

# ORAL HYGIENE HABITS OF CHILDREN WITH DELAYED SPEECH DEVELOPMENT AND CHILDREN WITH TYPICAL DEVELOPMENT IN THE AREA OF the TUZLA CANTON

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## ABSTRACT

Speech and language delay in children is associated with increased difficulties with reading, writing, attention and socialization which also affects the child's entire organism. The aim of the research was to examine the oral hygiene habits in children with delayed speech development and children with typical development in the area of the Tuzla Canton and to determine deviations and differences between the groups. The sample consisted of 80 respondents from the area of the Tuzla Canton, children with slow speech development who came for regular treatments at the Center for Early Growth and Development and children who came for regular dental examinations. During the research, a survey was conducted on children's parents with delayed speech development, as well as parents of children with typical development who made up the control group. Age and gender information were used, but not information of identity. There is a difference between answers regarding the child's birth weight, maintaining the child's oral hygiene, the first dental examination, extraction of deciduous and permanent teeth, consumption of sweets, frequency of annual visits to the dentist. In a larger number of observed parameters, the working hypothesis was confirmed while the null hypothesis was rejected. In order to preserve the oral health of children it is necessary to work on the promotion and prevention of oral health as well as early detection of oral and dental diseases and to strengthen cooperation between dentists and experts dealing with the problems of children with developmental disabilities.

**Key words:** delayed speech development, oral health, oral hygiene habits

## Introduction

According to the American Academy of Neurology and the Society of Child Neurology, global developmental disorder is a set of developmental difficulties defined as a significant delay in two or more domains of development, including activities of daily living as well as motor, cognitive, speech/language and social skills [1]. Speech and language development is a useful indicator of the overall development of a child's cognitive abilities [2]. Research shows that untreated speech and language delay can exist in 40% - 60% of children and that these children are at greater risk of social, emotional, behavioral and cognitive problems in adulthood [3]. Slow speech development is a specific difficulty in speech and language development and is an increasingly common developmental disorder in children, and indicates that the child's speech development does not follow the usual course, but lags behind the child's chronological age. Speech and language delay in children is associated with increased difficulties with reading, writing, attention and socialization, which also affects the entire organism of the child [4]. Scientific research in medicine shows that overall health begins with the mouth. Good oral health is important for the whole organism, disease prevention, socialization and quality of life of the individual [5]. The American Academy of Pediatric Dentistry recommends that the first dental examination be performed in the first year of a child's life [6]. Preservation of oral health, as well as prevention of oral diseases, is an important part of the primary level of health care, and should be available to every individual, especially people with certain developmental disabilities or others. People with developmental disabilities have poor oral hygiene and a higher prevalence of periodontal diseases [7]. Bad habits that include bruxism, sticking the tongue between the teeth, biting the lips, gingival injuries, biting on objects such as pencils are also very common. People with developmental disabilities are also prone to dental trauma and self-harm [8]. Dental medicine is largely engaged in changing and restoring structures within the oral cavity, in order to mitigate the ravages of disease and developmental abnormalities. The main part of speech articulation takes place inside the oral cavity, and any change or

restoration of structures in it will adversely affect speech in proportion to the location and size of the change [9]. The aim of this research was to examine the oral hygiene habits of children with delayed speech development and children with typical development in the area of Tuzla Canton, Bosnia and Herzegovina. Working hypothesis - There is a statistically significant difference between the oral hygiene habits of children with typical development and children with delayed speech development.

## Materials and methods

On the basis of Article 47 of the Statute of the Public Health and Teaching Institution Health Care Center "Dr Mustafa Šehović" Tuzla (Bosnia and Herzegovina), Articles 6 and 25 of the Rules of Procedure of the Ethics Committee, the consent of the Ethics Committee of the Institution was given, number: 01-6386-1 from 12/12/2022 for the purpose of conducting research for the purpose of assessing the oral health of children with delayed speech development and a control group of children with typical speech development, their oral hygiene habits, determining possible malformations, and the possibility of prevention, promotion and treatment of the said group. The research was conducted in the Center for Early Growth and Development of the Dispensary for Preschool Children - Service of General Family Medicine in the headquarters with outpatient clinics and Department for Children - Service of Dentistry, for the purpose of assessing their oral health. The sample consisted of 80 subjects from the area of Tuzla Canton who came for regular treatments at the Center for Early Growth and Development when it comes to children with delayed speech development and children who came for regular dental examinations at the Dental Service.

The sample is adapted to the number of users of the Center for Early Growth and Development who are undergoing treatment in the specified period. During the research, parents/guardians of children with delayed speech development as well as parents/guardians of children with typical development who made up the control group were surveyed. Of the data, information on the age and gender of the children was used, but not information

on identity. Statistical data processing was done using the computer program Excel (Microsoft Office Excel 2010) and SPSS computer program for statistical analysis (SPSS-Statistical Package for Social Sciences) version 22.0. The data were processed using standard statistical methods and presented in the form of tables and graphs. For categorical variables, the results are presented as absolute numbers (n) and as percentage frequency (%) of individual categories. The Kolmogorov-Smirn test was used to assess the normality of the distribution of continuous variables. The results were statistically processed to determine: mean (X) and standard deviation (SD) for continuous

independent variables that followed a normal distribution, or median and interquartile range for independent continuous variables that did not follow a normal distribution. The significance of the difference for continuous independent variables that followed a normal distribution was tested with the student t-test, while the significance of the difference for independent continuous variables that did not follow a normal distribution was tested with the MannWhitney test for independent samples and the Chi-square test. Values less than 0.05 are considered statistically significant.

## Results

**Table 1.** The frequency of answers to the survey questionnaire of respondents in the total population of children with typical speech development and children with delayed speech development

	YES (%)	NO (%)
Conception by artificial insemination	7 (8.8%)	73 (91.3%)
Natural conception	70 (87.5%)	10 (12.5%)
Premature	16 (20%)	64 (80%)
Child with low birth weight	17 (21.3%)	63 (78.8%)
Birth by caesarean section	38 (47.5%)	42 (52.5%)
Breastfeeding?	69 (86.3%)	11 (13.8%)
Child using a pacifier?	50 (62.5%)	30 (37.5%)
Trouble with chewing food?	22 (27.5%)	58 (72.5%)
Iron supplements?	20 (25%)	60 (75%)
Does the parent maintain the child's oral hygiene?	64 (80%)	16 (20%)
Has the child's first dental treatment ever been done?	43 (53.8%)	37 (46.3%)
Does the child cooperate during the dental examination?	39 (48.8%)	7 (8.8%)****
Has the child's deciduous tooth been extracted due to caries?	24 (30%)	56 (70%)
Has the child's permanent tooth been extracted due to caries?	5 (6.3%)	75 (93.8%)
General anesthesia for dental intervention?	2 (2.5%)	77(96.3%)
Need to repair a deciduous tooth?	44 (55%)	36 (45%)

The results are presented as N - number of respondents and % (percentage representation of respondents)

**Table 2.** The relationship between the groups of respondents with typical speech development and delayed speech development

N=80	Typical speech development		Slow speech development		$\chi^2$ (p)
	YES (%)	NO (%)	YES (%)	NO (%)	
Conception by artificial Insemination	1 (1.3%)	39 (48.8%)	6 (7.5%)	34 (42.5%)	3.914 (p=0.054)
Natural conception	36 (45%)	4 (5%)	34 (42.5%)	6 (7.5%)	0.457 (p=0.499)
Premature	5 (6.3%)	35 (43.8%)	11 (13.8%)	29 (36.3%)	2.813 (p=0.094)
Child with low birth Weight	4 (5%)	36 (45%)	13 (16.3%)	27 (33.8%)	6.05 (p=0.013)*
Birth by caesarean Section	19 (23.8%)	21 (26.3%)	19 (23.8%)	21 (26.3%)	0.000 (p=1)
Breastfeeding?	38 (47.5%)	2 (2.5%)	31 (38.8%)	9 (11.3%)	5.165 (p=0.023)*
Child using a pacifier?	24 (30%)	16 (20%)	26 (32.5%)	14 (17.5%)	0.213 (p=0.644)
Trouble with chewing food?	5 (6.3%)	35 (43.8%)	17 (21.3%)	23 (28.7%)	9.028 (p=0.003)**
Iron supplements?	7 (8.8%)	33 (41.3%)	13 (16.3%)	27 (33.8%)	2.4 (p=0.121)
Does the parent maintain the child's oral hygiene?	27 (33.8%)	13 (16.3%)	37 (46.3%)	3 (3.8%)	7.813 (p=0.005)**
Has the child's first dental treatment ever been done?	33 (41.3%)	7 (8.8%)	10 (12.5%)	30 (37.5%)	26.6 (p=0.000)**
Does the child cooperate during the dental examination?	32 (66.7%)	3 (6.3%)	7 (14.6%)	4 (8.3%)	5.78 (p=0.056)
Has the child's deciduous tooth been extracted due to caries?	22 (27.5%)	18 (22.5%)	2 (2.5%)	38 (47.5%)	23.81 (p=0.000)**
Has the child's permanent tooth been extracted due to caries?	5 (6.3%)	35 (43.8%)	0	40 (50%)	5.333 (0.021)*
General anesthesia for dental intervention?	1 (1.3%)	39 (48.7%)	1 (1.3%)	38 (47.4%)	0.000 (p=0.986)
Need to repair a deciduous tooth?	24 (30%)	16 (20%)	20 (25%)	20 (25%)	0.808 (p=0.369)

The results are shown on N - number of respondents, % - percentage representation of respondents, \*p<0.05; \*\*p<0.01

**Table 3.** Relationship between groups of respondents with typical speech development and comparative speech development

	Typical speech development	Slow speech development	$\chi^2$ (p)
	N (%)	N (%)	
Parent school			0.223 (p=0.895)
Elementary school	1 (2.5%)	1 (2.5%)	
High school Faculty	24 (60%) 15 (37.5%)	26 (65%) 13 (32.5%)	
Time of breastfeeding			5.527 (p=0.063)
0-11 month	10 (26.3%)	15 (50%)	
12-23 month >24 month	15 (39.5%) 13 (34.2%)	5 (16.7%) 10 (33.3%)	
Toothbrushing frequency			2.273 (p=0.603)
Morning and evening	30 (75%)	28 (70%)	
Morning only	3 (7.5%)	3 (7.5%)	
Evening only	2 (5%)	3 (7.5%)	
After every meal	4 (10%)	2 (5%)	
Not at all	1 (2.5%)	4 (10%)	
When a parent started taking care of a child's Teeth			0.536 (p=0.764)
<1. year	14 (42.4%)	17 (42.1%)	
1.-3. year >3. Year	17 (51.5%) 2 (6.1%)	21 (55.3%) 1 (2.6%)	
Child's first dental examination?			17.6 (p=0.000)**
<3. year	9 (22.5%)	11 (27.5%)	
4.-7. year	22 (55%)	0	
>8. year Never	2 (5%) 7 (17.5%)	0 29 (72.5%)	
Frequency of visits to the dentist?			12.54 (0.001)**
Once a year	2 (5%)	3 (7.5%)	
Twice a year	5 (12.5%)	0	
Three times a year	6 (15%)	3 (7.5%)	
as needed Not at all	26 (65%) 1 (2.5%)	4 (10%) 30 (75%)	
Frequency of using Candy			7.997 (p=0.092)
Once a day	9 (22.5%)	6 (15%)	
Twice a day	7 (17.5%)	22 (50%)	
Several times a day	22 (55%)	16 (40%)	
Very rarely Not at all	2 (5%) 0	3 (7.5%) 6 (15%)	
Frequency of consumption of sweetened drinks			6.428 (p=0.169)
Once a day	11 (27.5%)	4 (10%)	
Twice a day	2 (5%)	6 (15%)	
Several times a day	15 (37.5%)	18 (45%)	
Very rarely Not at all	10 (25%) 2 (5%)	8 (20%) 4 (10%)	

The results are shown on N - number of respondents, % - percentage representation of respondents, \*\*p<0.01

## Discussion

The results of a survey of parents of children with delayed speech development and children with typical development from the area of Tuzla Canton, Bosnia and Herzegovina show that a statistically significantly higher number of children with delayed speech development were born with low birth weight compared to children with typical speech development.

The research results show that 47.5% of children with typical speech development were breastfed by their mothers, while 2.5% of children were not, and 38.8% of children with delayed speech development were also breastfed, and 11.3% were not breastfed. Research conducted by Wendy H Oddy and her colleagues shows that infants who are breastfed for 4 months or longer show better performance in fine motor skills at ages one and three, significantly higher adaptability scores by age two, and better communication skills at the age of one and three years. Breastfeeding for 4 months or longer is associated with improved developmental outcomes for children ages one to three [10].

Also, the results show that a higher percentage of parents of children with delayed speech development maintain their child's oral hygiene, unlike the other group, which can be connected to the increased need of children with delayed speech development for parental care and care.

Hsiu-Yueh Liu in research with her collaborator's states that children with delayed development whose oral hygiene was maintained by their parents/guardians have healthier teeth and a lower prevalence of caries. [11].

There is a statistically significant difference when it comes to a child's first dental examination. 37.5% of children with delayed speech development have never visited a dentist, in contrast to children with typical speech development where the percentage is 8.8%. The American Academy of Pediatric Dentistry recommends that the first visit to the dentist be made in the first year, but some still challenge the

theoretical, clinical and scientific rationale for early preventive dental visits. A visit to the dentist at the age of one enables early prevention and treatment of dental diseases [12]. If we look at the results of the research, we came to the conclusion that there is a statistically significant difference between the respondents' answers as to whether the child's milk tooth was extracted as a result of caries, and a statistically higher percentage of children with typical speech development who underwent milk tooth extraction, in contrast to children with delayed speech development. In this case, it can be taken into account that a higher percentage of parents of children with delayed speech development maintain their child's oral hygiene, in contrast to parents of children with typical development.

Early loss of primary teeth can cause psychosocial problems, orthodontic problems such as crowding, ectopic teeth, appearance of impaction, which can result in malocclusion.

In the research conducted by Karolina Spodzieja, she states that the early loss of baby teeth can also cause phonetic problems, causing speech distortion in children, which can also be a problem for children with typical development [13].

The results of the research show that more children with typical speech development had their permanent teeth removed as a result of caries, in contrast to children with delayed speech development.

If we consider both groups of respondents, children with typical speech development and children with delayed speech development, a large percentage of them consume sweets and sweetened beverages several times a day, and there is also a certain percentage of respondents who do not brush their teeth at all.

Also, when it comes to both groups, the largest percentage of respondents visit the dentist only, when necessary, while a large percentage of respondents never visit the dentist.

Using the results obtained from this research, we can see that there is a difference between the

answers about whether the child was born with a low birth weight, about maintaining the child's oral hygiene, the first dental examination, extraction of milk and permanent teeth, consumption of sweets and sweetened drinks, frequency of annual visits to the dentist. In a larger number of observed parameters, the working hypothesis was confirmed, while the null hypothesis was rejected.

## Conclusion

Based on the conducted research, it was observed that there is a statistically significant difference between the examined groups when it comes to certain oral hygiene habits. It was also observed that oral hygiene habits are bad even within individual groups. Oral health is an important part of general health. In order to preserve the oral health of children, it is necessary to work on the promotion and prevention of oral health, as well as early detection of diseases of the mouth and teeth. Dentists and speech therapists play a key role in preserving the oral health

of children, especially when it comes to groups such as children with delayed speech development and those with typical development. Dentists are responsible for providing preventive measures, such as regular examinations and advice on oral hygiene, to reduce the risk of oral and dental diseases. On the other hand, speech therapists are crucial in the early identification and intervention of children with difficulties in speech development, which can affect oral health. Cooperation between dentists and speech therapists becomes essential for an integrated approach, enabling a holistic treatment that takes into account oral-health and language-communication aspects. Through early work and collaboration, this professional community can contribute to the improvement of children's oral health and prevent the development of problems in the future.

## Declaration of interest

The authors declare that there is no conflict of interest.

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