

Malocclusion, Oral Motor Function, and Food Selectivity in Autism Spectrum Disorder: A Narrative Review and Research for Orthodontic Care

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ABSTRACT

Children with autism spectrum disorder (ASD) present, as separate and well-documented phenomena, both a higher prevalence and complexity of malocclusion and a markedly elevated rate of food selectivity linked to oral sensory hypersensitivity and oral motor difficulties. Despite the plausibility of a relationship between these two conditions, no study has yet examined whether orthodontic or dental treatment, as an outcome or as an intervention, is directly associated with food selectivity patterns in individuals with ASD. This narrative review synthesises three established but previously unconnected lines of evidence—malocclusion in ASD, food selectivity and oral sensory hypersensitivity in ASD, and oral motor function as a mechanistic link between them—drawn from international (PubMed/MEDLINE, PMC, ScienceDirect, ResearchGate) and Brazilian/Latin American (SciELO, PePSIC, LILACS) databases. We argue that this intersection constitutes a genuine gap in the literature and propose two specific research directions: (a) testing whether oral motor function and parafunctional habits associated with food selectivity predict the type and severity of malocclusion in children with ASD, and (b) evaluating how the introduction of fixed orthodontic appliances affects the already restricted dietary repertoire of these children, with attention to potential nutritional consequences. Addressing this gap would allow clinicians to design orthodontic protocols that are both effective and sensitive to the sensory and behavioural particularities of this population.

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I. INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterised by persistent differences in social communication and interaction, alongside restricted and repetitive patterns of behaviour, which frequently include atypical sensory processing (American Psychiatric Association, 2013). Two clinical phenomena associated with ASD have been studied extensively, but almost always in isolation from one another: an elevated prevalence and complexity of malocclusion, and a strikingly high rate of food selectivity rooted in oral sensory hypersensitivity and oral motor difficulties. Both phenomena converge on the same anatomical structure—the oral cavity—and on overlapping underlying mechanisms, namely sensory processing atypicalities and oral motor function. Yet, to date, no published study appears to test whether orthodontic or dental treatment is directly associated with food selectivity patterns in children with ASD, either as a risk factor that treatment must accommodate or as an intervention that could plausibly influence dietary behaviour.

This narrative review had two purposes. The first was to map, across international and Latin American databases, the existing evidence connecting (a) malocclusion in ASD, (b) food selectivity and oral sensory hypersensitivity in ASD, and (c) oral motor function as a plausible mechanistic bridge between the two. The second was to make explicit the resulting gap in the literature and to propose a concrete research agenda for orthodontic and pediatric dental practice that takes food selectivity seriously as a clinically relevant variable.

II. METHODOLOGY

Searches were conducted in international databases (PubMed/MEDLINE, PMC, ScienceDirect, ResearchGate) and in Brazilian and Latin American databases (SciELO, PePSIC, LILACS, and institutional repositories), combining terms related to autism spectrum disorder, malocclusion, orthodontic treatment, food selectivity, and oral sensory processing. Because the aim was to characterise the state of the evidence and identify a specific gap rather than to exhaustively appraise study quality, we adopted a narrative, non-systematic review design, prioritising systematic reviews and meta-analyses where available and supplementing them with primary studies and descriptive clinical sources when higher-tier evidence was unavailable. Sources without identifiable individual authorship are cited in this review by article title, following APA style conventions for works without a named author.

Malocclusion in Children with Autism Spectrum Disorder

Several studies converge on the finding that children with ASD present a higher burden of malocclusion than their neurotypical peers. A comparison of 97 children (48 with ASD and 49 without) found a significantly higher Discrepancy Index score, a validated measure of malocclusion complexity, among children with ASD, an effect that persisted after adjusting for sex and age ("Malocclusion Complexity and Orthodontic Treatment Need," 2022). A systematic review and meta-analysis of malocclusion characteristics in ASD populations, drawing on PubMed, Scopus, Web of Science, Cochrane, Embase, and SciELO/LILACS, reached a similar conclusion and explicitly

recommended that future studies on malocclusion in ASD account for children's dietary and feeding history as a potential confounder ("Malocclusion Characteristics Amongst Individuals," 2022)—an early, if indirect, acknowledgment of the plausible link this review addresses directly. Occlusal traits in children with ASD have also been linked to parafunctional habits, oral motor function, and patterns of mastication and deglutition ("Prevalence of Malocclusion and Occlusal Traits," 2024).

In the Brazilian and Latin American literature, Campos Neto et al. (2025) examined the prevalence and types of malocclusion among pediatric and adolescent patients with ASD, while a literature review spanning PubMed/MEDLINE, SciELO, Google Scholar, and the Virtual Health Library (2009–2022) similarly described occlusal alterations in this population ("Alterações Oclusais em Pacientes com Transtorno do Espectro Autista," n.d.). A study on orthodontic treatment needs in children with ASD explicitly noted that malocclusion may worsen self-esteem, social interaction, and quality of life in this population, although this outcome was not measured empirically within the study itself ("Orthodontic Treatment Needs in Children with Autism Spectrum Disorder," 2025). Complementary integrative reviews on dental management in ASD, drawing on BIREME/BVS, SciELO, MEDLINE, PubMed, and LILACS, reinforce that behavioural and sensory particularities complicate both the diagnosis and the correction of occlusal problems in this population (Alves et al., n.d.; "Autismo Infantil e a Odontologia," 2021).

Food Selectivity and Oral Sensory Hypersensitivity in Autism Spectrum Disorder

A separate and substantial body of evidence documents that food selectivity is markedly more prevalent among children with ASD than among neurotypical children, with estimates ranging from roughly half to nearly nine in ten children affected ("Food Selectivity in Autism Spectrum Disorder," 2024). A scoping review of the interrelation between food selectivity, oral sensory sensitivity, and nutrient intake found that children with ASD are approximately five times more likely to develop feeding difficulties associated with selectivity, with oral sensory sensitivity to taste, smell, and texture playing a central role ("Interrelation of Food

Selectivity, Oral Sensory Sensitivity, and Nutrient Intake," 2022).

Regional studies echo this pattern. A statistical analysis conducted in Southern Italy found correlations between food selectivity and sensory domains—particularly taste and smell—as well as between oral motor skills and food selectivity, using the Brief Autism Mealtime Behaviour Inventory alongside the Child Oral and Motor Proficiency Scale ("Food Selectivity in Children with Autism Spectrum Disorder," n.d.). A Chilean study of 57 children similarly found a strong association between oral, tactile, and socioemotional sensory hypersensitivity and food selectivity, with texture cited as a factor in 78% of cases and colour in 53% ("Food Pattern, Food Selectivity and Sensory Profile in Autism Spectrum Disorder," 2024/2025). A Malaysian study extended this line of evidence by associating oral sensory hypersensitivity with atypical mealtime behaviours and with overweight and obesity in children with ASD ("Weight Status and Associated Risk Factors of Mealtime Behaviours," 2022), underscoring that the consequences of food selectivity in this population extend beyond nutrition into broader metabolic health.

Some descriptive, non-quantitative sources in the dental literature have also noted, based on clinical observation rather than controlled study, that children with ASD tend to favour soft, sugar-rich foods because of food selectivity, which may in turn increase caries risk (Dentalclean, 2025). While this observation has not been tested quantitatively, it is clinically consistent with the sensory and behavioural evidence reviewed above and suggests that food selectivity may have downstream consequences for oral health that extend beyond occlusion.

Oral Motor Function as a Mechanistic Link

The two lines of evidence reviewed above—malocclusion and food selectivity—are not merely co-occurring; they appear to share a common mechanistic pathway in oral motor function. Difficulties in mastication, deglutition, and oral motor proficiency have been associated both with the development of malocclusion ("Prevalence of Malocclusion and Occlusal Traits," 2024) and, independently, with food selectivity itself ("Food Selectivity in Children with Autism Spectrum Disorder," n.d.). This convergence suggests that oral

motor function may function as an intermediate variable linking sensory processing atypicalities to both feeding behaviour and occlusal development, though this pathway has not been tested directly within a single study population.

The Unexplored Intersection: Orthodontic Treatment and Food Selectivity

Despite these two well-established, converging lines of evidence, our search across international and Latin American databases did not identify any study that directly examines the relationship between dental or orthodontic treatment and food selectivity in patients with ASD. This gap has two distinct dimensions that remain untested. First, it is unknown whether pre-existing food selectivity functions as a risk factor or a barrier to orthodontic treatment itself—for instance, through difficulty adapting to fixed appliances or through resistance to the inevitable changes in food texture that such appliances require during adjustment periods. Second, it is unknown whether the introduction of orthodontic treatment, by altering oral sensation, chewing mechanics, or comfort, could favourably or unfavourably influence a child's already restricted dietary repertoire. Reviews on the general management of dental patients with ASD (Alves et al., n.d.; “O Desafio do Atendimento Odontológico em Pacientes com Transtorno do Espectro Autista,” 2024) and on orthodontists' perceptions of treating this population (“Transtorno do Espectro Autista no Atendimento Ortodôntico,” 2026) discuss behavioural management challenges extensively but do not treat food selectivity as a correlated variable.

Proposed Research Agenda

Building on the gap identified above, we propose two concrete lines of investigation. The first would test whether oral motor function and the parafunctional habits associated with food selectivity in children with ASD predict the type and complexity of malocclusion they present, extending the confounder identified but not measured by prior systematic reviews (“Malocclusion Characteristics Amongst Individuals,” 2022). The second would prospectively evaluate how the introduction of fixed orthodontic appliances affects the food repertoire of children with ASD who present pre-existing food selectivity, monitoring dietary intake and nutritional status in

collaboration with a multidisciplinary team that includes speech-language pathology, nutrition, and occupational therapy. Both lines of research would benefit from standardised instruments already validated in the food selectivity literature, such as the Brief Autism Mealtime Behaviour Inventory and the Child Oral and Motor Proficiency Scale (“Food Selectivity in Children with Autism Spectrum Disorder,” n.d.), applied alongside standard orthodontic indices such as the Discrepancy Index (“Malocclusion Complexity and Orthodontic Treatment Need,” 2022).

Clinical and Multidisciplinary Implications

Even before dedicated studies close this gap, the evidence reviewed here has practical implications for clinicians. Orthodontists and pediatric dentists treating children with ASD should anticipate that existing food selectivity may complicate adaptation to fixed appliances and should proactively coordinate with caregivers and, where possible, with speech-language pathologists and nutritionists to monitor dietary intake during treatment. Conversely, clinicians should not assume that food selectivity is solely a behavioural issue to be managed at the chairside; it is a sensory and motor phenomenon with plausible bidirectional links to occlusal treatment that merits monitoring rather than incidental observation.

III. CONCLUSION

The literature confirms, as two separate and well-supported bodies of evidence, that children with ASD present greater malocclusion complexity than the general population and that food selectivity in ASD is strongly tied to oral sensory hypersensitivity and oral motor deficits. However, no identified study directly tests whether orthodontic treatment influences, for better or worse, food selection patterns, nor whether pre-existing food selectivity constitutes a risk factor or barrier to orthodontic treatment itself. This intersection represents a genuine and clinically meaningful opportunity for future research, one that would allow orthodontic care for children with ASD to be designed with explicit attention to its potential nutritional and behavioural consequences, in keeping with a broader, multidisciplinary, and humanised model of care for this population.

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