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PARENTAL INVOLVEMENT IN PEDAGOGICAL AND PSYCHOLOGICAL SUPPORT FOR PRIMARY SCHOOLCHILDREN WITH AUTISM

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ABSTRACT

Parental involvement is an important component of educational and psychosocial support for children with autism. However, meaningful involvement cannot be reduced to parents' attendance at meetings or compliance with professional recommendations. It includes participation in educational planning, communication with professionals, decision-making, implementation of support strategies, and advocacy for the child's needs. This study examined the role of parental involvement in the pedagogical and psychological support of primary schoolchildren with autism and explored factors that facilitate or hinder such involvement. A mixed-methods design was used, combining semi-structured interviews, a structured questionnaire, and observation of non-verbal behavior. The purposive sample consisted of 30 parents of children with autism who were involved in school-based pedagogical and psychological support. The findings indicate a discrepancy between parents' recognition of the importance of their role and their actual participation in some formal educational processes. While 20 of 28 respondents (71.4%) considered parental participation very important, 13 of 27 respondents (48.1%) reported participation in the development of the Individual Education Plan. Twenty of 29 respondents (69.0%) reported cooperation with the support team, while 6 of 29 (20.7%) reported difficulties in such cooperation. Emotional burden was also prominent: 12 parents reported that anxiety, fatigue, and psychological distress sometimes affected their ability to take their child to school regularly. The findings suggest that effective parental involvement requires accessible communication, genuine participation in decision-making, psychological support for parents, and partnership-oriented relationships between families and professionals.

Keywords: *autism; parental involvement; primary school; pedagogical and psychological support; inclusive education; family-school partnership; parent-professional collaboration; parenting stress*

INTRODUCTION

The education of children with autism requires coordinated action among the child, family, school, and multidisciplinary professional team. Within inclusive education, parents should not be regarded merely as recipients of professional information or as persons responsible for implementing recommendations at home. They are important participants in the child's educational and developmental process because they possess extensive knowledge of the child's everyday functioning, communication patterns, preferences, strengths, difficulties, and emotional responses.

Parental involvement in the education of children with autism is a multidimensional phenomenon. It may

include communication with teachers and specialists, participation in educational planning, contribution to decision-making, implementation of recommended strategies at home, monitoring of the child's progress, advocacy, and emotional support of the child. Systematic reviews have demonstrated that parents may participate in school-based interventions in different ways and that their role may extend from communication and consultation to active participation in intervention planning and implementation (Goldman & Burke, 2017; Rispoli et al., 2019).

At the same time, the existence of formal opportunities for parental participation does not necessarily guarantee meaningful involvement. Parents may attend meetings without having sufficient opportunity to influence decisions, may receive information without being able to discuss it, or may be expected to follow professional recommendations without being treated as equal partners. Hodge and Runswick-Cole (2008) have emphasized that the concept of partnership itself may conceal unequal relationships between professionals and parents. Consequently, the quality of parental involvement should be considered not only in terms of its frequency but also in terms of the degree of agency, reciprocity, respect, and influence available to parents.

The family context is particularly important when the child has autism. The period surrounding recognition of developmental differences and diagnosis may be accompanied by uncertainty, emotional distress, changes in family relationships, and increased caregiving demands. Research has consistently identified elevated parenting stress among parents of children with autism compared with parents of children without autism (Hayes & Watson, 2013). The impact of autism on family life may also involve changes in daily routines, social participation, employment, financial resources, and parental well-being (Karst & Van Hecke, 2012).

Parental involvement should therefore be understood within the broader context of parental psychological resources. A parent experiencing substantial anxiety, exhaustion, or family difficulties may recognize the importance of participation while simultaneously experiencing barriers to active engagement. Recent research also indicates associations among parenting stress, family-school partnerships, and parental mental health (McIntyre et al., 2023). Similarly, parental quality of life is relevant to the sustainability and quality of involvement in interventions for children with autism (Musetti et al., 2021).

School-home communication represents another important dimension. Parents of children with autism value communication that is frequent, clear, open, and responsive to their perspectives. Communication patterns can influence whether parents experience themselves as members of the educational team or merely as recipients of information (Li & Burke, 2023). Professional terminology, unclear procedures, limited opportunities for dialogue, and differences in expectations may create barriers to partnership.

The Individual Education Plan (IEP) provides a particularly important context for parental participation. Because parents possess knowledge derived from everyday interaction with their child, their contribution can help professionals understand the child's needs across contexts and develop more individualized educational goals. However, meaningful participation requires that parents understand the purpose and procedures of the IEP and have genuine opportunities to contribute to decisions.

The present study addresses parental involvement as a component of pedagogical and psychological support for primary schoolchildren with autism. The study focuses not only on the extent to which parents participate but also on the relationship between involvement, parent-professional collaboration, parental psychological state, and perceived support needs.

The aim of the study was to identify the role of parental involvement in the pedagogical and psychological support of primary schoolchildren with autism and to examine how different forms and levels of parental participation are associated with the organization of educational and social-emotional support.

LITERATURE REVIEW

Research on parental involvement in autism education demonstrates that parental participation has multiple dimensions. Goldman and Burke (2017), in their systematic literature review, identified school involvement as encompassing communication, collaboration, participation, and advocacy. This multidimensional understanding is important because parents may be highly involved in one area while having limited participation in another.

Rispoli et al. (2019) similarly demonstrated that parents may occupy different roles in school-based interventions for children with autism. Their role may involve receiving information, assisting with intervention implementation, contributing information about the child, participating in intervention planning, and supporting generalization across settings. This suggests that the quality of parental involvement cannot be captured by a single indicator.

The relationship between parents and professionals is also central. Blue-Banning et al. (2004) conceptualized effective family-professional partnerships around characteristics such as communication, respect, equality, commitment, and trust. Such characteristics are especially relevant in special and inclusive education because families and professionals bring different forms of expertise to the support process.

Parents possess experiential knowledge based on continuous interaction with their child, whereas professionals possess specialized theoretical and practical knowledge. Effective collaboration requires these knowledge systems to be integrated rather than ranked hierarchically. When professional knowledge is treated as superior and parental observations are minimized, parents may become passive recipients of decisions rather than active participants.

Hodge and Runswick-Cole (2008) problematized the assumption that the existence of a formal partnership automatically means equality. Parents may formally be members of a support team while having limited influence over decisions. This distinction between formal participation and substantive participation is particularly relevant to educational planning.

School-home communication is another critical dimension of collaboration. Li and Burke (2023) identified patterns of communication between schools and caregivers of children with autism and emphasized the importance of communication processes that are understandable and responsive to families. Communication that is dominated by professional terminology may create a knowledge imbalance and reduce parents' confidence in expressing their perspectives.

Family stress further complicates involvement. Hayes and Watson (2013) found significantly elevated parenting stress among parents of children with autism. Karst and Van Hecke (2012) similarly described the broader impact of autism on family functioning and parental well-being. Therefore, parental involvement should not be interpreted independently from the resources available to the family.

Đorđević et al. (2021) examined parent-teacher interactions, family stress, well-being, and parental depression as factors related to parental involvement in the education of children with autism. Their work reinforces the need to consider parental involvement within a psychosocial context rather than as an isolated educational behavior.

McIntyre et al. (2023) further highlighted relationships among parenting stress, children's emotional difficulties, family-school partnerships, and parent mental health. These findings support the assumption that improving parent-professional collaboration may require attention to parental psychological well-being.

A systematic review by Musetti et al. (2021) also demonstrated the relevance of parental quality of life and involvement in interventions for children and adolescents with autism. Parent-mediated interventions have additionally demonstrated the potential value of involving parents directly in developmental support (Oono et al.,

2013).

The recent meta-narrative review by Hayward et al. (2025) emphasizes the importance of collaborative relationships between professionals and parents of children with neurodevelopmental conditions. Taken together, the literature indicates that parental involvement should be conceptualized as a relational and systemic process involving the child, family, school, and professional team.

Despite this body of research, there remains a need to examine how parents themselves experience participation within specific educational contexts and how emotional, organizational, and communication factors influence their involvement. The present study contributes to this discussion by combining qualitative accounts with questionnaire-based quantitative data.

METHODOLOGY

RESEARCH DESIGN

A mixed-methods design was employed, combining qualitative and quantitative approaches. The qualitative component was used to explore parents' experiences, perceptions, difficulties, emotional responses, and experiences of cooperation with professionals. The quantitative component was used to complement the qualitative findings and examine parental involvement more systematically.

The combination of methods made it possible to compare parents' reported experiences with the distribution of their responses to structured questions.

PARTICIPANTS

The purposive sample consisted of 30 parents whose children had autism and were involved in school-based pedagogical and psychological support. Parents were selected because they had direct experience of interaction with the educational system and professional support teams.

Among the children represented in the sample, 23 were boys (76.7%) and 7 were girls (23.3%). The children ranged in age from 6 to 10 years and older: 6 children were 6 years old (20.0%), 7 were 7 years old (23.3%), 6 were 8 years old (20.0%), 2 were 9 years old (6.7%), and 9 were aged 10 years or older (30.0%).

DATA COLLECTION PROCEDURES

Three complementary sources of data were used.

First, semi-structured individual interviews were conducted using a pre-developed thematic guide. The interviews addressed parents' experiences, perceptions of educational and psychological support, difficulties encountered in cooperation with professionals, and perceptions of their own role. The order of questions could be adapted and additional probing questions were used when necessary. Interviews were documented through written notes and, when necessary, audio recording.

The interviews were initially planned to last approximately 30–45 minutes. In some cases, however, they lasted 1.5–2.5 hours. The extended duration was associated with parents' need to describe accumulated emotional experiences, unresolved difficulties, and concerns related to the support system.

Second, a structured questionnaire was administered to complement the qualitative interview data. It contained closed and semi-closed questions concerning parental involvement, perceptions of support, cooperation with the professional team, participation in the Individual Education Plan, experiences of diagnosis, and parents'

own support needs. The questionnaire was completed independently in order to reduce researcher influence on responses.

Third, non-verbal behavior was observed during interviews. Attention was paid to facial expressions, gestures, posture, tone of voice, and other non-verbal indicators. Observational notes were compared with the verbal content of interviews.

DATA ANALYSIS

Quantitative responses were summarized using descriptive percentages and corresponding frequencies where these could be reconstructed from the source data. Because not all questionnaire items had the same number of valid responses, denominators were retained at the item level rather than assuming that every percentage was based on the full sample of 30 participants.

Qualitative interview material and open-ended questionnaire responses were examined thematically, with attention to recurring experiences concerning parental involvement, parent-professional communication, emotional responses to diagnosis, barriers to participation, and perceived support needs.

ETHICAL CONSIDERATIONS

Participation was voluntary. Confidentiality and anonymity were maintained. Given the sensitive nature of the topic, particular attention was paid to participants' psychological well-being during the interviews. Participants were informed in advance about the purpose of the study and the intended use of the findings.

RESULTS

EDUCATIONAL PARTICIPATION

Twenty-five of the 30 children (83.3%) were reported to attend school, while 5 children (16.7%) were not attending school at the time of the survey. Thus, school attendance represented the situation for the clear majority of children in the sample.

The findings indicate that school was perceived by many parents as an important environment for learning, communication, social interaction, and participation with peers. At the same time, non-attendance was associated in parents' accounts with different possible barriers, including the child's needs, the accessibility of the school environment, availability of support, and family circumstances.

PARENTS' EVALUATION OF EXISTING SUPPORT

The questionnaire data showed that, among 28 respondents to this item, 4 parents (14.3%) reported being satisfied with the support provided by the school, 7 (25.0%) reported dissatisfaction, and 17 (60.7%) believed that the existing support required revision or modification.

Thus, only a minority of respondents considered the current support fully satisfactory. The largest group—17 of 28 respondents—identified a need for changes. This finding is important because it coexists with relatively high reported parental involvement, suggesting that parents may remain actively engaged while simultaneously perceiving limitations in the support system.

LEVEL AND PERCEIVED IMPORTANCE OF PARENTAL INVOLVEMENT

The source data indicate that 24 of 29 respondents (82.8%) reported active participation in the support process. However, this high level of general participation was not mirrored across all forms of involvement.

Twenty of 28 respondents (71.4%) considered their participation in the child's educational process very important. Only 1 of 28 respondents (3.6%) considered parental participation unimportant.

These results demonstrate a substantial discrepancy between perceived importance and participation in specific formal decision-making processes. Parents generally recognized their role as important, but recognition did not necessarily translate into participation in educational planning.

PARTICIPATION IN THE INDIVIDUAL EDUCATION PLAN

Participation in the Individual Education Plan represented a particularly important indicator of substantive involvement. Thirteen of 27 respondents (48.1%) reported participating in the development of the IEP, while 4 of 27 respondents (14.8%) reported that they did not know what the IEP was.

The difference between general active participation and participation in the IEP is noteworthy. While 24 of 29 respondents reported active involvement in the broader support process, only 13 of 27 reported participation in educational planning through the IEP.

This finding suggests that parental involvement may be relatively high at the level of everyday support, communication, and monitoring but more limited at the level of formal educational decision-making.

PARENT-PROFESSIONAL COLLABORATION

Twenty of 29 respondents (69.0%) reported cooperation with the professional support team. Six of 29 respondents (20.7%) reported difficulties in such cooperation.

The reported barriers included lack of time, incompatibility of schedules, inaccessible or overly complex information, and the use of professional terminology that parents found difficult to understand. Some parents also reported a need for greater recognition and encouragement from professionals.

Qualitative data further indicated that communication was sometimes experienced primarily as information transmission rather than dialogue. Parents could feel that they were expected to listen to professional recommendations rather than contribute equally to decisions.

Six parents specifically reported that their opinions were sometimes insufficiently incorporated into decision-making. This finding provides qualitative support for the discrepancy between general parental involvement and more substantive participation in planning.

EARLY RECOGNITION OF DEVELOPMENTAL DIFFERENCES AND DIAGNOSIS

Fourteen of the 30 parents (46.7%) reported noticing developmental difficulties or distinctive characteristics when their child was 2 years old. Eight of 30 parents (26.7%) reported noticing such characteristics at age 3.

The most frequently reported age at diagnosis was 3 years, reported by 11 of 30 parents (36.7%). Approximately 30% reported diagnosis at a later age.

These findings suggest that parents often notice developmental differences before or around the period when a formal diagnosis is established. They also highlight the importance of parental observations as an early source of information concerning children's development.

Interpretation of the reasons for later diagnosis should remain cautious because the present study did not independently measure access to diagnostic services or systematically investigate causal factors. Parents' concerns

nevertheless referred to uncertainty, delayed recognition, psychological adjustment, information gaps, and limitations in access to professional services.

PARENTS' EMOTIONAL STATE

The qualitative analysis of open-ended responses revealed several recurring emotional reactions to the child's diagnosis, including shock, fear, denial, pain, confusion, and depressive states. Some parents described prolonged psychological distress and hopelessness, whereas others described a process of adaptation and recovery.

The interviews also demonstrated the emotional sensitivity of the research topic itself. Although interviews were planned for 30–45 minutes, some extended to 1.5–2.5 hours. Parents sometimes became visibly emotional, including crying, while discussing their experiences.

Twelve parents reported that psychological distress, anxiety, and fatigue sometimes led them to prefer not to take their child to school every day and instead remain at home. This represents 40.0% of the total sample.

The finding should not be interpreted as evidence that psychological distress caused school non-attendance. Rather, it indicates that a substantial subgroup of parents perceived their psychological state as affecting their ability to maintain regular educational routines.

FAMILY AND SOCIOECONOMIC CONTEXT

The majority of parents reported having higher or secondary professional education. At the same time, 25 of 30 parents (83.3%) were not employed at the time of the survey.

The study data suggest that childcare, treatment, rehabilitation, and educational support responsibilities may occupy a substantial proportion of parents' time. However, because employment status and reasons for non-employment were not measured through a standardized socioeconomic instrument, the findings should be interpreted descriptively rather than causally.

The combination of high parental involvement, substantial caregiving responsibilities, and low employment participation points to the need to consider the broader social and economic context in which parental involvement occurs.

PARENTS' SUPPORT NEEDS

Parents identified several types of support. The available data indicate that psychological support and financial support were each selected by approximately 37.9% of respondents, while physical support was selected by approximately 20.7%.

Because these percentages were based on item-level responses and the source data do not provide a complete denominator and response structure for this question, they should be interpreted as reported response proportions rather than mutually exclusive categories. They should not be summed to represent a single distribution.

The findings nevertheless indicate that parents' needs extend beyond information about education. Psychological, financial, and practical forms of support are relevant to parents' capacity to remain involved in their child's educational process.

Parents identified several factors that could facilitate their involvement, it is presented in table 1.

Table 1. Factors That Could Increase Parental Involvement

Factor	n	%
More sensitive and cooperative professional attitude	17	56.7%
Recognition of the child's small successes	15	50.0%
Special meetings and programs for parents	14	46.7%
Joint informational events	11	36.7%
More accessible information	9	30.0%
Increased parental motivation	9	30.0%
More frequent meetings with other parents	7	23.3%

These responses suggest that parents need more than information. They also need to feel heard, respected, recognized, and emotionally supported. The most frequently identified factor was a more sensitive and cooperative professional attitude, selected by 17 of 30 parents (56.7%).

DISCUSSION

The findings demonstrate that parental involvement is relatively high when measured as general participation in the child's support process, but substantially more limited when measured as participation in formal educational decision-making.

The most striking quantitative comparison is between the 82.8% of respondents who reported active involvement in the broader support process and the 48.1% who reported participation in IEP development. Although the denominators differ—29 and 27 valid respondents respectively—the difference remains conceptually important. Parents appear to participate more readily in everyday support than in formal educational planning.

This distinction supports the argument that parental involvement should not be reduced to frequency of contact. Meaningful involvement requires influence over decisions that affect the child's educational trajectory. Goldman and Burke (2017) and Rispoli et al. (2019) similarly emphasize the multidimensional nature of parental involvement in autism education.

The finding that 4 of 27 respondents (14.8%) did not know what the IEP was provides an additional explanation for limited participation in educational planning. Parents cannot be expected to participate meaningfully in a process that is unfamiliar to them. Accessible information and explicit explanation of the purpose, content, and decision-making procedures of the IEP are therefore essential.

The study also identified a discrepancy between parents' perceived importance of their role and their actual participation. Twenty of 28 respondents (71.4%) considered parental participation very important, while only one respondent (3.6%) considered it unimportant. Nevertheless, six parents reported that their views were sometimes insufficiently included in decision-making.

This finding is consistent with the distinction between formal and substantive partnership. A parent can be present at a meeting but still have limited influence. As Hodge and Runswick-Cole (2008) noted, the language of partnership does not necessarily guarantee equality in practice. The quality of the interaction, therefore, may be more important than the mere existence of meetings.

The 69.0% rate of reported cooperation with the professional team is also important. However, 20.7% of respondents reported difficulties in collaboration. The qualitative data indicate that professional terminology,

inaccessible information, schedule incompatibility, and insufficient recognition of parental contributions may contribute to these difficulties.

These findings correspond with the literature emphasizing communication as a central component of family-professional partnership (Blue-Banning et al., 2004; Li & Burke, 2023). Communication should therefore be conceptualized not merely as the transfer of information but as reciprocal exchange in which professionals and parents can articulate observations, concerns, and proposals.

The emotional findings provide an additional layer of interpretation. The presence of shock, fear, denial, confusion, pain, and depressive states in parents' descriptions of diagnosis is consistent with previous research concerning family stress associated with autism (Hayes & Watson, 2013; Karst & Van Hecke, 2012). Importantly, the current findings indicate that emotional distress may continue to influence parents' participation after diagnosis.

Twelve parents reported that anxiety, fatigue, and psychological distress sometimes affected their decision to take the child to school every day. This does not establish a causal relationship between parental psychological state and school attendance, but it demonstrates that educational participation occurs within a broader family system.

The high proportion of parents who were not employed—25 of 30 (83.3%)—should likewise be interpreted carefully. The study does not establish that autism-related caregiving caused unemployment. However, parents' accounts suggest that childcare, treatment, rehabilitation, and educational responsibilities can substantially influence their time and availability. This issue deserves attention because parental involvement should not be designed on the assumption that parents have unlimited time and emotional resources.

The support needs identified by parents reinforce this point. Psychological and financial support were each reported by approximately 37.9% of respondents, while physical support was reported by approximately 20.7%. Although the exact denominator for this item requires further verification, the pattern indicates that families may need multidimensional support.

The factors identified as potentially increasing parental involvement provide practical implications. The most frequently selected factor was a more sensitive and cooperative professional attitude (56.7%), followed by recognition of children's small successes (50.0%) and special meetings or programs for parents (46.7%).

These findings suggest that parents' involvement is influenced by the relational climate created by professionals. Parents are more likely to participate when they feel that their contribution is valued and that professionals recognize their knowledge of the child.

The findings therefore support a shift from a transmission model of parent-professional communication toward a partnership model. In the transmission model, professionals primarily provide information and parents receive it. In a partnership model, information moves in both directions: professionals contribute specialized knowledge, while parents contribute contextual and experiential knowledge.

Such a model is consistent with the partnership principles proposed by Blue-Banning et al. (2004) and with more recent research emphasizing collaborative relationships between families and professionals (Hayward et al., 2025).

The findings also suggest that parental psychological support should not be considered an optional addition to educational support. If parental stress and emotional exhaustion affect the parent's ability to participate, then supporting the parent may indirectly strengthen the child's educational continuity.

A systemic model can therefore be proposed in which the child, family, and professional team are considered interconnected components. Within such a model, support for the child and support for the family are not separate

processes. Rather, they should be coordinated according to the principle that strengthening parental resources can facilitate sustained participation in the child's development and education.

CONCLUSIONS

The study demonstrates that parents of primary schoolchildren with autism generally recognize their role as important and report substantial involvement in their children's educational and support processes. However, the findings reveal a significant difference between general involvement and participation in formal educational decision-making.

The main conclusions are as follows:

1. Parental involvement is multidimensional. Participation in everyday educational support does not necessarily imply participation in formal educational planning.

2. There is a discrepancy between perceived importance and substantive participation. While 20 of 28 respondents (71.4%) considered parental participation very important, only 13 of 27 respondents (48.1%) reported participation in IEP development.

3. Parent-professional collaboration is generally present but not consistently experienced as partnership. Twenty of 29 respondents (69.0%) reported cooperation with the support team, while 6 of 29 (20.7%) reported difficulties.

4. Communication remains an important barrier. Professional terminology, insufficiently accessible information, limited recognition of parental expertise, and insufficient inclusion in decision-making may reduce meaningful involvement.

5. Parents' psychological state is relevant to educational participation. Twelve parents reported that anxiety, fatigue, and psychological distress sometimes affected their ability to maintain regular school attendance routines.

6. Parents require multidimensional support. The findings indicate needs for psychological, financial, and practical support in addition to educational information.

7. Relational factors can facilitate involvement. A sensitive and cooperative professional attitude, recognition of children's achievements, parent-oriented programs, and accessible information were among the factors most frequently identified by parents as facilitating participation.

The findings support an integrated child-family-professional model of pedagogical and psychological support. Within such a model, the parent should be recognized as an equal participant in educational planning rather than simply as a recipient of professional recommendations.

Schools and support teams should therefore develop mechanisms that ensure understandable communication, regular dialogue, meaningful participation in IEP development, and opportunities for parents to express concerns and contribute to decisions. Parent meetings should move beyond information delivery and create space for reciprocal communication and problem-solving.

Psychological support for parents should also be incorporated into the broader support system. Given the emotional burden identified in the present study, a multidisciplinary approach involving psychologists may strengthen both parental well-being and family participation in educational processes.

LIMITATIONS

The study has several limitations. First, the sample was purposive and relatively small, consisting of 30 parents; therefore, the findings cannot be generalized to all families of children with autism. Second, the study relied substantially on self-reported information, which may be affected by recall and social desirability. Third,

different questionnaire items had different numbers of valid responses, and therefore percentages were calculated using item-specific denominators where these could be reconstructed. Fourth, the study did not employ inferential statistical analysis, and causal relationships between parental psychological state, socioeconomic circumstances, and educational participation cannot be established. Fifth, the qualitative analysis was based on thematic examination of interview material, but a formal named qualitative coding framework was not specified in the available research documentation.

Future research should include larger and more diverse samples, clearly defined quantitative measures of parental involvement and psychological well-being, systematic qualitative coding procedures, and comparative analysis of parent, teacher, and professional perspectives.

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OCCUPATIONAL THERAPY APPROACHES TO OVERCOME PLAY ACTIVITY PROBLEMS OF CHILDREN WITH RETT SYNDROME

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ABSTRACT

The goal of the research was to study the occupational therapy features of organizing play activities for children with Rett Syndrome. Qualitative research method was used for current research work and, a semi-structured interview was conducted with three occupational therapists working with children with Rett Syndrome (RS) who had three and more years working experience. Conducted semi-structured interview revealed and described the specifics of treatment approaches from their own professional perspective. As a result, it was studied what kind of play activities occupational therapists implement in their work with children with RS. The analysis of the research data was conducted based on the descriptive method.

Results: The results of the study showed that occupational therapists widely use various play methods and activities in their work with children with autism spectrum disorders, aimed at developing the child's motor, cognitive, and social abilities. Play activities contributed to the development of children's independence, concentration, interaction with the environment and participation in everyday life activities. At the same time, some difficulties have also been recorded, related to the child's motor limitations, short-term attention span and low level of play initiative. The study highlighted the role of occupational therapy in the process of organizing play activities for children with RS and emphasized the need for targeted, individual interventions. The results of the study further could contribute to the effective organization of occupational therapy treatment and improve children's quality of life.

Keywords: *Rett Syndrome, occupational therapy, play, occupational therapy intervention, play activity, participation, and quality of life.*

INTRODUCTION

It was well known that play activities were crucial for a child's holistic development and was the main mean of communication, mastering skills, and self-expression (Astik, & McDonald, 2016; Harvard, & Lindel, 2020). However, for children with various developmental disorders, especially girls with RS,

being involved in play activities may be accompanied by a number of complications such as physical, sensory, and communication difficulties.

Since RS considered to be a neurological genetic disorder which occurred mainly among girls it was characterized by the loss of skills acquired after a period of normal development and motor limitations, impaired hand function, lack of or limited speech, and sensory perception difficulties were often observed. All of these factors hindered child's participation in play activities, which were important for child's socialization, learning, and the development of emotional stability.

In this context, occupational therapy played a key role which aimed at promoting the child's practical skills, taking into account her/his individual needs, physical and sensory capabilities. Occupational therapy intervention approaches aimed to ensure the child's maximum participation in play and everyday activities by creating an appropriate environment, using adaptive devices and applying individual approaches (Sansom, & Krishnan, 2017; Stahlhut, 2018).

The current study highlighted the peculiarities of the play activities for children with developmental disabilities, the existing difficulties, and the possibilities of overcoming them through occupational therapy interventions. **Therefore, the aim of this study was to explore occupational therapy intervantion approaches for overcoming play activity problems of children with Rett Syndrome.**

LITERATURE REVIEW

According to the definitions included in the literature, Rett Syndrome (RS) is a rare, severe neurodevelopmental disorder characterized by developmental disorders, comorbidities, and abnormal behaviors, such as hand stereotypies and emotional features. It predominantly affectes girls and may occur, on average, in one in every 10,000–15,000 female births (Neul et al., 2022).

Scientific research in the health sector distinguished that RS is progressing by four-stage course. Developmental delay begin in early childhood, and there was usually a period of stunted head growth. Affected girls usually has normal development for the first 6–18 months, although subtle symptoms such as muscle hypotonia and slow head growth are presented at an earlier age but are not seen. Symptoms may not be apparent initially, but may become apparent during the first two clinical stages. Common symptoms include severe cognitive impairment, loss of goal-directed manual skills, and the development of stereotyped hand movements such as repetitive hand clenching (Hagberg et al., 1983). Motor dysfunction of children with RS include gait disturbances, muscle rigidity, and scoliosis. Loss of acquired motor skills such as walking is a hallmark of the disorder. Some studies have documented age-related decline in motor skills among children with RS (Marschik et al., 2013).

The play activities of children with RS often differ from those of children at other levels of normal development. Thus, play is the main activity of a child and develop the child's mind, increases intuition, helped to quickly orientate, and positively influenced on memory. It stimulated the child's development in the areas of social and spiritual development as well (Shah et al., 2017; Odom et al., 2010). Childhood considered to be the period when the child gradually discovers the environment and various authors, discussing play activities from a number of perspectives, unanimously noted that play activities were a unique and integral part of the human cultural system (Lucas, 2018).

As it was know, children typically developed social skills through play activities, but children with RS often had difficulties with both recognition and communication (Sigafoos et al., 2023) which made their social interaction with other people difficult. Therefore, for them, play can be used as a social and educational tool to better understand the child's inner world. They may be socially isolated or uncoordinated, which interfered with social play as well. Special programs have been developed for these children, including visual and highly sensory games that can contribute to their development. Using play activities during occupational therapy intervention are of great importance, since play is not only an effective tool for children, but also an important means of discovery, learning, socialization and self-expression (Case-Smith, 2015; Vignoli et al., 2019). Since play activities have an important therapeutic role for overcoming various issues it focused not only on physical, but also on social and psychological aspects of development. During occupational therapy intervention play can be used in the process of child development and disease treatment (Moser, 2017; Long, & Case-Smith, 2014).

Occupational therapy using individual goal setting and enriched environment for creating the conditions to reduce the functional deficit due to RS (Downs et al., 2018). Interventions may include: cognitive engagement, sensory stimulation, social stimulation, timing of activities and gross motor practice and exercise (Carter, 2010). The work of an occupational therapist begins with observation of the child in his/her natural environment, during which the specialist assesses movements, the child's response to external stimuli, the ability to functional use of hands, the degree of participation in play activities, and non-verbal communication methods. This observation allows to identify the child's behavioral patterns and understand how sensory and motor disorders affect the performance of his daily activities (Percy, 2016). Other study highlighted that there is a need for early and regular intervention, preventive management and an individualized approach at every age with RS (Anderson et al., 2014; Halbach et al., 2008).

Recent studies have shown that play can help children develop motor skills (Harvard, & Lindel, 2020; McAmis et al., 2017). Thus, occupational therapists often use methods that establish harmony between movement, play, and the body to improve coordination, and variety of play-based approaches to create practical environments that support integrated rehabilitation work across different disciplines (psychotherapy, physical therapy (Adams, 2019). The occupational therapist makes play the main means of development of the child, adapting it to his/her motor abilities, level of participation and sensory responses. Meaningfully selected game activities allowed the child to move, explore, communicate and express himself in comfortable way (Brunetti, & Lumsden, 2020; Carter et al., 2010).

Occupational therapy interventions may increase participation for children with RS since, occupational therapists use occupation as the primary therapeutic agent as well as a goal of intervention (Fisher, 2013). The opportunity to take part in activities differs due to age, interests, motivation, earlier experiences, support and network, aids, financial situation, place of residence, health care, school or daily work resources (Andrews, Falkmer, & Girdler, 2015). Collaboration with parents, teachers, and other members of the multidisciplinary team is also an important part of the occupational therapist's work, as family support increases the effectiveness of interventions and ensures more sustainable development (Urbanowicz, 2016; Retzlaff, 2007).

Scientific studies show that RS is not degenerative in nature, and with appropriate interventions, it is possible to maintain and develop a child's motor, practical, cognitive, and communication skills, as explained in a multidisciplinary study published by Cass (2003) and co-authors. According to the above, **the aim of this study was to explore occupational therapy intervantion approaches for overcoming play activity problems of children with Rett Syndrome.**

METHODOLOGY

A qualitative research methodology was used for this study, which allows for an in-depth study of the participants' subjective perceptions, practical experience, and professional approaches. Within the framework of the study, a semi-structured interview was used with three occupational therapists to identify the occupational therapy features of organizing and developing play activities for children with RS based on their professional experience. The semi-structured interview was conducted to identify and describe the features of their work activities from their own professional perspective. The descriptive method of data analysis was used to analyze the research data, as it allows us to identify the point of view or perception of the sample group on a given phenomenon, in particular, to describe what kind of play activities occupational therapists implement in their work with children with RS (Nayar, Stanley, 2015).

RESEARCH PARTICIPANTS

Semi-structured interview method was used with three qualified occupational therapists having at least three years of experience working with children with RS. Participants were selected through purposive sampling based on their professional experience and relevance to the topic (Adeoye, 2023).

DATA COLLECTION AND ANALYSIS

The main data collection tool was the semi-structured interview that was often used in qualitative research to obtain detailed information especially when a little was known about the topic being studied (Whiting, 2008). Conducted data collection method allowed to explore and discover the characteristics of children with RS and used assessment methods based on their work experience. Data collection was directed also for specifying the forms and effectiveness of occupational therapy intervention, as well as highlighting the difficulties and challenges encountered during collaborating with families.

The analysis of the research data was carried out by descriptive analysis method that aimed at to provide a clear picture of the problem under study while capturing the nuances and complexities inherent in the data (Ghorbani, & Matourypour, 2020). Applied descriptive analysis helped to summarize and define main areas of play activity problems that children with RS and their families meet. For research data analysis all interviews were recorded and transcribed ensuring the integrity of the content. The data was read multiple times to be familiar with the responses and after the main characteristics and patterns were identified based on the participants' responses. This approach allowed to identify the main recurring ideas, trends and significant differences in the experiences of specialists. All interviews conducted were

recorded and a detailed analysis was performed. The next step was to organize responses into meaningful categories using a coding framework. And after all data was categorized, the summary of key themes was developed without over-interpreting the content (Kim et al., 2017).

RESULTS

As a result of the analysis, several main directions were identified that characterize the effectiveness and existing difficulties during organizing occupational therapy intervention for play activities for children with RS. As a result of the analysis of interviews and observations collected during the research, it became clear that the organization of play activities for children with RS had a number of features that require a professional, flexible and individualized approach.

According to the occupational therapists' data analysis it was possible to declare that play-based interventions for children with RS cannot be implemented through general programs, as each child's motor, communication, and sensory capabilities were significantly different. Since each child's abilities could be in a different level of development such as motor limitations, communication difficulties, and sensory characteristics, that had to be taken into account when organizing play. According to the experts, the main difficulties related to: impaired eye-eye and eye-hand coordination, short-term attention span, inability to initiate and complete play activities, and difficulty participating in cooperative games.

Data analysis had shown that in addition repetitive and atypical hand-to-hand and hand-to-mouth movements interfered with the purposeful use of hands during play activities. All these stated the importance for developing an individual play program for each child, based on his or her preserved capabilities and abilities. All participants emphasized that sensory games play an important role in promoting play activity for children with RS. The most targeted games were those that included tactile stimulation (toys with different surfaces), motor stimulation (light rocking, rolling, swinging), olfactory and visual stimulation (safe materials with scents, bright colors).

According to the research participants during provided treatment sensory integration mainly used to reduce stereotypic movements of childnre, overcome their tactile hypersensitivity and develop a conscious perception of the hands for organizing further play activities using various sensory balls, kinetic sand, soft and rough touch surfaces and so on. The inclusion of **sensory integration approaches,** structured and socially interactive games, as well as a purposefully selected environment and safe toys significantly increased a child's engagement and reduce stereotypical behavior.

These works were connected to play in such a way that the child learns not only to "feel" the material, but also to use it in a playful way: to fill, squeeze, build, move. As a result, play becomes more purposeful, not just a series of stereotypical movements.

The research participants emphasized the importance **of developing social interaction in a play environment**, especially for communication and building relationships with peers and family members. It was noted that the effective duration of play for children with ADHD is a maximum of 20-30 minutes, since this duration is appropriate for a child to maintain maximum attention and engagement but with the support of another person. According to the data analysis it was possible to state that mentioned **during for games and organization of play activities should be well structured** so the child could

respond to the actions of an adult, take turns (e.g., "take turns rolling a ball") or maintain simple social rules during play (waiting, responding to name). As a result, it was observed that appropriately organized play interventions contribute to a small but steady increase in a child's communication initiative.

Research participants also emphasized that the purposeful selection of toys and the organization of the environment had great impact on the effectiveness of play. Occupational therapists who participated in the study noted that the following were most appropriate for children with RS:

1. toys made of ecologically friendly and safe materials,
2. toys with sound signals,
3. games with bright colors and simple structures.

This considered to be important since children with RS often put things in their mouths, and the toy needs to be completely safe. The sound and bright colors helped to focus attention and maintain interest.

The results of the study showed that **explanatory work with parents significantly increased the effectiveness of play activities at home**. While summarizing the research data the following important steps were outlined that occupational therapists usually offer to parents:

1. Creating a suitable play environment for the child: a bright room, an adapted table and chair.
2. Not placing multiple toys in front of the child at the same time so that he/she can focus on one specific game.
3. During play, giving clear and concise instructions and wait until the child tries to follow them.
4. Regularly implementing small sensory integration exercises as part of the play process.

According to the specialists above mentioned approaches contributed to the fact that the child with RS began to perceive play not only as a field of repetitive movements, but as a meaningful and enjoyable activity.

Research data analysis revealed that effective organization of play activities for children with RS could be possible only when it was based on an individualized approach, applied sensory integration, stimulation of social interaction, and a properly selected environment. The combination of these conditions promoted the child's active participation in play activities, contributing to reduce stereotyped movements, and gradually developing functional play skills.

The following recommendations were developed based on the research results:

1. Developing individual play programs for a child with RS based on the results of his/her motor, sensory, and communication skills and abilities.

2. Systematically applying sensory integration approaches to be sure that sensory integration exercises are linked to the play for reducing stereotyped movements and increasing attention focus.

3. Using structured and short game sessions – Organizing the game duration within 20–30 minutes, maintaining structural clarity and a simple sequence.

4. Promoting social interaction - Structure games to include turn-taking, response to an adult, and simple social rules, promoting the development of communicative initiative.

5. Adapting the environment – Creating a safe, bright, and overstimulation-free environment by reducing the number of unnecessary toys and ensuring focused attention.

6. Parental education and involvement – Organizing parental consultations and practical training to ensure the generalization of play skills at home.

7. Conducting multidisciplinary collaboration – Implementing the play-based intervention using the principle of teamwork, including a speech therapist, psychologist, physiotherapist, and educator.

DISCUSSION

The findings from this study highlight the features of organizing play activities for children with RS during occupational therapy treatment. This study provides concise overview of organization play activities that requires a high level of flexibility, creativity, and a use of sensory approach.

The research data also underscores the implications of rehabilitative intervention during play activities for children with RS through which it is possible to develop self-expression, motor and social interaction skills. Some challenges have also been noted, particularly children's mobility limitations, communication barriers, and varying degrees of family involvement. However, experts have found ways to overcome these barriers by linking sensory integration approaches during play activities, and giving simple structured tasks.

The results of the study showed that play-based interventions cannot be implemented **with general programs, since physical,** communication, and sensory capabilities of each child differ significantly from each other. According to sensory integration theory, interventions should build on existing sensory and motor foundations rather than deficits, which contributes to increasing the child's self-confidence and play motivation (Ayres, 1979; May-Benson, & Koomar, 2010*).* This conclusion coincides with the fundamental approaches of pediatric occupational therapy, according to which activity-based interventions should correspond to the individual functional profile of the child (Eklund et al., 2017). Christiansen and Townsend (2010) emphasize that "one-size-fits-all" approach to occupational therapy is inconsistent with the nature of activity-based interventions. Generic programs fail to address the frequency of stereotyped movements, limitations in purposeful hand use, and sensory hypersensitivity or hyposensitivity that children with RS exhibit.

The main difficulties, such as difficulty initiating and completing play activities, limitations in participating in cooperative games, and the presence of atypical movements, are due to the neurodevelopmental characteristics of RS. Literature review shows that such behavioral manifestations can hinder the formation of functional play if the intervention is not structured on a purposeful and gradual basis (Sansom & Krishnan, 2017).

The analysis of the results demonstrates that an effective play intervention should be based on an individual play program based on the child's existing capabilities. An individual play program is viewed as a structured form of intervention that takes into account the child's existing abilities, interests, and opportunities for participation. This approach is consistent with the provisions of Gary Kielhofner's Model of Human Activity (MOHO), according to which activity is effective when it is appropriate to the person's abilities, environmental conditions, and activity requirements (Kielhofner, 2008).

Reviewed literature stated that controlled multisensory environment, incorporating clinical knowledge in the field of RS and suggesting this approach as an appropriate intervention method for this

population (Lotan, 2006). During the study, special importance was given to sensory games, which, according to experts, are a key factor in promoting play activity in children with RS. The effectiveness of sensory stimulations and approaches used during play is also confirmed by modern research, which emphasizes the role of sensory play in the development of functional skills (Bundy et al., 2020). Also occupational therapy interventions may include: cognitive engagement; sensory stimulation; social stimulation; timing of activities and gross motor practice and exercise (Hammell, 2014).

Data analysis confirmed the importance of **social interaction development which** is an important platform for the formation of social skills, including turn-taking, responding to adult actions, and following simple social rules. This approach is consistent with the theory of sociocultural development, according to which play is a primary means of social interaction and development, where, with the support of an adult or peer, the child can act in his "zone of proximal development" (Vygotsky, 1978; Boonen, 2020). For children with RS social interaction often does not develop spontaneously, but targeted by play interventions and promote even minimal but sustained communication initiatives, are basis for emotional safety and participation (Rose et al., 2019).

Research findings highlight the importance of explanatory work with parents. Active parental involvement promotes the generalization of play skills in the home environment and increases the sustainability of interventions (King et al., 2018). There is a need for early and regular intervention, preventive management and an individualized approach at every age for children with RS (Anderson et al., 2014). Parents and all professionals supporting individuals with RS also need support to be able to cope (Lamb et al., 2016; Retzlaff, 2007).

In general, the discussion of the results of this study and their literary justification allow us to conclude that the effective organization of play activities of children with developmental disabilities is possible only when it is based on an individual approach, play programs built on preserved abilities, sensory integration, stimulation of social interaction, and a correctly selected environment. The combination of these factors contributes to the child's active participation in play, reduction of stereotypical behavior, and gradual development of functional play skills.

Occupational therapy interventions may increase participation for the RS individuals, since occupational therapists use occupation as the primary therapeutic agent as well as a goal of intervention (Fabio et al., 2020). The opportunity to take part in play activities differs for children with RS due to a range of reasons that are not solely related to the degree of severity (dyspraxia, latency, limited communication skills, seizures, stereotypies) and many other reasons that can include; age, interests, motivation, earlier experiences, support and network, aids, financial situation, place of residence, health care, school or daily work resources (Fabio et al., 2020).

SUMMARY

This research aim was to study of occupational therapy approaches for overcoming play activity problems of children with Rett Syndrome. Literature analysis has shown that RS is a neurological genetic disorder accompanied by motor, communication, and sensory difficulties that directly affect play

participation. At the same time, scientific studies have shown that with appropriate interventions, it is possible to maintain and develop a child's functional abilities.

The research was conducted using a qualitative methodology, using semi-structured interviews with three experienced occupational therapists. Descriptive data analysis allowed to identify the main directions and professional challenges in organizing play activities.

The results of this study allowed to conclude that the organization of play activities for children with RS was one of the key components of occupational therapy intervention and requires a highly individualized approach. The results showed that effective play intervention was based on individualized programs, including sensory integration approached, promoting social interaction, and proper organization of the environment. The importance of active parental involvement was also noted. Overall, the work emphasizes that play was one of the most important factors in the development of children with autism spectrum disorders and can serve as an effective rehabilitation tool, that was organized in a professional, scientifically, and individualized manner.

It was confirmed that general and unadapted programs did not provide sufficient effectiveness, since each child with RS had a unique motor, communicative, and sensory profile. The basis of effective play intervention should be the identification of the child's preserved abilities and an individual play program built on them.

Thus, it can be concluded that effective organization of play activities for children with Rett syndrome is possible only when it is based on:

1. on individual assessment,
2. on the activation of preserved abilities,
3. on the application of sensory integration approaches,
4. on promoting social interaction,
5. on the purposeful organization of the environment.

Research shows that the development of play activities for children with RS requires structured, sensory-rich, flexible approaches, since play not only contributed to the overall development of the child, but also provided an opportunity to create a bond between the specialist and the child.

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HORTICULTURAL THERAPY AS AN INTERVENTION FOR ENHANCING SOCIAL SKILLS IN CHILDREN WITH AUTISM SPECTRUM DISORDER: A MIXED-METHODS STUDY

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ABSTRACT

Children diagnosed with autism spectrum disorder (ASD) frequently experience persistent difficulties in social communication, interpersonal interaction, and adaptive behavior, limiting their participation in educational and community environments. Nature-based interventions have recently attracted increasing attention as complementary therapeutic approaches capable of supporting children's cognitive, emotional, and social development. Among these interventions, horticultural therapy integrates structured gardening activities with therapeutic objectives, creating a natural environment that promotes communication, cooperation, emotional regulation, and independence.

The present study investigated the effectiveness of horticultural therapy in improving the social skills of children with ASD. A mixed-methods research design was employed, combining structured behavioral observation, semi-structured interviews with parents and specialists, and an intervention program based on therapeutic gardening activities. Twenty-six primary school-aged children with ASD participated in the study. Fourteen children formed the experimental group and participated in horticultural therapy sessions twice weekly in addition to their regular behavioral and occupational therapy, whereas twelve children in the control group received only conventional interventions.

The findings demonstrated noticeable improvements among participants in the experimental group. Increased social engagement, enhanced communication initiation, improved cooperative behavior, better emotional regulation, and greater independence were consistently observed throughout the intervention period. Parents and therapists further confirmed positive behavioral changes beyond the therapeutic setting.

These findings suggest that horticultural therapy represents a promising complementary intervention capable of promoting social competence among children with ASD. The integration of structured gardening activities into special education and rehabilitation programs may contribute to improved social participation and overall quality of life. Nevertheless, additional longitudinal studies with larger samples are required to confirm the long-term effectiveness of this intervention.

Keywords: *Autism spectrum disorder; horticultural therapy; social skills; nature-based intervention; special education; rehabilitation; communication; social participation*

INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by persistent deficits in social communication and interaction accompanied by restricted, repetitive patterns of behavior, interests, and activities. These characteristics frequently interfere with children's participation in educational settings, peer relationships, and everyday social functioning. Despite considerable advances in behavioral and educational interventions, promoting meaningful social interaction remains one of the greatest challenges for professionals working with children diagnosed with ASD.

The prevalence of ASD has increased substantially during the past two decades, making the development of evidence-based intervention strategies an international public health priority. While behavioral interventions remain the cornerstone of treatment, researchers have increasingly emphasized the importance of complementary approaches capable of addressing emotional well-being, sensory processing, motivation, and social participation simultaneously.

Nature-based interventions have emerged as promising therapeutic approaches because they provide multisensory experiences within predictable and emotionally supportive environments. Among these interventions, horticultural therapy has received growing scientific attention due to its ability to combine physical activity, environmental engagement, structured learning, and social interaction. Gardening activities naturally encourage cooperation, communication, shared responsibility, problem solving, and emotional regulation while simultaneously reducing anxiety and sensory overload.

The theoretical foundations of horticultural therapy are grounded in environmental psychology, occupational therapy, sensory integration theory, and experiential learning. Interaction with living plants offers children opportunities to experience responsibility, observe tangible outcomes of their efforts, and participate in meaningful collaborative activities. Such experiences may be particularly beneficial for children with ASD, who often demonstrate stronger engagement when learning occurs through concrete, predictable, and sensory-rich experiences.

Previous research has reported positive effects of horticultural therapy on psychological well-being, stress reduction, attention, emotional regulation, and social functioning across various populations. Nevertheless, empirical evidence specifically examining its effectiveness for improving social skills among children with ASD remains limited. Existing studies often involve small samples, heterogeneous intervention protocols, or insufficient methodological rigor, highlighting the need for further investigation.

The present study addresses this gap by evaluating the impact of a structured horticultural therapy program on the development of social skills among children with autism spectrum disorder.

The study was guided by the following research question:

Does participation in a structured horticultural therapy program improve the social skills of children with autism spectrum disorder?

The study hypothesized that children participating in horticultural therapy would demonstrate measurable improvements in communication, social interaction, cooperative behavior, emotional regulation, and independence compared with children receiving conventional rehabilitation alone.

LITERATURE REVIEW

AUTISM SPECTRUM DISORDER AND SOCIAL SKILLS DEVELOPMENT

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by persistent difficulties in social interaction and communication, together with restricted and repetitive patterns of behavior, interests, and activities. Early descriptions of autism were provided independently by Leo Kanner and Hans Asperger in the 1940s. Kanner described autism as a distinctive developmental condition characterized by difficulties in emotional and social contact (Богдашина, 2016).

Children with ASD may experience qualitative impairments in social interaction, including difficulties interpreting social and emotional cues, establishing reciprocal relationships, using eye contact, facial expressions, and gestures appropriately, and participating in shared activities. Communication difficulties may involve delayed or absent speech, limited spontaneous communication, repetitive or stereotyped language, echolalia, and difficulties initiating or maintaining conversations. Restricted interests, repetitive behaviors, insistence on routines, and atypical sensory interests are also commonly observed (Богдашина, 2016; Шамрея & Марченко, 2019). Thus, communication, socialization, and imagination are among the developmental areas most significantly affected in children with ASD.

The etiology of ASD is complex and multifactorial. Different theoretical approaches have emphasized psychogenic, genetic, immunological, and neurochemical factors. Current evidence particularly supports the contribution of genetic and neurobiological mechanisms, including alterations in neurotransmitter systems (Volkmar, 2021).

The prevalence of ASD has increased substantially in recent decades, although the reasons for this increase remain unclear (Chiarotti & Venerosi, 2020; Isaksen et al., 2013). Given the central role of social difficulties in ASD, scientifically supported interventions aimed at improving social development are essential for promoting social inclusion, independence, and quality of life.

THERAPEUTIC HORTICULTURE AND ITS POTENTIAL ROLE IN ASD

Therapeutic horticulture has historical roots in the use of gardens and natural environments for restoration and well-being. Its therapeutic value received greater scientific recognition in the nineteenth century, particularly through the work of Benjamin Rush, who emphasized gardening as a beneficial activity for people with mental health difficulties (Niepel & Pfister, 2010).

Interaction with nature and participation in meaningful outdoor activities may provide psychological and physical benefits and may be particularly valuable for vulnerable populations, including people with learning and physical disabilities (Sempik et al., 2014). Research also suggests

that individuals with ASD may demonstrate interest in nature and gardening (Grove et al., 2018), while their characteristic restricted interests may potentially be incorporated into strength-based interventions (Hume et al., 2021).

Therapeutic horticulture represents a multidimensional intervention combining contact with nature, purposeful activity, sensory experiences, and social interaction. For children with ASD, gardening activities may support attention, concentration, creativity, motor coordination, and communication while simultaneously creating opportunities for social participation (Niepel & Neuhauser, 2010). According to Putz (2010), the effects of therapeutic horticulture can be considered across five interconnected domains: physical, cognitive, psychological-emotional, social, and identity/self-esteem development.

In the physical domain, gardening activities can support fine and gross motor coordination, balance, and sensory engagement. Cognitively, horticultural activities may stimulate perception, creativity, temporal and spatial orientation, and language development. Psychologically, interaction with plants and nature may contribute to emotional regulation, stress reduction, self-confidence, resilience, and motivation. The social dimension is particularly important because group gardening creates opportunities for cooperation, communication, mutual assistance, and a sense of belonging (Putz, 2010).

Several studies have explored the potential of nature-based and horticultural interventions for people with ASD. Barakat et al. (2019), for example, proposed a sensory garden specifically designed for individuals with ASD, incorporating stimulation of the five primary senses as well as balance and body awareness. Li et al. (2019) also demonstrated the potential suitability of natural environments for therapeutic interventions involving people with ASD.

Although these findings are promising, the evidence base remains limited. Few studies have specifically examined therapeutic horticulture as an intervention for ASD, and research addressing its long-term effects and mechanisms of influence on social development remains insufficient (Kamp-Becker & Bölte, 2021). Existing research also provides limited methodological guidance for systematically implementing horticultural therapy in educational and rehabilitation settings.

This gap is particularly important because social, sensory, and emotional development are closely interconnected in children with ASD. Nature-based interventions may provide an integrated environment in which these domains can be addressed simultaneously. Recent evidence continues to suggest that nature exposure and horticultural activities may support social interaction, sensory regulation, and well-being among individuals with ASD, while also emphasizing the need for more rigorous research.

Therefore, the relevance of the present study is determined by the need to further investigate therapeutic horticulture as a potential intervention for developing social skills in children with ASD. The combination of purposeful gardening activities, sensory experiences, and structured social interaction may provide an alternative and potentially valuable approach within contemporary educational and rehabilitation practices.

RESEARCH AIM

The aim of the study is to examine the effect of therapeutic horticulture on the development of social skills in children with autism spectrum disorder.

RESEARCH QUESTION

What effect does therapeutic horticulture have on the development of social skills in children with autism spectrum disorder?

MATERIALS AND METHODS

STUDY DESIGN

This study employed a **mixed-methods quasi-experimental research design**, integrating quantitative and qualitative approaches to evaluate the effectiveness of horticultural therapy in improving the social skills of children with autism spectrum disorder (ASD). A mixed-methods approach was selected to provide a comprehensive understanding of behavioral changes by combining objective observational data with the experiences and perceptions of parents and rehabilitation professionals.

The quantitative component consisted of pre- and post-intervention behavioral assessments conducted using structured observation protocols. The qualitative component included semi-structured interviews with parents and specialists to explore perceived changes in children's communication, social interaction, and emotional functioning throughout the intervention period.

RESEARCH SETTING

The study was conducted at the Child Development Foundation in Yerevan, a multidisciplinary rehabilitation center providing behavioral, occupational, and educational services for children with developmental disorders. The intervention was implemented within the institution's therapeutic garden, which was specifically organized to facilitate structured horticultural activities in a safe, predictable, and sensory-supportive environment.

The therapeutic garden contained designated planting areas, raised beds, child-friendly gardening tools, flowering and edible plants, and sufficient open space for cooperative group activities. The environment was intentionally designed to minimize sensory overload while encouraging exploration, communication, and collaborative participation.

SAMPLE

Twenty-six children diagnosed with autism spectrum disorder participated in the study. Participants were recruited through purposive sampling from children receiving rehabilitation services at the Child Development Foundation.

The participants were divided into two groups:

1. **Experimental group (n = 14):** Children participated in horticultural therapy in addition to their regular behavioral therapy and occupational therapy.
2. **Control group (n = 12):** Children continued receiving behavioral therapy and occupational therapy without participation in horticultural therapy.

All participants were of primary school age and had previously received a clinical diagnosis of ASD according to internationally accepted diagnostic criteria established by qualified healthcare professionals.

INCLUSION CRITERIA

Participants met the following inclusion criteria:

1. clinical diagnosis of autism spectrum disorder;
2. primary school age;
3. regular attendance at rehabilitation sessions;
4. medical ability to participate in outdoor therapeutic activities;
5. written informed consent provided by parents or legal guardians.

EXCLUSION CRITERIA

Children were excluded if they:

1. presented severe physical disabilities preventing participation in gardening activities;
2. had acute medical conditions requiring intensive treatment;
3. demonstrated behavioral difficulties that posed safety risks during group activities.

INTERVENTION PROGRAM

The horticultural therapy program was implemented over the intervention period through two sessions per week conducted alongside participants' routine rehabilitation services.

Each therapy session followed a standardized structure consisting of four sequential phases:

4. **Introduction and orientation**, during which children were introduced to the planned activities and necessary gardening materials.
5. **Practical horticultural activities**, including soil preparation, planting seeds or seedlings, watering plants, removing weeds, observing plant growth, and maintaining the therapeutic garden.
6. **Cooperative group tasks**, designed to promote communication, turn-taking, joint attention, shared responsibility, and collaborative problem-solving.
7. **Reflection and feedback**, allowing children to discuss their experiences, observe the results of their work, and reinforce positive social behaviors through therapist-guided interaction.

The intervention followed a gradual progression from simple individual tasks toward increasingly cooperative activities. This approach enabled participants to develop confidence before engaging in more complex social interactions.

DATA COLLECTION

Multiple data collection methods were employed to increase methodological rigor through data triangulation.

STRUCTURED BEHAVIORAL OBSERVATION

Behavioral observation served as the primary quantitative assessment method. Observations were conducted before and after the intervention using a standardized observation checklist developed specifically for the study.

Children's behaviors were evaluated during both individual and group activities across four primary domains:

1. social interaction;
2. communication initiation;
3. participation in group activities;
4. emotional and behavioral regulation.

Each behavioral indicator was rated using a 4-point Likert-type scale (0–3), where higher scores indicated better social functioning.

SEMI-STRUCTURED INTERVIEWS

Semi-structured interviews were conducted with parents and rehabilitation specialists following completion of the intervention.

Interview questions explored:

1. perceived changes in social interaction;
2. communication behaviors;
3. emotional regulation;
4. independence;
5. behavioral changes observed at home and during therapy sessions.

The flexible interview format enabled participants to provide detailed descriptions while ensuring consistency across interviews.

OUTCOME MEASURES

The primary outcome was improvement in children's social skills following participation in horticultural therapy.

Secondary outcomes included:

1. communication initiation;
2. cooperative behavior;
3. joint attention;
4. emotional regulation;
5. behavioral stability;
6. independence during therapeutic activities.

Changes were evaluated through comparison of baseline and post-intervention assessments together with qualitative interview findings.

DATA ANALYSIS

Quantitative data were analyzed using descriptive statistical methods.

Frequencies, percentages, means, and standard deviations were calculated to summarize participant characteristics and behavioral outcomes. Comparisons between pre- and post-intervention observations were performed to identify changes in social functioning within the experimental and control groups.

Qualitative interview data were analyzed using thematic analysis. Interview transcripts were coded independently according to recurrent themes related to communication, cooperation, emotional regulation, and social participation. Emerging themes were subsequently compared with observational findings to enhance the credibility and trustworthiness of the results.

The integration of quantitative and qualitative findings provided a comprehensive understanding of the effects of horticultural therapy on children's social development.

RESULTS

SAMPLE CHARACTERISTICS

A total of 26 children diagnosed with autism spectrum disorder (ASD) participated in the study. Fourteen children were allocated to the experimental group, which received horticultural therapy in addition to routine rehabilitation services, whereas twelve children formed the control group and received standard behavioral and occupational therapy only. No participants withdrew during the intervention period.

Table 1. Participant Characteristics

Characteristic	Experimental Group (n = 14)	Control Group (n = 12)
Participants, n	14	12
Mean age (years)	8.1 ± 1.4	8.3 ± 1.2
Male, n (%)	11 (78.6)	9 (75.0)
Female, n (%)	3 (21.4)	3 (25.0)
Receiving behavioral therapy	14 (100)	12 (100)
Receiving occupational therapy	14 (100)	12 (100)
Receiving horticultural therapy	14 (100)	0 (0)

BASELINE SOCIAL FUNCTIONING

Baseline behavioral observations demonstrated considerable deficits in social functioning among children in the experimental group prior to intervention. Most participants showed limited social engagement, communication difficulties, reduced initiative during peer interactions, and low participation in cooperative activities.

Table 2. Baseline Behavioral Characteristics of the Experimental Group

Behavioral Indicator	Children Demonstrating Difficulty, n (%)
Low social engagement	11 (78.6)

Behavioral Indicator	Children Demonstrating Difficulty, n (%)
Communication difficulties	10 (71.4)
Limited social initiative	9 (64.3)
Low interest in group activities	12 (85.7)
Preference for solitary activities	8 (57.1)
Limited peer interaction	10 (71.4)

These findings indicate substantial impairments in the core domains of social functioning before implementation of the horticultural therapy program.

CHANGES FOLLOWING HORTICULTURAL THERAPY

Behavioral observations conducted throughout the intervention demonstrated progressive improvements in several domains of social functioning among children in the experimental group.

The greatest improvements were observed in participation in cooperative activities, communication initiation, peer interaction, and shared attention.

Table 3. Improvements Observed During the Intervention (Experimental Group)

Outcome	Children Improved, n (%)
Increased participation in group activities	10 (71.4)
Increased social interaction	9 (64.3)
Development of cooperative behavior	8 (57.1)
Improved joint attention	7 (50.0)

Children gradually became more willing to cooperate with peers while participating in planting, watering, and maintaining the therapeutic garden. Therapists also observed greater willingness to wait for turns, share gardening materials, and complete collaborative tasks.

COMMUNICATION OUTCOMES

Communication skills improved progressively during the intervention period.

Children increasingly initiated interactions using both verbal and non-verbal communication strategies.

Table 4. Communication Outcomes Following Horticultural Therapy

Communication Indicator	Children Improved, n (%)
Increased non-verbal communication	9 (64.3)
Emergence or increase of verbal expressions	6 (42.9)
Increased communication initiation	8 (57.1)

Improvement was particularly evident during collaborative gardening activities requiring children to request tools, share responsibilities, and communicate with therapists and peers.

EMOTIONAL AND BEHAVIORAL OUTCOMES

Behavioral observations also indicated improvements in emotional regulation and behavioral stability.

Table 5. Emotional and Behavioral Changes

Behavioral Outcome	Children Improved, n (%)
Reduced anxiety and tension	10 (71.4)
Improved behavioral stability	9 (64.3)
Improved self-regulation	7 (50.0)

Children appeared increasingly relaxed during outdoor sessions and demonstrated longer periods of sustained attention while participating in gardening activities.

PARENT AND THERAPIST INTERVIEWS

Qualitative findings obtained from semi-structured interviews supported the quantitative behavioral observations.

Parents frequently reported that children became more willing to initiate communication at home, while therapists observed greater participation in structured rehabilitation sessions.

Table 6. Parent and Therapist Reports

Reported Change	Children, n (%)
Increased communication at home	8 (57.1)
Increased interest in social interaction	7 (50.0)
Improved behavioral regulation	6 (42.9)

Representative interview responses suggested that many behavioral improvements generalized beyond the therapeutic setting.

FINAL OUTCOME ASSESSMENT

At the conclusion of the intervention, repeated behavioral observations demonstrated meaningful improvements in social functioning among participants in the experimental group.

Table 7. Final Behavioral Outcomes

Outcome	Improved Children, n (%)
Increased social engagement	11 (78.6)
Development of cooperative behaviors	9 (64.3)
Increased communication initiation	8 (57.1)

In contrast, children in the control group exhibited only modest behavioral changes that were not comparable to those observed in the experimental group.

Overall, the findings indicate that participation in structured horticultural therapy was associated with improvements in social engagement, communication, cooperative behavior, emotional regulation, and independent participation among children with ASD.

SUMMARY OF FINDINGS

The integration of quantitative behavioral observations and qualitative interview data consistently demonstrated positive effects of horticultural therapy on the social development of children with autism spectrum disorder. Improvements were observed across multiple domains, including social interaction, communication, emotional regulation, and cooperative behavior. These findings support the hypothesis

that structured horticultural therapy may serve as an effective complementary intervention within multidisciplinary rehabilitation programs for children with ASD.

DISCUSSION

The present study examined the effectiveness of a structured horticultural therapy program in improving social skills among primary school-aged children with autism spectrum disorder (ASD). Findings from both quantitative behavioral observations and qualitative interviews consistently indicated that children who participated in horticultural therapy demonstrated greater improvements in social interaction, communication initiation, cooperative behavior, and emotional regulation compared with those receiving standard rehabilitation alone.

A key outcome of this study is the observed enhancement in social engagement within naturalistic, task-based contexts. The gardening environment provided structured yet flexible opportunities for reciprocal interaction, which appeared to facilitate spontaneous communication and peer-oriented behavior. These findings are consistent with theoretical assumptions derived from environmental psychology and occupational therapy, which emphasize the role of meaningful, goal-directed activity in promoting adaptive behavior and social participation.

The improvement in communication initiation, particularly non-verbal communication, suggests that horticultural activities may reduce linguistic demands while maintaining high levels of social necessity. Tasks such as planting, watering, and tool-sharing inherently require coordination and joint attention, which likely contributed to increased communicative attempts among participants. This aligns with previous evidence indicating that children with ASD often respond more effectively to interventions embedded in concrete and visually structured environments.

Emotional and behavioral regulation also improved across the experimental group. The reduction in anxiety-related behaviors and increased behavioral stability may be explained by the calming and predictable characteristics of the outdoor therapeutic environment. From a neurodevelopmental perspective, sensory-rich but non-overwhelming natural settings may help modulate arousal levels, thereby supporting sustained attention and self-regulation during task performance.

Importantly, qualitative findings from parents and therapists indicated partial generalization of skills beyond the intervention setting. This suggests that horticultural therapy may support not only situational behavioral improvements but also broader adaptive functioning in daily contexts. However, such generalization effects should be interpreted cautiously given the limited duration of the intervention and the absence of long-term follow-up data.

Overall, the results support the hypothesis that horticultural therapy can function as an effective complementary intervention within multidisciplinary rehabilitation programs for children with ASD. Nevertheless, its role should be considered adjunctive rather than substitutive, as it complements but does not replace established evidence-based behavioral and developmental interventions.

CONCLUSION

This study provides empirical evidence that structured horticultural therapy can positively influence the social development of children with autism spectrum disorder. Participation in guided gardening activities was associated with measurable improvements in social engagement, communication initiation, cooperative behavior, and emotional regulation.

The integration of quantitative and qualitative data strengthens the validity of these findings and highlights the potential of nature-based interventions as a meaningful component of special education and rehabilitation programs. The therapeutic garden environment offered a structured yet emotionally supportive context in which children were able to practice and internalize social behaviors through experiential learning.

While the findings are promising, they should be interpreted as preliminary evidence supporting horticultural therapy as a complementary approach. Further research using larger samples, randomized controlled designs, and long-term follow-up assessments is required to establish the robustness and sustainability of observed effects.

LIMITATIONS

Several limitations should be acknowledged. First, the relatively small sample size limits the statistical power of the study and reduces the generalizability of the findings. Second, the quasi-experimental design without full randomization introduces potential selection bias between experimental and control groups.

Third, the reliance on structured observation and subjective reporting, although triangulated with interviews, may still be influenced by observer expectancy effects. The absence of standardized psychometric scales also limits comparability with other studies in the field.

Fourth, the intervention period did not include long-term follow-up assessments, making it impossible to determine whether observed improvements were sustained over time. Finally, contextual factors such as therapist involvement intensity and environmental characteristics of the therapeutic garden may have contributed to outcomes and were not independently controlled.

PRACTICAL IMPLICATIONS

The findings suggest several practical implications for special education and rehabilitation settings. Horticultural therapy can be effectively integrated into existing intervention frameworks as a structured group-based activity that promotes naturalistic social learning.

Therapeutic gardening sessions may be particularly useful in contexts where children benefit from multisensory engagement and reduced cognitive-linguistic demands. The approach also allows for scalable group implementation, making it suitable for school-based and clinical rehabilitation environments.

Furthermore, the incorporation of goal-oriented horticultural tasks may enhance motivation and participation among children who demonstrate limited responsiveness to traditional desk-based

interventions. This supports the broader use of environment-based therapeutic strategies in ASD intervention planning.

ETHICAL CONSIDERATIONS

The study was conducted in accordance with ethical principles for research involving human participants. Written informed consent was obtained from parents or legal guardians of all participating children prior to enrollment.

All procedures were designed to ensure participant safety, emotional well-being, and dignity. Activities were adapted to individual developmental levels to prevent overload or distress. Children were not exposed to any harmful physical or psychological conditions during the intervention.

Confidentiality of participant data was maintained throughout the study, and all identifying information was anonymized during analysis and reporting.

FUNDING

This study did not receive external funding from public, commercial, or not-for-profit agencies. All resources required for implementation of the intervention were provided by the participating rehabilitation center.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this study. The research was conducted independently without any financial or commercial relationships that could be interpreted as influencing the outcomes or interpretation of the data.

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AWARENESS AND COOPERATION WITH PARENTS AND FAMILIES OF CHILDREN WITH SPEECH DISORDERS AS A CRUCIAL PREREQUISITE FOR SPEECH THERAPY WORK

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ABSTRACT

Speech disorders in children represent a significant developmental challenge that can affect communication, academic achievement, social interaction, and emotional well-being. The effectiveness of speech therapy depends not only on the professional intervention provided by a speech therapist but also on the active involvement and awareness of the child's family. This study examines the role of parental awareness and family participation in the speech therapy process for children with speech disorders. Particular attention is given to the forms of parent–specialist collaboration, the integration of speech therapy techniques into everyday family communication, and the factors influencing the effectiveness of such cooperation. The literature review demonstrates that family-centered intervention, systematic communication between specialists and parents, and the creation of a supportive home environment contribute to the consolidation and generalization of speech skills acquired during therapy. Parental education and active participation may also reduce anxiety and helplessness, increase parental confidence, and promote more positive parent–child communication. The study emphasizes that effective speech therapy requires a continuous, collaborative, and trust-based partnership between the child, family, and specialist. Strengthening parental awareness and integrating families into therapeutic and educational processes can contribute to improved speech outcomes, social inclusion, and the child's overall developmental well-being.

Keywords*: speech disorders, speech therapy, logopedics, parental awareness, family involvement, parent–specialist collaboration, family-centered intervention, speech development, early intervention, inclusive education.*

INTRODUCTION

Speech disorders represent one of the most critical developmental challenges in children, significantly impacting not only their communication skills and academic progress, but also their social and emotional development. These issues are often combined with various psychological, cognitive, and social difficulties, requiring comprehensive and systematic work that engages both professional and family resources. Logopedics, as a scientifically grounded profession, aims to improve the speech and communication skills of children with speech disorders (Bessonova, 2010; Republican Pedagogical-Psychological Center, 2022; Volkova, 2018). The family serves as one of the primary environments for a child's development, and its involvement in the speech therapy process is essential for ensuring the continuity of the specialist's work, reinforcing the child's achievements, and applying improved communication skills within a natural environment. Parents' awareness and active participation not only improve the effectiveness of speech therapy interventions, but also contribute to building trust and partnership between the family and the specialist—which constitutes an ethical and professional responsibility.

The present research aims to identify the level of awareness among parents and families of children with speech disorders, the types of their participation, and the impact of intervention effectiveness on speech therapy. This research is important not only from a scientific perspective, but also practically, as it can serve as a foundation for enhancing the effectiveness of speech therapy services, parent training, and the improvement of inclusive education programs (Republican Pedagogical-Psychological Center, 2022; Kuznetsova, 2017).

LITERATURE REVIEW

In modern logopedics and special education, speech disorders are viewed as complex, multi-factorial phenomena that affect not only the formation of a child's speech system, but also their entire cognitive, emotional, and social development. The reviewed literature emphasizes that speech disorders are often accompanied by secondary disorders – such as reduced self-esteem, communicative and social avoidance, and restricted interpersonal relationships – which necessitate a comprehensive and systemic organization of corrective work. From this perspective, overcoming speech disorders is no longer viewed as an isolated professional influence, but as an ongoing process involving the child's entire social development environment, primarily the family (Antonyan et al., n.d.).

According to socio-cultural developmental theories, the fundamentals of which were formulated by sociocultural scholarship, speech formation and development are driven by social interaction. A child's communicative abilities develop not only through targeted instruction, but also during everyday communicative experiences where adults act as mediators. Related perspectives emphasize that supportive adult participation in a child's daily activities fosters the natural development of communication skills. In this context, the family is seen as the primary environment where speech is used in natural, emotionally rich, and semantically meaningful situations. Consequently, the effectiveness of speech therapy work largely depends on how well corrective interventions are integrated into the home environment (Republican Pedagogical-Psychological Center, 2022).

In modern speech therapy approaches, the concept of family-centered intervention holds a central place, grounded in the active involvement of parents and family members in the child's speech development. The literature notes that parents - being the child's daily communication partners - actually exert a greater influence on reinforcing speech than even the most effective professional sessions if the latter are not continued at home. This approach assumes
that a parent should not only be informed about the child's speech difficulties, but also have a clear understanding of their own role and potential. The reviewed literature stresses that active parental involvement in the speech therapy process significantly increases intervention efficacy (Ivanova, 2024).

The reviewed sources suggest that family-centered programs contribute not only to speech progress, but also to building parental confidence and responsibility. Parental awareness is currently viewed as a structural component of speech therapy. The literature highlights that parental education fosters a shift in attitude, reducing fear, feelings of helplessness, and denial mechanisms (UNICEF Armenia & Khachatur Abovian Armenian State Pedagogical University, 2019; Kukushina, 2010). By understanding the patterns of speech disorder development, the parent begins to perceive the child's difficulties not as an insurmountable problem, but as a developmental characteristic that requires time, consistency, and professional support. This shift positively impacts both parent-child relationships and the quality of collaboration with the specialist.

Family-specialist interaction in modern theoretical models is characterized as a partnership. The reviewed literature emphasizes that effective collaboration is possible only when the specialist moves away from a hierarchical stance and regards the parent as an equal partner (Republican Pedagogical-Psychological Center, 2022; Volkova, 2018). Parents possess insights regarding the child's developmental history, behavioral characteristics, and daily communicative experience that cannot be fully captured through standard tests or evaluations. A similar position is found in the reviewed literature, where parent-specialist collaboration is viewed as a process based on mutual trust and shared responsibility. Integrating this information into the planning of corrective work allows sessions to become more individualized and targeted (Tadevosyan, 2006; Antonova, 2015).

At the same time, authors note that difficulties often arise in parent-specialist relationships due to communication asymmetry, complex professional jargon, and the neglect of the parent's emotional state (Ageev, 2016; Charchyan & Movsisyan, 2019; Eliseeva, 2024). The literature emphasizes that an empathetic approach, active listening, and simple, clear communication from the specialist are key conditions for building a trustworthy relationship. Without this trust, parent participation often remains formal, and corrective work yields unstable results.

In the context of parent-child relationships, speech disorders can become a source of tension. The reviewed literature notes that some parents tend toward overprotection and speaking on behalf of the child, which limits the child's communicative initiative, while others may exhibit emotional distance due to psychological defense mechanisms (Antonyan et al., n.d.; Amanatova et al., 2010). Both extremes can negatively affect speech development. Conversely, a supportive, accepting, and encouraging family environment promotes the child's communicative activity and natural speech growth.

METHODOLOGY

The article is a literature-based conceptual analysis of parental awareness and family–speech therapist collaboration. Its discussion draws on the published works and methodological sources listed in the references. The original manuscript does not report an empirical study design, recruitment procedure, or a separately collected dataset; therefore, no participant-based findings are claimed here.

RESEARCH PARTICIPANTS

Not applicable. This article examines published literature and professional approaches rather than reporting interviews, surveys, or observations with recruited participants.

DATA COLLECTION AND ANALYSIS

The material consists of the Armenian- and Russian-language publications and methodological resources cited in the original manuscript. The discussion organizes their ideas around parental awareness, cooperation with speech therapists, continuity of home-based support, and interdisciplinary participation. This is a narrative synthesis; no systematic-search protocol or quantitative analysis is reported.

RESULTS

The literature-based synthesis in the original article identifies the following recurring areas of practice and concern:

Within modern inclusive education frameworks, the role of the family is re-evaluated as a core component of both the educational and corrective process. The reviewed literature highlights that family involvement not only improves a child's speech progress, but also aids their social integration, academic motivation, and emotional stability. Families that participate in planning and implementing their child's development serve as guarantors of intervention continuity (Istratova & Porfireva, 2024; Smirnova, 2018).

The effectiveness of collaboration with parents and families of children with speech disorders is also shaped by organizational formats and methodological approaches. Modern authors stress that parental involvement should not consist of isolated consultations, but must be systematic and continuous (Eletskaya & Gorbachevskaya, 2005; Mazanova, 2009). The reviewed literature notes that cooperation is most effective when it includes not only informational support, but also joint planning, discussion of outcomes, and progress monitoring, making the parent a full participant in the process.

When organizing speech therapy work, it is essential to consider the social, cultural, and educational characteristics of families. Various studies show that parental education levels, family communication styles, and expectations for the child significantly influence collaboration effectiveness (Antonyan et al., n.d.; Antonova, 2015; Kuznetsova, 2017). Therefore, the specialist must flexibly adapt their work to the needs of each specific family, avoiding rigid or superficial approaches. This stance helps prevent parental passivity or resistance and raises the quality of their participation.

Modern approaches also place high value on interdisciplinary collaboration, where the family is not an isolated element, but the central component of the entire system. Interaction between the speech therapist, educator, psychologist, and other specialists with the family helps create a unified framework of expectations and approaches, preventing contradictory messages and ensuring stability in the developmental environment. The success of this collaboration heavily relies on the level of family involvement and the establishment of a collaborative culture among specialists (Amanatova et al., 2010; Harutyunyan & Hovyan, 2018; Kukushina, 2010).

The early intervention factor also deserves special attention. Many authors note that early detection of speech disorders and timely collaboration with the family significantly increase corrective effectiveness. Raising parental awareness during early childhood helps prevent the worsening of speech difficulties and the formation of secondary disorders (Republican Pedagogical-Psychological Center, 2022; Volkova, 2018). Thus, parent awareness is viewed not just as a supporting element of corrective work, but as a preventative measure.

DISCUSSION

Finally, the success of working with families of children with speech disorders depends on how effectively the specialist fosters a sense of responsibility in parents. Parents who view themselves as active participants in their child's development demonstrate greater consistency in the corrective process, pay closer attention to the child's speech, and remain committed to continuing the work even during temporary setbacks. This approach helps sustain long-term intervention results.

Taken together, the reviewed arguments position family participation as a continuing partnership rather than a one-time consultation. These are interpretations of the cited literature, not measured outcomes from a new participant sample.

CONCLUSIONS

One of the most essential prerequisites for effective speech therapy support for children with speech disorders is targeted, continuous, and trust-based collaboration with the family. Speech therapy work cannot be limited solely to sessions between the specialist and the child, because the formation and reinforcement of a child's speech abilities continue within the family and daily environment.

Increasing the awareness of parents and family members enables them to properly understand the nature of their child's speech difficulties, the potential avenues for overcoming them, and the importance of implementing the techniques suggested by the specialist. An informed parent responds more constructively to speech challenges, avoids negative evaluations, and creates a supportive, encouraging communicative environment.

Effective collaboration between the family and the speech therapist facilitates the consolidation of skills acquired during therapy sessions and their transfer into everyday communication. Simultaneously, active parental involvement allows the specialist to gain a comprehensive understanding of the child's developmental traits, communicative behavior, and existing difficulties, leading to more tailored and successful intervention planning.

Thus, raising parental awareness and collaborating with families is not merely an optional addition to speech therapy work, but a core condition for its success. Through the unified partnership of specialist, child, and family, it is possible to create a supportive, safe, and stimulating environment that ensures the steady development of speech skills and promotes the child's full social and educational inclusion.

A limitation of the present article is that it provides a narrative, literature-based discussion and does not present original empirical data or a systematic review protocol. Accordingly, the conclusions should be understood as practice-oriented synthesis rather than causal evidence of intervention effectiveness.

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DEVELOPMENT OF SELF-CARE SKILLS IN PRIMARY SCHOOL CHILDREN WITH INTELLECTUAL DISABILITIES

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ABSTRACT

This study examines how primary-school curricula in Armenia address the development of self-care skills among children with mild and moderate intellectual disabilities. The problem is especially important in the context of inclusive education, where independence, social behavior, spatial orientation, and everyday practical skills influence successful participation and adaptation. A qualitative curriculum-content analysis was conducted for Grades I-IV, focusing primarily on Technology, Physical Education, and Mathematics, while also considering the former Social and Everyday Orientation program for Grades V-IX. The analysis asked whether self-care is represented as a distinct area, how relevant content is distributed across grades and subjects, and whether interdisciplinary links support the consolidation of self-care skills. The findings indicate that Technology contains some directly relevant material, particularly in Grades II-IV, including clothing and footwear hygiene, household sanitation, safety, and food-related skills. Physical Education and Mathematics provide indirect opportunities for developing independence, hygiene, spatial and temporal orientation, and organization; however, these opportunities are not systematically framed as self-care outcomes. Overall, the curricula do not provide a coherent or sufficiently comprehensive pathway for developing self-care skills in primary-school children with intellectual disabilities. The study concludes that a dedicated Self-Care section should be incorporated into the Technology curriculum and supported through explicit interdisciplinary connections.

Keywords: *self-care skills, intellectual disabilities, primary education, inclusive education, Technology, Physical Education, independence.*

INTRODUCTION

The early elementary school years (Grades I-IV) are a critical foundation for children's development. For children with mild and moderate intellectual disabilities, this period has particular significance. While the acquisition of core academic skills is important, the development of self-care skills is equally essential for future independence, participation, and well-being.

This article examines the role of school curricula in developing self-care skills alongside traditional academic content. It analyzes existing curricula across several disciplines and considers how effectively

they respond to the educational and practical needs of children with mild and moderate intellectual disabilities. The purpose is to identify strengths and gaps in current curricular provision and to formulate proposals for improvement.

A well-designed curriculum can equip children with the skills required to manage everyday activities more successfully, while early development of self-care can strengthen confidence and independence. Previous work has emphasized the importance of adaptation, social and everyday preparation, and practical independence for learners with developmental disabilities (Gladkaya, 2003; Palikyan et al., 1995; Sarukhanyan, 2009).

In Armenia, the transition toward universal inclusive education has made this issue particularly relevant. Difficulties remain in ensuring that educational provision adequately reflects the practical and self-care needs of children with intellectual disabilities. Harutyunyan (2023) notes broader responsibilities and challenges associated with the development of inclusive education and regional pedagogical-psychological support systems in Armenia.

Self-care skills are fundamental for participation in inclusive schools. They can support active engagement, relationships, independence, and a sense of competence. These skills therefore need to be represented at different levels of school programming and across subjects (Turnbull et al., 2020).

The study addresses seven research questions: whether curricula include a self-care section; how self-care teaching is reflected in educational material; how relevant content is distributed across grades; which areas of self-care are directly or indirectly represented; how self-care is reflected in Mathematics and other subjects; what interdisciplinary connections support self-care; and whether Grade I-IV programs contain sufficient material to promote self-care development.

LITERATURE REVIEW

Children with moderate intellectual disabilities may experience particular difficulties in acquiring and independently applying self-care skills. Relevant areas include basic daily needs such as dressing, hygiene, and eating; communication; mobility; and emotional regulation. The development of practical independence requires systematic instruction, repeated practice, and opportunities to apply skills in meaningful everyday contexts (Heward & Orlansky, 2010).

Acquiring self-care skills can provide children with greater control over everyday life, reduce reliance on constant assistance, and strengthen self-confidence. Participation in daily activities is also closely connected with quality of life and functional independence. Occupational-therapy literature likewise emphasizes intervention aimed at participation and functional performance among children with developmental delays (Polatajko & Crabtree, 2011).

Historically, social and everyday orientation programs used in special schools addressed areas such as personal hygiene, clothing and footwear, family, housing, transport, organizations, enterprises, and economics. The program referenced by Mezhuev (2002) allocated substantial instructional time to such practical domains in Grades V-IX. Educational material was organized around topics, practical work, and requirements for students' knowledge and skills.

However, programs designed for older students were not fully suitable for the self-care needs of children in Grades I-IV. They did not establish self-care as a sufficiently distinct and developmentally appropriate area for younger learners. Moreover, sections such as transport, communications, employment, and trade could be too complex for younger children with mild and moderate intellectual disabilities to use independently.

In practice, the absence of a dedicated self-care program for primary-school students has meant that teachers may rely either on programs originally intended for older learners or on their own professional knowledge and experience. Such an approach cannot by itself guarantee systematic preparation for independent life. General education subjects and interdisciplinary connections nevertheless offer important opportunities to teach, practice, and consolidate theoretical knowledge and practical self-care skills.

METHODOLOGY

This study used qualitative curriculum-content analysis. The main materials analyzed were school programs for Grades I-IV in Technology, Physical Education, and Mathematics. The analysis also considered the former Social and Everyday Orientation program for students with intellectual-development difficulties in Grades V-IX in order to compare the extent to which self-care content had previously been represented.

The unit of analysis was curriculum content that directly or indirectly supported self-care, independence, hygiene, household functioning, spatial and temporal orientation, food-related skills, clothing and footwear care, and organization of everyday activities.

The analysis was guided by the following research questions:

- Is there a section on self-care?
- How are issues of teaching self-care skills reflected in the educational material?
- How is self-care material distributed across grades?
- What areas of self-care are directly or indirectly reflected in each subject curriculum?
- How are self-care issues reflected in Mathematics and other subject curricula?
- What interdisciplinary connections can support the teaching and consolidation of self-care skills?
- Do Grade I-IV school programs contain educational material that sufficiently promotes the development of self-care skills in this group of children?

The curriculum materials were reviewed comparatively, with attention to explicit self-care content, indirect opportunities for skill development, developmental progression across grades, and gaps in the coverage of practical independence.

RESULTS AND DISCUSSION

TECHNOLOGY

The educational material of the Technology subject for Grades I-IV was developed to familiarize students with different areas of practical work. In Grade I, the material is presented mainly through illustrated workbook activities. Topics include the surrounding environment, tools and materials, work with natural and artificial materials, plants, and setting the table for tea and coffee.

Analysis of the Grade I material shows that it contains very little explicit information aimed at forming self-care concepts in children with mild and moderate intellectual disabilities. The topics on setting a table for tea and coffee are among the few that provide direct visual material related to everyday self-service. Most other topics contribute to general development but are not directly connected with self-care.

The Grade II Technology curriculum is broader and combines illustrations with short explanatory texts. Its content includes preparation of materials for work, work with various objects and materials, birds and animals, growing and caring for flowers, holiday cards, seasonal compositions, trees, technical details, and rules of hygiene for clothing and shoes. Among these topics, the rules of clothing and footwear hygiene, cleaning, and care are directly connected with self-care.

The Grade III-IV Technology curriculum includes more material directly related to self-care. Relevant content concerns clothes and shoes, button fastening, sanitary and hygienic requirements for the home and furniture, kitchen utensils, safety rules for heating devices and gas, and food-related topics such as food requirements, sanitary conditions for food preparation, simple food preparation, and food storage.

These areas are important for developing everyday practical skills. They can support children in maintaining cleanliness of rooms, clothing, and footwear; following safety requirements; and making more independent choices related to food preparation, storage, and use. Nevertheless, important areas remain outside the scope of Technology, including broader household self-care, orientation in space and time, use of cutlery, and independent behavior during meals.

Table 1. Content of the Technology subject in Grades I-II

No.	Content area
1	How to prepare material for work
2	Work with various objects: appliqué, seed mosaic, foil, colored paper and cardboard
3	Birds and their varieties
4	Animals: elephant, lion, hare
5	Sea fish
6	Growing and caring for flowers
7	Holiday cards
8	Compositions: spring, summer, winter, forest
9	Trees

No.	Content area
10	Details of technical objects
11	Rules of hygiene of clothing and shoes, their cleaning and care

Table 2. Self-care-related content in Technology, Grades III-IV

Area	Examples of content
Clothes and shoes	Types of button fastening; necklaces and bracelets made of buttons
Sanitary and hygienic requirements	Apartment and furniture hygiene; kitchen utensils; safety rules for heating devices; gas safety rules
Food	Importance of food; general food requirements; hygiene in food preparation; sandwiches; meat foods; boiled potatoes; refrigerator storage of perishable foods

PHYSICAL EDUCATION

The analysis of primary-school Physical Education programs indicates that physical-education methods and activities have considerable potential to support self-care skills in addition to their primary motor-development objectives. Relevant work can be organized during lessons, extracurricular clubs, games, sports activities, and spatial-orientation tasks.

Examples include changing clothes before and after lessons, preparing and putting away sports equipment, moving safely around the gym or playground, determining location and direction of movement, maintaining personal and sportswear hygiene, following self-care routines during exercises and games, developing posture and a culture of movement and communication, and performing activities that strengthen orientation in space and time.

These activities can contribute indirectly to self-care and independence. However, the curriculum does not systematically identify them as self-care outcomes. The sections on gymnastics, athletics, and games do not provide specific exercises or explicit theoretical and practical requirements focused on self-care for children with intellectual disabilities. This limits the consistency with which such skills can be taught and assessed.

MATHEMATICS

The Mathematics curriculum for Grades I-IV also offers indirect opportunities to support independence and self-care. Completing mathematical tasks requires students to use objects such as rulers, pens, triangles, and squares, organize materials, work independently, and orient themselves in microspace.

The curriculum also introduces spatial and temporal concepts that are relevant to everyday functioning, including left, right, forward, hour, minute, and day. Such concepts can contribute to orientation in space and time and therefore have practical relevance for self-care.

Nevertheless, the Mathematics curriculum does not contain explicit educational material or special conditions designed to consolidate self-care skills alongside the main mathematical objectives. Its contribution remains indirect rather than systematic.

OVERALL DISCUSSION

The analysis demonstrates that the three subjects differ in the degree to which they can support self-care. Technology provides the strongest direct connection, particularly in Grades II-IV, but its coverage remains incomplete. Physical Education and Mathematics provide useful contexts for practicing independence, hygiene, organization, and orientation, yet these possibilities are not formulated as explicit self-care learning outcomes.

The findings therefore point to a curricular gap. Existing educational material can support selected components of self-care, but it does not form a coherent developmental sequence across Grades I-IV. The lack of explicit interdisciplinary connections further reduces opportunities to reinforce skills across contexts.

In practical terms, a separate Self-Care section within Technology would allow schools to organize developmentally appropriate content around hygiene, clothing, food, household activities, table skills, spatial and temporal orientation, and independent participation. These outcomes could then be reinforced through Physical Education, Mathematics, and other subjects.

CONCLUSIONS

The educational material of Mathematics in Grades I-IV is primarily directed toward elementary mathematical knowledge and concepts; its contribution to self-care is indirect. Physical Education similarly creates useful practical situations but does not explicitly define self-care knowledge and skills as expected outcomes.

Technology contains the most directly relevant self-care content, especially in Grades II-IV, yet a substantial number of important everyday skills remain outside its scope. Across the analyzed subjects, the available material is insufficient to solve the practical task of systematically developing self-care and independence in children with mild and moderate intellectual disabilities.

No clear interdisciplinary framework was identified for developing cultural-hygienic, household, spatial-orientation, temporal-orientation, and other self-care skills. Further analysis of subjects such as Drawing, The World Around Me and Myself, and Native Language may identify additional opportunities for reinforcing these skills.

The study is limited to curriculum-content analysis and does not include direct observation of classroom implementation, teacher interviews, or assessment of student outcomes. Future research should therefore examine how self-care-related curriculum content is actually taught and how children apply the acquired skills in school and everyday contexts.

Based on the analysis, it is important to develop an exemplary Self-Care program or a dedicated Self-Care section within the primary-school Technology curriculum, together with pedagogical conditions and interdisciplinary mechanisms for its systematic implementation.

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INCLUSION FOR LEARNERS WITH MULTIPLE DISABILITIES: BARRIERS AND STRATEGIES

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ABSTRACT

The study explores barriers that affect the meaningful inclusion of learners with multiple disabilities in mainstream schools and considers practical strategies for reducing those barriers. Fieldwork was carried out in ten mainstream schools in Ararat Region, Armenia. A qualitative research design was used, combining structured observation, questionnaires, and semi-structured interviews. The study drew on the perspectives of teachers, school leaders, support specialists, parents, and learners with multiple disabilities. Physical accessibility was examined through a structured observation checklist, while the use of reasonable accommodations, assistive technologies, and social participation was investigated through questionnaires and interviews. The findings show that inclusion is constrained by several interconnected factors. Physical accessibility was uneven across schools, with major gaps in adapted sanitary facilities, vertical access, and accessible information. Reasonable accommodations were often partial rather than comprehensive, and assistive technologies were not consistently available or used. Social participation was affected by teacher preparedness, peer acceptance, parental factors, community attitudes, and systemic conditions. The findings suggest that effective inclusion cannot be achieved through isolated measures. It requires coordinated work on the physical environment, individualized accommodations, assistive technology, professional development, family-school cooperation, and inclusive school culture.

Keywords: *inclusive education, multiple disabilities, physical accessibility, reasonable accommodation, assistive technology, social participation, mainstream schools*

INTRODUCTION

Inclusive education is not simply a question of where a learner is educated. Its central concern is whether every learner can participate, learn, communicate, and belong within the life of the school. This distinction is particularly important for learners with multiple disabilities, whose participation may be

limited by a combination of physical, sensory, communication, cognitive, and social barriers. A school may be formally inclusive while still leaving a learner dependent on others for movement, unable to access learning materials, or socially isolated from classmates.

Current international approaches describe inclusion as a continuing process of identifying and removing barriers to learning and participation (Ainscow, 2020; Booth & Ainscow, 2011). UNESCO (2020) similarly emphasizes that education systems should adapt to learner diversity rather than expect learners to fit unchanged structures. This perspective shifts attention from the learner's impairment to the interaction between individual needs and the educational environment.

Armenia has moved toward universal inclusive education, creating an important policy basis for the participation of children with diverse educational needs in mainstream schools. Yet implementation remains uneven. In practice, inclusion may be weakened by inaccessible school buildings, limited reasonable accommodations, insufficient assistive technology, uneven professional preparedness, and social attitudes that restrict participation. These barriers become particularly significant when a learner has more than one disability and therefore requires coordinated rather than single-purpose support.

The purpose of the present study is to identify the main barriers encountered by learners with multiple disabilities in mainstream schools and to examine strategies that may support their more effective inclusion. The analysis focuses on three closely related areas: physical accessibility; reasonable accommodations and assistive technologies; and social barriers within the school and the wider community. The research question is: What are the main barriers to the inclusion of learners with multiple disabilities in mainstream schools, and what strategies may contribute to their meaningful educational participation?

The study shows that the barriers identified in the participating schools are interconnected. Physical accessibility is often partial, accommodations are frequently incomplete, and social participation is influenced by professional confidence and attitudes. These findings indicate that inclusion is strongest when environmental, technological, pedagogical, and social supports are planned as parts of one system rather than as separate interventions.

LITERATURE REVIEW

The contemporary literature on inclusive education increasingly treats participation as the central criterion of inclusion. Booth and Ainscow (2011) conceptualize inclusion through the development of inclusive cultures, policies, and practices, while Ainscow (2020) stresses that schools need to use evidence about exclusion and participation to guide improvement. In this view, barriers are not fixed characteristics of learners; they arise when educational environments, expectations, or practices fail to respond to diversity.

For learners with multiple disabilities, this interaction between the individual and the environment is particularly complex. A learner may need support in several areas at the same time for example, mobility, vision, communication, and learning. As a result, an accommodation that addresses only one need may not be sufficient. Meaningful participation requires a coordinated understanding of how the

learner moves through the school, accesses information, communicates, interacts with others, and completes learning tasks.

Physical accessibility remains one of the most visible conditions of inclusion. However, accessibility cannot be reduced to the presence of a ramp at the entrance. A learner must also be able to move through corridors, use sanitary facilities, reach classrooms on different floors, understand signs, and safely use common spaces. The European Agency for Special Needs and Inclusive Education (2022) places accessibility within a wider systemic approach in which school organization, leadership, resources, and learning environments work together to support participation.

Reasonable accommodations are equally important because the same educational environment does not provide equal access for all learners. Adaptations may involve the organization of space, the format of learning materials, teaching procedures, communication supports, assessment practices, or the use of assistive technologies. The purpose is not to lower educational expectations but to remove barriers that prevent the learner from demonstrating knowledge and participating on an equitable basis.

Assistive technology can support access to communication, information, mobility, vision, hearing, cognition, and learning. The World Health Organization and UNICEF (2022) emphasize that access to appropriate assistive products remains highly unequal worldwide. They also note that technology is most effective when provision includes assessment, appropriate selection, training, maintenance, and follow-up. In education, this means that a device should not be viewed as a stand-alone solution. Its value depends on whether it is suitable for the learner, compatible with classroom activities, and understood by the people who support its use.

The source material examined in this study identifies a range of potentially useful technologies, including screen readers, text-to-speech functions, electronic books, high-contrast displays, adapted keyboards, audio description, and communication-supporting tools. Their educational relevance lies in enabling learners to perform tasks more independently and to take a more active role in classroom interaction.

Social and attitudinal barriers are less visible than architectural barriers, but they can be equally restrictive. Teacher expectations, confidence, peer attitudes, parental trust, and community perceptions shape a learner's experience of school. Florian (2019) argues that inclusive education depends on teaching approaches that extend opportunities to all learners rather than separating those who are perceived as different. This requires teachers to work collaboratively with special educators, psychologists, speech and language specialists, administrators, and families.

Taken together, the literature suggests that inclusion for learners with multiple disabilities should be understood as a multidimensional process. Physical access, educational adaptation, technology, professional competence, and social acceptance are interdependent. The research problem addressed here is therefore the gap between formal placement in a mainstream school and actual participation in its academic and social life.

METHODOLOGY

RESEARCH DESIGN

The study followed a qualitative research design, supported by descriptive quantitative summaries of selected findings. This approach was appropriate because the research sought to understand both observable conditions in schools and the experiences of people directly involved in the inclusion process. Data were collected through structured observation, questionnaires, and semi-structured interviews. Descriptive statistics were used to summarize frequencies and proportions, while qualitative material was examined thematically (Creswell, 2014).

SETTING AND PARTICIPANTS

The research was conducted in ten mainstream schools in Ararat Region, Armenia, where inclusive education is implemented and learners with special educational needs are enrolled. The thesis reports that the schools were selected from the region's mainstream schools through a random procedure. The broader fieldwork included 100 teachers, 30 specialists from the territorial pedagogical-psychological support system, 10 school directors, and 10 learners with multiple disabilities who were beneficiaries of the "For You" charitable public organization. Parents and other educational stakeholders were also involved in the questionnaire and interview components of the study.

Including participants with different roles made it possible to examine inclusion from several perspectives. Teachers and school leaders could describe organizational and instructional conditions; specialists could comment on support needs and accommodations; parents could reflect on everyday participation and family-school cooperation; and the experiences of learners with multiple disabilities provided the practical context for interpreting environmental barriers.

DATA COLLECTION

Data collection was organized around three domains. First, the physical environment of each school was examined using a structured observation checklist. The checklist covered the entrance and surrounding area, ramps, door width and thresholds, corridors, stairs, lifts or lifting platforms, adapted sanitary facilities, and information signs. Measurements and photographs were used to document the observed conditions and compare them with relevant accessibility requirements.

Second, questionnaires were used to explore how teachers, specialists, and parents perceived the availability and use of reasonable accommodations and assistive technologies. The questions addressed both the supports that were available and the difficulties encountered when trying to use them in everyday educational settings.

Third, semi-structured interviews and observations were used to examine social participation. Attention was given to interactions in lessons and extracurricular activities, participation in group work and play, relationships with peers, and the experiences of adults supporting learners with multiple disabilities.

DATA ANALYSIS

The observation data were organized by accessibility domain and summarized using percentages. Questionnaire responses were reviewed descriptively to identify general patterns. Interview and observation material relating to social participation was analyzed thematically. Recurrent barriers were grouped into five broad categories: teacher-related factors, peer acceptance, parental factors, community attitudes, and systemic or policy-related conditions.

ETHICAL CONSIDERATIONS

School administrations were approached before data collection, and permission to conduct the study was obtained. Participants were informed about the purpose of the research and provided oral consent. The names of the participating schools are not reported in order to preserve anonymity and confidentiality. The research topic and procedure were discussed and approved within the relevant academic structures of the Faculty of Special and Inclusive Education at Khachatur Abovyan Armenian State Pedagogical University.

RESULTS

PHYSICAL ACCESSIBILITY

The observations showed that physical accessibility was uneven across the ten schools. Some accessibility elements were present, but they did not consistently form a continuous accessible route through the school. This distinction is important: a learner may be able to enter the building but still be unable to use a toilet independently, reach another floor, or navigate information without assistance.

Table 1. Physical accessibility indicators in the participating schools

Accessibility indicator	Accessible / compliant (%)	Incomplete / inaccessible (%)
Entrance and surrounding area	35	65
Ramps compliant with standards	42	58
Door width and thresholds	34	66
Corridor accessibility	63	37
Adapted sanitary facilities	22	78
Lifts and lifting platforms	5	95
Accessible information signs	30	70

Corridors were the most accessible element, with 63% meeting the assessed criteria. By contrast, lifts or lifting platforms were available in only 5% of cases, and adapted sanitary facilities in 22%. Accessible information signs were recorded in 30% of the observed settings. The findings therefore point to fragmented rather than comprehensive accessibility. In practical terms, this means that the independence of a learner with mobility or sensory needs may depend on assistance even when some adaptations are already in place.

REASONABLE ACCOMMODATIONS AND ASSISTIVE TECHNOLOGY

The data on reasonable accommodations reveal a similar pattern. The thesis reports that 599 learners (67.2%) received only partial accommodations, while 148 learners (16.6%) received none. This suggests that support is often available in some form, but is not always sufficiently comprehensive or individualized to address the learner's full educational needs.

Assistive technology was recognized as important, although attitudes toward its role were not uniform. Sixty percent of the surveyed teachers and support specialists considered communication-supporting assistive technologies important for learners with multiple disabilities, whereas 40% did not attribute the same level of importance to them. The study also found that learners who used communication-supporting technologies were more able to communicate independently with teachers and peers and to take part in classroom activities.

The examples documented in the thesis include audio description, accessibility settings on computers and mobile devices, electronic books with text-to-speech functions, large-print or high-contrast keyboards, screen readers, external displays, and communication-supporting technologies. The findings suggest that the effectiveness of these tools depends on how well they match the learner's needs and how consistently they are incorporated into everyday teaching.

SOCIAL BARRIERS

The thematic analysis of social barriers identified five recurring categories. Teacher professional and psychological preparedness accounted for the largest share of the identified barriers (30%). Peer non-acceptance represented 25%, parental factors 20%, community-level sociocultural stereotypes 15%, and systemic or educational-policy problems 10%.

Table 2. Relative distribution of major social barriers

Barrier	**Relative share (%)**
Teacher professional and psychological unpreparedness	30
Peer non-acceptance	25
Parental factors	20
Community sociocultural stereotypes	15
Systemic and educational-policy problems	10

The prominence of teacher-related factors is noteworthy. The qualitative material suggests that uncertainty, limited professional confidence, low expectations, and fear of not being able to meet complex needs may influence how learners are included in classroom activities. Peer non-acceptance can further restrict opportunities for friendship and participation. Parental factors were linked to trust, communication, and involvement in school life, while community stereotypes reflected broader social attitudes toward disability. The systemic category included gaps in resources, professional support, coordination, and implementation.

DISCUSSION

The findings make clear that the barriers experienced by learners with multiple disabilities do not occur independently. They form a chain. A physically inaccessible environment may restrict movement; limited accommodation may reduce access to learning; inadequate technology may restrict communication; and negative expectations may further reduce participation. This pattern is consistent with the broader understanding of inclusion as the removal of barriers rather than the simple placement of a learner in a mainstream setting (Ainscow, 2020; Booth & Ainscow, 2011).

The physical-accessibility results illustrate why isolated adaptations are not enough. A ramp can improve entry to a building, but it does not create meaningful access if the learner cannot reach upper floors, use sanitary facilities, or move independently through internal spaces. Accessibility therefore needs to be planned as a continuous route. This also has implications for dignity and autonomy: dependence on adult assistance for basic movement can affect the learner's experience of participation even when academic support is available.

The findings on accommodations and assistive technology point to a second important issue: availability does not necessarily mean effective use. A partially adapted task or an unused device may have limited value. The WHO and UNICEF (2022) framework is relevant here because it treats assistive technology as a process that includes assessment, selection, training, and follow-up. In schools, this requires coordination between teachers, specialists, families, and, where possible, the learner. Technology should solve a real participation problem rather than simply be present as equipment.

The social findings are equally significant. Teacher professional and psychological preparedness emerged as the largest category of social barriers. This does not mean that teachers alone are responsible for inclusion. Rather, it points to the need for systems that give teachers practical knowledge, collaborative support, and realistic opportunities to plan for learner diversity. Florian (2019) argues for approaches that extend learning opportunities to everyone, and such approaches are difficult to sustain when teachers work in isolation or lack access to specialist support.

Peer relationships also deserve deliberate attention. A learner may be physically present in a classroom yet remain socially excluded. Structured cooperative learning, peer-support practices, classroom discussions about diversity, and teacher modeling of respectful interaction can help create a stronger sense of belonging. Family-school cooperation is similarly important because trust and shared decision-making influence the consistency of support across settings.

Overall, the study supports a systemic approach to inclusion. Physical accessibility, reasonable accommodation, assistive technology, professional development, and social participation should be planned together. Improving one domain while leaving others unchanged may produce only partial inclusion.

RECOMMENDATIONS

Schools should conduct comprehensive accessibility audits that examine the full route of participation, including entrances, internal movement, sanitary facilities, vertical access, classrooms,

information signs, and surrounding areas. Improvement plans should be prioritized according to the barriers that most directly limit learner independence.

Reasonable accommodations should be linked to individual educational needs and reviewed regularly. Adjustments should include not only physical changes but also flexible learning materials, communication supports, teaching procedures, and assessment arrangements.

Assistive technologies should be selected on the basis of functional need and real educational tasks. Training and follow-up should be provided for teachers, specialists, families, and learners so that technology can be used consistently across school, home, and digital environments.

Professional development should combine knowledge about multiple disabilities with practical work on inclusive pedagogy, communication support, assistive technology, collaborative planning, and attitudes toward learner capability.

Schools should invest in peer inclusion through cooperative activities, supported peer interaction, and explicit work on acceptance and respect for diversity. Families should be involved as active partners in assessment, planning, and evaluation of support.

At the system level, monitoring should focus not only on enrollment or the presence of individual adaptations but also on whether learners can participate, communicate, move independently, and make educational progress.

CONCLUSIONS

The study shows that learners with multiple disabilities in mainstream schools face barriers across several domains at the same time. Physical accessibility was incomplete in most of the assessed areas, particularly in relation to adapted sanitary facilities and access between floors. Reasonable accommodations were frequently partial, and assistive technologies were not consistently available or fully integrated into educational practice. Social participation was also affected by professional preparedness, peer attitudes, family factors, community stereotypes, and systemic conditions.

These findings suggest that meaningful inclusion requires more than isolated accommodations. It depends on the coordinated development of accessible environments, individualized support, appropriate technology, professional competence, family partnership, and inclusive relationships within the school community. When these elements reinforce one another, learners with multiple disabilities have a stronger opportunity to participate as active members of the educational process.

The study has several limitations. It was conducted in ten schools in one region of Armenia, so the findings should not be generalized to all schools in the country. Some data are based on participant perceptions and descriptive summaries rather than standardized outcome measures. In addition, the study did not examine the long-term effect of particular accommodations or technologies on academic and developmental outcomes. Future research would benefit from a larger and more geographically diverse sample, stronger direct participation of learners with multiple disabilities in the research process, and longitudinal evaluation of specific inclusive practices.

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THE USE OF DIGITAL TOOLS AND ARTIFICIAL INTELLIGENCE IN CHESS LESSONS: AN EXPLORATORY STUDY OF STUDENTS' PERCEPTIONS

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ABSTRACT

This article describes a classroom experience in which digital tools and artificial intelligence were incorporated into school chess lessons and examines how students perceived that experience. The study was carried out at Yerevan Basic School No. 143 named after Movses Khorenatsi. During the teaching period, students worked with interactive digital materials, AI-based tools, videos, and project assignments, including activities created with Canva. At the end of the experience, students completed a questionnaire. The database contained 80 responses, although the number of valid responses to individual questions ranged from 77 to 78.

Overall, students responded very positively to the technology-enriched chess lessons. Among those who answered the relevant questions, 94.8% said that they liked or very much liked the lessons; 88.3% reported that digital tools made the chess material much easier and clearer; and 83.1% said that the computer program immediately pointed out an incorrect move and helped them understand the mistake. Project work in Canva or a similar format was described by 81.8% of respondents as very interesting and helpful for remembering the lesson.

At the same time, the study did not include a control group, pre- and post-testing of knowledge, or standardized measures. The findings should therefore be interpreted as evidence of students' perceptions and learning experience rather than as proof of a causal effect of the technologies themselves.

Keywords: *chess education, digital tools, artificial intelligence, interactive learning, project-based learning, student engagement*

INTRODUCTION

The rapid development of digital technologies and generative artificial intelligence is changing not only the resources available in education, but also the ways in which teachers and students can organize their work. Digital environments can provide rapid feedback, present information in different formats, support more individualized tasks, and give students a more active role in the learning process. At the same time, international guidance emphasizes that AI in education should be used in a human-centred, age-appropriate, and pedagogically meaningful way. The teacher's role remains central, while issues such as data protection and the reliability of AI-generated responses also need to be taken seriously (UNESCO, 2023).

Chess provides a particularly suitable setting for experimenting with digital technologies. It is governed by clear rules, moves unfold in a visible sequence, and the consequences of a decision can often be checked immediately. Digital platforms can therefore respond directly to a student's choices. Earlier studies of chess education in Armenian schools have shown that students' attitudes, motivation, and forms of learning activity are related to achievement in chess. Interactive teaching strategies have also been identified as an important way of encouraging active participation and the practical use of knowledge (Gevorgyan, Manukyan, & Sargsyan, 2023; Gevorgyan et al., 2024). Studies using game-based formats and chess mini-games likewise suggest that such approaches may help sustain students' interest.

Against this background, what matters is not simply which technology is brought into the classroom, but what students actually make of it. A digital tool that makes an assignment more complicated or becomes an end in itself may add little to learning. By contrast, timely feedback, visualization, interactive practice, and creative project work can meaningfully complement a conventional chess lesson.

AIM AND RESEARCH QUESTIONS

The aim of the study was to describe the experience of enriching chess lessons with digital tools and elements of AI and to explore students' attitudes toward these lessons.

More specifically, the study addressed the following questions:

5. How did students evaluate the technology-enriched chess lessons overall?
6. Did they feel that digital materials helped them understand chess content and analyse their mistakes?
7. How did students perceive project-based activities?
8. Would they like to take part in similar activities in the future?
9. What broader skills did students themselves associate with these lessons?

THEORETICAL AND PEDAGOGICAL BACKGROUND

The educational value of a digital technology depends less on how new the tool is than on the pedagogical function it serves. In a chess lesson, technology can provide immediate feedback, make positions easier to visualize, allow students to experiment, support creative products, and help the teacher differentiate tasks. Studies of chess teaching in Armenian schools suggest that students' attitudes, game-

related and problem-solving activities, and interactive strategies are associated with the effectiveness of chess learning (Gevorgyan, Manukyan, & Sargsyan, 2023; Gevorgyan et al., 2024). Research on chess mini-games also suggests that playful and innovative formats can help sustain beginners' interest and engagement (Corpuz et al., 2024; Gevorgyan et al., 2024).

Quick and visible feedback. A digital chess environment can point out an inaccurate move, offer an alternative, and give the student an opportunity to try again. This becomes especially valuable when the learner does not merely see that a move was wrong, but begins to understand why it was wrong.

Interactive and active learning. Digital exercises move students from the role of observers to that of active participants. Armenian research on chess education has linked interactive strategies with active participation, problem solving, cooperation, and reflection.

Project-based and creative activity. Canva and similar platforms make it possible to present chess content as a poster, presentation, or video. In this type of task, students do more than reproduce information: they select, organize, and present it.

Opportunities for individualization. Generative AI and chess-analysis programs can help teachers differentiate assignments, formulate explanations for different levels, and prepare additional materials more quickly. Their output, however, still requires teacher review and pedagogical adaptation.

The wider literature on AI-supported learning is also useful for interpreting this classroom experience. A systematic review of 72 studies by Lo, Hew, and Jong (2024) suggests that ChatGPT and similar tools can support student engagement, but may also create risks of over-reliance and more passive learning. Meta-analyses published in 2025, mainly in higher-education settings, generally report positive effects on motivation, engagement, and learning outcomes. At the same time, they emphasize that the results depend on the subject, the teaching strategy, and the specific way in which AI is used (Deng et al., 2025; Chen & Cheung, 2025).

Although these findings cannot simply be transferred to primary-school settings, they strengthen an important point: AI is better understood as part of a broader pedagogical design than as an independent factor that automatically produces better learning.

Another important possibility offered by generative AI is support for self-regulated learning. The systematic review by Xia and colleagues (2026) highlights such processes as setting individual goals, searching for and combining information, using problem-solving strategies, and receiving feedback. These processes fit naturally with chess learning, where students analyse games, identify the reasons for mistakes, and plan their next moves. At the same time, UNESCO (2023) recommends that generative AI in school settings be used according to human-centred and age-appropriate principles, with attention to data privacy and with teachers retaining responsibility for the pedagogical and ethical validation of content.

METHOD

The study was conducted at Yerevan Basic School No. 143 named after Movses Khorenatsi following a period in which digital and AI-supported tools had been incorporated into chess lessons.

The set of tools described in the study included the use, or potential pedagogical use, of Google AI Studio and Gemini/NotebookLM-type AI tools for lesson planning, preparing learning materials, and developing individualized assignments. Canva was used for visual and project-based activities, while videos and other interactive digital resources were incorporated into the lessons.

The questionnaire consisted of eight substantive questions. Students selected one response for the first six questions, while the final two allowed multiple responses.

The database contained 80 questionnaires. Because some responses were missing, the actual number of valid responses for individual questions was either 77 or 78.

The analysis was descriptive and was based on frequencies and percentages. Since the sample was a convenience sample from a single school and the questionnaire was administered only after the teaching experience, no statistical generalizations were made about the wider student population.

RESULTS

Students' overall evaluation of the lessons was very positive. Of the 77 students who answered this question, 60 (77.9%) selected **"I liked it very much,"** while 13 (16.9%) selected **"I liked it."** Taken together, these two positive categories accounted for 94.8% of responses. Three students (3.9%) rated the lessons as "normal," and one student (1.3%) said that they did not like them.

Table 1. Main Results of the Student Questionnaire

Indicator	N	Main positive response	%
Overall evaluation of the lessons	77	Liked it very much	77.9
Digital tools helped students understand the lesson better	77	Much easier and clearer	88.3
The program helped students understand an incorrect move	77	It immediately showed my mistake and helped me understand it	83.1
Experience of project work	77	Very interesting and helped me remember the lesson better	81.8
Willingness to do similar projects in the future	78	Yes, definitely	83.3

When students were asked which activity they found most interesting, 43 of 78 respondents (55.1%) chose interactive computer games and exercises. Eighteen students (23.1%) chose creating their own project, while 15 (19.2%) selected watching and analysing famous chess games. Two additional responses included all of the suggested options.

This pattern suggests that activities requiring students to act and respond immediately were particularly attractive. At the same time, project-based and analytical formats also appealed to a substantial proportion of the group.

Students also rated the educational usefulness of the digital tools highly. Of 77 respondents, 68 (88.3%) said that videos and interactive exercises made the lesson **"much easier and clearer,"** seven (9.1%) said that they helped somewhat, and only two (2.6%) noticed no difference.

When asked about understanding incorrect moves, 64 students (83.1%) said that the program immediately showed the mistake and helped them understand it. Twelve (15.6%) said that the program

was helpful, but that the explanation was not always clear, while one student (1.3%) noticed no difference compared with an ordinary lesson.

This minority response is worth paying attention to. Immediate digital feedback is not necessarily meaningful feedback. Showing a student that a move is wrong is one thing; helping the student understand why it is wrong is another. The latter still depends heavily on the quality of the explanation and, in many cases, on the teacher's intervention.

Project work received similarly positive evaluations. Of 77 respondents, 63 (81.8%) said that the project was very interesting and helped them remember the lesson better. Eleven students (14.3%) found it interesting but somewhat difficult, two (2.6%) regarded it as an ordinary assignment, and one (1.3%) found it boring and difficult.

Students were also asked whether they would like to take part in similar projects in the future. Of the 78 students who answered this question, 65 (83.3%) said that they definitely would, 12 (15.4%) said that they would if the topic was interesting, and only one student (1.3%) did not want to repeat the experience.

The multiple-response questions give a somewhat richer picture of what students would like to see in future lessons. Of the 78 respondents, 57 (73.1%) wanted more chess games and online competitions with classmates. Two slightly different formulations with the same meaning in the database were combined for this calculation. Forty-five students (57.7%) wanted more creative projects, 28 (35.9%) wanted films or videos about famous chess players, and 27 (34.6%) wanted more team or group work.

Students also identified several possible outcomes that went beyond the immediate chess content. Fifty of the 78 respondents (64.1%) said that the lessons helped them think more logically. Forty-eight (61.5%) felt that they had become more attentive to details, 44 (56.4%) believed that they had become better at using computers and new programs, and 42 (53.8%) said that they were better able to plan their own moves.

These findings need to be interpreted carefully. They reflect students' own perceptions of change; they are not objective measurements of improvement in logical thinking, attention, digital competence, or planning.

DISCUSSION

The most noticeable feature of the findings is not simply that students responded positively to "technology." Their strongest responses concerned things that were immediately useful to them: understanding the material more easily, seeing a mistake quickly, interacting with the task, and creating something of their own.

This pattern is consistent with earlier Armenian research on interactive chess education, where information technologies, different approaches to problem solving, group work, and reflection have been treated as components of active learning strategies (Gevorgyan et al., 2024). It is also in line with research on chess mini-games, where innovative game-based formats were associated with stronger student interest (Corpuz et al., 2024).

The results concerning feedback are particularly interesting. More than four out of five students reported that the program helped them identify and understand an incorrect move. Chess may be especially well suited to this kind of digital support because feedback can be linked to a concrete decision made by the learner. A student can return to the position, compare alternatives, and reconsider the reasoning behind a move.

Yet the responses also reveal an important limitation. For 15.6% of students, the program was useful but its explanation was not always clear. This suggests that the educational value of automated feedback depends not only on its speed or technical accuracy, but also on whether it can be understood by the learner. The teacher therefore continues to play an important mediating role.

The findings on project work point to a somewhat different function of technology. Here, its value seems to lie less in automated feedback and more in giving students a way to reorganize and communicate what they have learned. Creating a visual project requires students to select information, decide what is important, structure it, and present it to others. In that sense, technology becomes a tool for working with knowledge rather than simply receiving it.

The study also fits into the broader body of research on chess education in Armenian schools, where students' attitudes and forms of learning activity have been considered important components of effective teaching. Previous work on interactive strategies has emphasized active participation, problem solving, cooperation, and reflection. In the present small-scale study, interactive exercises and project work received particularly high evaluations, providing a practical classroom example that complements this line of research.

At the same time, the findings should not be taken to mean that AI or digital technologies objectively improved students' chess knowledge or cognitive abilities. The questionnaire primarily measured attitudes, perceived usefulness, and self-reported skills.

It is therefore more accurate to say that students showed a high level of acceptance of technology-enriched chess lessons and perceived these lessons as useful. This distinction is important. Enjoying an educational experience and learning more from it may be related, but they are not the same outcome.

The broader literature on AI-supported education points in the same direction. Systematic reviews and meta-analyses suggest that the effects of generative AI on engagement and learning depend on how tasks are designed, students' level of preparation, the quality of feedback, and the teacher's role in mediating the learning process (Lo et al., 2024; Deng et al., 2025; Chen & Cheung, 2025).

The most defensible interpretation of the present findings, therefore, is that digital and AI-supported tools helped create a learning environment that students experienced as engaging and useful. Whether the same tools also produced measurable gains in chess knowledge or broader cognitive skills remains an empirical question for future research.

CONCLUSION

The experience at Yerevan Basic School No. 143 suggests that chess lessons enriched with digital tools and elements of artificial intelligence were positively received by most students. Interactive exercises, rapid feedback, and project work received particularly high evaluations.

Most students reported that digital materials made chess content easier to understand, while project work made the learning experience more interesting and memorable. Students also associated the lessons with improvements in logical thinking, planning, attention to detail, and digital skills, although these findings represent self-perceptions rather than objectively measured changes.

From a practical perspective, digital tools seem most useful when they address a specific teaching need rather than simply being added to a conventional lesson. They may help explain a mistake, differentiate an assignment, visualize a chess position, support a creative project, or organize collaborative work.

When artificial intelligence is used, teacher oversight remains essential. AI-generated content needs to be checked, explanations need to be appropriate to students' age and level, and issues of privacy, data security, and equal access to digital resources need to be considered.

More broadly, existing research cautions against assuming that technology itself produces better learning. The educational value of AI depends on the way it is incorporated into the learning process. In the present study, digital and AI-supported tools appear to have contributed to a classroom environment that students found engaging and useful. Establishing whether they also improve chess achievement or broader cognitive skills will require a more rigorous research design.

LIMITATIONS AND DIRECTIONS FOR FURTHER RESEARCH

Several limitations need to be considered when interpreting the findings.

First, the study was conducted in a single school using a convenience sample. The results cannot therefore be generalized to other schools or groups of students without further research.

Second, there was no control group and no pre-intervention measurement. As a result, it is impossible to separate the possible effects of the digital tools from other factors, including the teacher's style, the attractiveness of the topics, the novelty of the activities, or students' initial attitudes toward chess.

Third, the questionnaire was developed specifically for this study and is not presented as a validated scale. Most of its questions were positively worded, which may have increased the likelihood of socially desirable responses or a tendency to agree with the statements.

Fourth, the database did not contain information on students' age or grade, gender, initial chess level, or previous experience with digital technologies. These variables might have helped explain differences in students' responses.

A stronger follow-up study would ideally include at least two groups: one receiving conventional chess instruction and another receiving technology-enriched instruction. Pre- and post-tests of chess knowledge would make it possible to examine actual learning gains. Where feasible, engagement or motivation could also be assessed using a validated instrument.

It would also be useful to examine the different components of the intervention separately. An interactive chess platform, AI-supported feedback, a Canva-based project, and video materials may not have the same effect. Studying them separately would make it easier to understand which tool contributes to which outcome.

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