

Original article

The relationship between risk factors and speech-language disorders in children aged four to six years

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Summary

Introduction. In recent years, more and more attention has been paid to the research of factors that can potentially contribute to the development of speech and language impairment. It is believed that the results of these studies can contribute to better planning and implementation of early intervention in the field of speech and language in children. The aim of this research is to determine the influence of risk factors on the appearance of language disorders in children.

Methods. A total of 97 children aged four to six who participated in the research were divided into two groups. The first group consisted of 54 respondents with a speech and language impairment, and the second group consisted of 43 respondents with typical language development. In both groups, 70 children with risk factors were found. All children with speech and language impairment had some of the risk factors (diseases of mothers during pregnancy, medication during pregnancy, premature labor, caesarean section, asphyxia, disease of newborns, seizures, third tonsil, shortened frenulum, ear infection), while in the group of children with typical language development, 16 respondents had risk factors. The Global Articulation Test, Vocabulary Test, and Comic Story Test were used to assess speech and language abilities. Data on risk factors were obtained on the basis of a survey for parents, which was constructed for the purposes of this research.

Results. The results showed that children with risk factors had significantly worse results on the articulation test and the vocabulary test compared to children without risk factors. The results obtained on the Strip Story test did not show that these two groups differ significantly in terms of the number of words produced, the number of sentences and the grammatical structure of the sentence.

Conclusion. In general, the results of this research showed a significant connection between risk factors and speech and language disorder in children.

Key words: risk factors, speech-language impairment, articulation, vocabulary, syntax

Introduction

The development of speech and language is a process in which two basic phases can be distinguished: prelinguistic and linguistic [1]. Crying and screaming represent the first vocalizations of the newborn, which is the beginning of the prelinguistic phase and lasts until the conscious use of the first meaningful word. On average, speaking occurs around the twelfth month of

a child's life, when the first meaningful word appears [1, 2]. With the appearance of the first word, the linguistic phase begins, which lasts until complete mastery of the phonology, grammar and syntax of the native language [1, 3]. Phonological development ends with the acquisition of the ability to automatically and correctly use phonemes in spontaneous speech, around the seventh year of the child's life [4]. The lexical-semantic development of the language begins with the appearance and use of the first word with meaning. The further development of lexical-semantic abilities is reflected in the constant increase in the number of words in speech as well as in the understanding of their meaning. It is estimated that the child aged 18 months speaks on average 50 words, while at the age of five the child should produce between 1800 and 2200 words. Semantic development represents much more than a simple increase in vocabulary. In this process, children have to discover the meaning of words and master the meaning relationships between words. In this way, a mental lexicon is formed in which all the knowledge about the words of the language used by the speaker is stored. The mental lexicon enables the speaker to communicate smoothly, to speak quickly and easily, to understand and remember words, but also to build new words and to integrate linguistic knowledge into the knowledge of the world around him [1, 2].

The development of speech and language is conditioned by biological, psychological and environmental factors. Unfavorable factors of language development can lead to various forms of speech and language pathology. In some disorders of language development, such as developmental language disorder (DLD), for example, there is no clear cause. In other words, children with DLD are delayed in language development and exhibit various pathological patterns, even though they do not have neurological damage, impairment of hearing and vision, or difficulties in intellectual development.

In view of this, in recent years, there has been a growing awareness of the importance of research into the influence of various risk factors (prenatal, perinatal and early postnatal) on language development in children.

Disorders in the development of speech and language are characterized by damage to the typical patterns of acquisition of language structure. This disorder belongs to the group of developmental language disorders (ICD-10) and is denoted by the term developmental language disorder. In the past, this disorder was denoted by the term developmental dysphasia, and until recently by the term Specific language disorder (SLD). In children with a developmental language disorder, there is a significant delay in speaking as well as disorders in the development of certain elements of the language structure. The disorder is manifested by deficits in phonology, grammar and semantics [5].

Some empirical data show that premature birth, asphyxia or low body mass can lead to disorders in language development [1, 6]. Other authors did not establish a connection between these factors and the appearance of speech-language disorders [7]. In other studies of this type, it was determined that risk factors (low birth weight, low Apgar score, maternal age, newborn diseases, length of pregnancy) were more often observed in children with language disorders than in children with typical language development [7]. Language development in children was not affected even by frequent middle ear infections, but the occurrence of aphasia in children is often associated with significant illnesses of the mother during pregnancy, exposure to toxic substances, asphyxia of the newborn, epilepsy and brain inflammation or injury [1, 8]. A further review of the literature shows that in the group of children with disorders of speech and language development, there is a significant number of children who were born by caesarean section [9]. Furthermore, unfavorable environmental factors, including a larger number of children in the family, lower edu-

cational status of the mother and growing up with a single parent, were also more frequently recorded in children with speech and language disorders compared to children with typical language development [1, 7].

Given the paucity of information, the relationship between language development and risk factors in children is a topic that has recently attracted increasing attention from researchers. The discovery of risk factors is also important for establishing a database and linking certain risk factors with the characteristics of speech and language disorders. Determining the connection between certain risk factors and the occurrence of speech-language disorders in children would contribute to the initiation of early speech therapy intervention. Early intervention in the area of speech and language in children with risk factors could prevent the occurrence of some disorders in speech and language development or at least alleviate the

severity of their manifestation. With the intention of contributing to this topic, the goal of our research was to determine the influence of risk factors on the occurrence of language disorders in children aged four to six years.

Method

The sample consisted of 97 children (48 boys and 49 girls) aged from four to six years. At the time of the investigation, the children attended the "Čika Jova Zmaj" preschool in Bijeljina. The clinical group consisted of 54 subjects with the disorder in speech-language development, while the control group consisted of 43 subjects with typical language development. A total of 70 parents from both groups of respondents stated that they had some of the risk factors associated with the appearance of speech-language disorders

Table 1. Distribution of the total sample according to the occurrence of risk factors

		number (%)
Prenatal risk factors	Medicines	9 (9.28)
	Chronic illness of the mother	4 (4.12)
	Rh incompatibility	3 (3.09)
	Preeclampsia	2 (2.06)
	Without prenatal risk factors	79 (81.44)
Perinatal risk factors	Caesarean section	22 (22.68)
	Vacuum extractor	3 (3.09)
	Asphyxia	6 (6.18)
	Premature birth	12 (12.37)
	Without perinatal risk factors	54 (55.67)
Postnatal risk factors	Epilepsy	5 (5.15)
	Infections	6 (6.18)
	Bilingual family	1 (1.03)
	Third tonsil	4 (4.12)
	Shortened frenulum	4 (4.12)
	Without postnatal risk factors	77 (79.38)

(Table 1). Risk factors were more prevalent in the group of children with the disorder in speech and language development ($N = 54$), while the presence of risk factors was noted in 16 children with typical language development. The most prevalent risk factors were from the group of perinatal risk factors. The parents most often stated that the child was born by caesarean section, and the least common was that a vacuum extractor was used during delivery. In the group of postnatal risk factors, infections immediately after birth were most often cited, and growing up in a bilingual family was the least common. Prenatal risk factors were the least represented, and parents most often stated that the mothers took some medication during pregnancy, while preeclampsia was the least frequently mentioned as a prenatal risk factor.

Firstly, 245 children aged between four to six with preserved intellectual abilities, normal sense of hearing and sense of sight, without severe motor and physical impairments were selected. For further participation in the research, consent was obtained from the parents of 97 children. After obtaining consent for their child to participate in the research, parents were given a survey to collect data on the presence of risk factors. After that, we started testing. The children were tested individually, in a room isolated from noise.

The assessment of speech and language abilities was carried out using three tests: 1. Global articulation test, 2. Comic story test and 3. Vocabulary test for children aged three to seven years.

The global articulation test consists of 30 words and is used for a detailed analysis of voices, both pathological and those that meet the criteria of good pronunciation. A well-pronounced voice by the child is marked with (+), sounds that cannot be classified as either good or bad pronunciation are marked with (+ -), while incorrect pronunciation of sounds is marked with (-). If the child does not articulate the tested voice correctly, the

type of deviation is recorded: distortion, substitution or omission of the voice [10].

The vocabulary test is an instrument for assessing the speech and language of children aged three to seven years. It consists of 100 terms that are divided into five tests with 20 words each, according to age. This test examines children's vocabulary and understanding of abstract concepts such as death, life, punishment, pleasure, etc. When assessing the understanding of concepts, the following answers are recorded: (1) does not understand the concept, (2) recognizes the concept, (3) describes the concept and (4) defines the concept. The maximum number of points on this test is 20. A higher number of points on this test indicates a better vocabulary development in children [11].

The comic story test assesses speech and language development with the ability to logically connect images into a meaningful whole. The test consists of four pictures that are interconnected, that is, that represent the sequence of an event. All pictures from the test are adapted to the age of the child and are close to their life experience. Pictures are placed in front of the examinee with the request to look at them carefully and then to tell what is happening in them. The examiner indicates to the child that the pictures shown together illustrate one event. If the respondent is not able to tell the story independently, the examiner helps him by asking questions that prompt the respondent to tell what happened (For example: "And then?", "And what happened next?"). After the data obtained, the children's statements are analyzed by determining: (1) the total number of words in the story, (2) the total number of sentences in the story, (3) the number of ungrammatical sentences and (4) the understanding of the content of the story [10].

Table 2 shows the results of the Kolmogorov-Smirnov test, which shows that the distribution of most of the measures obtained on the sample deviates statistically significantly from the normal distribution model ($p < 0.05$), so we

decided to use non-parametric tests. In the statistical processing of the data, the methods of descriptive statistics and the Mann-Whitney U test were used to check the significance of differences between groups.

Results

First, the differences in achievements on the Global Articulation Test were assessed between respondents with the risk factors in their history and children without the presence of risk factors. The data presented

in table 3 show that respondents who have risk factors on average pronounce a smaller number of correctly articulated sounds ($M = 24.1$) than respondents who do not have risk factors ($Md = 27.04$). Voice distortions are more frequent in the group of children with risk factors ($M = 2.91$), while in children without risk factors, distortions appear on average in one voice. Respondents from the group without risk factors substitute on average of 1.96 voices, while this articulation disorder in the group of children with risk factors occurs in on average of 2.99 voices.

Table 2. Assessment of the normality of the distribution of numerical data

		K- Z S	P
Global Articulation test	Number of correctly articulated sounds	0.12	0.002
	Number of distortions	0.20	0.000
	Number of substitutions	0.17	0.000
Vocabulary test	Vocabulary test - total score	0.12	0.001
	Total number of sentences	0.16	0.000
Comic Story test	Total word count	0.08	0.16
	Number of ungrammatical sentences	0.41	0.000

KZ-S - Kolmogorov-Smirnov Z statistic; p - significance level

Table 3. Comparison of achievement on the Global Articulation test between subjects with risk factors and subjects without risk factors

	Risk factors	N	M	SD	U	z	p
Correctly pronounced voices	Without	27	27.04	2.21	403.5	-4.38	0.00
	With	70	24.10	2.91			
Distortions	Without	27	1.00	1.52	499.0	-3.67	0.00
	With	70	2.91	2.58			
Substitutions	Without	27	1.96	1.87	704.5	-1.96	0.05
	With	70	2.99	2.35			

N - number of respondents; M - mean; SD - standard deviation; U - Mann-Whitney U score; p - significance level

The Mann-Whitney U test was used to check the significance of the differences between the obtained results. The results showed that children with typical language development had better results on the Global Articulation Test compared to children with speech and language disorders. Table 4 shows that the clinical group had a lower number of correctly articulated voices ($M = 23.33$) compared to the control group ($M = 26.91$). Further analysis revealed that subjects from the clinical group had a significantly higher number of voice distortions and substitutions.

Vocabulary assessment in children was performed using the Vocabulary test. The results presented in table 5 show that respondents with risk factors on average score a lower number of points on the Vocabulary test ($M = 14.62$) compared to respondents without risk factors ($M = 16.15$). At the same time, it was shown that there were no differences between respondents of different genders in vocabulary development. Children with established speech-language disorders had worse achievements on the Vocabulary test ($M = 14.14$) compared to children with typical language development ($M = 16.19$) (Table 6).

Table 4. Differences between clinical and control groups in achievements on the Global Articulation test

	group	N	M	SD	U	z	p
Correctly pronounced voices	clinical	54	23.33	2.59	349.50	-5.93	0.00
	control	43	26.91	2.27			
Distortions	clinical	54	3.43	2.65	522.50	-4.74	0.00
	control	43	1.07	1.42			
Substitutions	clinical	54	3.24	2.41	819.50	-2.51	0.01
	control	43	2.02	1.83			

N - number of respondents; M - mean; SD - standard deviation; U - Mann-Whitney U score; p - significance level

Table 5. Comparison of achievement on the Vocabulary test between subjects with risk factors and subjects without risk factors

	N	M	SD	U	z	p
Subjects with risk factors	70	14.62	3.02	659.50	-2.31	0.02
Subjects without risk factors	27	16.15	2.07			

N - number of respondents; M - mean; SD - standard deviation; U - Mann-Whitney U score; p - significance level

Table 6. Differences between clinical and control groups in achievements on the Vocabulary test

Group	N	M	SD	U	z	P
clinical	54	14.14	3.15	693.50	-3.41	0.001
control	43	16.19	1.95			

N - number of respondents; M - mean; SD - standard deviation; U - Mann-Whitney U score; p - significance level

We did not find a statistically significant influence of risk factors on speech-language development assessed by the Comic Story test, which can be seen from Table 7. On the other hand, this test showed significant differences between boys and girls from our sample (Table 8). On average, boys uttered a slightly higher number of sentences ($M = 4.17$) than girls ($M = 3.53$). Also, the number of words pronounced by boys was on average higher ($M = 19.92$) compared to the number of words pronounced by girls ($M = 15.47$).

Table 7. Comparison of achievement on the Comic Story test between subjects with risk factors and subjects without risk factors

	Risk factors	N	M	SD	U	z	p
The total number of sentences	with	70	3.84	1.59	916.0	-.24	.81
	without	27	3.85	1.56			
The number of ungrammatical sentences	with	70	0.60	1.21	869.0	-.78	.44
	without	27	0.37	0.79			
Total number of words	with	70	17.64	8.49	911.5	-.27	.79
	without	27	17.74	7.78			

N - number of respondents; M - mean; SD - standard deviation; U - Mann-Whitney U score; p - significance level

Table 8. Comparison of achievement on the Comic Story test in relation to gender

	Gender	N	M	SD	U	z	p
The total number of sentences	Male	48	4.17	1.37	877.50	-2.19	0.03
	Female	49	3.53	1.71			
The number of ungrammatical sentences	Male	48	0.56	1.28	1122.00	-0.49	0.62
	Female	49	0.51	0.92			
Total number of words	Male	48	19.92	7.72	753.50	-3.05	0.00
	Female	49	15.47	8.35			

N - number of respondents; M - mean; SD - standard deviation; U - Mann-Whitney U score; p - significance level

Discussion

Given that a number of children exhibit disorders in the development of speech and language without visible causes, the aim of this research was to determine the relationship between risk factors and the occurrence of speech and language disorders in children aged four to six years. Earlier research shows that heredity and socioeconomic status predict speech and language disorders in children to the greatest extent, and that certain biological factors such as low body weight, low Apgar score, inadequate prenatal care and premature birth have a smaller influence [6, 7]. The results of our research show that the most common risk factors are premature birth, perinatal asphyxia, cesarean delivery, maternal medication during pregnancy, and infection of the newborn. In other studies, the most common risk factors in children were premature birth, difficult birth and childhood diseases [6]. However, the authors of the aforementioned study did not establish a connection between these risk factors and the occurrence of speech-language disorders [6].

Articulation deficits are a common problem in childhood, affecting 5 to 8% of preschool children [12]. The analysis of the data obtained from the examination of articulation in our sample revealed that children with risk factors incorrectly articulate almost twice as many voices as children without the presence of risk factors. Our results coincide with those of other authors who have dealt with this topic. For example, Vuković [1] mentions the more frequent occurrence of articulation disorders in the group of children who have risk factors such as positive family history and low economic status. At the same time, the results of our study showed that children diagnosed with a language development disorder correctly articulated fewer sounds compared to children in the control group, i.e. that children with a speech-language disorder exhibited a greater number of distortion and substitution type errors than children

with typical language development. Therefore, the results of our research coincide with the findings of some earlier studies in which it was determined that children with developmental language disorder had a significantly higher number of damaged voices compared to their peers with typical language development [4]. Further analysis of articulatory abilities showed that 44.4% of the children of the examined sample correctly articulated all the sounds of the Serbian language. Comparing this finding with the findings of other authors who determined that 47% of preschool children correctly articulate all 30 sounds of the Serbian language, we can conclude that there is a trend of increasing articulation disorders [13].

Examining the vocabulary revealed that children with risk factors had a poorer vocabulary compared to children without risk factors. The results of our research differ from some previous studies in which no association was found between delays in vocabulary development and risk factors, such as more severe childhood illnesses in early life or the hereditary factor of parental speech and language disorders [6]. On the other hand, it has been shown that environmental factors, such as parents' education and socioeconomic status, have an influence on vocabulary development in children [6]. At the same time, the results of our research showed that children diagnosed with the language development disorder have less developed vocabulary compared to children with typical language development. Our results correspond with the results of other studies that also show that lexical and lexical-semantic deficits form part of the clinical features of the specific disorder of language development [2]. Children who have the developmental language disorder often have difficulties in acquiring the meaning of words and limited vocabulary [6]. Further analysis of the data obtained with the Test dictionary showed that boys and girls do not differ in terms of lexical-semantic abilities. Our findings coincide with the results of other authors who also did not establish a connection

between gender and children's lexical-semantic abilities [14].

Analyzing the results of the Comic Story test, no statistically significant differences were found between children with risk factors and children without risk factors on any of the examined variables. However, it is interesting that significant differences between boys and girls were found on this test. Namely, boys produced larger number of sentences on average compared to girls. Girls also produced smaller number of words in the story compared to boys who produced significantly higher number of words in the comic story. These findings suggest the need for further research on the task of story formation, both in terms of a more precise determination of the relationship between risk factors and the number of words and sentences produced, as well as in terms of grammaticality. It is possible that the inclusion of larger number of respondents with the most common risk factors of children with the diagnosed language disorder and children with typical language development would shed a light on this problem. The need for additional research into the relationship between risk factors and language disorders in children is shown by the results of the authors who state that there is the connection between premature birth and the ability to understand and produce language in children [15].

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Our results, as well as the results of some other researches, suggest the possible connection between certain biological risk factors and speech-language disorders, which should be examined in more detail in future research. We assume that a study that would include a larger sample of children and parents, along with an insight into the medical documentation of the respondents, would provide much more data on the connection between certain risk factors and the occurrence of speech and language disorders.

Conclusion

Based on the analysis and discussion of the obtained results, the connection between risk factors and the occurrence of speech-language disorders in children was determined.

The most common risk factors for children with developmental language disorders were cesarean section, medications taken by mothers during pregnancy, premature birth, asphyxia and infection of the newborn.

Children with risk factors incorrectly articulated almost twice as many voices as children without data on the presence of risk factors.

Children with risk factors had significantly worse lexical-semantic abilities compared to children without risk factors.

was obtained from all individual respondents. The research was conducted according to the Declaration of Helsinki.

Conflicts of interest. The authors declare no conflict of interest.

References:

1. Vuković M. Diferencijalne karakteristike jezičkih poremećaja kod dece. II Kongres logopeda Srbije: Govorno-jezički poremećaji razvojnog doba. Beograd, 2015. Zbornik radova. Udruženje logopeda Srbije, Beograd, 2015;11–36.
2. Vuković B, Vuković M, Čalasan S. Razvoj vokabulara kod djece sa govorno-jezičkim poremećajima i djece tipičnog jezičkog razvoja: preliminarno ispitivanje. Proceedings of Eurlayid Conference 2017, Early Childhood Intervention: For meeting sustainable development goals of the new millennium. University of Belgrade – Faculty of Special Education and Rehabilitation, Beograd, 2017; 167–174.
3. Jovanović-Simić N, Duranović M, Petrović-Lazić M. Govor i glas. Foča: Medicinski fakultet; 2017.
4. Vuković I, Vuković M. Artikulaciono-fonološki deficit kod dece sa razvojnom disfazijom. Beogradska defektološka škola 2009;2:49–56.
5. Milošević N, Vuković M. Leksičko-semantičke sposobnosti dece sa specifičnim jezičkim poremećajem i nespecifičnim promenama elektroencefalografskih aktivnosti. Specijalna edukacija i rehabilitacija. 2011;10(3):435–43.
6. Korpilahti P, Kaljonen A, Jansson-Verkasalo E. Identification of biological and environmental risk factors for language delay: The Let's Talk STEPS study. *Infant Behav Dev* 2016;42:27–35.
7. Stanton-Chapman L, Chapman DA, Bainbridge NL, Scott KG. Identification of early risk factors for language impairment. *Res Dev Disabil* 2002;23(6):390–405.
8. Vuković M. Karakteristike jezičkih poremećaja i oporavak jezičkih sposobnosti kod dece sa traumatskom povredom mozga. Proceedings of Eurlayid Conference 2017, Early Childhood Intervention: For meeting sustainable development goals of the new millennium. University of Belgrade – Faculty of Special Education and Rehabilitation, Beograd, 2017;109–115.
9. Maksimović S. Učestalost carskog reza kod majki dece sa poremećajima govora, jezika, učenja i ponašanja. Tematski zbornik radova: Specifičnost oštećenja sluha- nove tendencije. 2020;31–48.
10. Kostić Đ, Vladislavljević S, Popović M. Testovi za ispitivanje govora i jezika. Beograd: Zavod za udžbenike i nastavna sredstva; 1983.
11. Vasić S. Veština govorenja: vežbe i testovi za decu i odrasle. Beograd: Pedagoška akademija za obrazovanje učitelja; 1991.
12. Nikolić M, Mijailović G, Katrina-Mitrović V. Identifikacija govorno-jezičkog poremećaja kao simptoma psihomotorne zaostalosti- preduslov za rane intervencije u vrtićima. Proceedings of Eurlayid Conference 2017, Early Childhood Intervention: For meeting sustainable development goals of the new millennium; University of Belgrade – Faculty of Special Education and Rehabilitation, Beograd, 2017;57–63.
13. Golubović S, Ječmenica N, Jovanović-Simić N, Petrović-Lazić M. Artikulacione i fonološke sposobnosti dece uzrasta od pet do sedam godina. *Nastava i vaspitanje* 2019;68(2):265–83.
14. Gavriilidou Z. The development of word definitions in Greek Preschoolers. In: Chatzopoulou K, Ioannidou A, Suwon Yoon, editors. Proceedings of the 9th ICGL; 2011. p. 88–96.
15. Chaimay B, Thinkhamrop B, Thinkhamrop J. Risk factors associated with language development problems in childhood-a literature review. *J Med Assoc Thai* 2006;89(7):1080–6.

Odnos riziko faktora i govorno-jezičkih poremećaja kod djece uzrasta od četiri do šest godina

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Uvod. Posljednjih godina se sve više pažnje posvećuje istraživanju faktora koji potencijalno mogu doprinijeti poremećaju razvoja govora i jezika. Smatra se da rezultati ovih istraživanja mogu pomoći boljem planiranju i sprovođenju rane intervencije u oblasti govora i jezika kod djece. Cilj ovog istraživanja je utvrđivanje uticaja riziko faktora na pojavu jezičkih poremećaja kod djece.

Metode. U istraživanju je učestvovalo 97 djece uzrasta od četiri do šest godina, koja su podijeljena u dvije grupe. Prvu grupu činilo je 54 ispitanika sa poremećajem u govorno-jezičkom razvoju, a drugu 43 ispitanika tipičnog jezičkog razvoja. U obje grupe pronađeno je 70 djece koja imaju riziko faktore. Sva djeca sa poremećajem u govorno-jezičkom razvoju imala su neki od riziko faktora (oboljenja majki u trudnoći, kao i lijekovi koje su majke pile u toku trudnoće, prematurus, carski rez, asfiksija, bolest novorođenčadi, epileptični napadi, treći krajnik, skraćeni frenulum, upala uha), dok je u grupi djece tipičnog jezičkog razvoja 16 ispitanika imalo riziko faktore. Za procjenu govorno-jezičkih sposobnosti korišćeni su Globalni artikulacioni test, Test-rječnik i test Strip priča. Podaci o riziko faktorima dobijeni su na osnovu ankete za roditelje koja je konstruisana za potrebe ovog istraživanja.

Rezultati. Rezultati su pokazali da djeca sa riziko faktorima imaju značajno lošije rezultate na testu artikulacije i testu rječnika u poređenju sa djecom bez podataka o riziko faktorima. Rezultati dobijeni na testu Strip priča nisu pokazali da se ove dvije grupe statistički značajno razlikuju u pogledu broja produkovanih riječi, broja rečenica i gramatičkoj strukturi rečenice.

Zaključak. Generalno gledano, rezultati ovog istraživanja pokazali su da postoji značajna povezanost između riziko faktora i smetnji u razvoju govorno-jezičkih sposobnosti kod djece.

Ključne riječi: riziko faktori, govorno-jezički poremećaji, artikulacija, rječnik, sintaksa