

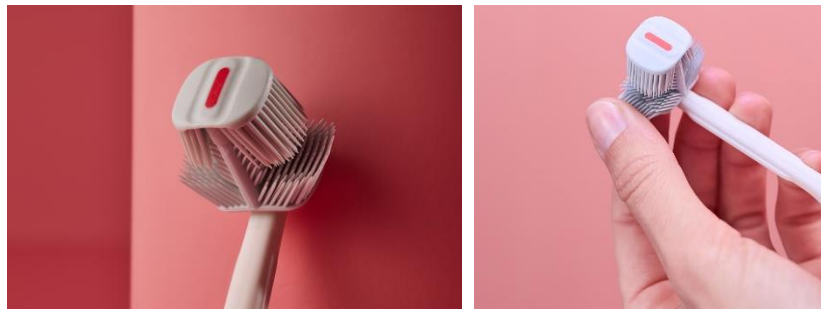
Effectiveness of a Double-Sided Toothbrush (BALENE®) Versus a Conventional Toothbrush in Children and Adolescents Diagnosed with Level 3 Autism Spectrum Disorder (ASD)

Brief description

Autism Spectrum Disorder (ASD) comprises a group of developmental disorders characterized by persistent deficits in communication and social interaction, along with restricted and repetitive patterns of behaviour, interests, or activities. The difficulty in performing daily tasks such as brushing teeth among children with ASD may increase the risk of developing oral diseases such as periodontitis and dental caries.

This innovative oral hygiene system, developed and promoted in Spain, is a toothbrush designed to adapt to all tooth surfaces simultaneously. There is no need to brush the outer, inner, and chewing surfaces separately. In addition, both dental arches are brushed at the same time.

This is made possible by the brush head, which features six sides with bristles that fully surround the teeth. All these advantages may result in significant time savings during oral hygiene routines—particularly relevant given the specific needs of paediatric patients with ASD. **Balene® is currently part of the ISDIN company.** www.isdin.com



Figures 1 and 2. Images of the Balene® triple-sided toothbrush, showing the distinctive design and flexibility of its bristles, all of which contribute to effective supragingival plaque removal.

How does it work and what problems does it solve?

Children with Autism Spectrum Disorder (ASD) represent a highly heterogeneous group, sharing behavioural characteristics that may interfere with oral health care. These patients are expected to have a higher risk of dental caries and gingivitis due to ineffective toothbrushing and flossing, often resulting from the challenges faced by parents and/or caregivers when brushing the child's teeth.

In addition, the lack of manual dexterity commonly observed in children with ASD may further contribute to these oral health issues. The potential application and effectiveness of this new oral hygiene toothbrush are evaluated in paediatric and adolescent patients diagnosed with Level 3 Autism Spectrum Disorder (ASD).

In our study, a total of 46 children aged between 7 and 19 years were analysed. They were previously instructed by their educators through an adaptation phase using the Balene® toothbrush. The Simplified Oral Hygiene Index (OHI-S) was used to assess initial and final oral health status. Two assisted brushing sessions were conducted by the educators, following the guidelines developed by our research team and previously published.^{1,2}

¹ Leiva-García, B., Planells, E., Planells Del Pozo, P., & Molina-Lopez, J. (2019). Association between feeding problems and oral health status in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 49(12), 4997–5008. <https://doi.org/10.1007/s10803-019-04211-w>

² Martínez Pérez E, Adanero Velasco A, Gómez Clemente V, Miegimolle Herrero M, Planells Del Pozo P. Importance of Desensitization for Autistic Children in Dental Practice. *Children (Basel)*. 2023 Apr 28;10(5):796. doi: 10.3390/children10050796. PMID: 37238344; PMCID: PMC10217695.



Competitive advantages compared to other research.

In previous studies conducted by the same research team on neurotypical paediatric patients, the Balene® toothbrush demonstrated greater effectiveness in removing dental plaque compared to conventional toothbrushes. Another advantage lies in the reduced brushing time, due to more efficient cleaning across all tooth surfaces and both arches simultaneously.

When comparing the Simplified Oral Hygiene Index (OHI-S) scores for the lingual surfaces between the two types of toothbrushes, better results were observed with the Balene® toothbrush, although these differences were not statistically significant when compared to the conventional manual toothbrush.

Next to these findings, the high level of acceptance and satisfaction expressed by the study participants, their parents, and their teachers/caregivers following the use of this innovative oral hygiene system was particularly noteworthy.

Where has it been developed?

The present study is being conducted at the Faculty of Dentistry, Complutense University of Madrid (UCM), within the framework of the postgraduate programme “Specialist in Integrated Dental Care for Children with Special Needs”.³

And moreover...

At present, our objectives are focused on expanding the study sample to include other populations of children and adolescents affected by disabilities or motor impairments. The aim is to enhance the effectiveness of supragingival plaque removal through the use of this product, whether by the patients themselves, their parents, or their caregivers/educators.

Researcher in charge

Paloma Planells del Pozo, pplanells@odon.ucm.es

Department: **Department of Clinical Dental Specialities**

Faculty: **Faculty of Dentistry, Complutense University of Madrid (UCM)**

³ Ingrid Góngora León,, José Ignacio Farfán Vargas, Alicia Elomba Biahakue, Paola Beltri Orta, Paloma Planells del Pozo, Lara Vivero Couto. Comparison of the effectiveness of a regular toothbrush vs. a double-sided toothbrush in children and adolescents with autism spectrum disorder: A pilot study. *Odontol Pediatr* 2024;32(1):1-30*

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