

Enhancing language development in autistic preschoolers through corrective interventions



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Abstract The problem of autistic disorders in preschool children is considered to be one of the most relevant for modern preschool educational institutions, as speech activity serves as a basis for the process of knowledge acquisition and overall personality development. Timely identification of speech disorders, practical study of their characteristics and differentiation of autistic disorders are identified as the basis of the speech therapy work system. The study aims to analyse the functionality of corrective speech development in preschool children with autistic disorders. Several general scientific research methods were used to achieve the research goals, including analysis, synthesis, abstraction, induction and deduction, specification and formalisation, and comparison. The study identified possible consequences of severe speech disorders on the process of children's mental development. It substantiated the necessity of their awareness during the implementation of the process of corrective speech development of children of the specified category in preschool educational institutions. It was established that the functionality of support of preschool children with autistic disorders includes stages of diagnostic and corrective work not only directly with the child but also with its environment. The research has shown that in order to integrate a child with autism into society successfully, it is necessary to effectively diagnose certain aspects of his/her mental development at an early stage, which significantly complicates speech problems, in order to provide practical specialised corrective assistance.

Keywords: autism spectrum disorders, speech therapy practice, peculiarities of the communication function, corrective assistance, speech activity

1. Introduction

Current trends indicate a significant increase in the frequency of cases of children with autistic disorders, accompanied by disruptive changes in the overall developmental algorithm, complex formation of speech skills and specific adaptation problems. Despite the level of cognitive development, children with autism experience a secondary delay in mental processes closely related to the development of speech and motor skills. To effectively correct speech disorders and implement preventive measures to prevent the development of pathological conditions, comprehensive psychological and corrective work with children who have autism is necessary.

Today, the need for speech correction within the framework of psychological and pedagogical support and accompaniment of children with various types of autistic disorders in different age groups is increasingly recognised. A vital component of this approach is speech and language correction with a specialised target methodological toolkit, which is highly effective in working with children diagnosed with autism. Through a comprehensive approach, significant positive changes are achieved in the development of children who lag in verbal-logical thinking and cannot fully master analysis and synthesis techniques, generalisation and comparison. The development of the functionality of corrective speech therapy in preschool children with autistic disorders leaves no doubt about its acute relevance and the need for fundamental study.

Numerous studies (Boiko et al., 2022; Solovei, 2023) have focused on the analysis of individual aspects of the studied problem, revealing the general theoretical principles of corrective speech development technologies for preschool children with autistic disorders. Considerable attention has also been given to this issue in the scientific works of scientists (Panov et al., 2022; Bavolska & Kyslychenko, 2023) who study the nature of speech disorders in children with autism, the features of their ontogenesis and the dynamics of adaptation to the social environment. Some researchers (Havrylova, 2012; Zhuravlova, 2016) have identified the causes of autism and the specifics of its characteristics and explored the possibilities of improving diagnostic tools and methods of educational correction for children with autism spectrum disorders.

Despite researchers' significant scientific achievements, the problems of speech disorders in autism and the development of appropriate, effective methods of corrective speech development at an early age remain understudied and require further research.

This study aims to provide an analytical substantiation of the functionality of correctional speech and language development within the framework of psychological and pedagogical support for preschool children with autistic disorders.



2. Literature review

The results of the analysis of scientific developments in the psychological, pedagogical, logopedagogical, and medical spheres of modern research show that scientists are interested in the studied problem. The problem of the need for speech therapy support for children with autistic disorders against the background of the need for effective social integration and specific aspects of it are reflected in numerous scientific studies from various scientific perspectives.

In particular, modern studies highlight potential difficulties in the psychological development of children with autism (Hnida, 2013; Kyslychenko, 2017), identify the role of corrective speech practices in support of preschool children in the studied category (Moroz et al., 2019), and examine aspects of diagnostic and correctional work with children (Chepka, 2023; Iuzzini-Seigel, 2022; Lopes et al., 2017).

At the same time, some researchers (Swanson, 2020; Vogindroukas et al., 2022) have generalised the purpose of the process of effectively integrating children with speech disorders into the social environment, emphasising the priority of early diagnosis of those developmental peculiarities of the psychological sphere that deepen the underdevelopment of speech functions into skills and proposing developing a particular preventive methodology to help the child.

The problem of autistic disorders in preschool children is considered by some scientists (Fedewa et al., 2023; Binns et al., 2022) to be one of the most relevant problems for the modern strategy of developing preschool educational institutions. Sánchez Pérez et al. (2020) and Gevarter & Sigafos (2020) also see speech activity as the basis for the formation of knowledge acquisition skills and the general development of the child as a person. According to the cited scientists, timely identification of speech disorders, practical study of their specificities and accurate differentiation of autistic disorders are the basis of the system of speech therapy work.

A number of scientists have analysed the functional capabilities of corrective means in relation to speech development in preschool children with autistic disorders. In particular, Broome et al. (2021) and Saul & Norbury (2020) determined the possible consequences of severe speech disorders for the mental development of children. Scientists have also singled out the functionality of supporting preschool children with autistic disorders, which includes the stages of diagnostic and corrective work not only directly with the child but also with his or her environment.

A study by Ferguson et al. (2020) convincingly confirmed that for the successful integration of a child with autism into society, effective and timely diagnosis of indicators of mental development at an early stage of development is considered necessary. Only such a conceptual approach, scientists believe, will make it possible to eliminate a number of speech problems and provide practical specialised corrective assistance to a child with autistic disorders.

Thus, the majority of contemporary researchers interpret corrective speech development as a valuable basis for building psychological-pedagogical support for children with autism. At the same time, questions concerning the functional characteristics of the formation of the functionality of corrective speech activities within the outlined pedagogical-educational process remain mainly outside the focus of modern scientific developments or need to be further researched, emphasising the necessity of further extensive study of this research.

3. Methods

A series of studies on the development of children with autistic disorders in an interdisciplinary context form the theoretical and methodological basis of the research. In the research process, several general scientific methods were applied, including analysis and synthesis (to study current theoretical concepts and scientific developments concerning the issues of corrective speech development in preschool children with autism and to refine the terminological apparatus), comparison (to systematise conceptual approaches to defining basic concepts and criteria for selecting effective technologies and tools for corrective speech work), and structural-logical methods (to develop practical proposals for improving the traditional mechanism of corrective speech development in children with autistic disorders). The information base of the research consists of materials from scientific-practical conferences and publications on developmental issues of preschool children with autism, as well as educational, speech therapy and medical guides.

4. Results

Psycholinguistic disorders in children with autism spectrum disorders are diverse and characterised by specific features. Children with autism show destructive processes in memory formation, perception, thinking, imagination and communication. According to the observations of parents and specialists, deviations in the development of children with autism become apparent from the ages of 2.5-3 to 6-7 years.

Children with autism are characterised by a disorder in establishing emotional relationships with others, as well as an uneven development of the language sphere. Different types of speech articulation are observed. Difficulties in modulating voice through pitch, volume and tone, speech rate and rhythm disruptions, and lack of expressive intonation in speech are marked. Speech is the result of coordinated multiprocess activity in the brain. In this process, the articulatory organs merely execute commands, as the projection of the fingers of the hand is directly adjacent to the speech zone in the brain. The phenomenon of the interdependence of speech and motor activity requires careful attention to the development of fine finger movements, which positively affect the

functioning of speech areas.

Unfortunately, parents of autistic children and educators involved in their development do not always have complete information about the speech aspect of developmental disorders or the methods and techniques of corrective work. The latter should take into account the special educational needs of children with early autism. Communicative skills, as the basis for comprehensive personal development, are most effectively formed when a child can interact with qualified support. According to the outlined requirements, it is reasonable to develop a methodological scheme of gradual correction and relevant activation for integrating preschool children with autism into society.

Certain types of speech and language disorders in children with autism are caused by neurological and physical disorders, brain damage, hearing impairment, and delays in cognitive development. Overall, speech disorders include articulation disorders, voice disorders, stuttering, rhinolalia and dysarthria, total or partial loss of speech, general underdevelopment of speech, and dysgraphia and dyslexia (reading and writing disorders).

Most of the abovementioned speech disorders can be successfully alleviated in preschool years through effective speech therapy and psycho-pedagogical support. In this regard, speech therapy functionality aims to provide highly targeted assistance aimed at intensifying and optimising the developmental process of children with autism until they achieve the maximum possible independence in the social environment.

The results of modern authoritative research convincingly demonstrate the need for a comprehensive study of speech defects in preschool children with autistic disorders. Acquiring knowledge skills directly depends on the peculiarities of mental development, which is a priority component of the school and creative activities preparation system. Therefore, it is considered necessary to take into account the individual psycho-pedagogical characteristics of children with speech disorders to choose the optimal educational approaches and technologies to achieve maximum effectiveness.

A characteristic feature of older preschool children with autism is insufficient formation of the sensorimotor basis of speech processes. In addition, excessive psychotrauma in children with severe speech disorders distorts the algorithm of general development. In the context of difficulties in the socialisation process of children with autism, delayed development of certain mental functions (retardation) or, conversely, intensified development of certain mental functions (acceleration) are often observed.

Children with autism share common characteristics in the development of mental functioning, as well as distinct differences. Most older preschool children with autism traditionally show significant underdevelopment of auditory-verbal memory function and deficits in establishing cause-and-effect relationships. This peculiarity is due to the slower development of mental health processes. At the same time, visual memory in children with autism is typically within normal limits, while dysfunction of spatial perception leads to a reduction in volume. Insufficient speed in the processes of memorisation, regulation and control of visual memory, as well as cognitive functions such as comparison, generalisation and grouping, are noted.

The psycholinguistic characteristics of older preschool children with autism are influenced by the disruption of the process of forming speech-thought connections due to insufficient development of internal speech mechanisms. In addition, preschool children with autistic disorders typically show reduced memory capacity for all types of memory compared to normative values (Panov & Zhadlenko, 2022; Bavolska & Kyslychenko, 2023). The level of auditory memory is directly dependent on language development, leading to a decrease in auditory memory functionality in children with autism. Furthermore, the algorithm of word memorisation differs significantly from the classical one, as children with speech disorders struggle to orient themselves in task conditions, often resorting to paramnesia, indicating an internal instability of the speech-thinking system in children with autistic disorders.

Notably, preschool children with language disorders associated with autism tend to have a longer-than-average preference for visual memory over verbal memory. Relatively developed semantic and logical memory functions are characteristic but lack the necessary systematicity and purposefulness. Among the identified functional disorders in the studied group of children, the profound underdevelopment of thinking processes is of considerable importance. In particular, the analytical function is characterised by insufficient volume, weak differentiation, and a lack of systematicity and purposefulness. Considering the above, the common precondition for the formation of psycholinguistic developmental complications in preschool children with autism is insufficient sensorimotor speech function, thinking operations (comparison, inference) and auditory-verbal memory development. In addition, insufficient development of spatial practice creates difficulties in text comprehension (Swanson, 2020; Vogindroukas et al., 2022).

Based on the above findings, the ability to develop lexical skills should play a significant role in the speech correction of preschool children with autism. In this regard, the primary aim of correction technology for enriching the vocabulary of children with speech disorders should be the practical application of acquired skills in constructing their expressions. Development of children's vocabulary should be a pedagogically organised process rather than a spontaneous process.

Furthermore, to achieve effective results in correcting the acquisition of language skills in older preschool children with autism, it is considered appropriate to use a range of kinesiological methods, including logorhythmics, specific exercises and playful elements. Logopedic rhythmics is a comprehensive tool of educational methodology that intensifies the elimination of speech disorders and promotes the active socialisation of children with speech disorders. The main task of the outlined logorhythmics concept is to develop a sense of rhythm, auditory attention, and improvement of speech processes. Playfully, concepts related to shape, size, colour and the understanding of the rhythmic organisation of speech are assimilated (Chepka, 2023; Iuzzini-Seigel, 2022; Lopes et al., 2017).

Kinesiology in the corrective speech arsenal intensifies the child's intellectual development, expands his motor sphere, optimises cognitive activity and memorisation processes, stimulates the development of attention stability and simplifies the process

of acquiring writing skills. Most developmental and didactic exercises and games from the kinesiological cycle are efficient in pedagogical-corrective work with preschool children. A teacher-logopedist uses them appropriately in targeted individual or group practice and the implementation of corrective work with preschool children during logorhythmic sessions. With an optimal concept of complexity and systematicity, games have gradually become part of children's independent play activities, significantly stimulating their interest in language tasks and relieving emotional tension in communication in the process of socialisation (Hnida, 2013; Kyslychenko, 2017).

The organisational structure of thematic-conceptual classes creates an atmosphere of ease and comfort, allowing children to feel confident and fully explore their potential. The comprehensive play methodology is highly adaptable to intensifying cognitive activity and is strongly correlated with the psychophysical capabilities of children. The outlined approach to forming the structural-functional model of classes enables the creation of a sustained attention effect and significantly increases the effectiveness of skill acquisition. Experience convincingly shows that to increase its effectiveness, each class should include finger gymnastics, motor, didactic and finger games, all of which contribute to developing a sense of rhythm. Linguistic material should be developed regarding lexical accessibility, including small folklore forms and the creativity of contemporary children's poets.

An essential role in the implementation of educational projects aimed at understanding the rhythmic structure of speech processes is assigned to the set of games based on poetic texts, which teach children with autistic disorders to coordinate movements with words, thus promoting active speech development (Chepka, 2023; Iuzzini-Seigel, 2022; Lopes et al., 2017). In turn, a teaching methodology that exploits the potential of noisy musical instruments is used as an effective tool for developing memory and attention and coordinating movements.

Modern corrective speech development sessions should be designed according to contemporary requirements for the educational process in an inclusive environment. A creative approach and imagination allow sessions to be conducted in a unique, lively and engaging style while simultaneously creating the conditions for corrective tasks to be approached effectively. This approach makes it possible to motivate the child to believe in his or her potential, making adapting to the social environment much more accessible. Given that children with autism often experience delays in the development of mental and language processes, preschoolers suffer from gross and fine motor impairments, are more prone to fatigue and have impaired memory and auditory attention. Innovative games and exercises can fully meet the objectives of speech and language therapy. Moreover, speech-language pathologists can effectively use them in general psychological and educational practice by creating playful situations during sessions (Boiko & Putsankova, 2022; Solovei, 2023).

As the development of language in children with ASD is associated with several difficulties, such as organising voluntary behaviour, manipulating objects without considering their functional purpose, stereotyped play, repetition and lack of narrative, it is a challenge for educators to ensure positive interaction. The educator must interact with the child's play in a nonintrusive and attentive way, choose the right moment to add necessary details, quietly repeat the child's words, and use the child's favourite toy. This tactic makes it possible to integrate the child calmly into the world of play without excluding the presence of the adult and to gain trust, which requires considerable time and patience.

Considering the outlined specificity, before starting the corrective process of speech development in children with autism, it is necessary to provide an emotional level approach, the basis of which is the formation of cognitive functions, stimulation and development of communication tools, as well as the child's social skills through the development of his or her affective sphere through shared emotional experiences with a speech development corrective specialist. The general specificity of the stages and methodology of corrective speech development for preschool children with autism spectrum disorders is outlined in Figure 1.

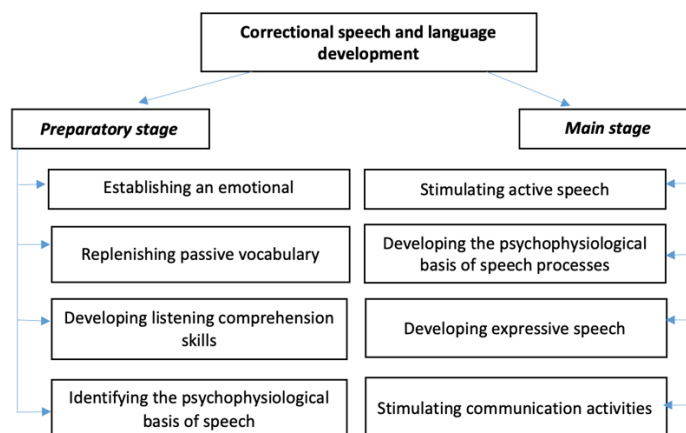


Figure 1 Correctional speech and language development methodology for preschool children with autistic disorders.

Source: Fedewa et al. (2023); Moroz et al. (2019)



It is advisable to include poetic forms of play in speech therapy practices for children with severe speech disorders, as they actively contribute to the sense of rhythm and emphasise words, which is extremely important for the group of children studied. In addition, including musical accompaniment in the game can significantly positively affect the child's emotional state and teach the dynamic character of movements, effectively developing auditory attention. Specific nuances of musical accompaniment induce the convergence of strong and weak muscle tension. The ability to control one's muscles is one of the priority tasks in the correction of speech disorders in children with autism (Chepka, 2023; Iuzzini-Seigel, 2022; Lopes et al., 2017). Skilful use of the potential of modern innovative approaches to a complex of games and exercises in the process of corrective speech development in preschool children with autism allows for preparing the speech-auditory apparatus for proper sound perception, for the development of speech breathing and rhythm, and for the formation of correct articulation through automation and differentiation of various sounds.

Early identification of speech disorders, practical study of their characteristics, and differentiation of autistic disorders in corrective educational practice promote creative imagination and holistic perception. Comprehensive and systematic application of innovative methods of corrective speech development significantly reduces the necessary duration of corrective work, improves the quality of the educational process, establishes cooperation between specialists in achieving the set goals of active and successful socialisation of students and facilitates their gradual adaptation to life in the social environment.

5. Discussion

Contemporary researchers emphasise that most older preschool children with autism spectrum disorders are characterised by problems with language activity, acquisition of literacy and numeracy skills, and disruptive cognitive functioning (Talbot et al., 2020; Oren et al., 2021). Several researchers (Bourque & Goldstein, 2020) have thoroughly analysed the process of verbal and nonverbal intelligence development in older preschool children with autism.

The immaturity of basic types of synthetic structures may cause the inadequate development of language skills in children with autism spectrum disorders. It is the belief of researchers (Fedewa et al., 2023; Binns et al., 2022) whose research emphasises the concept of the integrity of the structure of language deficits leading to difficulties in the acquisition of knowledge and skills in children with autism.

Several researchers (Broome et al., 2021; Saul & Norbury, 2020) are actively exploring the use of innovative methods in corrective speech development as a source of positive influence on preschool children with autism spectrum disorders in all dimensions of assessment (visual perception, auditory perception, instructional perception, lip muscle movement, tongue movement, object activities and initial communicative language skills). Some researchers (Ferguson et al., 2020) emphasise the differences between children with ASD in psychophysiological, cognitive and communicative indicators. According to the researchers, disturbances in all aspects of language development indicate the need to develop effective corrective methods in preschool educational institutions to address these issues.

Moreover, several authors (Sánchez Pérez et al., 2020; Gevarter & Sigafos, 2020) have confirmed the positive impact of modern corrective speech activities on the speech development of preschool children with autism. Contemporary scientific research (Shic et al., 2020) suggests that the analysis of genetic, biological and diagnostic aspects of autism has allowed for a deeper understanding not only of the disorder itself but also of its relationship to children's language development.

Despite the wide range of scientific studies on the issues explored, further research and program development are needed for effective intervention in the language development of preschool children with autism spectrum disorders.

6. Conclusions

The preschool years represent a unique period in a child's development characterised by increased vulnerability and sensitivity to social influences, with priority given to cognitive activity about the surrounding world. During preschool, the foundations of personal integrity and cognitive development are formed alongside an intensification of physical and sensory development processes. A significant number of cases currently characterise the issue of speech processes in children with autistic disorders. The inhibition of speech development leads to intellectual retardation, which limits the child's overall developmental trajectory and subsequently becomes a prerequisite for poor school performance, various complexes and neuroses.

Speech correction practice, as a part of psychological-pedagogical work with children with autism, is positioned as a necessary vector of interaction with the living environment of children with autistic disorders, contributing to the effective achievement of maximum possible integration and independence in the social environment. The main goal of specialists in the outlined field is to optimise interaction with the family based on a family-centred approach, an individualised approach to the educational process, and the continuous prioritisation of targeted speech correction assistance, depending on the dynamics of the problems. A necessary condition for the successful implementation of the functions of the speech and language development specialist in this direction is to coordinate teamwork with other specialists within the framework of psychological-pedagogical support and the child's family environment.

To increase the effectiveness of correctional speech development for preschool-aged children with autism, priority should be given to the development and implementation of innovative technologies, which are synergistic with the

requirements of the progressive educational process. One such progressive direction in the correction of motor activity in children with speech disorders is currently the variation of kinesiological tools, the use of which, in the practice of correctional development in cases of autism, allows for the development of visual-figurative thinking, memory and attention; the acquisition of spatial concepts; the expansion of vocabulary; the development of the ability to express oneself independently; and the increase in the level of motivation of children in dealing with disorders.

The current direction of further scientific research in this area is to improve diagnostic-corrective work technologies for children with autistic disorders, minimise anxiety and deformation in the personal development process, and increase the effectiveness of implementing socialisation vectors.

Ethical considerations

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Conflict of interest

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