

# Toothbrushing habits in people with and without autism spectrum disorder: A Review.

Hábitos de cepillado dental en personas con y sin trastorno del espectro autismo: Una Revisión.

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## INTRODUCTION.

Autism spectrum disorder (ASD) is a complex and highly heterogeneous disorder, which affects social communication and behavior, with the presence of repetitive and restricted behaviors and interests.<sup>1</sup> Many authors agree that oral hygiene in people with ASD is deficient, with a higher oral hygiene index than in people without ASD<sup>2-4</sup> mainly due to the multiple sensory alterations, lack of manual dexterity, the consumption of snacks between meals,<sup>1,5</sup> the presence of hypotonia of the perioral muscles<sup>6</sup> and a negative behavior towards dental care.<sup>7</sup>

Therefore, the general characteristics of people with ASD could lead to a series of problems in the health and oral hygiene of these patients, so it is necessary for dentists to know the oral hygiene habits that people with ASD may have, especially toothbrushing habits, which can contribute to worsening oral hygiene in these patients, increasing the risk of tooth decay and periodontal disease.

This review aims to compare oral brushing habits among people with and without ASD reported in the literature, since brushing is a basic element of great importance for the maintenance of optimal oral hygiene

## MATERIALS AND METHODS.

A descriptive study was carried out, a bibliographic review of scientific publications of toothbrushing habits of people with and without autism spectrum disorder. For which, a structured search was carried out in the Medline database via *PubMed*, *SCOPUS*, *SciELO* and *LILACS*, under the keywords of Autism, Autistic, ASD, "Autism Spectrum Disorder", "Autism Spectrum Disorders" together with "Oral health care", "Oral health status", "Oral hygiene", "Oral hygiene practices", Toothbrushing with different combinations of them. Subsequently, it was supplemented in the *Latindex* and *LILACS* databases with the terms in Spanish "autism", "autism spectrum disorder" together with "oral hygiene", "tooth brushing" with different combinations thereof.

The inclusion criteria were articles of toothbrushing habits in people with and without ASD, in English or Spanish, people of any age and with a number of subjects greater than 10. The exclusion criteria were articles in which the non-ASD group had some other disabling condition or disease, articles in which the toothbrushing habits and study populations were not clearly defined, articles from which the complete original was not obtained, and those in which toothbrushing habits were not compared between the groups.

From the search strategies in each database, a total of 407 articles were obtained in PubMed, 507 in Scopus, 40 in SciELO, 13 in LILACS, 4 in Latindex and 7 in LILACS. This corresponded to a total of 978 articles, of which 745 of them corresponded to duplicates, resulting in a

total of 233 articles obtained. Of the 233 articles from the six databases, 219 were excluded because they did not meet the inclusion criteria. Finally, 14 articles were collected that met all the inclusion criteria. For the selection, the abstracts were reviewed, and if necessary, the full articles were reviewed in order to decide whether or not the information was related to the objective of this work.

## RESULTS.

Of the 14 selected articles, 10 case-control studies, 2 cross-sectional studies, 1 correlational study and 1 cohort study were found. Some of the variables found on toothbrushing habits in a group of people with and without ASD were: frequency and types of brushing (Table 1), use of fluoride paste, difficulty

**Table 1.** Studies that measure frequency and type of toothbrushing in a group of people with and without ASD.

Authors	Year	Country	FREQUENCY OF TOOTHBRUSHING					ASD					NO-ASD											
			n ASD/ No ASD Total	Age- Range (years)	None		< once		Once		Twice		Three or more times	None		< once		Once		Twice		Three or more times		
					n	%	n	%	n	%	n	%		n	%	n	%	n	%	n	%			
Orellana et al <sup>2</sup>	2012	Spain	30/30 60	20-41	-	-	-	-	4	13.3	12	40	14	46.6	-	-	-	-	9	30	13	43.3	8	26.6
Vajawat et al <sup>4</sup>	2015	India	117/126 243	5-22	1	0.8	-	-	77	65.8	39	33.3	-	-	0	0	-	-	86	68.2	40	31.7	-	-
Sarnat et al <sup>8</sup>	2016	Israel	47/44 91	3.5-8	12	25.5	-	-	21	44.7	14	29.8	-	-	0	0	-	-	22	50	22	50	-	-
Kalyoncu et al <sup>1</sup>	2017	Turkey	60/60 120	6-14	20	30	-	-	26	43	14	24	0	0	6	10	-	-	20	35	28	47	6	10
Mansoor et al <sup>9</sup>	2017	India	84/53 137	ASD: 10.8 No ASD: 8.8	-	-	-	-	38	45.2	46	54.2	-	-	-	-	-	-	19	36.5	33	63.5	-	-
Suhaib et al <sup>10</sup>	2017	Pakistan	58/27 85	2-10	7	12	9	15.5	37	64	5	8.6	-	-	3	11.1	5	18.5	9	33.3	10	37	-	-
Du et al <sup>11</sup>	2018	China	257/258 515	32-77 months	-	-	-	-	93	37.1	158	62.9	-	-	-	-	-	-	71	31.1	180	71.7	-	-
Onol et al <sup>12</sup>	2018	Turkey	126/111 237	6-14	37	29.4	46	36.5	25	19.8	18	14.3	-	-	1	0.9	69	62.2	21	18.9	20	18	-	-
Kuter et al <sup>5</sup>	2019	Turkey	285/122 407	5-16	-	-	-	-	108	38.1	-	-	-	-	-	-	-	-	104	85.3	-	-	-	-
Daneshvar et al <sup>13</sup>	2020	Iran	55/165 220	6-12	19	34.5	-	-	30	54.5	6	10.9	-	-	6	3.6	-	-	86	52.1	73	44.2	-	-
Qiao et al <sup>14</sup>	2020	China	114/288 402	3-16	13	9	16	11.1	58	40.2	57	39.5	0	0	1	0.4	1	0.4	85	37.2	139	60.9	2	0.8

ASD: Autism Spectrum Disorder. No-ASD: No Autism Spectrum Disorder. [Table 1 continued].

Authors	Year	TYPE OF TOOTHBRUSHING			ASD						NO-ASD					
		Country	No. ASD/ No ASD Total	Range of age (years)	Autonomous		Assisted		Both		Autonomous		Assisted		Both	
					n	%	n	%	n	%	n	%	n	%	n	%
Orellana et al <sup>2</sup>	2012	Spain	30/30 60	20-41	7	23.3	14	46.6	9	30	30	100	-	-	-	-
El Khatib et al <sup>3</sup>	2014	Egypt	100/100 200	3-13	-	-	61	78.2	-	-	-	-	34	37.8	-	-
Vajawat et al <sup>4</sup>	2015	India	117/126 243	5-22	49	45.7	58	54.3	-	-	126	100	0	0	0	0
Sarnat et al <sup>8</sup>	2016	Israel	47/44 91	3.5-8	14	36.2	30	63.8	-	-	19	43	25	57	-	-
Kalyoncu et al <sup>1</sup>	2017	Turkey	60/60 120	6-14	16	27	24	40	-	-	53	90	1	2	-	-
Mansoor et al <sup>9</sup>	2017	India	84/53 137	ASD: 10.8 No ASD: 8.8	14	16.7	70	83.3	-	-	44	84.6	8	15.4	-	-
Suhaib et al <sup>10</sup>	2017	Pakistan	58/27 85	2-10	7	12	48	82	-	-	18	66.6	6	22.2	-	-
Du et al <sup>11</sup>	2018	China	257/258 515	32-77 months	8	3.2	181	73	59	23.8	15	6.0	81	32.4	154	61.6
Onol et al <sup>12</sup>	2018	Turkey	126/11 237	16-14	6	4.8	83	65.8	-	-	84	75.7	26	23.4	-	-
Kuter et al <sup>5</sup>	2019	Turkey	285/122 407	5-16	56	19.8	229	80.2	-	-	111	91.1	11	8.9	-	-
Qiao et al <sup>14</sup>	2020	China	114/288 402	3-16	23	16.2	48	33.8	66	46.4	166	75.1	11	4.4	49	22.1

**ASD:** Autism Spectrum Disorder. **No-ASD:** No Autism Spectrum Disorder.

in toothbrushing and type of brush. In 11 of the 14 studies evaluated, the frequency of toothbrushing was compared between people with and without ASD, observing a higher percentage of people with ASD who did not brush their teeth, with statistically significant differences between both groups.<sup>1,2,10-14</sup>

In 11 of the 14 studies evaluated, the type of toothbrushing was compared according to assistance between people with and without ASD, whether they brushed alone (autonomous), with the help of another person (assisted) or both. A higher percentage of people with ASD who required assistance with toothbrushing was observed, with significant differences between both groups.<sup>1-4,9-13</sup>

As for the other variables, of the 14 included studies, only 4 evaluated the use of fluoride paste between people with and without ASD, observing a lower percentage of people with ASD who used it compared to people without ASD, with significant

differences between both groups.<sup>3,11</sup>

Of the 14 included studies, only 4 evaluated the difficulty in toothbrushing between people with and without ASD, observing a higher percentage of people with ASD who had difficulties in toothbrushing when compared with people without ASD, finding significant differences between both groups.<sup>5,6,9,11</sup> Only 2 of the 14 included studies evaluated the type of toothbrush used by people with and without ASD. These authors did not find significant differences between both groups.<sup>2,7</sup>

## DISCUSSION.

From the analysis of the variables studied in the 14 articles included for this review, it was observed that the toothbrushing habits of patients with ASD were more deficient when compared with patients without ASD, since they had less frequency of toothbrushing, greater assisted brushing, less use of fluoride tooth-

paste and greater difficulties in toothbrushing.

This is due to the general characteristics of people with ASD, which has a negative impact on their oral hygiene, affecting their quality of life and of their families. The lower adherence to toothbrushing in the ASD group can be related to characteristics of these individuals, such as: behavioral disturbances, which make them uncooperative; restricted interests and activities,<sup>3</sup> which limit incorporating new routines into their lives such as toothbrushing; deficits in motor coordination<sup>4,6,10</sup> that hinder the movements and adequate grasp of the toothbrush, and added to this, a weakened oral musculature; multiple sensory problems, and with it the rejection of the incorporation of new flavors, textures or smells present in toothpastes or mouthwashes or the introduction of elements such as the brush in the mouth.<sup>6</sup>

Not tolerating anything in their mouth, not understanding toothbrushing, the hyperactivity manifested while brushing or a particular medical condition, together with alterations in communication that makes these patients unable to understand the importance of maintaining a good oral hygiene are factors that make brushing more complex, to the point that it takes a lot of effort and time for parents to carry it out,<sup>12</sup> and with it the ability to promote and create a habit over time.<sup>10</sup>

It is important to motivate and instruct parents and caregivers about the importance of maintaining good oral hygiene and the inclusion of toothbrushing, as a fundamental part of a daily routine, which should be established at an early age and rigorously maintained over time.

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