



ORIGINAL RESEARCH PAPER

Pediatrics

ORTHODONTICS IN CHILDREN WITH SPECIAL NEEDS: A BIBLIOGRAPHIC REVIEW.

KEY WORDS: Orthodontics, special health needs, autism spectrum disorder, tooth movement techniques, patient cooperation, accessibility to health services

Josefa Guíñez Maciel

Universidad Diego Portales

ABSTRACT

Introduction: Pediatric patients with special health care needs (SHCN) present a higher prevalence of malocclusions and clinical challenges that require adapted orthodontic interventions. Conditions such as autism spectrum disorder (ASD), cerebral palsy, or genetic syndromes increase the complexity of treatment due to functional, behavioral, and access factors. **Materials And Methods:** A structured narrative review of scientific articles published between 2020 and 2025 was conducted, selecting 10 studies from PubMed, SciELO, BMC, MDPI, Springer, Wiley, and Scopus. Research focused on the pediatric population with SHCN that addressed orthodontic needs, clinical management, cooperation, adapted techniques, or therapeutic outcomes was included. **Results:** The studies showed a high orthodontic need in patients with SHCN, assessed using indices such as IOTN and ICON. Common difficulties such as low cooperation, sensory hypersensitivity, and communication barriers were identified. Alternative approaches such as the use of clear aligners, individualized protocols, and clinical adaptation strategies that improve adherence and the patient experience were highlighted. **Discussion:** There is consensus regarding the lack of professional preparation and poor accessibility of orthodontic treatments in this population. The implementation of personalized protocols, interdisciplinary work, and specific training are presented as key solutions for providing effective and empathetic care. **Conclusion:** Orthodontics in pediatric patients with SHCN requires an inclusive, evidence-based, and patient-centered clinical approach. Overcoming current barriers demands both adapted therapeutic tools and a transformation of the care model toward a more humane, flexible, and accessible practice.

INTRODUCTION:

Orthodontic care in pediatric patients with special health care needs (SHCN) represents a growing challenge in clinical practice. These patients, which include children with physical, cognitive, sensory, or neurodevelopmental disabilities, such as autism spectrum disorder (ASD), cerebral palsy, or genetic syndromes, have a higher prevalence of malocclusions, oral dysfunctions, and functional limitations that require timely and adapted orthodontic interventions [1].

Several investigations have shown that these children not only have a greater need for orthodontic treatment, but also a greater clinical complexity, determined by factors such as altered craniofacial growth, persistent oral habits, difficulties in maintaining oral hygiene, and, in particular, limited cooperation during conventional dental care [2,3]. The presence of sensory hypersensitivity, severe dental anxiety and communication barriers increase the risk of therapeutic failure or dropout if specific adaptation strategies are not implemented [4].

Given this scenario, alternative orthodontic approaches have emerged, such as the use of clear aligners, advanced behavioral management, progressive desensitization techniques, and interdisciplinary care protocols. These proposals seek to optimize the patient experience, improve adherence, and enable more personalized interventions, especially in complex clinical contexts such as ASD [5].

This narrative review aims to describe and analyze the scientific evidence published between 2020 and 2025 regarding the orthodontic need, clinical challenges, therapeutic approaches, and adaptations required to provide effective and inclusive orthodontic care in pediatric patients with SHCN.

MATERIALS AND METHODS:

A structured narrative review was conducted to analyze the recent scientific literature on orthodontics in pediatric patients with special health care needs (SHCN). The review focused on identifying orthodontic needs, the main clinical challenges, available therapeutic approaches, and the adaptations required for the care of this population.

Sources Of Information

The bibliographic search was conducted between 2020 and

2025 in the following electronic databases: PubMed, BMC, MDPI, Springer, Wiley, Scopus, and SciELO. Priority was given to studies published in peer-reviewed journals with full texts available in English or Spanish.

Search Strategy

The following MeSH terms and free descriptors were used, combined with Boolean operators, based on the core keywords of the review: ("Orthodontics" OR "Orthodontic Treatment") AND ("Special Health Care Needs" OR "Disabilities" OR "Autism Spectrum Disorder") AND ("Tooth Movement Techniques" OR "Patient Compliance" OR "Health Services Accessibility").

Inclusion Criteria

- Articles published between January 2020 and May 2025.
- Studies conducted in pediatric or adolescent populations (<18 years).
- Articles focused on patients with physical, cognitive, sensory, or neurodevelopmental disabilities.
- Research that addresses at least one of the following aspects: orthodontic need, clinical management, cooperation, adapted techniques, use of aligners or evaluation of results.
- Publications in English or Spanish, with full access to the text.

Exclusion Criteria

- Studies exclusively in adults.
- Articles focused on orthognathic surgery without an orthodontic component.
- Opinions, editorials, or letters to the editor without data analysis.
- Duplication of results or preliminary versions without peer review.

Selection Of Articles

Ten scientific articles were selected that met the aforementioned criteria. The final selection was based on their clinical relevance, timeliness, and direct applicability in the orthodontic context. These studies include observational studies, systematic reviews, pilot studies, and a technical book chapter, allowing for a multifaceted approach to the topic.

RESULTS:

According to studies included in this review (Table I) the

following can be observed:

Orthodontic Need In SHCN

The studies by Akinwonmi et al. (2020) [1] and Farzanegan et al. (2024) [5] showed a greater need for orthodontic treatment in children with disabilities, particularly with ASD, assessed through standardized indices such as the "Index of orthodontic treatment need" (IOTN) which is composed of two components, the dental health component (DHC) that evaluates functional aspects and the Aesthetic Component (AC) that evaluates dental aesthetics based on a photographic scale. The other is the "Index of complexity, outcome and need" (ICON). A higher prevalence of Class II malocclusions, severe crowding and open overbites was found.

Cooperation And Adherence To Treatment

Di Giorgio et al. (2023) [3] explored satisfaction and cooperation in children with ASD undergoing orthodontic treatment, observing acceptable collaboration rates when adapted strategies were applied. Meuffels et al. (2024) [8] highlighted that clear aligners improve treatment tolerance in some selected cases.

Clinical Barriers And Adaptation

Antonarakis & Kiliaridis (2021) [4] conducted a nationwide survey in Switzerland that revealed a lack of specific training, infrastructure limitations, and professional resistance to treat SHCN patients. Cerritelli et al. (2023) [6] and Prynda et al. (2024) [10] proposed clinical adaptation strategies, such as visual guides, stimulus control, and personalized appointment scheduling.

Practical Evidence And Recommendations

Papageorgiou (2023) [7], in a technical chapter, synthesized clinical protocols for orthodontic management in disability, while Lebrun-Harris et al. (2021) [9] showed that the oral condition in children with SHCN in the US remains more precarious than in the general population, with less access to corrective treatments.

Table I: Summary Of Included Studies.

| Nº | First Author & Year | Study Type | Population | Key Topics Addressed |
|-----|---------------------------------|-----------------------------------|---|---|
| 1. | Antonarakis et al. (2021) | Cross-sectional observational | Children and adolescents with SHCN (Pregnant) | Orthodontic treatment need (IOTN) |
| 2. | Meuffels et al. (2022) | Comparative pilot study | Children with ASD vs controls | Malocclusion complexity (IOTN, AC) |
| 3. | Di Giorgio et al. (2023) | Pilot study | Children with ASD | Cooperation and treatment satisfaction |
| 4. | Antonarakis & Kiliaridis (2021) | National survey | Swiss orthodontists | Clinical barriers and adaptations |
| 5. | Farzanegan et al. (2024) | Cross-sectional observational | Children with ASD | Malocclusion pattern evaluation (ICON) |
| 6. | Cerritelli et al. (2023) | Systematic review | Patients with intellectual disability | Guidelines for adapted orthodontic management |
| 7. | Papageorgiou (2023) | Book chapter (literature review) | Pediatric patients with disabilities | Review of techniques and clinical adaptations |
| 8. | Meuffels et al. (2024) | Retrospective study | Children with ASD treated with aligners | Treatment outcomes with aligners |
| 9. | Lebrun-Harris et al. (2021) | Descriptive cross-sectional study | Children and youth with SHCN (USA) | General oral health and access to care |
| 10. | Prynda et al. (2024) | Systematic review of RCTs | Children with ASD | Clinical adaptation strategies in ASD |

DISCUSSION:

The results of this review reflect a general consensus in the recent literature regarding the high prevalence and complexity of malocclusions in pediatric patients with special health care needs (SHCN). Observational studies, clinical approaches, and systematic reviews all agree that this population has a greater need for orthodontic treatment, determined by anatomical, functional, and behavioral factors specific to each condition [1,2,5].

In children with autism spectrum disorders (ASD), several authors have described occlusal abnormalities such as anterior open bite, skeletal class II, dental malposition, and persistent oral habits that require early intervention. The use of standardized tools such as the IOTN or ICON has allowed for objective quantification of this need, revealing higher scores than in the neurotypical population [2,5].

One of the most relevant axes found in this review is patient cooperation during orthodontic treatment, which represents a significant barrier to clinical success. Di Giorgio et al. [3] and Meuffels et al. [8] agree that the implementation of individualized protocols, interdisciplinary work with caregivers and support professionals, and the use of less invasive techniques (such as clear aligners), can improve treatment tolerance in certain subgroups, particularly in patients with mild to moderate ASD.

However, a significant gap in professional training remains. The national survey by Antonarakis & Kiliaridis [4] showed that many orthodontists do not feel prepared to treat patients with disabilities, which coincides with the need raised by Cerritelli et al. [6] to establish formal clinical guidelines and specific training in this area. Similarly, the analysis by Prynda et al. [10] reinforces the importance of structured behavioral strategies, such as the use of visual aids, advance planning, and reduction of sensory stimuli.

Furthermore, evidence shows that unequal access to orthodontic treatment remains a problem, even in countries with developed healthcare systems. A study by Lebrun-Harris et al. [9] in the USA revealed that children with SHCN are less likely to receive specialist orthodontic care, despite having greater needs, highlighting a structural inequity that needs to be addressed from a public health perspective.

Taken together, the reviewed studies not only describe orthodontic needs and clinical obstacles but also propose viable strategies and successful adaptations, such as progressive aligner use, interdisciplinary collaboration, targeted clinical training, and adaptation of the dental environment. These elements are essential for building truly inclusive and patient-centered orthodontics.

CONCLUSION:

Evidence analyzed between 2020 and 2025 confirms that pediatric patients with special health care needs (SHCN) have a higher prevalence of malocclusions, greater clinical complexity, and multiple barriers to accessing appropriate orthodontic treatment. This condition not only implies an objective need for intervention, but also a demand for more inclusive, adaptive, and empathetic orthodontic practice.

The main challenges include behavioral difficulties, sensory hypersensitivity, limited clinical cooperation, and limited specific training of professionals in this area. However, the reviewed studies demonstrate that many of these limitations can be overcome through strategies such as the use of clear aligners, structured behavioral management techniques, modification of the clinical environment, and active participation of caregivers.

The implementation of personalized protocols, strengthening professional training in orthodontics for patients with disabilities, and incorporating interdisciplinary approaches emerge as fundamental pillars for improving the quality of care for this vulnerable group.

In conclusion, moving toward truly inclusive orthodontics requires not only clinical evidence, but also institutional commitment, professional empathy, and an approach focused on the real needs of patients. This review highlights the urgency of transforming pediatric orthodontic practice from a technical paradigm to a truly humane and accessible one.

REFERENCES:

1. Akinwonmi, BA, Kolawole, KA, Folayan, MO, & Adesunloye, AM (2020). Orthodontic treatment need of children and adolescents with special healthcare needs in Ile Ife, Nigeria. *European Archives of Pediatric Dentistry*, 21(3), 355–362. <https://doi.org/10.1007/s40368-019-00492-y>
2. Meuffels, SA, Kuijpers-Jagtman, AM, Tjoa, STH, Bonifacio, CC, & Carvajal Monroy, PL (2022). Malocclusion complexity and orthodontic treatment need in children with autism spectrum disorder: Pilot study. *Clinical Oral Investigations*, 26(5), 3459–3468. <https://doi.org/10.1007/s00784-022-04578-8>

3. Di Giorgio, G., Corridore, D., Corvino, I.C., Zumbo, G., Pranno, N., Voza, I., et al. (2023). Orthodontic treatment in pediatric patients with autism spectrum disorder: Compliance and satisfaction: Pilot study. *Applied Sciences*, 13(16), 9189. <https://doi.org/10.3390/app13169189>
4. Antonarakis, G.S., & Kiliaridis, S. (2021). Orthodontic treatment of patients with special needs in Switzerland: A national survey. *Swiss Dental Journal*, 131(3), 220–227. <https://doi.org/10.61872/sdj-2021-03-727>
5. Farzanegan, F., Ahmadi Shadmehri, S., Shooshtari, Z., Hamidi, A.R., & Shahri, A. (2024). Evaluating malocclusion patterns in children with autism spectrum disorder using ICON: A cross-sectional study. *BMC Oral Health*, 24, 759. <https://doi.org/10.1186/s12903-024-04524-y>
6. Cerritelli, L., Abate, G., Luzzi, V., Ierardo, G., & Polimeni, A. (2023). Guidelines for orthodontic management of individuals with mental disabilities: A systematic review. *European Journal of Orthodontics*, 45(1), 1–9. <https://doi.org/10.7759/cureus.40604>
7. Papageorgiou, S.N. (Ed.). (2023). Orthodontics for children with disabilities. In *Pediatric Orthodontics: Current Principles and Techniques* (Chap. 14). Wiley. <https://doi.org/10.1002/9781119870081.ch14>
8. Meuffels, SA, Kuijpers-Jagtman, AM, Tjoa, STH, & Carvajal Monroy, PL (2024). Orthodontic aligner therapy outcomes in children with autism spectrum disorder. *International Journal of Pediatric Dentistry*, 35(2), 456–467. <https://doi.org/10.1111/ipd.13257>
9. Lebrun-Harris, LA, Canto, MT, Vodicka, P., Mann, MY, & Kinsman, SB (2021). Oral health among children and youth with special health care needs: United States, 2016–2018. *Pediatrics*, 148(2), e2020025700. <https://doi.org/10.1542/peds.2020-025700>
10. Prynda, M., Pawlik, A.A., Niemczyk, W., & Wiench, R. (2024). Dental adaptation strategies for children with autism spectrum disorder—A systematic review of randomized trials. *Journal of Clinical Medicine*, 13(23), 7144. <https://doi.org/10.3390/jcm13237144>