

Assessment of the Main Causes and Degrees of Speech Disorders in Children Aged 3 to 5 Using Various Scales and Tests

Kosimova Zarrina Aslonovna

Tashkent Medical Academy, Uzbekistan

Abstract This article presents the results of an assessment of the main causes and degrees of speech disorders in children aged 3 to 5 using various scales and tests. A total of 80 children were included in the study, and their speech development was thoroughly analyzed based on the ELOLA, Wechsler, and Bezrukova-Kalenkova methods. The children were divided into groups according to mild, moderate, and severe speech disorders. The results revealed that severe speech impairments were often associated with neurological and auditory factors, as well as a lack of speech stimulation in the environment. Gender differences were also observed, with speech problems being more frequently recorded among boys. The study highlights the importance of a comprehensive approach to speech therapy diagnosis and rehabilitation.

Keywords Speech disorder, Preschool age, Speech assessment, ELOLA test, Wechsler test, Bezrukova-Kalenkova method, Verbal IQ, Phonetic development, Cognitive development, Gender differences

1. Introduction

Speech disorders (SD) are common among children aged 3 to 5 years and represent a significant issue in the developmental trajectory of this age group. Identifying the causes and degrees of these disorders is crucial, as it greatly influences children's future development. According to global epidemiological studies, approximately 10–15% of children suffer from speech development delays [1]. Such delays often lead to setbacks in physical and cognitive development, resulting in challenges with learning and social adaptation later in life. These issues not only contribute to delays in social and psychological development but also cause difficulties in family and preschool education environments [2].

Early detection and proper treatment of speech disorders support children's social development and help them achieve successful outcomes in educational settings [3]. Early identification and analysis of speech disorders are therefore essential stages of child development. Delays or disruptions in speech development are influenced by a wide range of factors, including genetic predispositions, environmental exposures, family dynamics, and neurological conditions. In a study by Adams (2020), it was emphasized that delays in speech development are often linked to alterations in brain function, adverse environmental influences, and the child's psychological state [4–5]. Adams also noted that social

influences—such as a child's role within the family and changes in the home's linguistic environment—play a significant role [6]. These factors impact speech development, as children depend heavily on social environments to acquire language skills (Adams, 2020).

Tests and scales play a critical role in detecting and analyzing speech development disorders. A study by Smith et al. (2019) emphasized the importance of analyzing social and genetic factors when diagnosing speech disorders [7]. Their findings indicated that developing accurate diagnostic and therapeutic methodologies for early detection of speech disorders can positively influence children's development. Their work demonstrated the effectiveness of timely interventions in addressing language and speech delays. Furthermore, Smith and colleagues highlighted the role of specialized exercises, psychological approaches, and educational strategies in supporting speech development and designing effective intervention methods [8].

The effectiveness of various diagnostic methodologies and tests is especially important in the identification and treatment of speech disorders. According to Patel (2020), delays in speech development may stem from the child's adaptation to the environment, the influence of the family setting, and the cultural context in which the child is raised. Patel suggested implementing broader approaches and methods in the speech training process to foster children's social communication skills. These inclusive approaches, which consider social and cultural factors, can help detect speech delays and disorders, leading to the development of effective therapeutic interventions [9].

Epidemiological studies on speech delays and disorders indicate that the rising incidence of these conditions is strongly tied to social and cultural factors. In a study by Tufan (2019), it was revealed that delays in speech development are not solely caused by neurological conditions but are also significantly influenced by social and cultural environments. Tufan emphasized the need to reassess educational settings and strengthen family interactions to enable earlier detection of speech development delays. As a result, this could lead to improvements in children's speech development [10].

In conclusion, studying speech disorders—especially identifying developmental delays and various degrees of impairment in children—is critical. Effective approaches and methodologies must be developed to address this issue, as the proper development of speech is essential for ensuring the child's social and psychological well-being.

Research Objective. The aim of this study is to identify the main causes and degrees of speech disorders in children aged 3 to 5 and to perform diagnostics using various scales and tests.

2. Materials and Methods

This prospective observational study involved 80 children aged between 3 and 5 years. Among them, 19 (23.75%) were girls and 61 (76.25%) were boys. The study was conducted in local family polyclinics (CTMP), preschool institutions (kindergartens), and speech therapy centers. Oral and written informed consent was obtained from each child's parents.

Initially, the children underwent a general pediatric examination, and their somatic and neurological status was assessed. Then, the level of speech development was determined using specialized tests, and each child's phonetic-phonemic, grammatical, and semantic abilities were evaluated separately.

The following methods were used in the study:

- Bezrukova-Kalenkova Method: a comprehensive assessment tool for evaluating phonemic hearing, grammar, vocabulary, and cognitive abilities;
- Wechsler Test: adapted for children to determine verbal intelligence levels;
- ELOLA Test: a logopedic analyzer aimed at assessing pronunciation, storytelling ability, and vocabulary development.

Based on the assessment results, the children were divided into three main groups:

1. Mild speech disorder (34 children);
2. Moderate speech disorder (28 children);
3. Severe speech disorder (18 children).

Each group underwent individual testing. The assessment considered pronunciation, vocabulary, grammatical structure, storytelling ability, auditory differentiation, verbal and nonverbal intelligence, and cognitive development levels. The collected data were subjected to statistical analysis.

3. Results

The study revealed that the forms and degrees of speech disorders in children aged 3–5 vary and are closely related to their intellectual and auditory functions, family environment, medical history, and psychological factors. In line with the study's objective, the use of multiple assessment tools made it possible to identify each child's individual issues and determine the severity of their condition.

The following tables present data on the children's gender distribution, levels of speech disorders, scores from various tests, and developmental indicators.

Table 1. Gender distribution of children participating in the study

Gender	Quantity	Percentage
Female	19	23.75 %
Male	61	76.25 %
Total	80	100 %

As shown in Table 1, the majority of the 80 children participating in the study were boys (76.25%). This allowed for a more detailed observation of the prevalence of speech disorders among male children. Although the number of girls was relatively lower, their performance was more favorable in certain parameters. The predominance of boys in the study sample confirms that speech and language issues are more frequently observed among male children.

Table 2. Distribution by degree of speech disorder

Degree of speech disorder	Number of children	Proportion (%)
Mild	34	42.5
Moderate	28	35.0
Severe	18	22.5
Total	80	100

According to the distribution in Table 2, 42.5% of the children were found to have mild speech disorders, 35% had moderate disorders, and 22.5% had severe speech disorders. This indicates that one in three children requires complex or clinical-level speech therapy support. Most children exhibited mild to moderate impairments, while severe cases accounted for 22.5% of the sample.

Table 3. Distribution of ELOLA test results (mean scores)

Group	Vocabulary	Pronunciation	Storytelling
Mild	7.8	8.1	7.4
Moderate	5.3	5.8	5.0
Severe	3.2	3.4	2.8

The results of the ELOLA test clearly demonstrate differences in parameters such as vocabulary, pronunciation, and storytelling ability. Among children with mild speech disorders, the average vocabulary score was 7.8, whereas in children with severe disorders, this figure was only 3.2. Notably, the storytelling ability in the severe group was significantly lower (2.8 points), indicating underdeveloped

verbal thinking and a limited capacity to express cause-effect relationships. In the ELOLA test, children with mild impairments showed higher performance, with relatively better storytelling and pronunciation skills. In contrast, children with severe speech disorders exhibited significantly lower scores across all parameters.

Table 4. Verbal IQ results based on the Wechsler test (mean scores)

Group	Verbal IQ (mean)
Mild	95.4
Moderate	78.6
Severe	62.1

The average verbal IQ scores based on the Wechsler test were 95.4 in the mild group, 78.6 in the moderate group, and 62.1 in the severe speech disorder group. These differences indicate that speech impairments affect not only pronunciation but also levels of intellectual functioning. Verbal IQ scores were found to decrease in proportion to the severity of the speech disorder. This trend directly impacts verbal reasoning and comprehension abilities.

Table 5. Developmental assessment based on the Bezrukova-Kalenkova scale (maximum score: 10 points)

Group	Phonetic-Phonemic	Grammatical	Cognitive
Mild	9.0	8.8	9.1
Moderate	6.5	6.2	6.9
Severe	3.4	3.1	3.7

According to the results based on the Bezrukova-Kalenkova scale, phonetic-phonemic development was rated highest in the mild group at 9.0 points, while in the severe group it was only 3.4 points. Significant differences were also observed in grammatical development: children with severe speech disorders scored just 3.1 points for understanding and using grammatical structures. Cognitive development was similarly poor in the severe group, with an average score of only 3.7 points. The comprehensive assessment scale showed clear differences across all components. While children in the mild group demonstrated positive levels of speech and cognitive development, those in the severe group exhibited low performance in all assessed areas.

The results of these tables demonstrate that children with mild speech disorders achieved significantly higher scores across all parameters, whereas those with severe impairments showed marked limitations in overall development.

4. Discussion

The analysis of the study results shows that the development of speech disorders in children aged 3 to 5 is influenced by multiple factors, including neurological, auditory, social-environmental, and pedagogical aspects. In particular, noticeable developmental delays in phonetic, grammatical, and cognitive domains were observed in children with a

history of perinatal asphyxia and hearing impairments.

The test results indicate that the ELOLA, Wechsler, and Bezrukova-Kalenkova methodologies are effective as complementary diagnostic tools. These assessments enable targeted evaluation of speech issues and support the development of individualized therapeutic approaches.

In cases of mild speech disorders, children tend to adapt more quickly, and speech therapy yields faster results. However, moderate to severe cases require long-term psycho-pedagogical approaches, improvements in the family environment, and structured speech therapy rehabilitation.

The study also highlighted the relevance of gender differences in speech disorders. It was found that speech disorders are more prevalent in boys than in girls, which may be attributed to differences in neurological development.

Overall, early detection and accurate diagnosis of speech disorders, along with the development of individualized speech therapy programs, can significantly support healthy speech development in children.

5. Conclusions

Based on the findings of this study, speech disorders in children aged 3 to 5 are associated with a variety of internal and external factors. The research employed a combination of methodological approaches—ELOLA, Wechsler, and Bezrukova-Kalenkova tests—to conduct a comprehensive assessment of each child's speech and cognitive development.

The results show that children with mild speech disorders are generally more likely to achieve positive progress quickly. In contrast, those with moderate to severe disorders require specialized speech rehabilitation and a multi-stage intervention approach. Factors such as hearing impairment, perinatal neurological damage, and a lack of linguistic stimulation in the family environment contribute significantly to the development of severe speech pathologies.

The study also emphasized the importance of gender-based differences in speech disorders, noting a higher prevalence among boys. This highlights the need for preventive measures and early diagnostic strategies, particularly targeted at male children.

6. Recommendations

1. Implement mandatory speech development screenings for all children at the preschool (kindergarten) stage;
2. Expand access to speech therapy services in outpatient clinics;
3. Provide pedagogical consultations for parents on how to create a linguistically stimulating environment at home;
4. Systematically apply comprehensive test batteries and assessment scales for diagnosing speech disorders.

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