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Structured Approach to Diagnosis and Rehabilitation of Children with Autism Spectrum Disorder: Strategies for Effective Social Adaptation

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ABSTRACT

This article aims to explore diagnostic procedures and rehabilitation methods for children with ASD, focusing on the importance of early intervention and structured developmental activities. The study employs a comprehensive, four-stage diagnostic approach, including an indicative stage for initial assessment, developmental potential evaluation, dynamic diagnosis, and social adaptation analysis. The rehabilitation strategies discussed involve medical, educational, and therapeutic methods, with an emphasis on individualized education plans and family involvement. The findings suggest that timely intervention and continuous, multidisciplinary support improve children's social adaptation and personal growth. This research contributes to the understanding of effective ASD rehabilitation practices and underscores the role of integrated support systems. By focusing on early intervention and personalized care, this study aims to enhance the long-term outcomes for children with autism and promote their integration into society, ultimately improving their quality of life and fostering inclusive environments in educational settings.

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1. INTRODUCTION

Autism Spectrum Disorder (ASD) is one of the most significant global health concerns, affecting an increasing number of children worldwide. Recent studies indicate that approximately 1 in 160 children globally are diagnosed with ASD, with this number continuing to rise due to better diagnostic practices and growing awareness (Homdijah *et al*., 2022; Al Husaeni *et al*., 2024). In Uzbekistan, the prevalence has also increased, with over 200 children officially diagnosed with ASD in the last few years. However, despite this increase in diagnoses, there remains a substantial gap in the availability of specialized support services for these children. This lack of adequate rehabilitation and educational services leaves many children without the interventions they need to improve their social, communicative, and cognitive abilities (Malik-Soni *et al*., 2022).

Autism manifests in a broad spectrum, from mild cases with subtle symptoms to more severe cases that can significantly impair a child's ability to communicate and engage with others. Common symptoms of ASD include challenges in social interactions, repetitive behaviors, restricted interests, and delays in language development (Homdijah *et al*., 2022). These symptoms can present differently in each child, further complicating the diagnostic process (Al Husaeni *et al*., 2024). Early intervention is widely recognized as a critical factor in improving outcomes for children with autism, yet access to early, targeted intervention remains inadequate in many regions, including Uzbekistan.

Addressing the challenges of ASD requires a holistic, multidisciplinary approach. This includes not only medical intervention but also educational, psychological, and social strategies to help children reach their full potential. Early and accurate diagnosis, combined with structured rehabilitation efforts, is crucial in enhancing the quality of life for children with autism, allowing them to achieve greater social integration and personal independence (Kuruvilla *et al*., 2024).

The concept of autism emerged in the early 20th century, when patterns of communication difficulties and limited social interaction among children began to be recognized as distinct from other developmental conditions (Homdijah *et al*., 2022). Initially referred to as a form of "intellectual mutism," these early descriptions highlighted traits now understood as part of the autism spectrum. During the mid-20th century, more defined characteristics of autism and its subtypes were established, laying the foundation for the current understanding of Autism Spectrum Disorder (ASD) (Smith *et al*., 2022).

The term "autistic withdrawal" also gained attention during this period, emphasizing social isolation and a retreat from external engagement. It was not until the development of standardized diagnostic frameworks, such as those introduced in the DSM-III during the 1980s, that autism began to be formally categorized as a spectrum disorder with varying degrees of severity and manifestations (Bröcker *et al*., 2023).

In more recent years, research has identified key behavioral indicators of ASD. These include marked challenges in forming emotional connections, a propensity for repetitive behaviors, and significant delays in speech and language development. Many children with ASD also face difficulty in interpreting social cues and engaging with peers, often resulting in limited participation in typical social settings (Canu *et al*., 2021).

Advancements in diagnostic tools—such as neuroimaging techniques and genetic analysis—have enhanced the understanding of underlying causes of autism. Despite these

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developments, diagnostic practices remain uneven due to the complexity of the condition and the lack of standardized application across different regions. Therapeutic approaches often include behavioral therapy, speech therapy, and, in some cases, pharmacological support. However, no single approach has proven universally effective, reinforcing the need for individualized interventions and tailored educational plans (Yen *et al*., 2023).

Despite global progress in autism research and treatment, there continues to be a notable gap in the application of structured and multidisciplinary rehabilitation programs within specific cultural settings (Nedungadi *et al*., 2024). In contexts such as Uzbekistan, the approach to diagnosing and treating autism remains fragmented, with limited access to specialized services and minimal coordination between healthcare, educational, and familial systems. There is also a lack of contextual adaptation of diagnostic criteria and intervention strategies, which must consider local cultural norms and resource constraints (Schendel *et al*., 2022).

This study aims to address these challenges by proposing a holistic, stepwise model for the diagnosis and rehabilitation of children with ASD, designed specifically for application in Uzbekistan. The model includes early screening, comprehensive developmental assessments, and ongoing support through individualized rehabilitation programs. It emphasizes collaboration among healthcare providers, educators, and families to ensure continuity of care and long-term impact.

A key innovation of this research lies in its commitment to adapting internationally recognized best practices to suit the local sociocultural and infrastructural context. By promoting early intervention and multidisciplinary collaboration, the study contributes a new perspective on how ASD can be managed effectively in resource-limited settings.

The central objective of this paper is to examine the organization of diagnostic procedures and to develop a structured, multidisciplinary rehabilitation framework for children with ASD. The specific goals include: (i) evaluating the effectiveness of a multi-stage diagnostic approach, including initial screening and dynamic assessment; (ii) designing an integrated rehabilitation program combining medical, educational, and therapeutic components tailored to the individual child; (iii) assessing the role of individualized education plans (IEPs) and active parental involvement in fostering social adaptation and integration into mainstream education; and (iv) analyzing the long-term developmental outcomes of early intervention programs in terms of social, cognitive, and emotional functioning.

This research offers a practical, evidence-based framework that can be implemented in Uzbekistan and other regions with similar challenges in accessing specialized autism services. By focusing on early detection, personalized intervention, and sustained support, the study provides a scalable model aimed at improving the quality of life, independence, and social integration of children with ASD.

2. METHODS

This study adopts a qualitative, descriptive research design that integrates both observational and experimental methods to evaluate the effectiveness of a four-stage diagnostic and intervention process for children with Autism Spectrum Disorder (ASD). The primary goal of this methodology is to develop a comprehensive, individualized framework for diagnosing ASD and providing intervention strategies. The methodology is designed to be

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adaptable to different contexts while focusing on early diagnosis, personalized interventions, and ongoing social adaptation. The four stages of the process are detailed below, each of which is intended to evaluate different aspects of the child's development and determine appropriate intervention strategies. Throughout the process, data will be gathered through a variety of sources, including parental surveys, psychological assessments, pedagogical observations, and clinical evaluations.

2.1. Stage 1: Indicative Stage

The Indicative Stage serves as the initial phase of the diagnostic process and is focused on gathering information about the child's early development, behavioral characteristics, and familial context. The goal is to create a baseline understanding of the child's developmental trajectory and identify possible early signs of ASD. The methods employed during this stage include:

(i) Parent Interviews: Structured interviews with the parents or guardians to gather detailed information about the child's prenatal, perinatal, and postnatal history. These interviews will also include questions about early behavioral signs (e.g., delays in speech, lack of eye contact, difficulties in social interaction) and family history of developmental disorders.

(ii) Environmental Observation: Observing the child in various settings (e.g., at home, in a school environment, and during play) to assess behavioral patterns and interactions with others. This observational data provides insights into the child's social communication and behavioral challenges, offering preliminary evidence of potential ASD-related symptoms.

(iii) Background Information: Collection of relevant background data from pediatricians, teachers, and other professionals familiar with the child's early development. This can include school records, medical history, and any previous evaluations or interventions the child may have undergone.

Data collection methods: (i) Structured interviews with parents (open-ended and closed-ended questions); (ii) Observational notes from teachers, caregivers, and other professionals; (iii) Review of medical and educational records.

2.2. Stage 2: Developmental Evaluation

In the Developmental Evaluation stage, a comprehensive assessment of the child's cognitive, emotional, and social development is conducted. This stage focuses on identifying specific developmental delays or challenges that may point to ASD and assessing the child's abilities in multiple domains. The following tools and techniques are employed:

(i) Comprehensive Psychological Assessments: Additional diagnostic tests, including Wechsler Intelligence Scale for Children (WISC) and other cognitive assessments, are administered to evaluate the child's intellectual functioning. These assessments measure verbal and non-verbal reasoning, memory, and processing speed, providing a baseline for understanding the child's cognitive strengths and weaknesses.

(ii) Behavioral Observations and Pedagogical Experiments: The child participates in targeted learning experiments designed to assess specific skills such as problem-solving, emotional regulation, and social communication. These tasks might include structured games or learning scenarios that require the child to interact with peers or educators. During these activities, specialists observe the child's behavior, learning strategies, and social engagement.

(iii) Speech and Language Evaluation: Speech therapists conduct detailed assessments to evaluate the child's ability to understand and produce language. This includes testing for

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receptive and expressive language skills, as well as pragmatic language abilities. Tools like the Preschool Language Scale (PLS) or Clinical Evaluation of Language Fundamentals (CELF) are commonly used to assess various language domains.

(iv) Social-Emotional Assessment: This part of the evaluation focuses on the child's emotional development and social behavior. Tools such as the Social Skills Improvement System (SSIS) and Empathy Quotient (EQ) are used to assess the child's ability to recognize and respond to social cues, form relationships, and manage emotions.

2.3. Stage 3: Dynamic Diagnosis

The Dynamic Diagnosis stage involves a precise, detailed diagnosis based on the data collected from the previous stages. Specialists make a more refined diagnosis and design a tailored Individualized Correctional Education Plan (ICEP). The methods and techniques used in this stage include:

(i) Analysis of Data: Specialists (psychologists, speech therapists, and educators) analyze the data from the psychological tests, behavioral observations, and interviews to identify key areas of difficulty and potential for growth. This involves reviewing the child's developmental history, current functioning, and progress in various domains.

(ii) Designing the Intervention Plan: The multidisciplinary team collaborates to create a detailed Individualized Correctional Education Plan (ICEP). This plan outlines specific goals for each area of the child's development (e.g., social skills, language development, emotional regulation) and specifies the targeted interventions. Techniques may include Applied Behavior Analysis (ABA) for behavioral modification, speech therapy for language skills, and social skills training for improving social interaction.

(iii) Targeted Educational Experiments: Specific educational interventions are implemented to assess the child's response to different teaching strategies. These may involve activities such as role-playing, peer interactions, or problem-solving exercises designed to improve social and academic skills. The goal is to test the effectiveness of various approaches and refine the teaching methods based on the child's response.

(iv) Monitoring and Adjustment: During this stage, regular monitoring is conducted to track the child's progress. Progress reports are generated, and adjustments to the ICEP are made as necessary. If the child is not responding well to a particular intervention, the team will explore alternative methods to better support the child's development.

2.4. Stage 4: Social Adaptation Analysis

The final stage of the process focuses on assessing the child's ability to adapt to social and academic environments, evaluating how well they integrate with peers, teachers, and family members. The following methods are used:

(i) Social Adaptation Assessment: This involves observing the child in various social situations, including interactions with peers, teachers, and family members. Specialists monitor the child's ability to communicate effectively, engage in cooperative play, and manage emotional responses in social settings.

(ii) Categorization of Social Adaptation Levels: Based on the child's performance in social situations, they are categorized into three levels of adaptation:

(iii) Fully Adapted: The child is socially integrated with minimal communication or learning difficulties. They participate in social activities and academic tasks with little support.

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(iv) Partially Adapted: The child experiences challenges in communication or social interactions but is able to function relatively well in structured settings with some assistance.
(v) Poorly Adapted: The child struggles significantly with both academic and social integration, requiring continuous support and intervention.

2.5. Feedback from Parents and Educators

Feedback from Parents and Educators: Parents, teachers, and caregivers provide feedback on the child's progress, noting changes in the child's social behavior, communication skills, and emotional regulation. This feedback is used to assess the effectiveness of the intervention and to identify areas that may need further support.

3. RESULTS AND DISCUSSION

The results from this study suggest that a structured, multidisciplinary intervention approach leads to significant improvements in the social adaptation, cognitive development, and overall well-being of children with Autism Spectrum Disorder (ASD). This improvement is most pronounced when early diagnosis, individualized care, and a combination of medical, pedagogical, and therapeutic interventions are employed. The findings of this study align with the growing body of research that emphasizes the importance of a holistic, individualized approach to ASD intervention (Syriopoulou-Delli, 2025).

The core interventions in this approach were centered around communication skills, social interactions, cognitive development, and vocational training. These elements were chosen for their proven effectiveness in improving outcomes for children with ASD (Kasari & Smith, 2013; Ke *et al*., 2018; Warren *et al*., 2011). Behavioral therapies, particularly Applied Behavior Analysis (ABA), were shown to significantly improve various aspects of functioning, such as communication, social skills, and adaptive behavior (Spreckley & Boyd, 2009). These therapies focus on reinforcing desired behaviors and reducing problematic ones through systematic, individualized approaches, helping children understand social norms and effectively communicate in different settings (Gitimoghaddam *et al*., 2022; Makrygianni *et al*., 2018). Speech therapy, focusing on both receptive and expressive language skills, played a critical role in improving children's ability to understand and produce language. Additionally, pragmatic language training helped develop social communication skills, such as initiating and maintaining conversations, understanding body language, and using appropriate tone and context in their speech (Turkstra *et al*., 2017; Baird & Norbury, 2016). Cognitive interventions, such as structured cognitive games and tasks, stimulated problem-solving skills, memory retention, and attention regulation (Parthasarathy *et al*., 2023; Pichierri *et al*., 2011). The use of visual aids, sensory activities, and individualized tasks engaged children and promoted cognitive development (Lo & Wang, 2024; Kalina & Powell, 2009). Vocational training, although still in the early stages of implementation, proved beneficial for older children and adolescents, focusing on life skills, work-related tasks, and basic job skills, ultimately enhancing self-sufficiency and preparing them for future educational and employment opportunities.

In addition to these core interventions, supportive methods further contributed to the child's rehabilitation process by creating enriching and therapeutic environments that promoted emotional regulation and social engagement. Hippotherapy, which involves interaction with horses, was used to improve motor coordination, balance, and emotional regulation (Viruaga *et al*., 2022). The rhythmic movement of the horse has been found to have a calming effect, while the bond between the child and the animal helped develop empathy,

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trust, and communication skills. Art therapy allowed children to communicate and process their emotions in non-verbal ways, providing a creative outlet for those who struggled with verbal communication (Carlyle & Graham, 2019; Kar *et al*., 2024; Ahmad Rizal & Zainol, 2025). Rhythmic movement therapies, such as Eurythmy, used structured rhythmic exercises to engage children's senses, promote mindfulness, and support social interaction, while reducing repetitive behaviors by offering new ways to express energy and emotion (Carlyle & Graham, 2019; Léger-Goodes *et al*., 2024). The involvement of parents was another crucial component of the intervention process. By training parents in autism-specific strategies, they were able to apply therapeutic techniques consistently at home, reinforcing progress made during formal therapy sessions. Parents were trained to use behavior management techniques, integrate communication strategies into daily activities, and create sensory-friendly environments that supported their child's development (Clément *et al*., 2022; Schaaf *et al*., 2011).

The results emphasize that a multimodal approach combining various therapeutic techniques—behavioral, cognitive, communication-focused, and creative therapies—yields the most significant improvements for children with ASD (Tachibana *et al*., 2017). No single method was found to be universally effective, as the diverse nature of ASD requires tailored interventions that address the unique needs of each child. This study supports research by Housman (2017) and Webster-Stratton & Reid (2004), which highlights the importance of early intervention in communication and social skills to significantly enhance brain development, particularly in social cognition and emotional regulation. Children who received early diagnosis and intervention exhibited improved social interactions, better communication, and enhanced adaptive behaviors. The use of multidisciplinary teams, as emphasized in this study, has proven essential in providing a well-rounded approach to ASD intervention, integrating various expertise to address all aspects of a child's development.

4. CONCLUSION

This study demonstrates that a comprehensive, individualized approach, which includes early diagnosis, behavioral therapies, speech therapy, vocational training, and family involvement, significantly enhances the social adaptation and developmental outcomes of children with ASD. The combination of therapeutic methods, including supportive interventions like hippotherapy, art therapy, and rhythmic movement therapy, created a well-rounded rehabilitation strategy that addressed the emotional, social, and cognitive needs of the child. The findings suggest that children with ASD benefit most when interventions are holistic, early, and personalized, with ongoing support and involvement from both professionals and families being crucial for long-term success. The results contribute to the growing body of evidence supporting the effectiveness of early intervention and multidisciplinary strategies in enhancing the lives of children with autism.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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