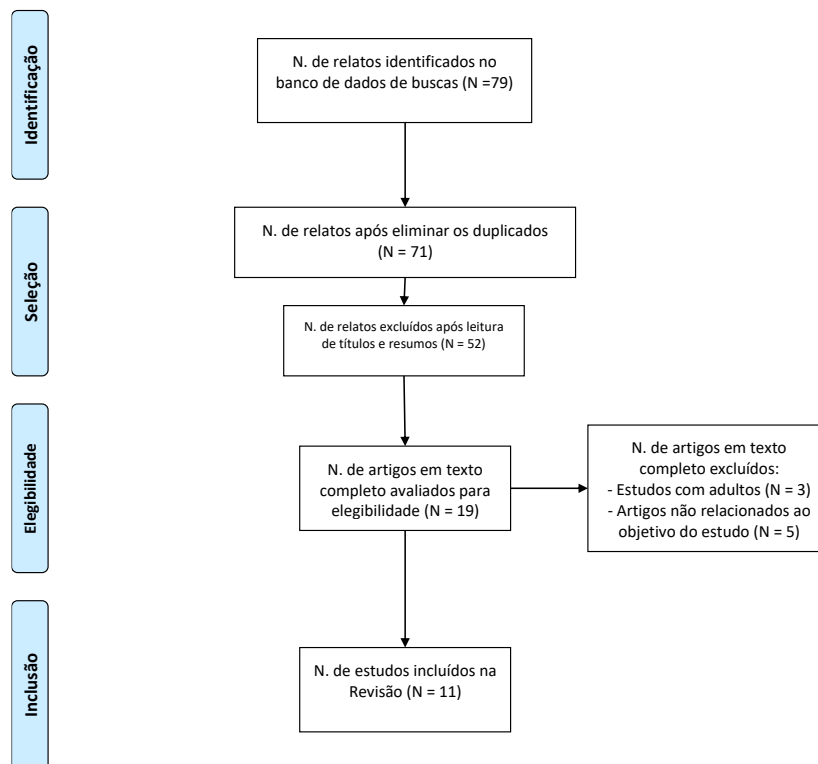
Figure 1. Article's identification flowchart.

Results

The survey addressed the publication period from 2014 to 2018. Samples from the studies ranged from 81 to 6,855 patients. The age of the patient groups ranged from 4 to 12 years old. In relation to the region, we found: a study in the Northern Region of Brazil, one in the Northeast Region, one in the Midwest Region, four in the Southeast Region and two in the South Region. Two studies[18,19] used samples from several municipalities, from all Brazilian regions.

Table 1 shows the place and type of study, objectives, sample used and age of the children, in addition to the main findings of the 11 selected articles. These data guide the description and discussion of the results of this article and supported the construction of the flow proposal for dental care of children as a diagnosis of dental malocclusion (Figure 2).
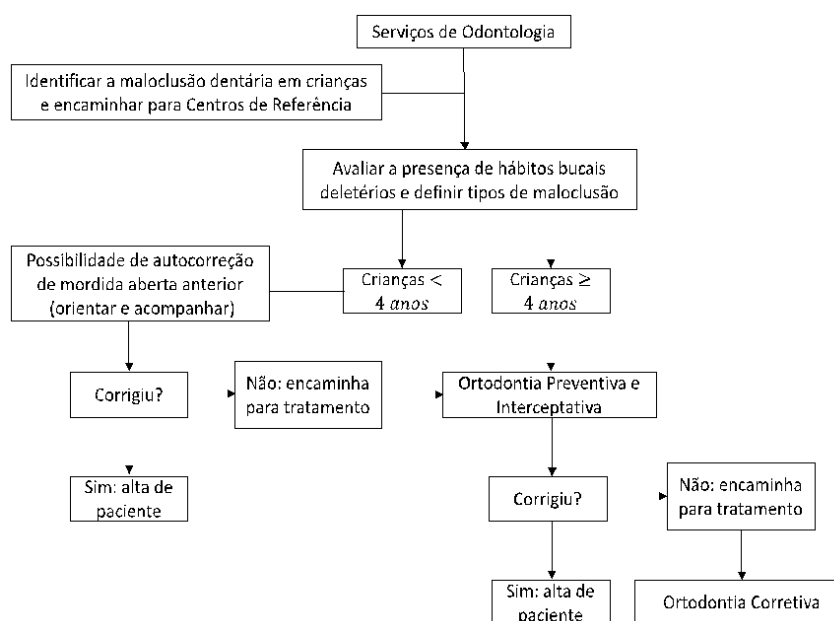
Figure 2. Service flow of children diagnosed with malocclusion.

Table 1. Short record of studies, author, year of publication, place and type of study, objectives, sample and age of children, and results.

Author, Year	Location and Type of Study	Objectives	Sample (H) and Age (in years old)	Main Findings
Miotto et al., 2014 [11]	Vitória – Southeast Transverse	Assessing the prevalence of anterior open bite and possible association with deleterious habits in children.	920 3 - 5	The prevalence of open bite was 20%. Children who have the habit of digital sucking had a 3 times greater chance of presenting open bite, while for those who used pacifiers, the risk was 5 times higher.
Normando et al., 2014 [12]	Belém – North Transverse	Evaluating the influence of socioeconomic status on the prevalence of malocclusion on deciduous dentition in an Amazonian population.	652 3 - 6	A high prevalence of malocclusion was observed (81.44%) in the sample examined. Girls from public schools showed a significantly lower prevalence (72.1%) compared to private schools (84.7%).
Jordão et al., 2015 [13]	Goiânia – Central-West Transverse	Describing the prevalence of malocclusion and its association with individual and contextual factors among Brazilian schoolchildren.	2.075 12	The prevalence of malocclusion was 40.1%. Inequalities in their distribution were determined by individual and contextual factors.
Leôncio et al., 2015 [14]	Patos – Northeast Transverse	Verifying the prevalence of malocclusion in preschoolers of public day care centers.	131 5	A prevalence of 38.2% of malocclusion was evidenced in the children evaluated, with the highest rates for the anterior open bite (30.0%) and overbite (28.0%).
Vedovello et al., 2016 [15]	Piracicaba – Southeast Transverse	Examining the associations between malocclusions and the contextual approach to quality of life and socioeconomic status.	1.256 7 - 10	Of the children, 82.1% had some type of malocclusion. Increased age associated with low socioeconomic status was determinant for occlusal problems.
Vilain et al., 2016 [16]	Criciúma – South Transverse	Analyzing the prevalence of malocclusion in schoolchildren.	100 5	Girls had more malocclusion (58%). Overjet was the most prevalent and 100% of the children who presented it required orthodontic intervention.
Pereira et al., 2017 [17]	Porto Alegre – South Transverse	Evaluating the prevalence of malocclusion in children and its association with dental consultations in a Primary Health Care service.	81 4	Total prevalence of malocclusion was 33.3%. There was no association between malocclusion and number of dental consultations.
Bauman et al., 2018 [18]	5 Regions of Brazil Transverse	Evaluating the prevalence and distribution of malocclusion in Brazilian preschoolers and its association with macro-region, housing, gender and skin color.	6.855 5	Of the children, 63.2% had at least one of the occlusal problems evaluated. Less probability of the presence of malocclusion was identified among residents of the Northern Region and males. No associations were identified regarding the breed and location of the municipality.
Corrêa-Faria et al., 2018 [19]	44 Brazilian cities Transverse	Investigating the association between the proportion of breastfed children and the prevalence of malocclusion in deciduous dentition.	5.278 5	The prevalence of malocclusion was 63.3%. The cities with the highest prevalence of breastfeeding between 9-12 months old had a lower prevalence of malocclusion.
Dutra et al., 2018 [20]	Belo Horizonte - Southeast Transverse	Evaluating the impact of malocclusion on children's quality of life and its prevalence.	270 8 - 10	The prevalence of malocclusion was 41.9%. Children with normal occlusion or mild malocclusion were 56% less likely to impact quality of life.
Guimarães et al., 2018 [21]	Diamantina – Southeast Transverse	Evaluating the prevalence and impact of malocclusion on oral health-related quality of life among schoolchildren.	390 8 - 10	The prevalence of malocclusion was 78.7%. The prevalence of malocclusion was high in the sample investigated and had a negative impact on quality of life.

Discussion

In the research of Miotto et al. [11], it was identified that the prevalence of open bite was higher in children with deleterious habits. Amary et al.[22], when comparing for malocclusion and sucking habits, in a sample of preschoolers, reached the percentage that 70.9% of children who had the habit of digital sucking, pacifier sucking and/or finger sucking developed some type of occlusal alteration. However, Almeida et al. [23], when conducting a retrospective study, they concluded that these habits were not determining factors for the development of malocclusion in the sample studied.

Although there is divergence among the authors, the etiology of open bite is multifactorial, and may originate from environmental and hereditary factors, in which different results may be related to social and cultural aspects. Malocclusion is a dental anomaly that may be related to several etiological factors, including harmful oral habits, and the removal of these habits is essential for the prevention and correction of the anomaly. It is a public health problem that has been widely studied over the years, but most studies on the prevalence of malocclusion in deciduous dentition are conducted in preschoolers[24,25]. According to the databases, rare population-based studies were found that investigated all children in a community. In addition, socioeconomic status can significantly influence the prevalence and severity of malocclusion, due to lower access to dental treatment, as reported by Vedovello et al. [15], which found an association between low socioeconomic status and occlusal problems. However, Normando et al.[12] showed that girls from public schools had a lower prevalence (72.1%), compared to private schools (84.7%).

Although with great variability, the epidemiological studies addressed in this literature review indicate that most children, in the mixed dentition phase, present some type of morphological deviation of occlusion, reaching a prevalence of 82.1% [15], 81.44% [12], or even 78.7% [21]. The high prevalence observed coincides with that reported by Brito et al. [26], which found 80.84% of malocclusion in children aged 9 to 12 years old. In contrast, Albuquerque et al.[27] reported in their study a lower prevalence (40.7%), which can be justified by the fact that their sample was composed of children up to 3 years old, suggesting that occlusal deviations occur less frequently in deciduous dentition. This was corroborated in the present review with the findings of Pereira et al. [17], which found a prevalence of 33.3% in children aged 4 years old, and of Leôncio et al. [14], 38.2% in children aged 5 years. Therefore, it can be reported that social factors can affect the emotional state of the child and this is manifested through oral habits, such as pacifier sucking and digital sucking, aggravating the establishment of occlusopathy.

It can also be observed that the prevalence of malocclusions presents great variability, even in populations with the same origin, as presented in the study by Sayn et al.[28] This occurs mainly, due to the different evaluation criteria applied by researchers and by different samples.

Malocclusion has been related to different conditions, such as behavioral, socioeconomic and other oral diseases, such as dental caries. In addition, the establishment of malocclusion negatively impacts the daily life of individuals, being relevant and necessary identify groups with higher prevalence, in addition to the diagnosis and appropriate treatment, to reduce such impacts.[29-31] However, over time, there was a significant decline in dental caries in the world population, which interfered in the valorization of other oral problems, with emphasis on occlusopathies[32,33].

The articles found showed great variations in the samples, which may have contributed to a significant change in the prevalence level of malocclusions in the various regions evaluated. These results do not exclude the reliability of the studies, but on the opposite, they prove that the level of occlusopathies present among Brazilian children is expressive. This evidences the need for early intervention, as well as the implementation of public policies aimed at preventing and controlling orthodontic problems in children of this age group.

Due to the high prevalence of dental malocclusion in early childhood, it becomes necessary, in the political scenario, that managers plan actions, whose preventive measures streamline and make flexible the care to this portion of the population. Professionals who provide primary care in dental services should identify possible children with deleterious oral habits, especially those related to non-nutritive breastfeeding, such as prolonged pacifier use and digital sucking, since they are children with a greater possibility of developing occlusions. Thus, it is possible to perform preventive work, since there are studies demonstrating that in children up to 4 years old there is the possibility of self-correction of dental malocclusion [34].

In the clinical routine, it is observed that children who have the pathology already installed, can be treated with preventive and interceptative orthodontics, with removable mouthpieces. Only when dental malocclusion is not possible, corrective mouthpieces should be indicated, whose treatments are more complex, long-lasting and expensive.

Conclusion

The prevalence of malocclusion in the population studied was considered significantly high, thus justifying the need and importance of obtaining always updated epidemiological data, capable of helping managers to plan their actions effectively, considering the reality and need of each region, aiming at strategies that can benefit and expand care to this demand of patients in the public network.

It is important that dental services standardize the service flow of these children to avoid evolution to more complex and costly treatments.

Conflict of interest: The authors stated that there was no conflict of interest.

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