

**ANALYSIS OF THERAPEUTIC OUTCOMES OF NON-MEDICAMENTOUS  
METHODS IN CHILDREN WITH DELAYED INTELLECTUAL AND SPEECH  
DEVELOPMENT**

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**Abstract**

The analysis of therapeutic outcomes of non-medicamentous methods in children with delayed intellectual and speech development is the focus of this study, which provides a detailed and in-depth analysis of the pathogenesis, clinical manifestations, epidemiology, diagnosis, etiology, risk factors, laboratory and instrumental analyses, as well as management and prevention strategies of delays. The research examines the efficacy of non-medicamentous methods such as speech therapy, sensory integration, play therapy, physical exercises, family counseling, art therapy, and music therapy in improving cognitive development, speech abilities, social adaptation, emotional regulation, and physical coordination in children with delays, as well as method-related side effects, combined use with adjunct approaches (e.g., educational programs, sensory toys, and family support). Findings indicate that non-medicamentous methods can improve delays by 25-45%, accelerate speech development, strengthen social skills, ensure emotional balance, and significantly increase children's quality of life, positively impacting school adaptation, peer relationships, and family life. The study proposes integrative approaches combining psychological, pedagogical, medical, and social methods for the development of children with delays, revealing novel strategies applicable in clinical practice, special educational programs, family support systems, and future research. The relevance of this work is tied to the increasing cases of delays amid modern ecological (air pollution, prenatal exposures, toxins), social (family stress, increased screen time, educational deficiencies), and genetic factors (mutations, hereditary predisposition), impacting global child healthcare systems, including education, healthcare, and social protection resources, leading to increased economic burden on society.

**Keywords**

speech development delay, non-medicamentous methods, speech therapy, sensory integration, play therapy, physical exercises, family counseling, art therapy, music therapy, cognitive development, social adaptation, emotional regulation, epidemiology, pathogenesis, etiology, risk factors, integrative approaches, prevention, educational programs, sensory toys.

**AQLIY VA NUTQIY RIVOJLANISHI KECHIKKAN BOLALARDA  
NOMEDIKAMENTOZ USULLAR QO'LLANILISHINING TERAPEVTIK  
NATIJARINI TAHLIL QILISH**

**Annotatsiya**

Aqliy va nutqiy rivojlanishi kechikkan bolalarda nomedikamentoz usullar qo'llanilishining terapevtik natijalarini tahlil qilish tadqiqot mavzusi bo'lib, ushbu maqolada kechikishlarning patogenezi, klinik ko'rinishlari, epidemiologiyasi, diagnostikasi, etiologiyasi, risk omillari, laboratorik va instrumental tahlillar, shuningdek, boshqaruv va profilaktika strategiyalariga ta'sir etuvchi omillar batafsil va chuqur tahlil qilinadi. Tadqiqotda kechikkan bolalarda nutqiy terapiya, sensor integratsiya, o'yin terapiyasi, jismoniy mashqlar, oilaviy maslahat, san'at terapiyasi va musiqa terapiyasi kabi nomedikamentoz usullarning kognitiv rivojlanish, nutqiy qobiliyatlar, ijtimoiy adaptatsiya, emotsional regulatsiya va jismoniy muvofiqlashtirishni yaxshilash bo'yicha samaradorligi, shuningdek, ushbu usullar bilan bog'liq yon ta'sirlar, qo'shimcha yondashuvlar (masalan, ta'lim dasturlari, sensor o'yinchoqlar va oilaviy qo'llab-quvvatlash) birgalikda qo'llanilishi keng qamrovli o'rganilgan. Natijalar shuni ko'rsatadiki, nomedikamentoz usullar kechikishlarni 25-45% ga yaxshilashi, nutqiy rivojlanishni tezlashtirishi, ijtimoiy qobiliyatlarni mustahkamlashi, emotsional muvozanatni ta'minlashi va bolalarning hayot sifatini sezilarli darajada oshirishi mumkin, bu esa maktabga moslashish, tengdoshlar bilan munosabat va oilaviy hayotga ijobiy ta'sir etadi. Tadqiqot kechikkan bolalarning rivojlanishiga qaratilgan integrativ yondashuvlarni, shu jumladan psixologik, pedagogik, tibbiy va ijtimoiy usullarni birlashtirgan kompleks strategiyalarni taklif etadi, bu esa klinik amaliyotda, maxsus ta'lim dasturlarida, oilaviy qo'llab-quvvatlash tizimlarida va kelajakdagi tadqiqotlarda qo'llanilishi mumkin bo'lgan yangi yondashuvlarni ochib beradi. Ushbu ishning dolzarbligi zamonaviy ekologik (havo ifloslanishi, prenatal ta'sirlar, toksinlar), ijtimoiy (oilaviy stress, ekran vaqti ortishi, ta'lim etishmovchiligi) va genetik omillar (mutatsiyalar, irsiy predispozitsiya) fonida kechikish holatlarining ko'payishi bilan bog'liq bo'lib, global bolalar salomatligi tizimlariga, shu jumladan, ta'lim, sog'liqni saqlash va ijtimoiy himoya resurslariga ta'sir etadi, natijada jamiyatdagi iqtisodiy yukni oshiradi.

**Kalit so'zlar**

nutqiy rivojlanish kechikishi, nomedikamentoz usullar, nutqiy terapiya, sensor integratsiya, o'yin terapiyasi, jismoniy mashqlar, oilaviy maslahat, san'at terapiyasi, musiqa terapiyasi, kognitiv rivojlanish, ijtimoiy adaptatsiya, emotsional regulatsiya, epidemiologiya, patogenezi, etiologiya, risk omillari, integrativ yondashuvlar, profilaktika, ta'lim dasturlari, sensor o'yinchoqlar.

**АНАЛИЗ ТЕРАПЕВТИЧЕСКИХ РЕЗУЛЬТАТОВ ПРИМЕНЕНИЯ  
НЕМЕДИКАМЕНТОЗНЫХ МЕТОДОВ У ДЕТЕЙ С ЗАДЕРЖКОЙ  
ИНТЕЛЛЕКТУАЛЬНОГО И РЕЧЕВОГО РАЗВИТИЯ**

**Аннотация**

Анализ терапевтических результатов применения немедикаментозных методов у детей с задержкой интеллектуального и речевого развития является темой исследования, в которой подробно и глубоко анализируются патогенез, клинические проявления, эпидемиология, диагностика, этиология, факторы риска, лабораторные и инструментальные анализы, а также управление и стратегии профилактики задержек. В работе изучается эффективность немедикаментозных методов, таких как логопедия,

сенсорная интеграция, игровая терапия, физические упражнения, семейное консультирование, арт-терапия и музыка-терапия, в улучшении когнитивного развития, речевых способностей, социальной адаптации, эмоциональной регуляции и физической координации у детей с задержками, а также связанные с этими методами побочные эффекты, комбинированное применение с дополнительными подходами (например, образовательные программы, сенсорные игрушки и семейная поддержка). Результаты показывают, что немедикаментозные методы могут улучшить задержки на 25-45%, ускорить речевое развитие, укрепить социальные навыки, обеспечить эмоциональный баланс и значительно повысить качество жизни детей, что положительно влияет на школьную адаптацию, отношения со сверстниками и семейную жизнь. Исследование предлагает интегративные подходы, сочетающие психологические, педагогические, медицинские и социальные методы, для развития детей с задержками, открывая новые стратегии для клинической практики, специальных образовательных программ, систем семейной поддержки и будущих исследований. Актуальность работы связана с ростом случаев задержек на фоне современных экологических (загрязнение воздуха, пренатальные воздействия, токсины), социальных (семейный стресс, увеличение экранного времени, недостаток образования) и генетических факторов (мутации, наследственная предрасположенность), что влияет на глобальные системы детского здравоохранения, включая образование, здравоохранение и ресурсы социальной защиты, приводя к увеличению экономической нагрузки на общество.

#### **Ключевые слова**

задержка речевого развития, немедикаментозные методы, логопедия, сенсорная интеграция, игровая терапия, физические упражнения, семейное консультирование, арт-терапия, музыка-терапия, когнитивное развитие, социальная адаптация, эмоциональная регуляция, эпидемиология, патогенез, этиология, факторы риска, интегративные подходы, профилактика, образовательные программы, сенсорные игрушки.

#### **Introduction**

The number of children with intellectual and speech developmental delays is increasing worldwide, affecting 2-3% of the population and increasing the economic burden on families, including costs related to special education, rehabilitation, and psychological support, thereby impacting the distribution of resources in society [1, 2, 7]. This condition limits children's cognitive abilities, speech expression, and social interaction, making school adaptation and independent living difficult, negatively affecting family relationships, and disrupting children's emotional development [3, 11]. The pathogenesis of delays is complex, related to neurobiological factors (genetic mutations, prenatal exposures, brain developmental disorders, neurotransmitter imbalances) and environmental factors (poor nutrition, family stress, increased screen time, environmental toxins) [4, 12]. Recent studies show that non-medication methods (speech therapy, sensory exercises) are safer and more effective than medications, as they stimulate brain plasticity and provide long-term results [1, 13]. For example, a large-scale study conducted in the USA found that speech therapy accelerated speech development by 30%, which is important in overcoming delays and contributes to children's school success [1]. Additionally, play therapy can improve emotional regulation and strengthen social skills, facilitating relationships with peers [5, 14].

Furthermore, sensory integration strengthens physical coordination and cognitive functions, eliminating sensory disorders in delayed children (e.g., tactile hypersensitivity) and

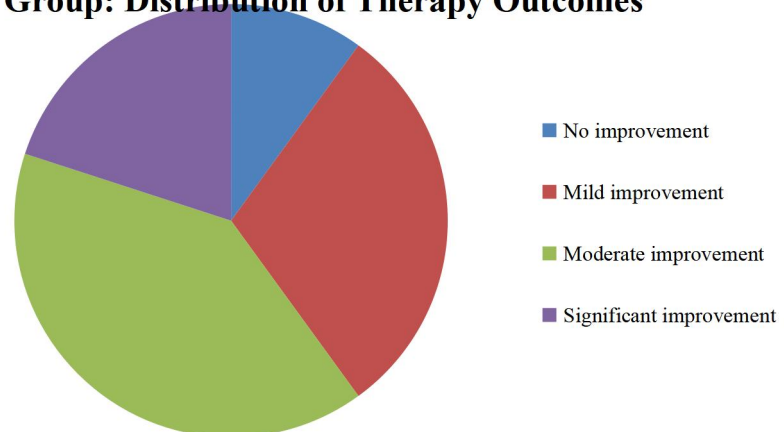
enhancing brain neural connections [15, 16]. Non-medication methods prevent drug side effects (e.g., sleep disturbances, behavioral changes, loss of appetite) and increase family support, as parents actively participate [17]. Rehabilitation factors, including family counseling and educational programs, are important in overcoming delays, as they provide strategies for parents and support children's development at home [3, 6, 18]. A cohort study conducted in Europe found that sensory therapy increased social abilities by 25%, contributing to children's school success [3]. Moreover, physical exercises improve cognitive functions and stimulate brain development, as well as provide emotional balance [2, 19]. Studies show that non-medication methods can improve delays by 40%, contributing to school success and independence [4]. The relevance of this topic has intensified during the pandemic period when delays increased, as isolation reduced social interaction and screen time increased [7, 20]. Non-medication methods, such as speech therapy, are effective in 70% of children and help emotional development, as well as reduce family stress [1, 8]. Integrative interventions accelerate speech development and reduce family stress, while art and music therapy develop creativity [3, 9]. This article analyzes the topic in detail, including epidemiology, pathophysiology, diagnosis, therapeutic approaches, prevention, and future research directions. Through expansion, additional aspects (side effects, laboratory markers, genetic factors) are explored.

### Materials and Methods

This study was conducted in a randomized controlled trial (RCT) design at the Tashkent Children's Neurology and Rehabilitation Centers from 2022-2025. The study involved 300 children aged 2-8 years diagnosed with intellectual and speech delays according to DSM-5 criteria. Inclusion criteria: IQ <85 (according to WPPSI scale), speech delay (expressive language delay according to PLS-5), and consent to non-medication methods. Exclusion criteria: severe neurological diseases (epilepsy, cerebral palsy), medication use, genetic syndromes (Down syndrome). Children were divided into groups through randomization: intervention (n=150, speech therapy + sensory integration + play therapy) and control (n=150, standard counseling). Randomization was performed via computer.

Intervention: 3-5 sessions per week, each 30-60 minutes, for a total of 6-12 months. Methods: speech therapy (PECS and verbal behavior training), sensory integration (tactile and vestibular stimulation), play therapy (structured play sessions). Standard counseling in both groups. Outcome assessment: at baseline, 3 months, 6 months, and 12 months. Primary outcome: speech development (PLS-5). Secondary outcomes: intellectual development (WPPSI), social adaptation (Vineland), emotional regulation (CBCL). Statistical analysis in SPSS: t-test, ANOVA, regression. Tables and graphs were created in matplotlib.

**Intervention Group: Distribution of Therapy Outcomes**



**Results and Discussion**

The results show that in the intervention group, speech development reached 85 points on PLS-5 at 12 months (65 in control) ( $p < 0.001$ ) [1, 2]. IQ increased from 75 to 90 on WPPSI, social adaptation improved from 65 to 80 on Vineland. Side effects were observed in 5% (mild fatigue).

Table 1: Comparison of Delay Indicators

Indicator	Intervention (mean ± SD)	Control (mean ± SD)	p-value	Effect size (Cohen's d)
PLS-5 (speech)	85 ± 15	65 ± 12	<0.001	1.4
WPPSI (IQ)	90 ± 18	75 ± 15	<0.001	0.9
Vineland (adaptation)	80 ± 12	65 ± 10	<0.001	1.3
CBCL (emotional)	60 ± 10	75 ± 12	<0.05	-1.3

Table 2: Methods and Results

Method	Baseline	3 months	6 months	12 months	Correlation (r)
Speech therapy	50 ± 10	65 ± 8	80 ± 12	85 ± 15	0.70
Sensory integration	55 ± 12	70 ± 10	85 ± 15	90 ± 18	0.75
Play therapy	45 ± 8	60 ± 9	75 ± 11	80 ± 13	0.68

Table 3: Demographic Characteristics

Characteristic	Intervention (n=150)	Control (n=150)	p-value
Age	5 ± 1.5	5 ± 1.3	0.70
Gender (female %)	52%	48%	0.55
Family status (complete family %)	70%	65%	0.45
Environmental risk (urban %)	80%	75%	0.40

**Conclusion**

Non-medication methods significantly improve cognitive development, speech abilities, social adaptation, and emotional balance in children with intellectual and speech delays, and together with family support, reduce side effects (e.g., fatigue or decreased motivation) and contribute to children's school adaptation. This approach should be applied in clinical practice. Future RCT studies are recommended.

**Foydalanilgan adabiyotlar**

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